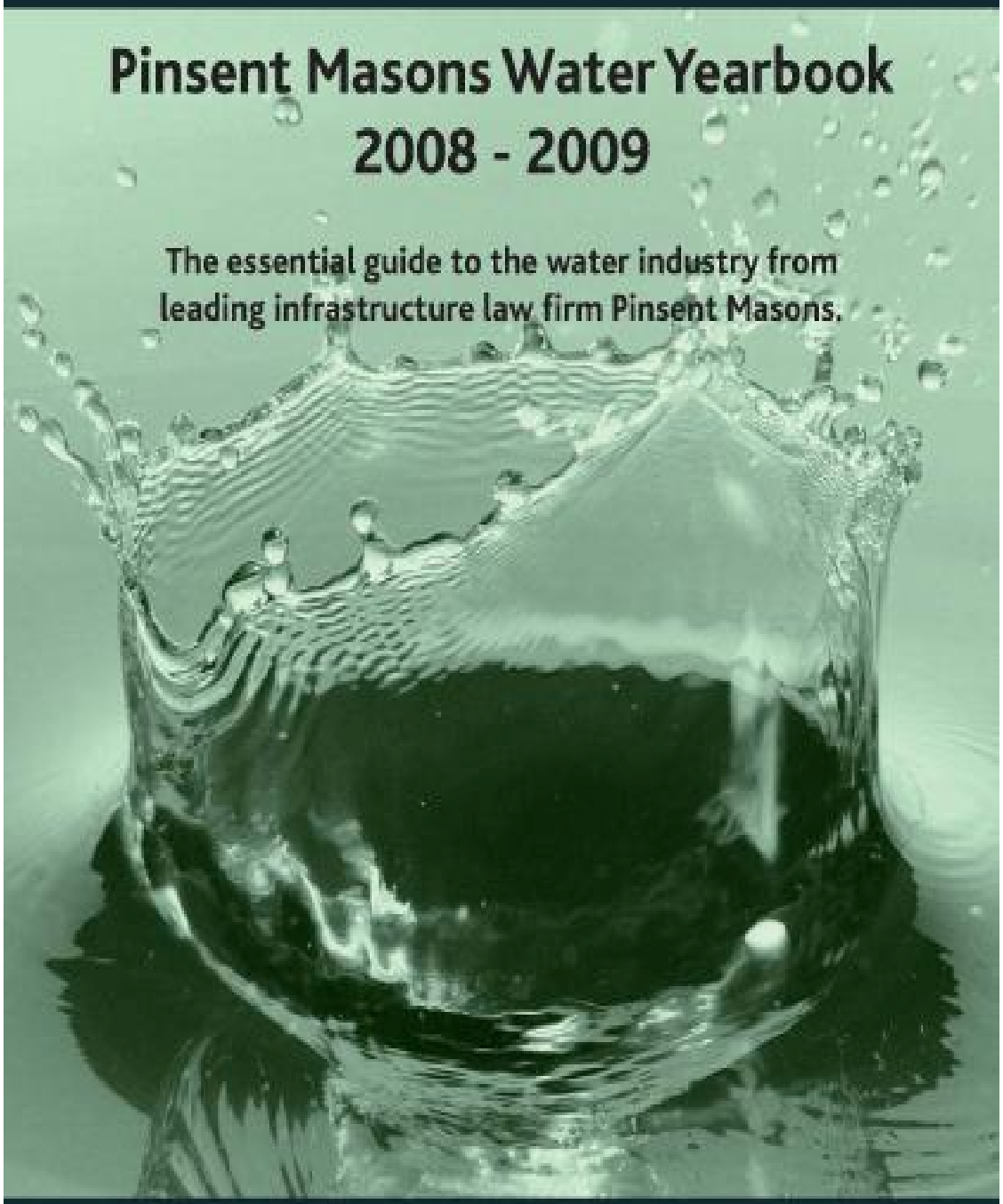
10th anniversary edition

Pinsent Masons Water Yearbook 2008 - 2009

The essential guide to the water industry from leading infrastructure law firm Pinsent Masons.



Pinsent Masons

Published by Pinsent Masons LLP

Pinsent Masons LLP
30 Aylesbury Street
London EC1R 0ER
Telephone: 020 7490 4000
Facsimile: 020 7490 2545
Email: enquiries@pinsentmasons.com
Website: www.pinsentmasons.com

ISBN (10) 0 9551747 4 0

ISBN (13) 978 0 9551747 42

Previous editions:
Pinsent Masons Water Yearbook 2007 – 2008 ISBN 0-9551747-3-2
Pinsent Masons Water Yearbook 2006 – 2007 ISBN 0-9551747-1-6
Pinsent Masons Water Yearbook 2005 – 2006 ISBN 0-9537076-9-5
Pinsent Masons Water Yearbook 2004 – 2005 ISBN 0-9537076-7-9
Pinsent Masons Water Yearbook 2003 – 2004 ISBN 0 9537076-5-2
Pinsent Masons Water Yearbook 2002 – 2003 ISBN 0 9537076 4 4
Pinsent Masons Water Yearbook 2001 – 2002 ISBN 0 9537076 2 8
Pinsent Masons Water Yearbook 2000 – 2001 ISBN 0 9537076 1 X
Pinsent Masons Water Yearbook 1999 – 2000 ISBN 0 9537076 0 1

PINSENT MASONS WATER YEARBOOK 2008-2009

PREFACE

Human foibles and their impact on every sphere of human endeavour condemn history to repeating itself and in few fields more persistently than the industrial sector, with its water component a contender perhaps for the wooden spoon.

Nationally and globally, it's an industry of habit, of fixed and restricted itineraries through foreseeable avenues of repetition which, in a novelist, say, might be reassuring in guaranteeing the reader a predictable and easy ride, but in an industry sector it's a threat to all that depend on it, especially the supply chain. This is a near-universal phenomenon, particularly in public service industries governed by contracts involving the private sector. Arguably, however, it's worse for publicly-owned service facilities where investment spending priorities are determined as much by political ideology and horse-trading as by social need.

The UK

To be fair to the industry at the national level, however, it's the regulatory regime, driven by legislation, that is ultimately responsible for the adverse consequences of this historical repetition. We're on the verge of the twentieth anniversary of water privatisation in England and Wales, a period throughout which recurrent themes of past Asset Management Programmes re-emerged with unfailing regularity, demonstrating the point. Lean threshold spending at the outset of a five-year investment programme, "balanced" by a tailing off again towards the end, and interspersed with a roughly three-year bounty period during which the supply chain is stretched to the full and beyond, have challenged the industry supply chain, stymied invariably by acute staff shortages triggered by the preceding famine period. It's a recipe for serial havoc, and long-term erosion of industry capacity, as suppliers are forced to grapple with the peaks and troughs that have seemed an implacable feature of the industry's landscape.

We may, however, be at the dawn of a revolution in industry practice. The water companies, in the run-up to PR09, have been obliged to submit Strategic Direction Statements (SDS) containing an overview within the scope of their draft business plans, for a twenty-five year period - a challenge of alignment of commercial aspiration and strategic vision, not to say creativity! The plans themselves envisage an unprecedented investment of GBP27bn - up from GBP17bn in the previous AMP period – in the years 2010-2015, with just three companies (Thames, United Utilities and Severn Trent) accounting for 50 percent of the total programme and Thames alone committed to more than GBP6.5bn over the period.

In addition, there are also signs of further change in industry practice, which suggest that the water companies may be moving away from the partnering arrangements of AMPs 3 and 4 by adopting a more hard-nosed approach to programme management. Delivery partners are

increasingly being expected to shoulder a greater burden of risk and undergo competitive tendering for additional work under the AMP, or individual projects.

In the south-east, all this inevitably begs an especially pertinent question of construction industry capacity. Whether, in particular, the clash between this major water industry spend, the huge Olympic games infrastructure programme and the imminent Cross Rail project is likely to put construction staff resources sufficiently under pressure to trigger escalating prices that will affect all three, not to mention the consumer, is a moot point.
The regulator, moreover, doubtless sensitive to mounting public and political concern over cost escalation in public and utility services across the board, has also placed greater emphasis on costs vs benefits, throwing in a new Capital Incentive Scheme aimed at rewarding more challenging and accurate cost forecasting and methodologies for achieving them.

Of course, whether measures such as these are substantive enough to add up to step-improvements in regulatory performance, with benefits to industry productivity and efficiency overall, as well as in service delivery, remains to be seen. And we shall all be watching.

The wider picture

A major UK national priority highlighted by the Pitt Review, and earlier neatly and dramatically demonstrated by the widespread flooding in parts of England in 2007, is for "urgent and fundamental changes in the way the country is adapting to the increased risk of flooding and in…..improving the country's flood resilience", a process in which our industry will have to play a leading and formative role.

As a priority, however, this is not a phenomenon confined to the UK, since climate change orthodoxy confidently predicts a global surge in extreme weather conditions, including flooding on an unprecedented scale, throughout the developed and developing world. While in theory this represents potential human catastrophe on a scale unknown since records began, it also offers enormous challenges for politicians and planners everywhere – and opportunities for the water industry.

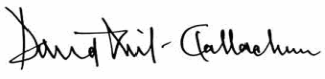
The author of this Yearbook, in common with other industry thinkers, has long advocated the more widespread adoption of private finance in the provision of water and wastewater services, as a means of accelerating infrastructure development, enhancing administrative transparency and combating the corruption rife in many countries. He does so once again in this latest edition, with his customary eloquence, his arguments given added force by the prevailing world financial crisis, not to mention the dwindling prospects for the Millennium Development Goals, a lesson, maybe, for the politicians responsible for this aspirational puff - less cant and posturing, more realism. However, in the absence of affordable and sustainable charging mechanisms in

many countries, it has to be debatable whether foreseeable returns will ever be sufficient to pull the private investor.

Local conditions will always ensure that problems will be unique to particular regions and localities, although the impact of flooding, for example, will always be aggravated by a cavalier approach to urban development in flood plains. While this might be unavoidable in some cases, it is wilfully and dangerously negligent in past and prospective development in England, for example, where a government has ridden roughshod over urban planning guidelines that were once the archetype for the world. Prudent development policies are needed to protect the public everywhere from disaster.

An abiding problem in all societies, however, is that, wherever we are, the urban legacy from the past will largely dictate the scope for future development, since we cannot re-locate conurbations to more convenient, or safer, locations. All development, moreover, imposes strains on infrastructure, notably water. This is an object lesson for the developing world - where creeping industrialisation fuels urbanisation and mushrooming water consumption - which is being heeded in some countries. It drives us irresistibly to policies aimed at encouraging the use of water wisely, technological innovation, the more judicious planning of water extraction practices and the areas that perhaps offer the greatest potential for relieving water stress - improved water-efficiency/re-use in all its forms and desalination. All of these practices are becoming widespread in many countries, including, for example, Australia, Israel and Singapore, who almost certainly lead the UK, where progress in these areas has been very limited. The potential is enormous, at the micro level as well as the macro, inter alia, through measures like rainwater harvesting, dual plumbing systems, greywater recycling to lavatories, water-efficient fittings, zero-flush urinals and the use of non-potable source water (recovered sewage effluent) for irrigation, among other conservation practices. These are solutions to some of the most pressing issues the world has ever faced which engage the international water strategy ambitions of governments, planning authorities and industry.

Pinsent Mason's Water Yearbook, now celebrating its tenth year, once again tells the story of the world water markets more illuminatingly and comprehensively than other industry reference works. It represents an outstandingly successful collaboration between **Pinsent Masons LLP**, the London-based international law firm specialising in the global water industry, and **Dr David Lloyd Owen** of **Envisager**, the specialist consultancy in environmental services for the water, wastewater and renewable energy sectors. It provides an incomparable market reference for which they are again to be congratulated for its unparalleled scope.



David Neil-Gallacher
Chief Executive of British Water

October 2008

Dr David Lloyd Owen

David Lloyd Owen is the CEO of Envisager Limited, a company that advises companies, investment banks and governments on water and waste management markets and their competitive, regulatory and environmental drivers. He was an equity analyst at UBS (Savory Milln) and BNP Paribas and founded Ecofin Limited in 1991 and has followed the water and waste management sectors since 1989. In addition to writing nine editions of the Pinsent Masons Water Yearbook, he has written three books on the water services sector in Europe, one on
water finance and is a columnist for Global Water Intelligence. He is Head of Research at WHEB Ventures, a non-executive director of EnviroGene Limited, a member of the advisory boards of Pictet Funds Water Fund and XPV Capita , and a member of Glâs Cymru Cyf (Dwr Cymru Welsh Water).

His publications include:

2006: Financing water and wastewater to 2025: From necessity to sustainability, Thomsons Financial, London

2002: The European Water Industry: Market Drivers and Responses. CWC Publishing, London

1999: Making Waves Overseas, West LB, London

1998: The European Water Industry: A country-by-country analysis

Financial Times Energy, London

1998: European Water Company Profiles

Financial Times Energy, London

Pinsent Masons Water Sector Group

Pinsent Masons LLP is a full service law firm with around 280 partners, a total legal team of around 1100 and more than 1600 staff in the UK and internationally.

The firm's Water Sector Group has extensive experience on a world-wide basis of water, wastewater, desalination, and industrial water reuse projects, many of them procured on a BOT basis or on a Public/Private Partnership basis, as well as of water resource management issues, and of corporate issues encountered by water utilities.

Pinsent Masons Water Sector Group also has significant experience in the field of regulatory law issues relating to water.

The Water Sector Group was recently awarded a Distinction by Global Water Intelligence in the Global Water Law Firm of the Year Category at the Global Water Awards in April 2008.

The Water Sector Group regularly holds Wet Network events to promote the introduction of new technology into the global water sector.

Examples of recent projects include the following:

- advising one of the largest water treatment companies in the world and a blue-chip conglomerate in Hong Kong in respect of a foreign direct investment in a water treatment plant in Chongqing, People's Republic of China;

- advising a bidder on its bid for the Riyadh Water Privatisation;

- advising a bidder in connection with the Jeddah Water Privatisation;

- acting for the concessionaire on its negotiations with the Government of Pakistan for a desalination concession project to be located in Karachi;

- advising a major Singapore based contractor on risk allocation and contractual arrangements for various water process unit projects in Dubai, including Palm Jumeirah;

- advising the Degremont/Besix joint venture in connection with the Jumeirah Golf Estates wastewater treatment plant concession;

- advising United Utilities on procurement of an extension to their Mersey Valley site process treatment plant and de-watering facilities, including the addition of a new incinerator;

- advising a member of the EPC construction consortium on its successful bid for the USD3.5billion Marafiq desalination project at Jubail, Saudi Arabia;

- advising a member of the EPC construction consortium on its successful bid for the Ras Laffan C desalination project in Qatar;

- advising an international operator in its bid for a water and electricity distribution operations and maintenance contract in Abu Dhabi;

- advising in connection with the restructuring and refinancing of the Ajman wastewater concession project;

- advising a bidder in connection with the USD200million Taweelah desalination project in Abu Dhabi;

- advising United Utilities on their AX4 programme under which they are procuring all capital works for their water and electricity businesses from 2005 to 2010. This is one of the largest procurement programmes in the utilities industry: value GBP4billion;

- advising a bidder on its bid for Project Aquatrine, the UK Ministry of Defence project to outsource its water and wastewater functions under the Private Finance Initiative;

- advising on a major industrial water outsourcing project in the UK;

- advising a UK Utility Group, part of the preferred bidder consortium, on the Engineering Procurement Construction contract issues (Package 1), in connection with the design, build and operation of a water treatment plant in Beijing. Beijing No. 10 is the fourth formal BOT project in China;

- advising a member of a bidding consortium in connection with the Disi-Amman water conveyor BOT project in Jordan;

- advising part of a consortium bidding for the Dublin Bay Ringsend Treatment Works wastewater project in Dublin;

- acting for the Government of Sri Lanka on the Greater Negombo Water PSP project;

- advising the South African Department of Water Affairs and Forestry on the form of model contracts to regulate water services for the benefit of South African municipalities;

- acting for the preferred bidder in connection with the Levenmouth Wastewater Treatment project in Scotland. This is a bond financed project procured under the UK Government's Private Finance Initiative;

- advising administrators to a mineral water company on the transfer of abstraction licenses;

- advising OFWAT on an appeal to the Competition Appeal Tribunal by Aqua Resources Limited;

- advising PAI Partners on the UK aspects of their EUR1.7billion disposal of water company SAUR to a consortium led by Caisse des Depots.

For further details of Pinsent Masons' capabilities and experience in the water, wastewater, desalination and industrial water re-use sectors, and of the firm's capabilities and experience in the regulatory field, contact **Mark Lane**, Head of the Water Sector Group, at:

Pinsent Masons	
30 Aylesbury Street	
London	
EC1R 0ER	
Tel:	+44 (0)20 7490 4000
DDI:	+44 (0)20 7490 6214
Mobile:	+44 (0)7860 872533
Fax:	+44 (0)20 7490 2545
Email:	mark.lane@pinsentmasons.com
Web:	www.pinsentmasons.com

CONTENTS

Please click on page numbers for link to relevant section

INTRODUCTION

This is the 10th edition of the Pinsent Masons Water Yearbook, and thanks to the onward march of new companies and contracts across the world, the tome continues to grow in substance, even after being split into its current bi-annual reporting cycle. This edition marks the completion of the second cycle of the 'new series' and has benefited from new information sources, especially for smaller companies, which throws more light on the emergence of local players, especially in India, East Asia and Latin America.

Company changes

13 new company entries have been made in this edition, four in China, four in the USA (one of which specialises in the Chinese market) and one each in Chile, India, the Philippines, Japan and Thailand. In addition, the seven name changes include two companies who have floated their shares on the market (Cascal and Epure International).

The return of American Water Works has been most welcome, especially due to the improved information flow about the leading player in the USA. There is a glorious circularity about the partial divestment of Suez Environnement after the Suez – Gaz de France merger. La Lyonnaise became Lyonnaise Dumez in 1991 and Lyonnaise des Eaux again in 1993 only to be renamed Suez in 1997. The emphasis in the companies reporting since the flotation shows that Suez Environnement has made a return to its roots. The information provided by Thai Tap, Epure and Cascal has also been of great value.

Nine companies have left, but in reality, this is eight as RUAS (acquired by Veolia) was bubbling under for a company entry. This time five companies have left from Asia, in three cases, due to IPOs (Manila Water and Thai Tap) or a partner company taking overall control of their interests (Maynilad Water), because of the sale of their water interests (Xinjiang Huitong) and in the case of Marubeni, because Berlinwasser International was never in fact acquired.

16 companies are currently held by financial investors, one in France, two in the USA, five in Chile and eight in the UK, including three of the ten water & sewerage companies. This is a net increase of five since 2006, with one company (SmVaK of the Czech Republic) being sold by its private investor to a listed company (FCC of Spain), the first such exit noted to date. SAUR is set to follow in the medium term, as Séché Environnement (a French waste management company) has the option to buy out its financial partners at an appropriate date. For the believers in the highly geared private equity, interesting times lie ahead, especially when it comes to financing new capital obligations and realising one's investment at a time of cheap equity and costly capital.

Companies covered

While the number of companies meriting a full entry has grown by 112% over the previous decade, the proportion of those from developing economies had surged from 12% to 35%. China, India and the Philippines have taken the lead here, with the number of countries contributing a company entry having increased from 13 to 28.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Number of countries	13	15	16	15	18	22	28	27	27	28
Number of companies	70	81	82	84	102	117	128	142	145	150
- OECD countries	59	69	70	68	73	72	77	74	75	78
- Advanced developing	2	2	2	2	6	13	13	18	19	20
- Developing	9	10	10	14	23	32	38	50	51	52

The size of the sector continues to grow

In 1999, 5% of the world's population was served to some extent by the private sector. Since 2006, this had increased to 10% of the world's population and to 11% in 2007 and 2008, with between 731 and 751million people served. As the sector grows (there were some 272

contracts in 1999 against 935 in the current edition) the balance of growth moves away from Western companies with well staffed press offices to combing annual reports, conference presentations and sectoral studies. Thus a time lag of a year or more can emerge between a contract's award and its being identified.

A new set of forecasts looks to 2025

Our revised forecast for the extent of PSP in 2015 is 1,161million, an upwards adjustment of 13million on the forecast made in 2007. As a proportion of the forecast 2015 global population it remains steadily at 16%. It is gratifying to realise that in ten sets of forecasts, the proportion has remained within a 15-17% range. But 2015 is not as distant as it appeared back in 1999 so it is timely to introduce a new set of forecasts, that project PSP covering 1,538million people by 2025, or 19% of the population. That may not appear to be wildly ambitious.

And to grow more diverse

The entire nature of the market has changed over the past half decade. While the 'big two' remain the clear market leaders, the perceived global domination of the former 'big five' is rapidly becoming a memory. As Agbar and SAUR develop more focussed strategies and RWE winds up its interests outside Germany and Central & Eastern Europe, the market share enjoyed by the 'big five' is set to slip from a peak of 73% reached in 2001 to 39% by the end of 2008. Once RWE eases its holding in American Water Works below 50%, this will fall to a pro forma 37%. The 'Big Five' is becoming an increasingly fluid concept, as Suez takes control of Agbar and RWE continues to experience contractions. Perhaps a new member ought to come from one of the major companies in China and Brazil.

The number of stable, long term international contracts held by Veolia Environnement and Suez Environnement has shown a steady rise since 2006. Meanwhile, the stated numbers served in France by Veolia and Suez have both been pared back since 1995, due to the elimination of double counting as jointly held contracts are prised apart. In addition, by the time the next edition comes round, we will have a proper idea about what the changes in Eau de Paris will mean for the companies. To what extent will the ending of the original contract be replaced by a plethora of outsourcing and other sub-contracts?

Still a contentious sector to operate in

Since 1997, contracts involving 64million people have ended, some 10% of all identified contracts, and it thus represents a high attrition rate. Encouragement is to be drawn from the stabilising of this attrition rate since 2006, but according to the World Bank, 29% of contracts (in terms of total investment) were either cancelled or in distress in 2006, compared with 4-9% for telecoms, electricity and transport, even if this represents an improvement from 37% in 2005.

And one which needs to be taken seriously

Water will never be a simple sector to operate in and communicating its complexities remains an urgent priority. Since 2006, there has been a dearth of new initiatives by the sector to provide serious, engaged research into their role. Working with UNCTAD on this year's World Investment Report was sometimes an exercise in firefighting, as myths about the sector (just one million people connected by PSP since 1993 for example) have taken hold due to the absence of accessible evidence to the contrary.

The grim progress being made towards the water and sanitation Millennium Development Goals especially in Sub-Saharan Africa and South Asia are a direct result of water and sanitation not being taken seriously by politicians, companies and civic society as a direct result of their being de-commodotised. Expecting the informal operators, such as water vendors to fill this gap is missing the point. They exist because there is nothing being provided by the incumbent utilities. They in effect exploit underinvestment by forcing the poor to pay more for an even poorer service. That people are willing to pay should not be a question – the challenge is to informal services within the formal sector to boost the level of people with adequate water and sanitation services at affordable prices.

Another concern is the impact of demographic change and climate change. According to Government projections in 2007, Britain may have a population of 87million in 2056 (high population growth scenario) while the Environment Agency in 2008 warned that summer river levels will be 30-50% lower by 2050. Developing and imposing water efficiency and management targets are as urgent and challenging as those being put forward in response to rising carbon emissions.

America shuffles inwards again

The sale and splitting up of Earth Tech's water outsourcing activities marks the effective ending of companies in the USA operating in a number of countries globally. Another area of uncertainty lies in the future direction of GE, where concern has been expressed about the pace and profitability of the company's move into the water utility, CleanTech and environmental services sectors. Niche companies such as Han's Water continue to develop a contrary view.

Multi utilities fade from sight but waste returns

United Utilities in the UK is no longer an asset owning power provider and Suez Environnement has been eased away from the merger of Suez and Gaz de France. Amongst the major players, the multi utility strategy for the time being is becoming very much the exception rather than the norm it appeared to becoming a few years ago. Rather like water and waste management, water and power utility management have much in common on the surface, but deeper differences endure, especially when the regulatory climate moves on. And as the regulatory and market climate moves on again, so it is fascinating to see how water and waste management alliances are developing again as seen by Remondis in Germany, Séché in France and industrial wastewater outsourcing projects worldwide.

Taking the Yearbook forward

The task of assembling each edition of this Yearbook provides a mass of new insights into the market and its modus operandi. Each edition gets closer to its goal of providing a true and fair view about the markets and companies that serve them and this year has been productive in finding new players in India and China. The narrow range of market size estimates reflects the improved understanding about the size of the formal market. The author is responsible for any errors and omissions that may occur in this Yearbook. He is thus grateful for any feedback and suggestions so that future editions can rectify them and more closely reflect the needs of its readers. This feedback lay behind the splitting of the Yearbook into its current format in 2005. With the emergence of new contracts and companies, there may come a time when a three year cycle (Europe, the Middle East and Africa / Asia / the Americas?) might be needed.

Dr David Lloyd Owen

October 2008

HOW TO USE THIS BOOK

The Pinsent Masons Water Yearbook is divided into four parts. Part 1, The World of Water takes a look at trends noted in water and wastewater services worldwide over the past 12 months and considers how these are set to evolve. Part 2 covers countries of interest in Asia and the Americas to those involved in providing water and wastewater services. Part 3 covers companies providing these services that are wholly or partly in the private sector; firstly the major international players and then companies based in Asia and the Americas. The Appendices make up the final part and provide background data about the sector, a Glossary of Terms and Abbreviations used in the Yearbook and a listing of the main references used.

Country entries

Population and economic data is given in order to provide an indication of demographic trends and the current state of economic development. The former outlines the size of the potential market, while the latter highlights affordability issues and spending priorities. The surface water and ground water data boxes outline how much water is available in each country on an annual basis, along with how much is currently being taken out. For groundwater, water availability relates to the annual natural recharge of water into water bearing rocks. For surface water, this refers to water that is in an abstractable form, entering rivers, streams and lakes whether through rainfall or rivers in neighbouring countries. Generally, any country that takes more than 25% of these renewable resources is likely to be facing at least regional water shortages.

Two tables containing information about companies and contracts in each country aim to provide access to company entries. Where reference is made to specific data, it is mentioned in the country entry. Otherwise, a range of global and regional overviews have been used for compiling the common data entries. Details can be found in the References section in the Appendices.

Company entries

The country entries provide a description of how each company became involved in the sector and its overall strategies, when known. Wherever possible, a Profit & Loss account is provided along with contact data (company address, main switchboard, and web site, along with senior management) and details about water and wastewater services in their home and international markets. While the company contact details are as up to date as possible, the turnover in senior management seen in the sector means that sometimes names change between, for example, Annual Reports being published. In addition, wherever possible, international contracts are tabulated to show [1] year of contract award, [2] city/region, [3] contract type and duration and [4] population served and service provided.

Appendices

Three appendices provide an overview of the drivers affecting the water and wastewater service sectors, where the private sector fits in (or does not) and pertinent issues affecting the role and responsibilities of private sector players including risk management, assisting in meeting the Millennium Development Goals and joint initiatives.

Glossary

The water and wastewater sectors are not immune to jargon and acronyms, especially the TLA (triple letter acronym). The Glossary at the back of the Yearbook provides an explanation of those examples that are to be found in this book. As with definitions of contract types, definitions of certain terms can vary. In this book, we have kept with the most commonly accepted definitions and those that are most likely to be of relevance to potential readers.

References

As well as outlining the major studies that have provided the basis for the country data entries, the references are divided into thematic sections to provide a selection of the more pertinent publications about water and wastewater services and their political, social, environmental, economic and regulatory contexts. Web sites are not included in this section due to their transient nature, especially when it comes to accessing pages within a particular site, but this will be reviewed in future editions.

PART 1: THE WORLD OF WATER 2008-09

THE WORLD OF WATER 2008-09

CORPORATE CHANGES, 2007-2009

16 companies are currently held by financial investors, one in France, two in the USA, five in Chile and eight in the UK, including three of the ten water & sewerage companies. This is a net increase of five since 2006, with one company (SmVaK of the Czech Republic) being sold by its private investor to a listed company (FCC of Spain), the first such exit noted to date. SAUR is set to follow in the medium term, as Seche Environnement (a French waste management company) has the option to buy out its financial partners at an appropriate date.

13 new company entries have been made in this edition, four in China, four in the USA (one of which specialises in the Chinese market) and one each in Chile, India, the Philippines, Japan and Thailand. In addition, the seven name changes include two companies who have floated their shares on the market (Cascal and Epure International).

The return of American Water Works has been most welcome, especially due to the improved information flow about the leading player in the USA. There is a glorious circularity about the partial divestment of Suez Environnement after the Suez – Gaz de France merger. La Lyonnaise became Lyonnaise Dumez in 1991 and Lyonnaise des Eaux again in 1993 only to be renamed Suez in 1997. The emphasis in the companies reporting since the flotation shows that Suez Environnement has made a return to its roots. The information provided by Thai Tap, Epure and Cascal has also been significant.

Nine companies have left, but in reality, this is eight as RUAS (acquired by Veolia) was bubbling under for a company entry. This time five companies have left from Asia, in three cases, due to IPOs (Manila Water and Thai Tap) or a partner company taking overall control of their interests (Maynilad Water), because of the sale of their water interests (Xinjiang Huitong) and in the case of Marubeni, because Berlinwasser International was never in fact acquired.

Financial sector parent companies [1]

Operating Company	Private Equity / Bank
Utilities Inc (USA)	AIG (USA)
South Staffs Water (UK)	Alinda Infrastructure Fund (USA)
ESSCO (Chile)	Aguas Neuvas (Chile)
ESVAL (Chile)	Ontario Teachers Pension Plan (Canada)
East Surrey Water (UK)	Deutsche Bank (Germany)
Aquarion (USA)	Macquarie (Australia)
Thames Water (UK)	Macquarie (Australia)
AWG (UK)	Osprey Acquisitions (Canada)
SAUR (France)	Seche Environement, CDC & AXA (France)
Southern Water (UK)	JP Morgan (USA)
ESSEL (Chile)	Ontario Teachers Pension Plan (Canada)
ESSBIO (Chile)	Ontario Teachers Pension Plan (Canada)
ANSM (Chile)	Ontario Teachers Pension Plan (Canada)
Portsmouth Water (UK)	South Downs (UK)
Mid Kent Water (UK)	Westpac (Australia)
South East Water (UK)	Westpac (Australia)

Water operating subsidiaries

Operating Company	Parent Company(s)
Aqualia (Spain)	FCC (Spain)
Bristol Water (UK)	FCC (Spain)
Cambridge Water (UK)	Cheung Kong Holdings (China)
Cascal (UK)	Biwater (UK)

Earth Tech (USA)	Tyco International (USA)
Earth Tech (USA)	AECOM (USA)
EMC (USA)	BOC (UK) / Linde (Germany)
Ondeo / Lyonnaise des Eaux	Suez Environnement (France)
SmVaK (Czech Republic)	Aguas de Barcelona (Spain)
Veolia Water / Generale des Eaux	Veolia Environnement (France)
Wessex Water (UK)	YTL Holdings (Malaysia)

Major corporate changes since 2007

New Entries

AECOM (USA)	Acquisition of Earth Tech from Tyco
American Water Works (USA)	Partial IPO
Bio Treat Technologies (China)	Identified as significant player
China Water Affairs (China)	Identified as significant player
China Water Industry (China)	Identified as significant player
China Water Industry Investment (China)	Acquired water utility Xinjiang Huitong
ESSBIO (Chile)	Sold by Thames Water / RWE
Global Water Resources (USA)	Regulated water utility in Arizona
Han's Technologies (USA)	Identified as significant player
JUSCO (India)	Identified as significant player
Metro Pacific (Philippines)	Acquired majority of Maynilad Water
Mitsui (Japan)	Acquisition of Earth Tech's Mexican contracts
Thai Tap (Thailand)	IPO

Companies Removed

Benpres (Philippines)	IPO of Manila Water
BIW (USA)	Sale of activities to Connecticut Water
CK Karnchang (Thailand)	Thai Tap IPO
DM Consunji (Philippines)	Metro Pacific holds majority of Maynilad Water
Iberdrola (Spain)	Sale of ESSAL to Aguas Andinas
Marubeni (Japan)	Non-acquisition of Berlinwasser International
Meta Modena (Italy)	Acquired by Hera
RUAS (France)	Acquired by Veolia Environnement
Xinjiang Huitong (China)	Sale of water utility to CWIIG

Name Changes

Beijing Sound (China)	Epure International (Singapore)
Biwater (UK)	Cascal
China Evergreen Environmental (China)	China Water Group
Consorcio Financiero (Chile)	ESVAL
Eco Water (Malaysia)	EMS Energy
Shanghai Municipal Water (China)	Shanghai Chengtou Holding
Suez (France)	Suez Environnement

[1] Companies held by private equity houses and banks: As these are financial rather than operating holdings, these are typically classified under the operating company's name and country.

NUMBER OF PEOPLE SERVED BY COUNTRY AND COMPANY

Developments during 2007-08

After the dramatic setbacks noted in 2003 and 2004, with contracts being handed back and a cooler corporate attitude towards seeking contracts in developing economies, 2005 saw an upsurge in business in Europe and Asia, along with a more difficult operating climate in Latin

America and Sub-Saharan Africa. During 2006-07, this continued, with the end of the corporate clear out in Argentina and Bolivia and a continued resurgence of activity in Brazil and China.

As in 2006, there was a boost to numbers for earlier years as information has filtered through about contracts awarded in 2006 and 2007, which is particularly important in China, where information tends to take some time to emerge.

PSP contracts awarded by year (million people served)

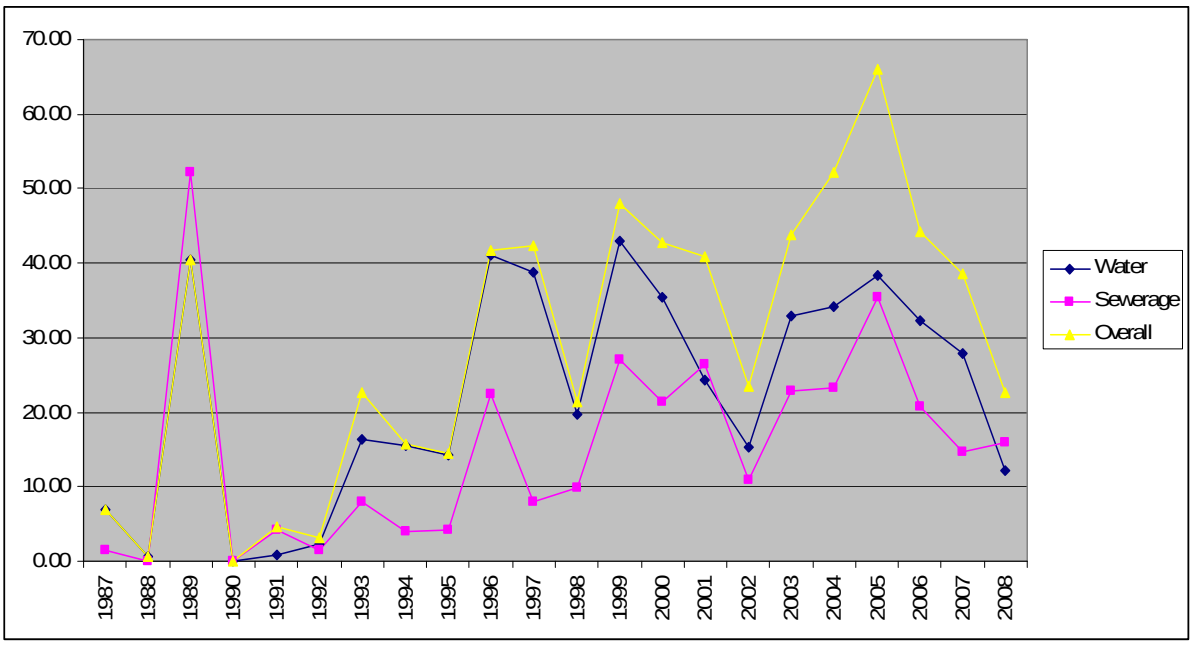
	Water	Sewerage	Overall	Number
1987	7.00	1.50	7.00	2
1988	0.54	0.00	0.54	1
1989 [1]	40.47	52.25	40.47	13
1990	0.00	0.00	0.00	0
1991	0.74	4.27	4.54	4
1992	2.26	1.56	3.05	6
1993	16.34	8.00	22.54	14
1994	15.42	3.94	15.82	27
1995	14.23	4.27	14.44	25
1996	41.02	22.33	41.74	32
1997	38.73	7.95	42.42	42
1998	19.79	9.81	21.38	31
1999	42.88	27.13	48.02	75
2000	35.44	21.43	42.72	72
2001	24.34	26.44	40.80	58
2002	15.20	10.83	23.46	43
2003	32.91	22.75	43.70	79
2004	34.13	23.35	52.12	115
2005	38.45	35.34	65.98	109
2006	32.29	20.73	44.26	76
2007	27.96	14.69	38.52	65
2008 [2]	12.18	15.88	22.56	46
Total	**492.32**	**334.45**	**636.08**	**935**

[1] Sewerage privatisations in England & Wales not added to the overall year total as these areas had been served for water by the Statutory Water Companies

[2] To the end of September

As shown on the following graph, when taking into account the one to two year lead effect of contracts filtering through, overall activity in terms of the number of PSP awards, the number of people being connected to new projects is continuing to advance at a steady rate.

Graph: PSP awards – million people per year, 1987-2008



Cumulative total of contract awards, 1987-08

	Water	Sewerage	Overall	Number
1987	7.00	1.50	7.00	2
1988	7.54	1.50	7.54	3
1989 [1]	48.01	53.75	48.01	16
1990	48.01	53.75	48.01	16
1991	48.75	58.02	52.55	20
1992	51.01	59.58	55.60	26
1993	67.35	67.58	78.14	40
1994	82.77	71.52	93.96	67
1995	97.00	75.79	108.40	92
1996	138.02	98.12	150.14	124
1997	176.75	106.07	192.56	166
1998	196.54	115.88	213.94	197
1999	239.42	143.01	261.96	272
2000	274.86	164.44	304.68	344
2001	299.20	190.88	345.48	402
2002	314.40	201.71	368.94	445
2003	347.31	224.46	412.64	524
2004	381.44	247.81	464.76	639
2005	419.89	283.15	530.74	748
2006	452.18	303.88	575.00	824
2007	480.14	318.57	613.52	889
2008 [2]	492.32	334.45	636.08	935

[1] Sewerage privatisations in England & Wales not added to the overall year total as these areas had been served for water by the Statutory Water Companies

[2] To the end of September

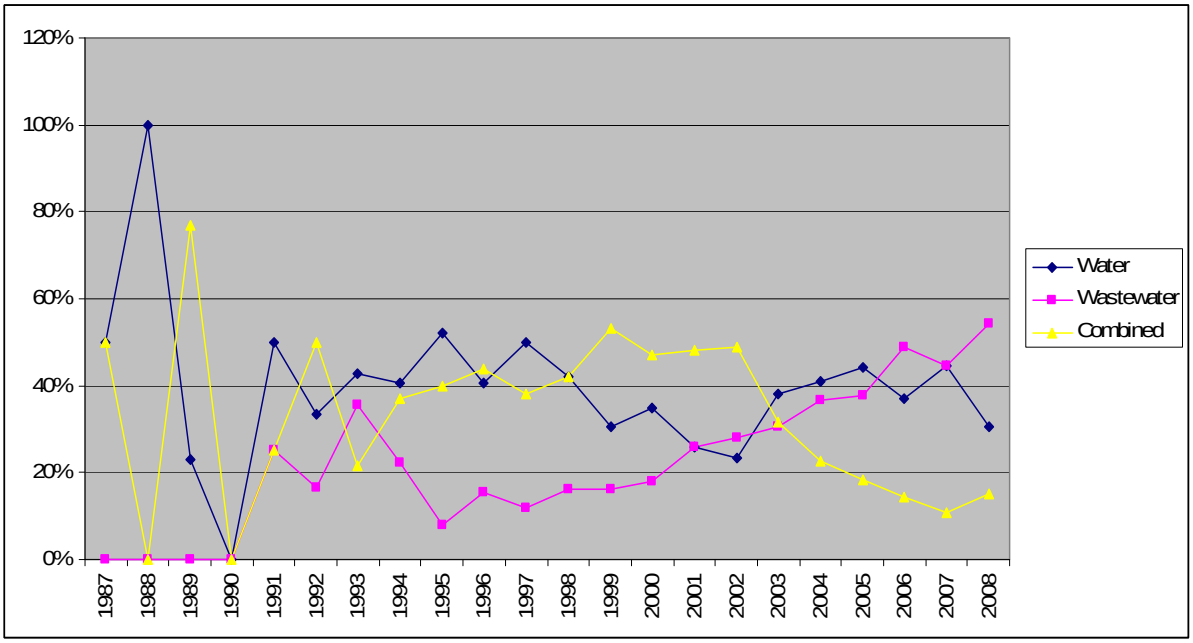
At the time of writing, 935 contracts had been identified, which compared with 818 in 2007 which was in turn a notable increase on the 548 contracts identified for the 2007 edition. It is increasingly evident that contracts in certain countries (especially in China) are not being identified for some time after their initial award, along with new data sources becoming available. The number of Singapore and Shanghai listed companies posting full annual reports and regulatory updates has made a material impression here.

Frequency of contract awards, by year

	Water	Wastewater	Combined	Contracts
1987	1	0	1	2
1988	1	0	0	1
1989	3	0	10	13
1990	0	0	0	0
1991	2	1	1	4
1992	2	1	3	6
1993	6	5	3	14
1994	11	6	10	27
1995	13	2	10	25
1996	13	5	14	32
1997	21	5	16	42
1998	13	5	13	31
1999	23	12	40	75
2000	25	13	34	72
2001	15	15	28	58
2002	10	12	21	43
2003	30	24	25	79
2004	47	42	26	115
2005	48	41	20	109
2006	28	37	11	76
2007	29	29	7	65
2008	14	25	7	46
Total	**355**	**280**	**300**	**935**

The increasing frequency of sewerage and sewage treatment contract awards since 1999 has been maintained. This has also been reflected by an increasing tendency for local companies to gain these contracts, which until 1995 were regarded as being almost exclusively the domain of companies operating in or from OECD economies.

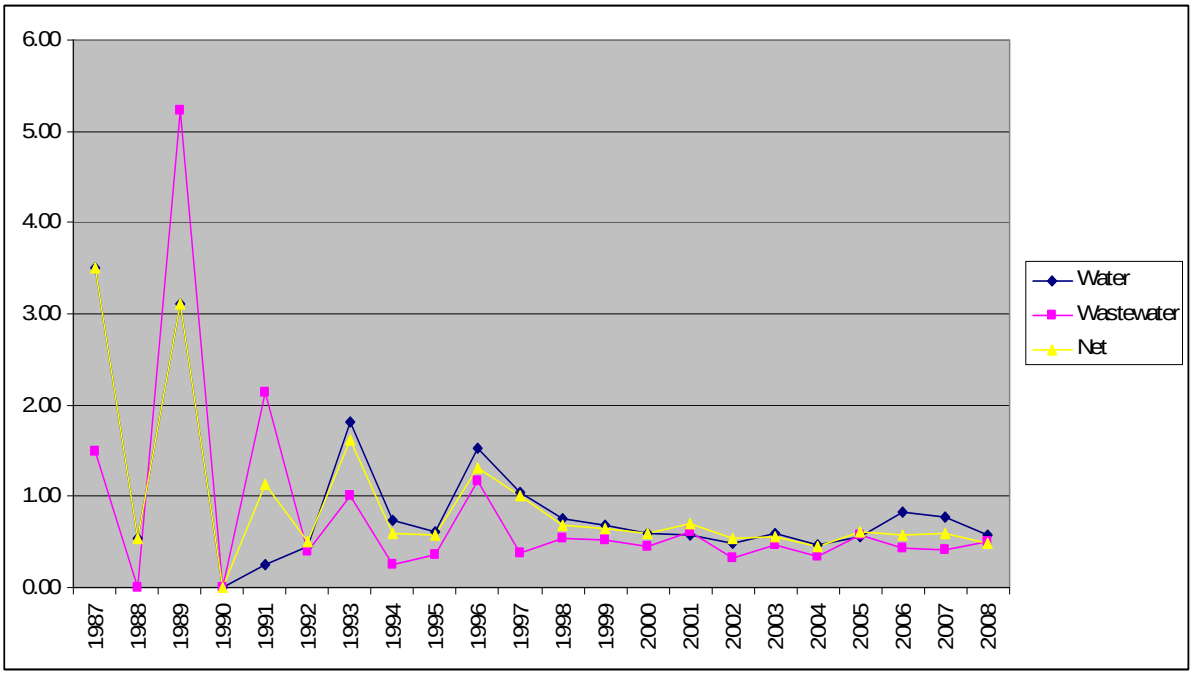
Graph: Contract award by type (% - 1987-08)



Average size of contract awards (millions of people)

	Water	Wastewater	Net
1987	3.50	1.50	3.50
1988	0.54	0.00	0.54
1989	3.11	5.23	3.11
1990	0.00	0.00	0.00
1991	0.25	2.14	1.14
1992	0.45	0.39	0.51
1993	1.82	1.00	1.61
1994	0.73	0.25	0.59
1995	0.62	0.36	0.58
1996	1.52	1.18	1.30
1997	1.05	0.38	1.01
1998	0.76	0.55	0.69
1999	0.68	0.52	0.64
2000	0.60	0.46	0.59
2001	0.57	0.61	0.70
2002	0.49	0.33	0.55
2003	0.60	0.46	0.55
2004	0.47	0.34	0.45
2005	0.57	0.58	0.61
2006	0.83	0.43	0.58
2007	0.78	0.41	0.59
2008	0.58	0.50	0.49
Average	**0.76**	**0.58**	**0.68**

Graph: Average size of contract awards (millions of people)



The volume of contracts remains high, underlining the development of local, small scale contract awards, especially for water. Wastewater only contracts continue to be scarcer, reflecting their lower perceived priority. Wastewater contracts tend to be smaller, due to a number of major bulk water contracts as well as sewerage services being less extensive than water provision services at the start of a typical privatisation. Even so, the gap has eased since 1998.

The average contract size has diminished since the 1990s, with the move away from mega-contracts to more local and possibly less contentious contracts. 1993, 1996 and 1997 for example are now remembered for Buenos Aries, Manila and Jakarta respectively, which with the exception of Manila Water, have had their share of eventful moments.

World Bank data - Where the money goes in the developing world

The World Bank's 2008 water & sanitation sector review covers all loans for contracts in all developing economies between 1990 and 2007. All the data in this section is adapted from this report.

Overview of World Bank water & sewerage PSP lending, 1990 to 2007

Number of countries with private participation	60
Projects reaching financial closure	584
Region with largest investment share	East Asia (48%)
Type of PPI with largest share in investment	Concessions (68%)
Type of PPI with largest share in projects	Concessions (40%)
Projects cancelled or under distress	53 representing 29% of total investment

The distress level of 29% compares poorly with Electricity (8%), Telecoms (4%) and Transport (8%). It is a marginal improvement from the 31% level in 2006. While the quality of the World Bank's overall water and sewerage lending portfolio has improved in recent years (see the Appendices), problems in South East Asia and Latin America are reflected in the very high rate of funding covered by projects either cancelled or under distress.

Cancelled or under distress projects and investment by region (USDmillion)

Region	Projects	Total Investment
East Asia and Pacific	23	7,724
Europe and Central Asia	2	8
Latin America & Caribbean	24	8,632
Middle East and North Africa	1	0
Sub-Saharan Africa	3	9
Total	**53**	**16,373**

Number of projects by region and year of financial closure

Financial closure	East Asia & Pacific	Europe & Cent Asia	Latin America	MENA	South Asia	Sub-Saharan Africa	Total
1990	0	0	0	0	0	0	**0**
1991	0	0	1	0	0	1	**2**
1992	1	0	3	1	0	1	**2**
1993	3	1	6	0	0	1	**6**
1994	4	0	10	0	0	0	**11**
1995	4	3	10	0	0	1	**18**
1996	5	2	15	1	0	1	**24**
1997	14	3	22	0	0	0	**39**
1998	13	2	16	0	0	1	**32**
1999	8	6	21	2	1	5	**38**
2000	13	6	18	0	1	1	**39**
2001	13	4	16	0	0	4	**40**
2002	20	4	17	1	0	2	**44**
2003	26	9	7	1	1	1	**44**
2004	29	5	18	0	1	0	**53**
2005	43	6	6	4	0	1	**61**
2006	42	9	3	1	0	2	**57**
2007	44	3	4	4	5	2	**62**
Total	**282**	**61**	**193**	**15**	**9**	**24**	**584**

The number of projects invested in year by year has eased upwards, with a recent shift away from Latin America to East Asia and a constant level of activity for Eastern Europe and Central Asia.

Investment in projects by region and year of investment (USDmillion)

Year of investment	East Asia & Pacific	Europe & Cent Asia	Latin America	MENA	South Asia	Sub-Saharan Africa	Total
1990	0	0	0	0	0	0	**0**
1991	0	0	75	0	0	0	**75**
1992	284	0	0	0	0	0	**284**
1993	2,558	0	4,071	0	0	0	**6,629**
1994	821	0	525	0	0	0	**1,346**
1995	520	10	1,293	0	0	0	**1,823**
1996	149	942	192	0	0	20	**1,304**
1997	8,033	196	1,933	0	0	0	**10,161**
1998	943	108	1,276	0	0	0	**2,327**
1999	273	6	6,011	0	0	82	**6,372**
2000	4,064	1,288	2,845	0	0	31	**8,229**
2001	673	300	1,165	0	2	3	**2,143**
2002	934	51	604	0	0	0	**1,589**
2003	697	324	296	169	0	9	**1,494**
2004	3,127	401	1,133	0	111	0	**4,772**
2005	991	311	190	510	0	0	**2,001**
2006	1,554	411	3,713	0	0	0	**2,677**
2007	1,605	435	539	403	142	121	**3,245**
Total	**27,225**	**4,782**	**22,860**	**1,082**	**255**	**266**	**56,471**

In contrast to the number of projects, actual funding mobilised through these projects has not recovered to the levels disbursed between 1993 and 2000, although it has bounded back from the 2001-02 low. While there was a fairly steady level of activity in Latin America, which has recently tailed off, the most dramatic decline has been in East Asia where funds were mobilised for major projects in, for example, the Philippines and Malaysia. In China, the shift has been towards local and expatriate funding.

Number of projects by type of private participation

Financial closure year	Concession	Divestiture	Greenfield project	Management & lease contract	Total
1990	0	0	0	0	**0**
1991	1	0	0	1	**2**
1992	2	0	2	2	**6**
1993	6	0	3	2	**11**
1994	8	0	5	1	**14**
1995	9	1	3	5	**18**
1996	7	1	9	17	**24**
1997	16	2	9	12	**39**
1998	18	1	11	2	**32**
1999	13	7	8	13	**38**
2000	28	1	5	5	**39**
2001	12	1	13	14	**40**
2002	22	3	8	9	**44**
2003	12	1	21	10	**44**
2004	27	0	21	5	**53**
2005	18	0	32	11	**61**
2006	15	2	27	13	**57**
2007	20	5	30	7	**62**
Total	**236**	**25**	**207**	**116**	**584**

In terms of contracts awarded each year, numbers have been pretty steady since 1996. There has been an evident shift away from divestitures since the move in Chile away from outright privatisations to concessions from 2000, but they have not gone away as seen by the renewed activity in 2006-07.

Investment in projects by type of private participation (USDmillion)

Year of Investment	Concession	Divestiture	Greenfield project	Management & lease contract	Total
1991	75	0	0	0	**75**
1992	284	0	0	0	**284**
1993	6,465	0	164	0	**6,629**
1994	966	0	380	0	**1,346**
1995	1,563	20	228	13	**1,823**
1996	122	36	1,125	20	**1,304**
1997	9,164	499	333	166	**10,161**
1998	1,676	266	385	0	**2,327**
1999	1,684	4,313	347	27	**6,372**
2000	7,134	456	633	7	**8,229**
2001	1,138	51	937	17	**2,143**
2002	1,032	448	232	1	**1,589**
2003	804	47	554	92	**1,494**
2004	3,341	210	1,041	180	**4,772**
2005	697	0	974	331	**2,001**
2006	1,162	383	405	737	**2,667**
2007	1,323	409	1,422	2	**3,245**
Total	**37,301**	**7,099**	**9,161**	**1,593**	**56,471**

Greenfield projects are less contentious than many as they do not directly affect people living there at the time. They are designed to serve companies seeking to operate in a newly designated zone and housing for staff attracted to these companies. The divestiture segment has been dominated by Chile, and has had a peripheral impact in recent years, with funding flows stemming from contracts awarded by 2000. Likewise, management and lease contracts are chiefly concerned with mobilising capabilities rather than funding.

Number of projects by region and type

Region	Concession	Divestiture	Greenfield project	Management & lease contract	Total
East Asia and Pacific	116	8	146	12	**282**
Europe and Central Asia	8	5	7	41	**61**
Latin America	109	12	42	30	**193**
M East & North Africa	0	0	6	9	**15**
South Asia	1	0	4	4	**9**
Sub-Saharan Africa	2	0	2	20	**24**
Grand Total	**236**	**25**	**207**	**116**	**584**

Management type contracts have been most popular in Sub-Saharan Africa, chiefly because of the difficulties in attracting full project funding there. In Europe and Central Asia, the management and lease contract is operated separately from funding, typically directed towards rehabilitating infrastructure. Concession and Greenfield contracts have been focussed on East Asia and Latin America, especially the major cities.

Investment in projects by region and type (USDmillion)

Region	Concession	Divestiture	Greenfield project	Management & lease contract	Total
East Asia and Pacific	22,393	270	4,011	551	**27,225**
Europe and Central Asia	1,531	448	1,825	978	**4,782**
Latin America	14,610	6,381	1,865	4	**22,860**
M East & North Africa	0	0	1,082	0	**1,082**
South Asia	9	0	245	2	**255**
Sub-Saharan Africa	76	0	133	57	**266**
Total	**38,618**	**7,099**	**9,161**	**1,593**	**56,471**

The lack of funding for projects in Sub-Saharan Africa and South Asia is telling. These are the two regions which are currently set to fail to reach the Millennium Development Goals.

Sewerage and sewage treatment projects remain the least popular, partly due to the problems of gaining public support for projects where the benefits for extra costs cannot be directly discerned as with water provision projects.

Funding by sectoral activity

Subsector	Segment	Project Count	Total Investment
Treatment plant	Potable water & sewerage treatment plant	12	292
	Potable water treatment plant	120	8,113
	Sewerage treatment plant	163	3,945
Total Treatment plant		**295**	**12,350**
Utility	Sewerage collection	1	43
	Sewerage collection and treatment	9	2,726
	Water utility with sewerage	215	31,326
	Water utility without sewerage	64	10,026
Total Utility		**289**	**41,121**
Grand Total		**584**	**56,471**

Water and sewerage projects dominate in terms of funding mobilised because of a series of major projects in Asia and Latin America such as Buenos Aries and Manila which were intended to cover the comprehensive rehabilitation and extension of a major city's water and sewerage services.

Contract awards, 2005-08

The table below summarises all contract awards identified by the author which have been awarded between the start of 2005 and mid October 2008. The list excludes contract awards that serve industrial clients alone.

Year	Country	Contract	Country	Water (million people)	Sewerage (million people)
2005	Algeria	Oran	Abengoa	0.400	0.000
2005	Algeria	Skikda	Abengoa	1.000	0.000
2005	Algeria	Algiers	GE	1.100	0.000
2005	Algeria	Athmania	Suez Environnement	1.000	0.000
2005	Algeria	Taksebt	Suez Environnement	2.000	0.000
2005	Algeria	Algiers	Suez Environnement	3.500	3.500

2005	Argentina	Aguas de Tumbes	Latin Aguas	0.157	0.095
2005	Armenia	Yerevan	Veolia Environnement	1.200	1.200
2005	Australia	Perth	Suez Environnement	0.250	0.000
2005	Austria	Gerasdorf	EVN	0.011	0.000
2005	Chile	Antofagasta	OHL	0.000	0.000
2005	China	Pizhou, Jiangsu	AEH	0.250	0.000
2005	China	Shenzen, Guangdong	Anhui Guozhen	0.000	0.500
2005	China	Hanxi	Asia Water Technology	0.000	0.600
2005	China	Wuhan, Hubei	Asia Water Technology	0.000	1.333
2005	China	Tianmen	Asia Water Technology	0.300	0.000
2005	China	Huaiyuan, Anhui	Asia Water Technology	1.250	0.000
2005	China	Qingdao	Beijing Capital	0.250	0.000
2005	China	Huainan	Beijing Capital	0.550	0.000
2005	China	Qinhuangdao, Hebei	Beijing Capital	0.720	0.000
2005	China	Xuzhou, Jiangsu	Beijing Capital	1.200	0.000
2005	China	Nanjing, Jiangsu	Bio Treat Technology	0.000	0.200
2005	China	Suqian, Jiangsu	Bio Treat Technology	0.000	0.300
2005	China	Lianyunguang, Jiangsu	Bio Treat Technology	0.000	0.400
2005	China	Lianyunguang, Jiangsu	Bio Treat Technology	0.000	0.500
2005	China	Jiangdu, Jiangsu	Bio Treat Technology	0.250	0.000
2005	China	Tianjin	Boustead	0.100	0.000
2005	China	Hai Yang, Shandong	China Evergreen	0.000	0.080
2005	China	Fenyi, Jiangxi	China Water Affairs	0.350	0.000
2005	China	Qianshan, Jiangxi	China Water Affairs	0.350	0.000
2005	China	Wannian, Jiangxi	China Water Affairs	0.350	0.000
2005	China	Xinyu, Jiangxi	China Water Affairs	0.350	0.000
2005	China	Beijing	Chongqing Kanda Env	0.000	0.033
2005	China	Nangong, Hebei	CNA Group	0.000	0.100
2005	China	Anshan, Liaoning	Dalian Dongda Env Eng	0.000	0.333
2005	China	Nanchang, Jiangxi	Eguard	0.000	0.667
2005	China	Huzhou, Zhejiang	Eguard	0.600	0.000
2005	China	Bengbu, Anhui	FCC	0.000	2.000
2005	China	Daxing, Beijing	Golden State Env	0.000	0.083
2005	China	Fenghua, Zheijiang	Golden State Env	0.000	0.200
2005	China	Kushan	Golden State Env	0.000	0.293
2005	China	Tie Ling	Goldis	0.200	0.400
2005	China	Shenzen, Guangdong	Guozhen Env Protn	0.000	0.600
2005	China	Xitang, Zhejiang	Han's Technologies	0.000	0.100
2005	China	Hezhang, Guizhou	Han's Technologies	0.050	0.000
2005	China	Dafang, Zhejiang	Han's Technologies	0.080	0.000
2005	China	Zhuozhou, Hebei	Interchina Holdings	0.000	0.247
2005	China	Shanghai	Interchina Holdings	0.000	5.667
2005	China	Changyi, Shandong	Jinan Shifangyuantong	0.000	0.100
2005	China	Yuyao	Ningbo Fuda	0.400	0.000
2005	China	Qianjiang	Qianjiang Water Res	0.315	0.000
2005	China	Cao, Shandong	Qingdao Galaxy	0.000	0.100
2005	China	Shan City, Shandong	Qingdao Galaxy	0.000	0.133
2005	China	Kunming, Yunnan	Salcon	0.120	0.000
2005	China	Linyi, Shandong	Salcon	1.000	0.000
2005	China	Wenzhou, Zheijiang	Shanghai Industrial	0.000	0.500
2005	China	Xianyang	Shanghai Industrial	0.350	0.000
2005	China	Shanghai	Shanghai Urban Const	0.000	2.000

2005	China	Shanghai	Shanghai Young Sun	0.000	0.500
2005	China	Sichuan	Sichuan Guangan AAA	0.100	0.000
2005	China	Baoying	Tianjin Env Protection	0.000	0.250
2005	China	Hangzhou	Tianjin Env Protection	0.000	2.000
2005	China	Honghu	Tianjin Env Protection	0.350	0.350
2005	China	Qujing	Tianjin Env Protection	0.750	0.750
2005	China	Wujiang	Towngas	0.780	0.000
2005	China	Wuhu, Anhui	Towngas	1.100	0.000
2005	China	Xintai, Shandong	United Envirotech	0.000	0.267
2005	China	Urumqi, Xinjiang	VE / Beijing Capital	0.000	1.140
2005	China	Handan, Hebei	Veolia Environnement	0.000	0.800
2005	China	Changzhou, Jiangsu	Veolia Environnement	1.200	0.000
2005	China	Kunming, Yunnan	Veolia Environnement	3.500	0.000
2005	China	Wuxi, Jiangsu	Wai Kee Holdings	0.000	0.067
2005	China	Tangshan, Hebei	Xucheng Industrial Dev	0.000	0.133
2005	China	Korla, Xinjiang	China Water Industry Group	0.300	0.000
2005	Colombia	Barranquila	Consultores de Desarrollo	N/A	N/A
2005	Colombia	Sabanagrande	Tecvasa	0.070	0.060
2005	Colombia	San Andres Island	VE / FCC - Pro Activa	0.015	0.015
2005	Croatia	Vodice	EVN	0.000	0.010
2005	Czech Rep.	Hodonin	Aquaplus	0.070	0.070
2005	Czech Rep.	Kolln	Energie	0.051	0.051
2005	Czech Rep.	Chrudim	Energie	0.080	0.080
2005	Czech Rep.	Hradec Karlove	Veolia Environnement	0.150	0.150
2005	Egypt	Cairo El Asfar	Suez Environnement	0.000	3.000
2005	Germany	Braunschweig	Veolia Environnement	0.000	0.250
2005	Ghana	Ghana	Vitens	N/A	N/A
2005	India	Chennai	IVRCL	1.000	0.000
2005	Ireland	Fringal County	Earth Tech (Tyco)	0.000	0.030
2005	Italy	Sarnese	ACEA	0.700	0.700
2005	Malaysia	Negeri Sembilan	Salcon	0.100	0.000
2005	Morocco	Marrakech	Suez Environnement	0.000	1.000
2005	Peru	Tumbles & Zarumilla	Latin Aguas	0.120	0.100
2005	Philippines	Baguio	Benguet	0.250	0.000
2005	Portugal	Vila do Conde	Mota-Engil	0.078	0.078
2005	Portugal	Matosinhos	Mota-Engil	0.167	0.167
2005	Portugal	Covilha	Sacyr	0.054	0.054
2005	Portugal	Canaveses	Sacyr	0.055	0.055
2005	Portugal	Faro	Sacyr	0.061	0.061
2005	Portugal	Penafiel	Sacyr	0.075	0.075
2005	Qatar	Doha	Suez / Marubeni	0.000	0.500
2005	Russia	Rostov on Don	Eurasian Water Partnership	1.100	0.000
2005	Russia	Petrozavodsk	Russian Utility Systems	0.260	0.000
2005	Russia	St Petersburg	Veolia Environnement	2.000	0.000
2005	Singapore	Ulu Pandan	Keppel	0.700	0.000
2005	Sudan	Khartoum	Biwater	2.500	0.000
2005	Taiwan	Hsin Chu	Darco	0.000	0.150
2005	Thailand	Koh Samui	East Water	0.010	0.000
2005	UK	Northern Ireland (Alpha)	Kelda / Earth Tech	0.700	0.000
2005	USA	Gresham, Oregon	Veolia Environnement	0.000	0.160
2006	Algeria	Beni Saf	Abengoa	0.400	0.000
2006	Australia	Pimpama	Suez Environnement	0.000	0.075

2006	Australia	Ballarat	Veolia Environnement	0.000	0.115
2006	Australia	Gold Coast	Veolia Environnement	0.450	0.000
2006	Brazil	Minas Gerais	COPASA	12.000	6.200
2006	Canada	Brockton	Veolia Environnement	0.010	0.010
2006	China	Zhangzhu, Jiangzu	AEH	0.000	0.100
2006	China	Changzhou	Asia Environment	0.000	0.025
2006	China	Yixing, Jiangsu	Asia Environment	0.000	0.033
2006	China	Fengtai, Anhui	Asia Environment	0.100	0.000
2006	China	Lu Liang, Shanxi	Asia Water Technology	0.080	0.000
2006	China	Linyi, Shandong	Beijing Capital	0.000	0.600
2006	China	Beijing	Bio Treat Technology	0.000	0.200
2006	China	Wuhan	Bio Treat Technology	0.000	0.500
2006	China	Suzhou, Jiangsu	Bio Treat Technology	0.000	2.000
2006	China	Jinan 1, Shandong	China Everbright International	0.000	1.000
2006	China	Handan, Hebei	China Evergreen	0.000	0.150
2006	China	Fenyi, Jiangxi	China Water Affairs	0.000	0.200
2006	China	Jingzhou, Hubei	China Water Affairs	0.000	0.200
2006	China	Fugou, Henan	China Water Affairs	0.350	0.000
2006	China	Haikou, Hainan	China Water Affairs	0.350	0.000
2006	China	Jingling, Hubei	China Water Affairs	0.350	0.000
2006	China	Wujin, Jiangsu	China Water Affairs	0.350	0.000
2006	China	Xihua, Henan	China Water Affairs	0.350	0.000
2006	China	Xinhui, Guangdong	China Water Affairs	0.350	0.000
2006	China	Zhoukou, Henan	China Water Affairs	0.350	0.000
2006	China	Yongchuan, Chongqing	China Water Affairs	0.600	0.000
2006	China	Linyi, Shandong	Chongqing Kanda Env	0.000	0.267
2006	China	Shangqiu, Henan	Chongqing Kanda Env	0.000	0.267
2006	China	Suzhou, Anhui	Chongqing Kanda Env	0.000	0.267
2006	China	Jiaozuo, Henan	Chongqing Kanda Env	0.000	0.333
2006	China	Jiaozuo, Henan	Chongqing Kanda Env	0.000	0.500
2006	China	Nin Jin, Shandong	CNA Group	0.000	0.100
2006	China	Deging, Zhejiang	Darco	0.200	0.000
2006	China	Tongliao	Eguard	0.000	0.333
2006	China	Xiangfan, Hubei	Epure	0.000	0.333
2006	China	Baotou, Inner Mongolia	Epure	0.000	0.500
2006	China	Ganyu, Gansu	Goldis	0.000	0.100
2006	China	Liaoyang, Liaoning	Hyflux	0.000	0.100
2006	China	Tianchang, Anhui	Long Quan Group	0.200	0.000
2006	China	Shandong Province	Salcon	0.000	0.600
2006	China	Xiuning, Anhui	Shanghai Fudalefumen	0.000	0.133
2006	China	Dengzhou, Henan	Sinomem	0.000	0.100
2006	China	Ji An City	Sinomem	0.000	0.400
2006	China	Chongqing	Suez Environnement	0.000	1.000
2006	China	Changshu, Jiangsu	Suez Environnement	1.500	0.000
2006	China	Baoji, Shaanxi	Veolia Environnement	0.000	0.167
2006	China	Liuzhou, Guangxi	Veolia Environnement	1.000	0.000
2006	China	Wendeng, Shandong	Weihai Dean Water Eng	0.020	0.000
2006	China	Jixiang, Shandong	China Water Industry Group	0.700	0.000
2006	China	Jinan, Shandong	China Water Industry Group	2.600	0.000
2006	Colombia	Cucuta	Aguas Kpital	0.500	0.400
2006	Czech Rep.	Slany	Veolia Environnement	0.021	0.021
2006	Czech Rep.	Prostejov	Veolia Environnement	0.070	0.070

2006	Denmark	Allerod	Veolia Environnement	0.000	0.023
2006	Hungary	Erd	Veolia Environnement	0.100	0.100
2006	Ireland	Limerick	Veolia Environnement	0.000	0.090
2006	Italy	Caltanissetta	FCC	0.275	0.275
2006	Oman	Barka	Suez Environnement	0.500	0.000
2006	Oman	Muscat	Veolia Environnement	0.000	0.700
2006	Philippines	Maynilad Water	Metro Pacific	5.900	0.500
2006	Poland	Wozniky	Veolia Environnement	0.010	0.000
2006	Portugal	Leziria do Tejo	Aqualia (FCC)	0.240	0.240
2006	Qatar	Lusail	Suez / Marubeni	0.000	0.200
2006	Russia	Krasnodar	Alfa Group	0.710	0.000
2006	Russia	Tyuman	Alfa Group	N/A	N/A
2006	Russia	Kranokamsk	Russian Utility Systems	0.053	N/A
2006	Slovakia	Popgrad	Veolia Environnement	0.290	0.290
2006	Slovakia	Banska Bystrica	Veolia Environnement	0.660	0.660
2006	Slovenia	Lasko	EVN	0.000	0.005
2006	Slovenia	Bled	EVN	0.000	0.016
2006	South Africa	Maluti-a-Phofung	Amanz' aBantu / Uzinzo	0.300	0.000
2006	Thailand	Si Chang	East Water	0.010	0.000
2006	Thailand	Jaopraya	East Water	0.045	0.000
2006	UAE	Ajman	Veolia Environnement	0.000	0.235
2007	Algeria	Oran	Agbar	1.500	0.000
2007	Australia	Sydney	Veolia Environnement	0.500	0.000
2007	Brazil	Belford Roxo	Gupo Equipav	0.400	0.300
2007	Brazil	Rio das Ostras	Obrecht Engenharia	0.000	0.035
2007	China	Lishui, Jiangsu	AEH	0.000	0.100
2007	China	Jingezhen, Jiangxi	AEH	0.000	0.250
2007	China	Xinning, Qinghai	AEH	0.000	0.350
2007	China	Wangcheng, Hunan	AEH	0.125	0.000
2007	China	Nanjing, Jiangsu	Agbar / Golden State Water	0.000	1.250
2007	China	Xuyi	Agbar / Golden State Water	0.250	0.000
2007	China	Taizhou	Agbar / Golden State Water	1.000	0.000
2007	China	Binzhou, Shandong	Bio Treat Technology	0.000	0.200
2007	China	Zibo, Shandong	China Everbright International	0.000	0.450
2007	China	Daya Bay	China Water Affairs	0.000	0.400
2007	China	Jingzhou, Hubei	China Water Affairs	0.200	0.000
2007	China	Daya Bay, Huizhou	China Water Affairs	0.350	0.000
2007	China	Gaoan, Jiangxi	China Water Affairs	0.350	0.000
2007	China	Wuhu	Guozhen Env Protn	0.000	0.500
2007	China	Minguan, Anhui	Hyflux	0.000	0.150
2007	China	Mancheng, Hebei	Hyflux	0.000	0.250
2007	China	Xiajin, Shandong	Hyflux	0.200	0.000
2007	China	Wuxi, Jiangsu	Hyflux Water Trust	0.000	0.050
2007	China	Yangkou Rudong	Hyflux Water Trust	0.000	0.067
2007	China	Guanyun, Jiangsu	Hyflux Water Trust	0.000	0.100
2007	China	Tantai, Zhejiang	Hyflux Water Trust	0.000	0.100
2007	China	Langfang, Hebei	Hyflux Water Trust	0.000	0.403
2007	China	Xeucheng, Shandong	Hyflux Water Trust	0.125	0.000
2007	China	Guanyun, Jiangsu	Hyflux Water Trust	0.200	0.000
2007	China	Changli	Interchina Holdings	0.000	0.467
2007	China	Siping, Jilin	Sinomem	0.000	0.200
2007	China	Haikou, Hainan	Veolia Environnement	0.800	0.800

2007	China	Tianjin	Veolia Environnement	3.000	0.000
2007	China	Lanzhou, Gansu	Veolia Environnement	3.200	0.000
2007	China	Suzhou, Anhui	China Water Industry Group	0.000	0.000
2007	China	Duyun, Guizhou	China Water Industry Group	0.200	0.000
2007	China	Danzhou, Hainan	China Water Industry Group	0.230	0.000
2007	China	Shangqiu, Henan	China Water Industry Group	2.000	0.000
2007	China	Linyi, Shandong	China Water Industry Group	3.000	3.000
2007	Egypt	Cairo El Asfar	Suez Environnement	0.000	1.500
2007	Georgia	Tbilisi	Multiplex Solutions	1.050	0.000
2007	Germany	Burghausen	Energie	0.015	0.000
2007	India	Jamshedpur	JUSCO	0.050	0.000
2007	India	Haldia	JUSCO	0.250	0.000
2007	India	Chennai	Suez Environnement	4.000	0.000
2007	India	Nagpur, Maharashtra	Veolia Environnement	0.100	0.000
2007	Indonesia	Bangka Island	Darco	0.150	0.000
2007	Mexico	Querétaro	FCC	0.700	0.000
2007	Mexico	Querétaro	Mitsui	0.000	0.500
2007	Oman	Sur	Veolia Environnement	0.350	0.000
2007	Poland	Toszek	Remondis Aqua	0.010	0.010
2007	Portugal	Abrantes	Aqualia (FCC)	0.000	0.040
2007	Portugal	Campo Major	Aqualia (FCC)	0.020	0.020
2007	Saudi Arabia	Jubail	Suez Environnement	3.500	0.000
2007	Turkey	Istanbul	EVN	0.000	2.000
2007	UAE	Dubai	Suez Environnement	0.000	0.000
2007	UAE	Abu Dhabi & Al Ain	Veolia Environnement	0.000	1.200
2007	UAE	Fujairah	Veolia Environnement	0.130	0.000
2008	Australia	Townsville, Queensland	United Utilities Australia	0.000	0.000
2008	Chile	Santiago	Cascal	0.100	0.000
2008	China	Danyang, Jiangsu	AEH	0.500	0.000
2008	China	Hewenhu, Jiangxi	Beijing Capital	0.500	0.500
2008	China	Dongying, Shandong	Beijing Capital	0.650	0.650
2008	China	Foshan, Guangdong	Bio Treat Technology	0.000	0.250
2008	China	Xuancheng, Anhui	Bio Treat Technology	0.000	0.250
2008	China	Zhumadian, Henan	Cascal	0.400	0.000
2008	China	Yancheng, Jiangsu	Cascal	0.600	0.000
2008	China	Boxing, Shandong	China Everbright International	0.000	0.300
2008	China	Jiangyin	China Everbright International	0.000	1.000
2008	China	Jinan 2, Shandong	China Everbright International	0.000	2.000
2008	China	Yiliang, Yunnan	Han's Technologies	0.000	0.100
2008	China	Ninghua, Fujian	Han's Technologies	0.000	0.150
2008	China	Lishui	Qianjiang Water Res	1.000	0.000
2008	China	Nan An, Fujian	Salcon	1.000	0.000
2008	China	Shenzhen	Shanghai Industrial	0.000	1.500
2008	China	Yuanping, Shanxi	Sino-Dutch Water Investment	0.100	0.250
2008	China	Chongqing	Suez Environnement	1.200	0.000
2008	China	Xian, Shaanxi	Tianjin Env Protection	0.000	1.000
2008	China	Yunan County	China Water Industry Group	0.000	0.100
2008	China	Yunan County	China Water Industry Group	0.000	0.100
2008	China	Boluo, Shenzhen	China Water Industry Group	0.000	0.150
2008	China	Huizhou No 4	China Water Industry Group	0.000	0.150
2008	China	Huizhou No 6	China Water Industry Group	0.000	0.150
2008	China	Sihui Urban, Shenzhen	China Water Industry Group	0.000	0.150

2008	China	Huidong, Shenzhen	China Water Industry Group	0.000	0.200
2008	China	Sihui, Shenzhen	China Water Industry Group	0.000	0.250
2008	China	Baoji, Shenzhen	China Water Industry Group	0.000	0.500
2008	China	Geermu	China Water Industry Group	0.200	0.000
2008	China	Yunfu City, Guangdong	China Water Industry Group	0.200	0.300
2008	China	Shenyang City	China Water Industry Group	0.250	0.000
2008	China	Tangshan, Shenzhen	China Water Industry Group	0.350	0.000
2008	China	Shenzhen	China Water Industry Group	1.000	2.000
2008	India	Kolkata	JUSCO	0.030	0.030
2008	India	Delhi	Suez Environnement	0.000	0.600
2008	India	Nagpur, Maharashtra	Veolia Environnement	0.650	0.000
2008	Indonesia	Telang Kelapa	Cascal	0.030	0.000
2008	Ireland	Mullingar	Veolia Environnement	0.000	0.030
2008	Mauritius	Mauritius	Berlinwasser International	0.000	0.200
2008	Portugal	Elvas	Aqualia (FCC)	0.023	0.023
2008	Saudi Arabia	Jeddah	Suez Environnement	3.000	3.000
2008	Singapore	Changi	SembCorp	0.400	0.000

Contract losses

This is an attempt to outline all PSP awards that have been rescinded for whatever reason in recent years. Despite the excitable rhetoric of the anti-private sector lobbies, these contracts may end for quite prosaic reasons.

Contracts ended unilaterally

Start	End	Country	Contract	Company	Water	WW
1995	1997	Argentina	Tucuman	Veolia Environnement	1.200	0.000
1996	1999	Trinidad	Trinidad & Tobago	Severn Trent	0.400	0.000
1999	2000	Bolivia	Cochabamba	Bechtel	0.558	0.000
1997	2001	Venezuela	Monagas	Veolia Environnement	0.552	0.000
1999	2002	Argentina	Buenos Aries	Enron	2.500	0.000
1999	2002	Venezuela	Lara	Agval	1.100	0.000
2001	2003	Viethnam	Ho Chi Minh	Suez	1.000	0.000
1997	2004	Colombia	Bogota	Suez	0.000	1.500
2002	2004	Colombia	Sabanagrande	Acuasasa	0.027	0.025
2001	2004	Venezuela	Zulia	Tecvasa	3.500	0.000
2004	2005	Russia	Volgograd	Russian Utility Systems	1.013	0.000
2003	2005	Tanzania	Dar es Salaam	Biwater	0.750	0.000
2000	2005	Uruguay	Maldonado	Iberdrola	0.260	0.260
1997	2007	Bolivia	La Paz & El Alto	Suez	1.400	1.000
2003	2007	Russia	Tomsk	Russian Utility Systems	0.488	0.000

In the cases of Tanzania and Bolivia, the contracts ended due to political pressures. Suez handed back the Puerto Rico contract (which has previously been handed back by VE) after being unable to renegotiate its terms and the Bogota wastewater treatment works contract was pulled in circumstances that still remain unclear. In the US, the Allete-held utility was acquired by the municipality under ‘eminent domain’, whereby a municipality is allowed to buy a private sector utility irrespective of its performance. The Atlanta and Halifax contracts in the US and Canada were cancelled primarily due to political change and disputes about performance delivery. In the case of Halifax, a new contract was subsequently awarded to Suez.

Contracts ended by negotiation

Start	End	Country	Contract	Company	Water	WW
1994	2000	China	Shenyang, Liaoning	Suez	1.400	0.000
1993	2000	Malaysia	National - Sewerage	Indah	0.000	6.100
1991	2001	C African Rep	Bangui	SAUR	0.075	0.000
1995	2001	South Africa	Nkokobe	Suez	0.128	0.000
1999	2002	Argentina	Aguas de La Rioja	Latin Aguas	0.201	0.122
1997	2002	China	Binzhou, Shandong	Cathay International	0.250	0.000
1997	2002	China	Jinan, Shandong	Cathay International	2.550	0.000
1998	2002	China	Binzhou, Shandong	Cathay International	0.100	0.000
1998	2002	China	Jinan, Shandong	Cathay International	1.800	0.000
1999	2002	Philippines	Magdalena Laguna	Benpres	0.010	0.000
1999	2002	Turkey	ANTSU	Suez	0.535	0.535
1996	2003	Brazil	Itu, Sao Paulo	Carmargo Correa	0.000	0.110
1995	2003	China	Shanghai	RWE	1.300	0.000
1997	2003	China	Xian	Berlinwasser	3.000	0.000
2003	2003	China	Nanchang, Jiangxi	Berlinwasser	1.000	0.000
1994	2004	Brazil	Sao Carlos	Hidrogesp	0.025	0.000
1992	2004	Mexico	Toluca	Mexico de Desarrollo	0.000	0.647
1994	2004	Mexico	Puerto Vallarta	Cascal	0.000	0.250
1991	2005	Belgium	Flanders	Aquafin	0.000	3.800
2001	2005	Belize	Belize	Biwater	0.100	0.000
1992	2005	Mexico	Chihuahua	Atlatec	0.000	0.750
1996	2005	Mexico	Navojoa	Tribasa	0.100	0.000
1999	2005	Mexico	Peubla	Suez	0.000	0.200
1997	2005	Philippines	Maynilad Water	Suez	4.500	0.700
2003	2005	Philippines	Mindanao	Benguet	0.027	0.000
1993	2006	Argentina	Buenos Aries	Suez	7.700	6.000
1995	2006	Argentina	Santa Fe	Suez	1.800	0.000
1998	2006	Argentina	Mendoza	SAUR	1.140	0.950
2000	2006	Argentina	Aguas de G BA	Grupo ACS	1.700	0.000
2000	2006	Argentina	Catamarca	PA (FCC / VE)	0.200	0.000
1996	2006	China	Shenyang, Liaoning	China Water Company	0.740	0.000
1998	2006	China	Shaoxing, Zhejiang	China Water Company	0.800	0.000
2001	2006	China	Shanghai	SAUR	0.700	0.000
2000	2006	China	Cgangchun, Jilin	China Water Company	0.000	2.500
2004	2006	China	Xianyang, Shaanxi	Interchina Holdings	0.750	0.000
2005	2006	China	Zhuozhou, Hebei	Interchina Holdings	0.000	0.247
2004	2006	Mexico	Xalapa	Earth Tech (Tyco)	0.400	0.400

Negotiations can range from the despairing (Prime Utilities) to the constructive. It is understood that both Chinese contracts were exited for a profit and this was certainly the case when Severn Trent concluded fifteen years of involvement with Belgium's Aquafin.

Contracts ended at their expiry

Start	End	Country	Contract	Company	Water	WW
1994	1999	Colombia	Ocana	Servicios de Ocana	0.079	0.070
1999	2001	Colombia	Ocana	Servicios de Ocana	0.079	0.070
1993	2001	Macao	Macao	UU	0.000	0.490
1993	2003	South Africa	Sutterheim	Suez	0.200	0.000
2000	2005	Armenia	Yerevan	ACEA	0.900	0.900
1999	2005	Kenya	Malindi	Gauff Ingenieure	0.050	0.010
2000	2005	Zambia	Copper belt	Bouygues	0.300	0.300

2002	2006	Albania	Elbasan	Berlinwasser	0.100	0.100
2001	2006	Brazil	Mirassol	Paz Gestao Ambiental	0.048	0.048
2000	2006	Jordan	Greater Amman	Suez	2.500	2.500
2001	2006	Russia	Syzran	Syzran Vodokanal	0.186	0.000
2001	2006	South Africa	Johannesburg	Suez	0.500	0.000
2002	2007	Kosovo	Gjakova,	Gelsenwasser	0.200	0.000
1993	2007	Mexico	Cuernavaca	USF / Siemens	0.000	0.173

Remarkably, given the media coverage, some contracts expire when their allotted time span has run its course. The Yerevan and Tirana contracts have been in turn replaced by successor contracts. Such events are a healthy reminder that a concession is not forever, it is in effect a slice of time and for a further slice to be gained, the contract has to have its evident charms for both parties. This will become a more regular feature in future years as the more contracts there are, the more contracts will in time end and the longer PSP is in operation, the more contracts will reach their expiry date.

Major PSP contract losses, January 1997 to October 2008 (million people)

[1] Yearly totals

Year	Water	Sewerage	Overall
1997	1.20	0.00	1.20
1998	0.00	0.00	0.00
1999	0.48	0.07	0.48
2000	1.96	6.10	8.06
2001	0.83	0.07	0.83
2002	7.15	0.66	7.15
2003	6.50	0.11	6.61
2004	3.55	2.18	5.70
2005	6.96	6.92	11.71
2006	17.70	5.78	20.85
2007	1.60	1.00	1.60
2008	0.00	0.00	0.00
Total	**47.93**	**22.88**	**64.19**

[2] Cumulative total

Year	Water	Sewerage	Overall
1997	1.20	0.00	1.20
1998	1.20	0.00	1.20
1999	1.68	0.07	1.68
2000	3.64	6.17	9.74
2001	4.47	6.24	10.57
2002	11.62	6.90	17.72
2003	18.12	7.01	24.33
2004	21.67	9.19	30.03
2005	28.63	16.11	41.74
2006	46.33	21.89	62.59
2007	47.93	22.89	64.19
2008	47.93	22.89	64.19

[3] As a percentage of the population served by contracts identified at the time

Year	Water	Sewerage	Overall
1997	1%	0%	1%
1998	1%	0%	1%
1999	1%	0%	1%
2000	1%	4%	3%
2001	1%	3%	3%
2002	4%	3%	5%
2003	5%	3%	6%
2004	6%	4%	6%
2005	7%	6%	8%
2006	10%	7%	11%
2007	10%	7%	10%
2008	10%	7%	10%

Overall, 10% of contracts have expired in terms of populations served. It is nothing to celebrate, but it does serve as a reminder of the nature of this market. Water is an inherently more attritional and irrational subject than other utilities and the stabilising contract ending rate since 2006 offers some encouragement.

Listed market entries since 1989

The two tables below outline those companies whose shares have been either listed following their sale by municipal (or state) holders or were previously held by private companies.

Water utility privatisations, by country, 1989–2006

Company	Country	IPO date	Current status
Anglian Water	UK	1989	Taken private
Dwr Cymru Welsh Water	UK	1989	Not for profit (Glas)
Northumbrian Water	UK	1989	Acquired, re-listed
North West Water	UK	1989	Listed (UU)
Severn Trent Water	UK	1989	Listed
Southern Water	UK	1989	Bought, taken private and again
South West Water	UK	1989	Listed (Pennon)
Thames Water	UK	1989	Bought, taken private
Wessex Water	UK	1989	Bought (twice)
Yorkshire Water	UK	1989	Taken private
Aquafin	Belgium	1991	Bought back
SmVaK	Czech Rep	1993	Taken private, bought
SABESP	Brazil	1994	Listed
Prime Utilities	Malaysia	1994	Re-nationalised
AMGA	Italy	1996	Bought by Iride
Shanghai Industrial	China	1996	Listed
Suzhou New District	China	1996	Listed
East Water	Thailand	1997	Listed
ACEA	Italy	1999	Listed
ASCM Como	Italy	2000	Listed
EYDAP	Greece	2000	Listed (Athens Water)
Nanhai Development	China	2000	Listed
Beijing Capital	China	2000	Listed
Acegas	Italy	2001	Listed
EYATH	Greece	2001	Listed

Aguas Andinas	Chile	2002	Listed
ASM Brescia	Italy	2002	Merged with AEM
PBA Holdings	Malaysia	2002	Listed
KPS	Malaysia	2003	Listed
Hera	Italy	2003	Listed
Meta Modena	Italy	2003	Bought by Hera
Tallinna Vesi	Estonia	2005	Listed
Manila Water	Philippines	2005	Listed
Jiangxi Hongcheng	China	2004	Listed
COPASA	Brazil	2006	Listed

Market listings of private water utility companies, by country, 1991–2006

Company	**Country**	**IPO date**	**Current status**
South Staffordshire	UK	1991	Demerged, taken private
Puncak Niaga	Malaysia	1997	Listed
Intan Utilities	Malaysia	1997	Listed
Darco Water Tech	Singapore	2002	Listed
Goldis	Malaysia	2002	Listed
Eco Water	Singapore	2003	Listed
Salcon	Singapore	2003	Listed
Asia Env Holdings	Singapore	2004	Listed
Bio Treat Technologies	Hong Kong	2004	Listed
Pure Cycle	USA	2004	Listed
Cascal	UK	2008	Listed

The big three (or five) diminish

In 2002 the author declared that the acquisition of market share by the leading five companies was a 'remorseless' process. It is evident that when events turn against them, a retreat can be equally remorseless.

People served by company (million)

	1999	**2001**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Suez	81.7	94.7	104.2	102.4	104.5	98.2	100.4	88.2
Veolia	74.8	95.2	104.5	108.2	117.5	115.0	133.9	119.3
SAUR	27.6	30.4	34.0	33.5	13.7	13.6	13.6	13.0
Agbar	31.2	35.3	35.2	35.2	34.9	26.0	22.1	29.5
RWE	23.7	56.5	70.1	69.5	67.2	42.7	35.7	38.2
Total	**239.0**	**312.1**	**348.0**	**348.8**	**337.8**	**295.5**	**305.7**	**288.2**
Global	**350**	**430**	**490**	**545**	**565**	**632**	**681**	**742**
% by above	**68%**	**73%**	**71%**	**64%**	**60%**	**47%**	**45%**	**39%**

These are net of cross-holdings, so Suez Environnement does not include Agbar

While a retreat from the peak of 2002 has been an ongoing process, the splitting up of SAUR and Bouygues and the divestment of Thames Water and Thames Water International from RWE has ramped up these changes, a process that would have gone further if market conditions had allowed a more than partial sell-off of American Water in 2008. Presuming AWW will in time be deconsolidated; the Big Five's market share eases further to 37%.

THREE PERSPECTIVES ON CONTRACT AWARDS

The Envisager contract award database has been used to provide three perspectives on the patterns of contract awards: [1] by competing contract awards to local (one country only), regional (contract awards within a single geographical region) and global (contract awards in at

least two regions); [2] contract awards within the OECD's 30 member states and outside the OECD; and [3] comparing contract awards between those awarded to companies in their home country and to those based in other countries.

People served by contract company award type (million)

	1985-89	1990-94	1995-99	2000-04	2005-08	Total
Local – Water	39.77	4.40	59.24	50.28	45.03	**198.72**
Local – Sewage	52.25	10.73	29.21	54.97	45.11	**192.27**
Local – Total	39.77	15.05	60.29	87.06	76.42	**278.59**
Regional – Water	2.00	0.75	3.84	12.00	8.48	**27.07**
Regional – Sewage	0.00	0.62	4.05	6.70	12.60	**23.97**
Regional – Total	2.00	0.81	4.98	17.78	20.38	**45.95**
International – Water	6.24	29.80	93.56	79.73	57.37	**266.70**
International – Sewage	1.50	6.42	38.23	43.14	28.97	**118.26**
International – Total	6.24	30.29	102.73	97.96	74.52	**311.74**
Total – Water	48.01	34.95	156.64	142.01	110.88	**492.49**
Total – Sewage	53.75	17.77	71.49	104.81	86.68	**334.50**
Total – Total	48.01	46.15	168.00	202.80	171.32	**636.28**

The 1985-89 figures were inevitably distorted by the England and Wales WaSC privatisation. As the English & Welsh WaSCs were all local companies at the time of their classification, they are classified as such, irrespective of their subsequent international ambitions. Again, sewerage for 1990-94 was affected by the ill-fated Malaysian national sewerage PSP. These excepted, there appears to be a gradual shift from the international to the local company award. Regional players have remained somewhat peripheral, although less so for sewerage than for water.

Contract awards - % of population served for water

	1985-89	1990-94	1995-99	2000-04	2005-08	Total
Local – Water	83%	13%	38%	35%	41%	**40%**
Regional – Water	4%	2%	2%	8%	8%	**5%**
International – Water	13%	85%	60%	56%	52%	**54%**

Contract awards - % of population served for sewerage

	1985-89	1990-94	1995-99	2000-04	2005-08	Total
Local – Sewage	97%	60%	41%	52%	52%	**57%**
Regional – Sewage	0%	3%	6%	6%	15%	**7%**
International – Sewage	3%	36%	53%	41%	33%	**35%**

Contract awards - % of population served for both

	1985-89	1990-94	1995-99	2000-04	2005-08	Total
Local – Total	83%	33%	36%	43%	45%	**44%**
Regional – Total	4%	2%	3%	9%	12%	**7%**
International – Total	13%	66%	61%	48%	43%	**49%**

The OECD and the rest of the world

The 30 OECD member countries dominated the global market in the decade from 1985-94. Their market share has been almost peripheral in recent years.

OECD and Rest of the World contract awards

	1985-89	1990-94	1995-99	2000-04	2005-08	Total

OECD – Water	39.17	16.41	24.20	23.04	5.90	**108.72**
OECD – Sewage	52.54	10.96	23.43	28.41	6.57	**121.91**
OECD – Total	39.17	21.41	33.31	33.96	9.21	**137.06**
ROW – Water	8.84	18.54	132.45	118.97	104.99	**383.79**
ROW – Sewage	1.50	6.81	48.06	76.39	80.73	**213.49**
ROW – Total	8.84	24.74	134.69	168.85	162.11	**499.23**
Total – Water	48.01	34.95	156.65	142.01	110.89	**492.51**
Total – Sewage	54.04	17.77	71.49	104.80	87.30	**335.40**
Total – Total	48.01	46.15	168.00	202.81	171.32	**636.29**

Contract awards - % of global contracts awarded to OECD countries

	1985-89	1990-94	1995-99	2000-04	2005-08	Total
OECD – Water	82%	47%	15%	16%	5%	**22%**
OECD – Sewage	97%	62%	33%	27%	8%	**36%**
OECD – Total	82%	46%	20%	17%	5%	**22%**

Home and abroad – domestic and international contract awards

This table compares the numbers of people served by new contracts by companies in their country of origin (e.g. a WaSC in England & Wales gaining a sewage contract in Scotland, all being within the UK) whether local, regional or international companies and those awarded to countries operating outside their country of domicile. With the exception of international awards for water services during the 1990s (driven by Chile, Argentina, the Philippines and Indonesia) the majority of contract awards in population terms have been to home companies.

Contracts awarded in a company's home country or internationally

	1985-89	1990-94	1995-99	2000-04	2005-08	Total
Home – Water	41.77	11.23	72.71	86.75	73.12	**285.58**
Home – Sewage	52.25	24.9	42.13	69.85	55.7	**244.83**
Home – Total	41.77	21.88	79.16	127.32	110.52	**380.65**
International – Water	6.24	23.72	83.94	55.26	37.76	**206.92**
International – Sewage	1.5	2.87	29.36	34.95	30.94	**99.62**
International – Total	6.24	24.27	88.84	75.49	60.8	**255.64**
Total – Water	48.01	34.95	156.65	142.01	110.88	**492.50**
Total – Sewage	53.75	27.77	71.49	104.80	86.64	**344.45**
Total – Total	48.01	46.15	168.00	202.81	171.32	**636.29**

Contract awards - % of contracts awarded to companies in their home countries

	1985-89	1990-94	1995-99	2000-04	2005-08	Total
Home – Water	87%	32%	46%	61%	66%	**58%**
Home – Sewage	97%	90%	59%	67%	64%	**71%**
Home – Total	87%	47%	47%	63%	65%	**60%**

International investment strategies of leading water companies

The caution of recent years has been maintained, except for a general interest in the Chinese market and developed country markets. The latter is of interest given the low proportion of contract awards noted in OECD countries in recent years.

Company	Strategy
Suez	Withdraw from Latin America and most developing economies save MENA & China
Veolia	Concentrating on Europe, China and selected markets
RWE	Withdrawing from all markets except Germany and Central Europe
SAUR	Concentrate on Europe
Agbar	Withdrawal from most of Latin America, investing in Europe and China
FCC	Retain some Latin American activities, invest in Europe and China
ACEA	Maintain international activities but no new projects
AWG	All international activities (except Ireland) have been or are being sold
Severn Trent	Maintain asset operation strategy (no capital expenditure)
UU	Maintain a highly selective policy, emphasising Eastern Europe
Bouygues	Maintain activities in former French Africa
Cascal	Continue to seek suitable contracts globally

CHINA: AFTER THE OLYMPICS, IT'S BACK TO BUSINESS

In 2005, contracts covering 105million people were noted. By this edition, contracts covering 231 million people have been identified, an increase of 126 million people on the 2005 figure, via new contract awards and other already awarded contracts which have been subsequently identified. In 1989, China accounted for 8% of the people served by the private sector worldwide. In 2008, the figure is 38%. The state has declared that USD125billion needs to be spent on new projects between 2006 and 2010, with services in 100 cities being opened to private investment during this time. It is evident that this remains a work in progress.

In China, legislation was passed in 2002 outlawing fixed returns on investment for water or wastewater projects held and operated by international entities. As a result Berlinwasser and RWE Thames sold back their holdings in two projects back to state held entities. This legislation does not apply to projects funded and operated by domestic companies and companies such as Beijing Capital, Tianjin Capital Environmental Protection and Shanghai Industrial Holdings operate contracts on a fixed rate of return basis.

China, contract awards by year (million of people served)

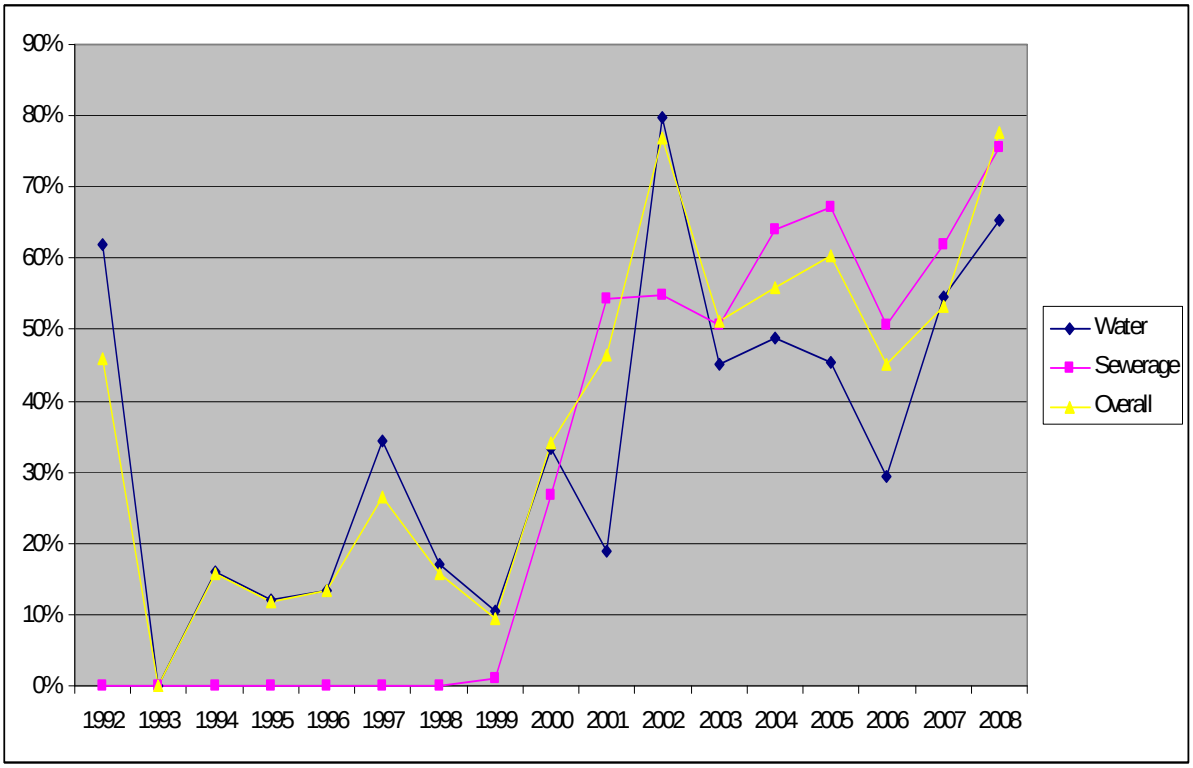
	Water	Sewerage	Overall
1992	1.40	0.00	1.40
1993	0.00	0.00	0.00
1994	2.47	0.00	2.47
1995	1.70	0.00	1.70
1996	5.54	0.00	5.54
1997	13.34	0.00	11.25
1998	3.35	0.00	3.35
1999	4.55	0.30	4.55
2000	11.81	5.75	14.56
2001	4.58	14.33	18.92
2002	12.11	5.95	18.06
2003	14.84	11.52	22.36
2004	16.65	14.96	29.11
2005	17.47	23.73	39.89
2006	9.45	10.51	19.96
2007	15.23	9.09	20.52
2008	7.95	12.00	17.50
Total	**142.44**	**108.14**	**231.14**

As a percentage of the yearly total

	Water	Sewerage	Overall
1992	62%	0%	46%
1993	0%	0%	0%
1994	16%	0%	16%
1995	12%	0%	12%
1996	14%	0%	13%
1997	34%	0%	27%
1998	17%	0%	16%
1999	11%	1%	9%
2000	33%	27%	34%
2001	19%	54%	46%
2002	80%	55%	77%
2003	45%	51%	51%
2004	49%	64%	56%
2005	45%	67%	60%
2006	29%	51%	45%
2007	54%	62%	53%
2008	65%	76%	78%

During the current decade, China has accounted for at least 50% of contract awards in population terms in every year. It has become the powerhouse of the global market and that picture does not look like changing in the immediate future.

Graph – Contract awards in China as a percentage of the global yearly total



As a percentage of the cumulative total by year

	Water	Sewerage	Overall
1992	3%	0%	3%
1993	2%	0%	2%
1994	5%	0%	4%
1995	6%	0%	5%
1996	8%	0%	7%
1997	14%	0%	12%
1998	14%	0%	12%
1999	14%	0%	12%
2000	16%	4%	15%
2001	16%	11%	18%
2002	19%	13%	22%
2003	22%	17%	25%
2004	24%	21%	29%
2005	26%	27%	33%
2006	26%	29%	34%
2007	28%	30%	35%
2008	29%	32%	36%

THE ENGLISH & WELSH COMPANIES RETURN TO THEIR ROOTS

There has been an increasing focus on the regulated activities at the expense of the last eighteen years of diversification strategies. This reflects the influence of lower coupon debt and refinancing in relation to non core activities. Both AWG and Thames have been spinning off their non core activities now that they have been taken private.

Company FY 31/03	Non core revenues			Current activities
	2000 Act	2005 Act	2010 Est.	
AWG	16%	47%	5%	Limited infrastructure services
First Aqua	0%	0%	0%	Regulated activities only
Glas Cymru	63%	0%	0%	Regulated activities only
Kelda	13%	16%	10%	Infrastructure services
Northumbrian [1]	14%	12%	3%	Peripheral non regulated
Pennon	40%	46%	50%	Waste management
Severn Trent	37%	51%	15%	Water & laboratory services
Thames	19%	55%	0%	Regulated activities only
UU	60%	52%	25%	Utility services
Wessex	0%	0%	0%	Regulated activities only

Note: [1] Northumbrian's 2000 figures are for the year ending 22 December 1988

Private equity versus listed equity

The bids for AWG and Thames Water last October and for Southern Water this October represent a dramatic continuation of a process that has been building momentum since 2000. In 2007, one broker had predicted there will be no listed companies by the end of 2008, a prediction which was as accurate as some of his colleagues' pronouncements about their understanding of risk management issues in the banking sector.

Changes in the sector 2000-08 and possible changes to 2010

Company	2000-07 status	2008-10 changes
AWG	Listed, taken private (Osprey)	Private – medium term
Dwr Cymru	Went private (Glas)	Private – long term
Kelda	Listed	Private – medium term
Northumbrian	Re-listed (ex Suez)	Probably remain listed
Pennon	Listed	Probably remain listed
Severn Trent	Listed	Possibly remain listed
Southern	Private (from RBS to JP Morgan)	Private – medium term
Thames	Acquired (RWE then taken private)	Private – medium term
UU	Listed	Remain listed
Wessex	Re-acquired (Azurix to YTL)	Remain with YTL

Will the allowable cost of capital be at such a generous premium to the cost of funding in the 2009 Periodic Review? The Regulator remains keen to have as many companies as possible retaining a market listing, but this carries little weight when the equity model is materially less efficient that the debt one. Has the sector moved on or is this a matter of perception? One of the key questions over the next two years will be how to encourage companies to return to the listed equity model, perhaps when the Private Equity players are seeking exits in a few years time.

HOW MANY PEOPLE ARE SERVED BY THE PRIVATE SECTOR?

To gain a reasonable picture of the status of private sector participation in water and wastewater services requires a suitable set of operational assumptions that are robust enough to deal with the vagaries of the data that is currently available.

There are three quantifiable sets of data available:

[1] Contract information at the time of the award
[2] Published data on service extension and demand growth
[3] Data about the current status of markets with a long-established private sector presence

In addition, populations grow within contract areas as a result of urban migration and indigenous population growth. This can be regarded as a contract's organic growth. These figures are extremely difficult to quantify where urbanisation involves people moving into informal settlements as the likelihood of any connection to a formal water service (let alone sanitation) is minimal unless a specific initiative (such as at La Paz in Bolivia by Suez) has been developed by a concession holder. As a result, population growth figures have been kept to a minimum.

For the sake of simplicity, all contracts that have subsequently been ended whether at the end of the contract life or prematurely, as a consequence of various externalities have been excluded from the ongoing picture. The major contract exits identified have been included in a separate table, as these have become a material factor over the past five years.

How (and why) numbers served change

Positive drivers:

Privatisations and IPOs: Contract awards (Tianjin Capital's contract gains in China since 2005), the acquisition of municipal service companies by private companies (ESSAR by Chile's Aguas Neuvas) or stock market flotations (COPASA's IPO in 2006). In addition, privately held companies (Asia Environmental Holdings in Singapore in 2004) can be floated, bringing them to the public's attention.

Acquisitions: The acquisition of small privately held companies by larger entities. This is particularly notable in the USA, where there are many privately held companies serving 150 - 5,000 people and having a very low profile. Aqua America and AWW both pursue an aggressive tuck-in acquisition strategy, taking up 5,000-15,000 new customers each year this way. It is also

seen in Italy and Greece, with ACEA actively seeking to take in the small municipalities in the Rome region.

Service extension and population growth: Water and sewerage services are extended to people who have previously relied on water vending or informal water supplies. New developments within a concession area are connected to the networks. Manila Water is an example of both.

Negative drivers:

Condemnations and re-nationalisations: The USA can be a surprisingly hostile place for the private sector. Municipalities can 'condemn' a regulated operator under 'Eminent Domain' law and seek to buy its assets from the owner as recently seen at Pennichuck, a case that is already generating useful attorney fees. In France concessions were nationalised as the political climate changed between 1918 and 1939 and Suez has lost two significant contracts since 2001. Paris is also in some form of public control but the status of this change is unclear as Veolia and Suez continue to manage many aspects of these services.

Time: Contracts do not last forever and there is no obligation to renew them at their expiry. Indeed, that can be the essence of a BOT contract. However, assets do not last forever and the need to upgrade, rehabilitate and extend assets points towards new contracts being awarded.

Divestment: Concessions being handed back as a company changes strategy (Suez in Puerto Rico), or judges that a contract has become inoperable (International Water in Bolivia). Companies can also be sold to municipalities when a parent company changes direction as seen with Allete's Florida water activities.

Population decrease: This will affect a number of concessions and companies in Europe in the longer term.

People served by contract awards, 1987-2008

These databases exclude France, Spain (with two exceptions) and the USA due to the contract award details in these countries not being typically available and individually of a small and non-specific nature. The average contract award in France for example covers 2,000 people.

Not all water privatisations are fated to be subsumed within other companies, even though this sometimes appears to be the fate of the British water sector. In general, market listings to date have come about through government or municipal privatisations.

Published data on service extension subsequent to the contract award

Examples of service extension identified include Metro Manila (water service extension by both concessions), and various contracts in Brazil, Malaysia and in Shanghai. In many cases the service extension seen to date is a partial picture.

The long established markets

There were six markets with an extensive private sector presence at the start of 1987: the USA (mainly regulated activities, rather than the non-regulated O&M outsourcing contracts that have become a feature of the past decade); France (the private sector share has advanced from 72% in 1987 to 79% by 2005); Italy (11% of the market served by the private sector and semi-private companies in 1987); Spain (the private sector share has advanced from 35% in 1987 to 46% by 2005); Germany (Gelsenwasser and some local companies holding approximately 8% of the market through long term contracts) and; England & Wales (there were 29 Statutory Water Companies serving 13.8million people in 1989).

Country	Comments	Million people
England & Wales	SWCs in operation in 1987	13.8
USA	Non-regulated activities	40.0
USA	Regulated activities	25.1
Germany	PSP since 1887	6.4
Italy	Mainly pre ATO contracts	6.5
Spain	PSP since 1867	22.0
France	PSP since 1853	45.5
Total		**159.3**

To count as private sector participation, contracts have to be of at least five years in duration and either a formally established O&M contract, a concessional contract or an outright asset privatisation. In this context, national private water service companies are defined as legal entities that have signed a formal contract with the relevant municipal or state authorities for the provision of water or wastewater services. In order to distinguish between such contracts and formal or quasi legal contracts drawn up with small local entities, these contracts also cover at least 10,000 people. Contracts for industrial water services or for developing industrial zones are excluded.

A global figure

The uncorrected total feeds directly from the Envisager databases. It does not take into account all population growth within contract areas since the contract award date, nor all service extension work. Neither does it include small formal PSP projects such as those highlighted by the 2006 World Bank study (Triche et al, 2006).

[1] Contract data driven estimate

Contract type	Million people
Contract awards	636.3
Contract endings	-65.0
Incumbent markets	159.3
Global total	**730.6**

[2] A corrected estimate

Contract type	Million people
Global total – uncorrected	730.6
Small formal PSP	10.0
Contract service extension	5.0
Population growth & urbanisation	7.0
Global total – corrected	**752.6**

The final figure compares with, for example 485 million people as being identified as served by the private sector in the 2003 edition and 563 million in 2005. The rise both reflects improved data as well as contract awards in recent years.

COMPANIES AND THEIR COVERAGE

This table outlines the number of people served by each country in their home and international markets. Wherever possible, it refers to actual companies rather than private equity holders.

When looking at the company entries and contract awards to date, the shift away from the global market leaders to more diverse and local management and financing solutions continues. These entries highlight the notable development of activities in the sector by companies based in China, Malaysia and Singapore. Other players are emerging across Latin America and in the Philippines and more recently India, thus compounding a trend away from European and Western company experience and finance operating globally towards more local applications.

Size, home and abroad

The table below needs to be approached with some circumspection. While numbers served in 'home' contracts typically refer to contracts where the company has a majority holding of a concession, 'international' contracts (here defined as being outside the country of the company's registration) may well involve relatively small stakes. Where companies have minority shareholdings in contracts managed by other water companies, these have been ignored. These also exclude companies which only serve industrial water customers or where no reliable customer data is available.

Company	Home	Intl	Total	% Home
Argentina				
Latin Aguas	1,152,000	0	**2,173,000**	100%
Australia				
Macquarie	0	17,700,000	**17,700,000**	0%
United Group	0	0	**0**	N/A
Westpac	0	1,720,000	**1,720,000**	0%
Austria				
Aquaplus	10,000	70,000	**80,000**	13%
Energie	130,000	517,000	**647,000**	20%
EVN	488,000	2,795,000	**3,283,000**	15%
Brazil				
Andrade Gutierrez	8,136,000	0	**8,136,000**	100%
COPASA	12,200,000	0	**12,200,000**	100%
Gruppo Equipav	1,490,000	0	**1,490,000**	100%
SABESP	26,200,000	0	**26,200,000**	100%
Canada				
Aquatech	856,000	0	**856,000**	100%
Chile				
Aguas Andinas [1]	6,591,000	0	**6,591,000**	100%
Aguas Nuevas	1,503,000	0	**1,503,000**	100%
Antofagasta	485,000	0	**485,000**	100%
ESVAL	1,902,000	0	**1,902,000**	100%
Nuevosur	600,000	0	**600,000**	100%
Southern Cross	2,100,000	0	**2,100,000**	100%
China				
Anhui Water Resources	N/A	N/A	**N/A**	N/A
Beijing Capital	10,750,000	0	**10,750,000**	100%
Bio-Treat Technology	6,250,000	0	**6,250,000**	100%
Cathay International Water	3,500,000	0	**3,500,000**	100%
Cheung Kong Infrastructure	0	348,000	**348,000**	0%
China Everbright	3,750,000	0	**3,750,000**	100%
China Water Group	127,000	0	**127,000**	100%
China Water Affairs Group	6,850,000	0	**6,850,000**	100%
China Water Industry Group	15,280,000	0	**15,280,000**	100%
China Water Industry Investment				
Citic Pacific	600,000	0	**600,000**	100%
Eguard Resources Development	2,050,000	0	**2,050,000**	100%
Global Green Tech Group	800,000	0	**800,000**	100%
Guangdong Investment	6,800,000	0	**6,800,000**	100%
Guozhen	2,055,000	0	**2,055,000**	100%
Interchina Holdings	8,170,000	0	**8,170,000**	100%
Jiangxi Hongcheng Waterworks	1,550,000	0	**1,550,000**	100%
Nanhai Development Ltd	1,100,000	0	**1,100,000**	100%

NWS Holdings	16,120,000	0	**16,120,000**	100%
Ningbo Fuda Company	400,000	0	**400,000**	100%
Qianjiang Water Resources	1,315,000	0	**1,315,000**	100%
Shanghai Industrial Holdings	13,900,000	0	**13,900,000**	100%
Shanghai Chengtou	3,000,000	0	**3,000,000**	100%
Shanghai Urban Construction Group	2,000,000	0	**2,000,000**	100%
Shanghai Young Sun	500,000	0	**500,000**	100%
Shenzhen Kondarl	N/A	N/A	**N/A**	N/A
Sichuan Guangan AAA Public	100,000	0	**100,000**	100%
Suzhou New District	100,000	0	**100,000**	100%
Tianjin Capital Env Protection	12,350,000	0	**12,350,000**	100%
Towngas	3,030,000	0	**3,030,000**	100%
Wuhan Sanzheng Industry Holdings	3,500,000	0	**3,500,000**	N/A
Xinjiang Hui Tong	380,000	0	**380,000**	100%
Estonia				
Tallinna Vesi	405,000	0	**405,000**	100%
France				
Alteau	250,000	0	**250,000**	100%
Bouygues	0	9,160,000	**9,160,000**	0%
SAUR	5,500,000	7,454,000	**12,954,000**	42%
Sogedo	50,000	0	**50,000**	100%
STGS	166,000	0	**166,000**	100%
Suez	12,300,000	98,479,116	**110,479,116**	11%
Ternois Epuration	80,000	0	**80,000**	100%
VE	24,100,000	95,171,000	**119,271,000**	20%
Germany				
E.ON	N/A	0	**N/A**	N/A
Gelsenwasser	5,800,000	351,000	**6,151,000**	94%
Linde	0	500,000	**500,000**	0%
MVV	990,000	0	**990,000**	100%
Remondis	200,000	4,101,000	**4,210,000**	5%
RWE	13,200,000	25,035,000	**38,235,000**	35%
Greece				
Athens Water	4,000,000	0	**4,000,000**	100%
Thessaloniki Water	850,000	0	**850,000**	100%
India				
BHEL	100,000	0	**100,000**	100%
IVRCL	1,100,000	0	**1,100,000**	100%
JUSCO	1,030,000	0	**1,030,000**	100%
Larssen & Toubro	500,000	0	**500,000**	100%
Italy				
ACEA	9,605,000	5,195,000	**14,305,000**	61%
Acegas-APS	669,000	0	**669,000**	100%
ASCM Como	250,000	0	**250,000**	100%
ASM Brescia	563,000	0	**563,000**	100%
Edison	0	2,500,000	**2,500,000**	0%
Iride	2,925,000	667,000	**3,592,000**	74%
Hera	3,032,000	0	**3,042,000**	100%
Kuwait				
Utilities Development Company	1,900,000	0	1,900,000	100%
Japan				
Mitsui	0	1,267,000	**1,267,00**	**0%**
Malaysia				

EMS Energy	N/A	0	**N/A**	N/A
Goldis	0	500,000	**500,000**	0%
Intan Utilities	600,000	0	**600,000**	100%
K P Selangor	500,000	0	**500,000**	100%
PBA Holdings	1,450,000	250,000	**1,700,000**	85%
PPB	0	250,000	**250,000**	0%
Puncak Niaga	7,100,000	0	**7,100,000**	100%
Ranhill Utilities	2,950,000	458,000	**4,408,000**	90%
Salcon	0	3,400,000	**3,400,000**	0%
Taliworks	2,045,000	200,000	**2,245,000**	91%
YTL Holdings	0	2,397,000	**2,397,000**	0%
Mexico				
Aquasol	500,000	0	**500,000**	100%
Morocco				
LYDEC	2,800,000	0	**2,800,000**	100%
Philippines				
Benguet	250,000	0	**250,000**	100%
Manila Water	5,600,000	0	**5,600,000**	100%
Metro Pacific	5,900,000	0	**5,900,000**	100%
Poland				
Aquarius	52,000	0	**52,000**	100%
Portugal				
Mota-Engil	529,000	0	**529,000**	100%
Russian Federation				
Rosvodokanal	2,010,000	0	**2,101,000**	100%
RKS	3,745,000	0	**3,745,000**	100%
Syzran Vodokanal	186,000	0	**186,000**	100%
Qatar				
QEWC	500,000	0	**500,000**	100%
Saudi Arabia				
Amiantit	0	1,727,000	**1,727,000**	0%
Singapore				
Asia Environment	0	2,975,000	**2,975,000**	0%
Asia Water Technology	0	3,563,000	**3,563,000**	0%
Boustead	0	550,000	**550,000**	0%
Darco	0	850,000	**850,000**	0%
Dayen	125,000	0	**125,000**	100%
Epure International	0	6,030,000	**6,030,000**	0%
Hyflux	350,000	1,845,000	**2,195,000**	16%
Keppel	700,000	0	**700,000**	100%
Sembcorp	400,000	0	**400,000**	100%
Spain				
Acciona	3,500,000	3,300,000	**6,800,000**	52%
Agbar [2]	15,000,000	14,511,718	**29,511,718**	51%
Agval [3]	2,040,000	150,000	**2,190,000**	93%
FCC [4]	13,000,000	9,900,000	**22,900,000**	57%
Gruppo ACS	2,200,000	2,100,000	**4,300,000**	51%
Iberdrola	0	760,000	**760,000**	0%
OHL	750,000	210000	**960,000**	78%
Sacyr Vallehermoso	822,000	1,754,000	**2,576,000**	30%
Tecasva	0	7,204,000	**7,204,000**	0%
Sweden				
Lackeby Water Group	0	250,000	**250,000**	0%

Thailand				
East Water	525,000	0	**525,000**	100%
Thai Tap	1,200,000	0	**1,200,000**	100%
UK				
AWG	5,792,000	2,500,000	**8,292,000**	70%
Cascal	430,000	3,612,000	**4,032,000**	11%
Costain	N/A	0	**N/A**	N/A
South Downs	665,000	0	**665,000**	100%
Dee Valley	258,000	0	**258,000**	100%
Glas Cymru	3,043,000	0	**3,043,000**	100%
Sutton & East Surrey	560,000	0	**560,000**	100%
Kelda Group	5,993,000		**5,993,000**	100%
Nature Technology Solutions	N/A	0	**N/A**	N/A
Northumbrian Water	6,296,000	246,000	**6,542,000**	96%
Pennon Group	1,516,000	0	**1,516,000**	100%
First Aqua	4,400,000	0	**4,400,000**	100%
Severn Trent	8,280,000	6,195,000	**14,475,000**	57%
South East Water	1,500,000	0	**1,500,000**	100%
South Staffordshire	1,233,000	0	**1,233,000**	100%
Swan Group	563,000	0	**563,000**	100%
United Utilities	7,285,000	13,455,000	**20,790,000**	34%
USA				
AECOM	0	5,163,000	**5,163,000**	0%
Alliance Water Resources	230,000	0	**230,000**	100%
American States	1,225,000	0	**1,225,000**	100%
Aqua America	3,120,000	0	**3,120,000**	100%
American Water Works	16,600,000	400,000	**17,000,000**	98%
Artesian	250,000	0	**250,000**	100%
Cadiz	N/A	0	**N/A**	N/A
California WS	2,250,000	0	**2,250,000**	100%
CH2M Hill	5,000,000	0	**5,000,000**	10%
Connecticut	278,000	0	**278,000**	100%
Consolidated Water	0	46,000	**46,000**	0%
Covanta Holdings	400,000	0	**400,000**	100%
Global Water Resources	110,000	0	**110,000**	100%
Han's Technologies	0	680,000	**680,000**	0%
Middlesex	385,000	0	**385,000**	100%
Pennichuck	138,000	0	**138,000**	100%
Pico Holdings	N/A	0	**N/A**	N/A
Pure Cycle	N/A	0	**N/A**	N/A
SJW	1,100,000	0	**1,100,000**	100%
Southwest	1,110,000	0	**1,110,000**	100%
Tyco	0	350,000	**350,000**	0%
Utilities Inc	1,000,000	0	**1,000,000**	100%
Western Water	N/A	N/A	**N/A**	N/A
York	171,000	0	**171,000**	100%

[1] Also included in Aguas de Barcelona
[2] Also in Suez
[3] Now separate from SAUR
[4] VE and FCC share the Pro-Activa activities

Companies covered by country

This excludes entries for companies only included in the country entries.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Argentina	0	0	0	0	0	1	1	1	1	1
Austria	0	0	1	1	1	2	3	3	3	3
Australia	0	0	0	0	0	0	1	1	3	3
Belgium	1	1	1	1	1	1	1	0	0	0
Brazil	1	1	1	1	1	1	1	4	4	4
Canada	0	0	0	0	0	1	1	1	1	1
Chile	1	1	1	1	1	4	4	5	5	6
China	4	6	7	7	9	16	19	30	31	31
Czech Republic	1	1	1	0	0	1	1	0	0	0
Estonia	0	0	0	0	0	0	1	1	1	1
France	3	3	3	3	3	3	4	4	4	4
Germany	5	5	5	4	4	4	4	4	5	5
Greece	0	1	2	2	2	2	2	2	2	2
India	0	0	0	0	1	2	3	3	3	4
Italy	5	9	8	8	12	12	7	7	9	9
Japan	0	0	0	0	0	0	0	1	0	1
Kuwait	0	0	0	0	0	0	0	0	1	1
Malaysia	3	3	2	6	10	10	11	11	11	11
Mexico	0	0	0	0	0	1	1	1	1	1
Morocco	0	0	0	0	0	0	1	1	1	1
Netherlands	0	1	1	1	1	1	1	0	0	0
Philippines	0	0	0	0	2	3	3	3	3	3
Portugal	0	0	0	0	0	0	1	1	1	1
Qatar	0	0	0	0	0	0	0	1	1	1
Saudi Arabia	0	0	0	0	0	1	1	1	1	1
Singapore	0	0	0	0	4	6	6	6	6	6
Spain	6	8	8	8	8	7	8	8	8	7
Sweden	0	0	0	0	0	0	1	1	1	1
Thailand	2	1	1	1	1	1	1	2	2	2
United Kingdom	18	16	15	17	18	17	19	18	15	15
USA	20	24	25	23	23	20	21	21	21	24

The table below summarises these results in terms of the number of companies identified, along with which countries they are based in.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Number of countries	13	15	16	15	18	22	28	27	27	28
Number of companies	70	81	82	84	102	117	128	142	145	150
- OECD countries	59	69	70	68	73	72	77	74	75	78
- Advanced developing	2	2	2	2	6	13	13	18	19	20
- Developing	9	10	10	14	23	32	38	50	51	52

COUNTRY MARKET DEVELOPMENT, PROSPECTS AND PROGNOSIS

A new set of forecasts

After ten sets of annual forecasts, 2015 is not as far distant as it appeared to be in 1999. It is therefore timely to introduce a longer term forecast.

The addressable population is the percentage of the population (2007 figures) that the author believes have a better than even chance of being served with privatised water and/or sewerage provision by 2015. That may once have appeared a long way off, but it is not as distant as it may have seemed to have been in 1999 and it does allow for current political, regulatory and market trends to be translated into realistic market developments, while allowing for years of contract award and implementation slippage for political and economic changes.

The table below consists of a set of estimates for the current extent of private sector participation in water and sewerage services for the main markets, along with forecasts for the potential extent of private sector penetration by 2015 and 2025. Perhaps 25-30% of the market is 'suitable' for PSP in that PSP can offer genuine benefits to people under current conditions and those foreseeable in 2025. Almost all of this market is the urban market, meaning that by 2025, 45-55% of the urban market is potentially suitably placed for PSP.

The potential for private sector participation

Not all markets are suitable for privatisation, even on a 25 or a 50 year view. Yet the only predictable element in the above statement is its inherent unpredictability. In 1999, 5% of the world's population was served to some extent by the private sector. Since 2006, this had increased to 10% of the world's population and to 11% since 2007.

Current and forecast extent of private sector participation

What has been fascinating to observe is the steady development of numbers served and a series of forecasts for PSP coverage between 1999 and 2008 that have remained in a 15-17% range. Our revised forecast for the extent of PSP in 2015 is 1,161million, an upwards adjustment of 13million on the forecast made in 2007.

2015 forecasts (million people)

Year	Number	% of global population
2003	1,160	16%
2004	1,125	15%
2005	1,085	15%
2006	1,145	16%
2007	1,148	16%
2008	1,161	16%

The figures for privatisation to date demonstrate the variable progress that the private sector has made. In Western Europe, private sector service provision is already becoming commonplace, which can be related to the global domination of international markets by a number of companies from this region. The forecasts for most other regions with the exception of the Americas are on the cautious side for the time being. What is notable is the gap between the estimation of the addressable populations in the Americas and the extent of privatisation to date.

What has been consistently evident over the past years is that nothing can be taken for granted when it comes to assessing market developments and prospects. China was seen as something of interest in 1999, now it is the single most important global driver. The Russian Federation was seen as 'unsuitable before perhaps 2050' as recently as five years ago. Now a market is emerging, especially in Moscow and St. Petersburg. India was beyond most boundaries, characterised by blocked initiatives and mothballed plans. Now not only have a number of contracts been awarded since 2002, but also the new Congress Government has made it clear that PSP is to be highlighted as a method for mobilising new resources.

Western Europe

	PSP in 2008		PSP by 2015		PSP by 2025	
	Water	**Sewerage**	**Water**	**Sewerage**	**Water**	**Sewerage**
Austria	7%	0%	9%	14%	12%	17%
Belgium	3%	10%	3%	11%	3%	12%
Denmark	1%	0%	2%	2%	2%	2%
Finland	0%	1%	0%	2%	2%	2%
France	74%	55%	80%	71%	84%	76%
Germany	21%	18%	26%	29%	27%	31%
Greece	44%	37%	46%	45%	48%	48%
Ireland	1%	42%	21%	46%	19%	47%
Italy	40%	29%	51%	46%	53%	50%
Netherlands	0%	10%	0%	11%	0%	11%
Norway	6%	0%	5%	10%	8%	12%
Portugal	25%	23%	56%	51%	61%	56%
Spain	43%	50%	63%	57%	64%	62%
Sweden	1%	1%	5%	5%	5%	5%
Switzerland	0%	0%	0%	0%	0%	0%
United Kingdom	88%	90%	94%	96%	94%	97%

Central & Eastern Europe

	PSP in 2008		PSP by 2015		PSP by 2025	
	Water	**Sewerage**	**Water**	**Sewerage**	**Water**	**Sewerage**
Albania	16%	15%	24%	30%	29%	31%
Armenia	65%	65%	73%	67%	76%	69%
Azerbaijan	1%	0%	6%	11%	11%	16%
Bulgaria	20%	16%	42%	49%	53%	53%
Croatia	0%	17%	22%	27%	27%	34%
Czech Republic	82%	76%	84%	79%	89%	87%
Estonia	31%	31%	38%	38%	42%	42%
Georgia	24%	0%	29%	12%	46%	38%
Hungary	29%	27%	36%	36%	37%	37%
Kosovo	11%	0%	13%	0%	16%	11%
Latvia	0%	0%	23%	23%	24%	24%
Lithuania	0%	0%	15%	0%	19%	19%
Moldova	18%	0%	19%	7%	29%	14%
Montenegro	25%	25%	25%	25%	33%	33%
Poland	3%	3%	11%	13%	16%	22%
Romania	11%	0%	19%	17%	26%	21%
Russian Federation	7%	1%	18%	12%	23%	20%
Slovakia	20%	20%	37%	37%	38%	38%
Slovenia	0%	11%	25%	25%	26%	26%
Ukraine	0%	0%	5%	5%	13%	10%

Middle East and North Africa

	PSP in 2008		PSP by 2015		PSP by 2025	
	Water	**Sewerage**	**Water**	**Sewerage**	**Water**	**Sewerage**
Algeria	31%	10%	35%	16%	42%	23%
Bahrain	0%	0%	100%	100%	100%	100%
Egypt	0%	7%	6%	17%	10%	25%

Iraq	0%	0%	0%	0%	0%	0%
Israel & Palestine	13%	0%	21%	8%	21%	28%
Jordan	0%	37%	43%	36%	50%	63%
Kuwait	0%	66%	100%	100%	100%	100%
Lebanon	0%	0%	11%	11%	0%	0%
Morocco	21%	15%	29%	23%	37%	32%
Oman	33%	27%	39%	48%	42%	56%
Qatar	0%	88%	40%	100%	91%	91%
Saudi Arabia	26%	12%	43%	34%	50%	43%
Tunisia	0%	0%	18%	0%	33%	16%
Turkey	2%	3%	10%	7%	3%	11%
UAE	3%	33%	38%	47%	63%	79%
Yemen AR	0%	0%	0%	0%	0%	0%

Sub-Saharan Africa

	PSP in 2008		PSP by 2015		PSP by 2025	
	Water	**Sewerage**	**Water**	**Sewerage**	**Water**	**Sewerage**
Burkina Faso	0%	0%	11%	0%	13%	0%
Cameroon	29%	0%	28%	9%	30%	8%
Central African Rep	2%	0%	5%	0%	17%	0%
Chad	7%	0%	22%	0%	9%	0%
DR Congo	0%	0%	0%	0%	0%	0%
Côte d'Ivoire	26%	8%	36%	13%	38%	15%
Ethiopia	0%	0%	0%	0%	0%	0%
Gabon	47%	0%	47%	0%	53%	0%
Ghana	26%	0%	26%	0%	28%	6%
Guinea	4%	0%	18%	0%	21%	0%
Guinea-Bissau	0%	0%	14%	0%	17%	0%
Kenya	0%	0%	6%	0%	14%	2%
Lesotho	0%	0%	0%	0%	0%	0%
Mali	1%	0%	1%	0%	2%	0%
Mauritius	0%	15%	0%	15%	16%	16%
Mozambique	4%	0%	12%	0%	21%	0%
Namibia	0%	4%	0%	7%	0%	10%
Niger	4%	0%	8%	0%	8%	0%
Nigeria	0%	0%	0%	0%	5%	1%
Senegal	31%	0%	34%	0%	39%	6%
South Africa	3%	1%	4%	2%	10%	4%
Sudan	6%	0%	8%	0%	8%	0%
Tanzania	0%	0%	0%	0%	0%	0%
Uganda	0%	0%	5%	3%	9%	0%
Zambia	0%	0%	4%	0%	5%	0%

South East and East Asia and Oceania

	PSP in 2008		PSP by 2015		PSP by 2025	
	Water	**Sewerage**	**Water**	**Sewerage**	**Water**	**Sewerage**
Australia	27%	7%	37%	13%	43%	18%
China	10%	8%	14%	12%	18%	16%
Hong Kong	67%	0%	91%	26%	90%	30%
Indonesia	5%	0%	8%	1%	13%	1%
Japan	0%	0%	5%	13%	8%	16%

Macao	100%	0%	100%	0%	100%	100%
Malaysia	61%	0%	80%	33%	80%	36%
New Zealand	1%	10%	3%	11%	3%	10%
Philippines	14%	2%	22%	8%	26%	13%
Singapore	33%	0%	33%	8%	33%	10%
South Korea	0%	5%	0%	16%	10%	24%
Taiwan	13%	1%	30%	2%	35%	6%
Thailand	3%	0%	64%	22%	65%	36%
Vanuatu	15%	0%	20%	0%	33%	0%
Vietnam	0%	0%	8%	0%	12%	5%

South and Central Asia

	PSP in 2008		PSP by 2015		PSP by 2025	
	Water	**Sewerage**	**Water**	**Sewerage**	**Water**	**Sewerage**
Bangladesh	0%	0%	0%	0%	0%	0%
India	1%	0%	3%	0%	5%	1%
Iran	0%	0%	0%	0%	0%	0%
Kazakhstan	2%	0%	3%	0%	6%	3%
Maldives	32%	0%	50%	0%	50%	0%
Mongolia	0%	0%	0%	0%	0%	0%
Nepal	0%	0%	3%	0%	8%	0%
Pakistan	0%	0%	0%	0%	0%	2%
Sri Lanka	0%	0%	1%	0%	5%	0%
Uzbekistan	2%	0%	3%	0%	6%	3%

The Americas

	PSP in 2008		PSP by 2015		PSP by 2025	
	Water	**Sewerage**	**Water**	**Sewerage**	**Water**	**Sewerage**
Argentina	14%	8%	23%	18%	26%	22%
Belize	0%	0%	53%	33%	50%	50%
Bolivia	0%	0%	0%	0%	0%	0%
Brazil	28%	18%	36%	24%	52%	46%
Canada	2%	0%	7%	9%	8%	11%
Chile	81%	77%	95%	94%	96%	93%
Colombia	26%	10%	31%	16%	34%	20%
Cuba	12%	0%	13%	0%	15%	4%
Dominican Republic	13%	0%	13%	0%	13%	8%
Ecuador	19%	13%	38%	38%	43%	40%
Honduras	7%	7%	8%	8%	10%	10%
Mexico	12%	9%	22%	17%	24%	20%
Panama	9%	0%	53%	53%	56%	56%
Paraguay	0%	0%	4%	0%	6%	3%
Peru	3%	0%	16%	13%	29%	35%
Trinidad & Tobago	0%	0%	71%	71%	79%	79%
Uruguay	3%	3%	9%	6%	14%	14%
USA	16%	5%	20%	8%	23%	11%
Venezuela	0%	0%	8%	6%	14%	11%

People served by private water or sewerage services in 2007 and forecast for service in 2015

Million people		2008		2015		2025
Western Europe	177.1	44%	217.5	53%	229.6	55%
C&E Europe	33.8	10%	64.4	20%	81.1	27%
ME & Africa	67.3	6%	119.1	8%	202.6	12%
South & Central Asia	10.1	1%	53.1	3%	97.4	5%
South East Asia	250.7	12%	436.1	20%	555.2	24%
Oceania	8.4	25%	12.1	32%	14.7	36%
North America	93.9	21%	137.9	29%	209.0	40%
Latin America	79.9	17%	120.5	24%	148.0	27%
World total	**721.2**	**11%**	**1160.6**	16%	**1537.6**	19%

MERGERS AND ACQUISITIONS

Mergers and acquisition activity in the sector has been remarkably intense over the past decade, reflecting how ownership changes as strategies and perspectives change. Over 80 corporate transactions have been listed here, which have taken place since 1997. These transactions are primarily in the water sector and involved at least USD10million being paid for their stakes. In addition, more bids are in the offing, especially in Chile, the Philippines and perhaps in the UK. A considerable number of smaller transactions (typically 20-40 per annum) have also been recorded, especially in the US, where regulated utilities 'tuck in' privately-owned small water systems near to their own systems, in order to expand their customer base and benefit from economies of scale. These major transactions can be divided into four areas:

1. Acquisitions of listed companies
2. Acquisitions of municipal stakes
3. Acquisitions of private companies and divisions
4. Acquisitions of strategic stakes

Where appropriate, an implied value has been derived for the company by dividing the actual price paid by the size of the share stake acquired. Disclosure of earnings and asset earnings is somewhat inconsistent and incomplete, so two measures have been used here: the price paid per person (implied value divided by the number of people served either by water or sewerage services), and price/turnover (implied value divided by revenues) to outline the varying valuations for these assets and activities.

Private equity deals, 2001–08

This list covers all 21 major deals where a company has either been acquired by a private equity house or sold from one such institution to another.

Company	Holding	Date	Stake	Price
WestLB	Mid Kent	03/2001	100.0%	GBP106.0m
Glas Cymru	Dwr Cymru	05/2001	100.0%	GBP1,850.0m [3]
South Downs	Portsmouth	10/2001	100.0%	GBP71.0m
RBS	Southern Water	04/2002	100.0%	GBP1,050.0m
Macquarie	South East	09/2003	100.0%	GBP426.0m [3]
Consorcio Financiero	ESVAL [1]	10/2003	49.8%	USD92.3m
Penta Finance	SmVaK (AWG)	11/2003	54.3%	EUR54.5m
Penta Finance	SmVaK (Ondeo)	04/2004	44.1%	EUR46.5m
Arcapita Bank	South Staffs	11/2004	100.0%	GBP143.0m
PAI	SAUR	02/2005	85.0%	EUR1,037.0m
Hastings	Swan Group	02/2005	100.0%	AUD210.0m
AIG	Utilities Inc	05/2005	100.0%	N/A
Terra Firma (UK)	East Surrey	10/2005	100.0%	GBP435.0m
Deutsche Bank	East Surrey [2]	12/2005	100.0%	GBP189.0m

Macquarie	Aquarion	02/2006	100.0%	USD860.0m [3]
Aqualia	SmVak	04/2006	98.4%	EUR167.0m
Westpac	South East	01/2006	100.0%	GBP665.0m [3]
Osprey	AWG	10/2006	100.0%	GBP2,200m
Macquarie	Thames Water	10/2006	100.0%	GBP8,000.0m [3]
CIF / JP Morgan [4]	Southern Water	10/2007	100.0%	GBP4,195.0m
Alinda IF	South Staffs	10/2007	100.0%	N/A
Saltaire Water [5]	Kelda	02/2008	100.0%	GBP3,036.0m

Notes:
[1] 44.8% acquired by Consorcio Financiero and 5.0% by the Moneda Chile Fund.
[2] The original acquisition of East Surrey Holdings plc included the assets of Phoenix Gas, which have been retained by Terra Firma.
[3] Cash and assumed debt
[4] JP Morgan Asset Management Infrastructure 32%, CIF 27%, UBS 18%
[5] CII 47%, GIC Infra Holdings 33% & Infracapital 20%

Bids for listed companies

The highest prices paid are for asset-owning companies in the US and the UK. In the former, the level of activity has been intense, with a significant proportion of the regulated customer base having seen its owners change hands twice during this period. The lower prices for SmVaK and ScVK reflect their being non-asset owning companies in the Czech Republic.

Acquisitions, by bidding and target company, 1998–2007, (USDmillion)

Year	Bidder	Target	Bid price (USDm)	Stake bought	USD per person	Price / turnover
1998	Azurix	Wessex Water	2,500	100%	702	5.9
1998	Aqua America	Consumers	463	100%	691	4.7
1998	California WS	Dominguez	64	100%	427	2.6
1999	AWG	SmVaK	48	53%	60	2.8
1999	Union Fenosa	Cambridge	87	100%	300	2.9
1999	Anglian	Hartlepool	30	100%	333	3.0
1999	Kelda	York Waterworks	45	100%	265	3.2
1999	Thames	E'Town	923	100%	1,420	6.3
1999	Kelda	Aquarion	444	100%	888	3.8
1999	American WW	SJW Corp	390	100%	398	3.7
1999	American WW	NEI	700	100%	412	3.9
1999	Veolia	ScVK	27	38%	37	1.9
1999	Suez	United Water	927	67%	553	3.9
2000	RWE	Thames	6,750	100%	356	4.1
2000	American States	CCWC	31	100%	775	N/A
2000	American WW	Citizens Utilities	49	100%	445	0.5
2000	American WW	UWR	835	100%	835	N/A
2001	TMWA	Sierra Pacific	350	100%	1,400	N/A
2001	RWE	American WW	4,600	100%	341	3.2
2004	Arcapita	South Staffs	245	100%	199	2.4
2006	Agbar	Bristol Water	281	100%	264	2.2
2007	ESVAL	OTPP	365	49%	746	4.3
2007	ESSBIO	OTPP	340	51%	669	4.6
2007	RUAS	Veolia	42	100%	323	1.1

The two bids for Thames are for somewhat different entities. The EUR11.3billion bid in 2000 included a GBP4.3billion bid for the company's listed shares, while the GBP8.0billion bid in 2006 includes Macquarie paying GBP250million for 11% of Thames' equity, valuing Thames' equity at GBP2,275million, with the rest being accounted for by debt. RWE believes that it has made a EUR500million profit in this sale.

Equity stakes in municipal/state entities acquired by listed companies

This list is by no means comprehensive, but it highlights that USD7.4billion has been spent by the private sector in acquiring equity stakes from governments and municipalities in the past nine years. Including other transactions where data was inadequate for inclusion, the real figure is likely to be in the range of USD9.0–10.5billion. Assets are not actually being bought in these cases, but instead either the equity of an operating company to manage the underlying assets or a minority stake in the asset owning company is being bought. The high price/turnover ratios seen, especially in Chile, reflect the potential for revenue growth through extending water and sewerage services and, even more dramatically, sewage treatment.

Completed acquisitions of stakes in municipal/state entities, by bidding company and target, 1997–2006 (USDmillion)

Year	Bidder	Target	Bid price (USDm)	Stake bought	USD per person	Price / turnover
1997	Veolia	Budapest Sewerage	79	25%	158	5.4
1997	Suez	Budapest Water	82	25%	164	5.5
1998	Veolia	Sanepar	217	30%	100	2.6
1999	Bouygues/Azurix	OSM	133	80%	88	3.0
1999	Azurix	BA Province (C & A)	439	90%	244	12.2
1999	Dragados	A del Grande B A	44	31%	39	
1999	EMOS	Aguas Cordeillara	193	100%	345	N/A
1999	Suez	EMOS	957	42%	226	14.2
1999	Suez	EMOS	178	9%	196	12.4
1999	Iberdrola	ESSAL	94	51%	312	10.8
1999	Thames & EDP	ESSEL	113	45%	251	13.2
1999	Suez	EMOS	957	42%	230	14.3
1999	AWG / Enersis	ESVAL	138	40%	136	5.1
1999	Gelsenwasser	Hanse Wasser	355	75%	676	N/A
1999	Vivendi / RWE	BWB	1,749	50%	448	3.1
1999	Azurix	G M de Desarrollo	39	80%	64	2.2
1999	Thames	Izmit Su As	21	12%	146	N/A
2000	Suez	Manuas Saneamento	111	90%	51	3.1
2000	Thames	ESSEL	73	26%	281	14.8
2001	EVN	Nosiwag	83	100%	184	5.5
2001	Thames	ESSBIO	336	51%	220	14.4
2001	AWG / VE	PVK	160	66%	101	2.4
2001	IW / UU	Tallinna Vesi	78	50%	186	N/A
2004	Falabella	ESSAT	74	100%	90	2.1
2004	Falabella	ESSAR	61	100%	55	2.0
2004	Falabella	ESMAG	35	100%	117	3.2
2004	Veolia	BVAG	450	75%	1,200	1.8
2004	Veolia	BVAG	450	75%	1,200	1.8
2004	Veolia	BVAG	450	75%	1,200	1.8
2004	Veolia	BVAG	450	75%	1,200	1.8
2006	DM Consunji	Maynilad Water	503	84%	N/A	N/A
2007	Acegas	APGA	N/A	100%	N/A	N/A
2008	Cascal	Zhumadian Water Co	18	51%	N/A	6.0
2008	Cascal	Yancheng Water Co	29	49%	100	6.1

Source: Envisager M&A Database

Acquisitions of stakes in subsidiaries of listed companies and unlisted companies

Examples here include the buying out of joint venture stakes (AAET, International Water, Cascal and China Water), along with buying out minority partners (SAUR), the outright acquisition of water assets held by a third party (Cambridge, Wessex, American WW and AquaSource), the acquisition of privately-owned companies (Utilities Inc, GH Holdings and Citizens Utilities) and non-core divisions from other water companies (Crea and Berlinwasser International).

Completed acquisitions of stakes in subsidiaries, by bidding and target company, (USDm)

Year	Bidder	Target	Bid price (US$ m)	Stake bought	US$ per person	Price / revenues
1999	American WW	AAET	32	50%	67	1.7
1999	Edison	Intl. Water	40	50%	70	N/A
2000	Bouygues	Crea	60	71%	30	1.7
2000	Nuon	Biwater Capital	130	50%	64	N/A
2000	RWE	China Water Co	70	49%	40	N/A
2000	AWG	Aguas Puerto	131	29%	179	6.7
2000	Guangdong Inv	GH Holdings	508	81%	123	1.9
2000	Bouygues	SAUR	158	13%	101	0.7
2001	Nuon	Utilities Inc.	405	100%	476	6.3
2001	Bouygues	SAUR	181	14%	108	0.7
2001	American WW	Citizens Utilities [1]	231	100%	330	N/A
2001	American WW	Azurix NA	160	100%	80	N/A
2002	YTL	Wessex Water	2,150	100%	581	N/A
2002	Kelda	AWW New Eng	120	100%	678	N/A
2002	RWE	Citizens Utilities [1]	859	100%	781	N/A
2003	Sime Darby	China Water Co	70	46%	43	N/A
2004	CKI	Cambridge	87	100%	301	3.4
2004	Aqua America	Heater Utilities	48	100%	320	N/A
2004	Aqua America	AquaSource	191	100%	382	N/A
2005	Westpac	Mid Kent Water	480	100%	820	5.6
2005	Amga	Aqua Italia	68	63%	348	2.2
2006	FCC	SmVAK	350	100%	315	4.4
2006	Westpac	South East Water	1,330	100%	885	5.9
2007	Aqua America	Utilities & Industries	51	100%	378	N/A
2007	Aqua America	Aquarion NY	7	100%	652	N/A
2007	Macquarie	Aquarion	760	100%	1,150	3.7
2007	OTPP	ASNSM	N/A	100%	N/A	N/A

Note: [1] Separate parts of the same company

Source: Envisager M&A Database

Examples of strategic stake acquisitions in listed companies

Information on these activities is particularly poor, as companies are not always inclined to publicise such deals. These exceptions give an indication of the scope of activities that take place, usually referring to building up stakes in a company which has been already invested in (Aguas Andinas), a strategic relationship (Intan Utilities), a prelude to a bid (Acque Potabili) or a stake divestment by a previous owner to a third party (Northumbrian).

Completed acquisitions of strategic stakeholdings, by bidding and target company, (USD million)

Year	Bidder	Target	Bid price (USDm)	Stake bought	USD per person	Price / turnover
1999	ACEA	Acque Potabili	10	11%	123	2.3
1998	Veolia	Intan Utilities	12	18%	111	3.0
2002	Agbar	Aguas Andinas	210	9%	229	16.5
2004	Agbar	Aguas Andinas	167	15%	109	3.2
2005	Ontario Teachers	Northumbrian	460	25%	236	2.8
2006	RBS	Southern Water	N/A	25%	N/A	N/A

Source: Envisager M&A Database

Looking back, at least 14 companies have changed hands twice during this period, ranging from Thames Water and American Water Works at one extreme, to Cambridge and Mid Kent at the other. This is likely to be a unique era of corporate activity for the sector.

LOCAL COMPANIES – A SUBTLE SIDE OF PPP

Information continues to emerge about smaller and lower profile companies which continue to merit keeping at least a watching brief on them. Their very nature (unlisted, usually privately held and locally based) means that information about them can be patchy and at times inconsistent. This is highlighted by the somewhat volatile nature of some companies reported as active in the Russian Federation. This year, Han's Technologies has continued to gain contracts in China and has been promoted to a full entry. Others such as RUAS of France have left because they have been acquired by a larger player. Then there are the potentially major players who for now have a low profile. The best example of this is Multiplex of Switzerland, which has gained the Tbilisi water concession.

To merit inclusion in the following list, companies need to have gained at least one water or sewerage contract since 1987 which is still active and serves at least 10,000 people.

The last few years have been marked by the increase in the quality of local companies as well as their quantity. This reflects a shift away from opportunists (water vendors who provide a debatable quality of service based on exploiting deficiencies in the utility's service) to enablers, companies often working with the utilities to expand and improve services both in currently served areas and where no formal service previously existed.

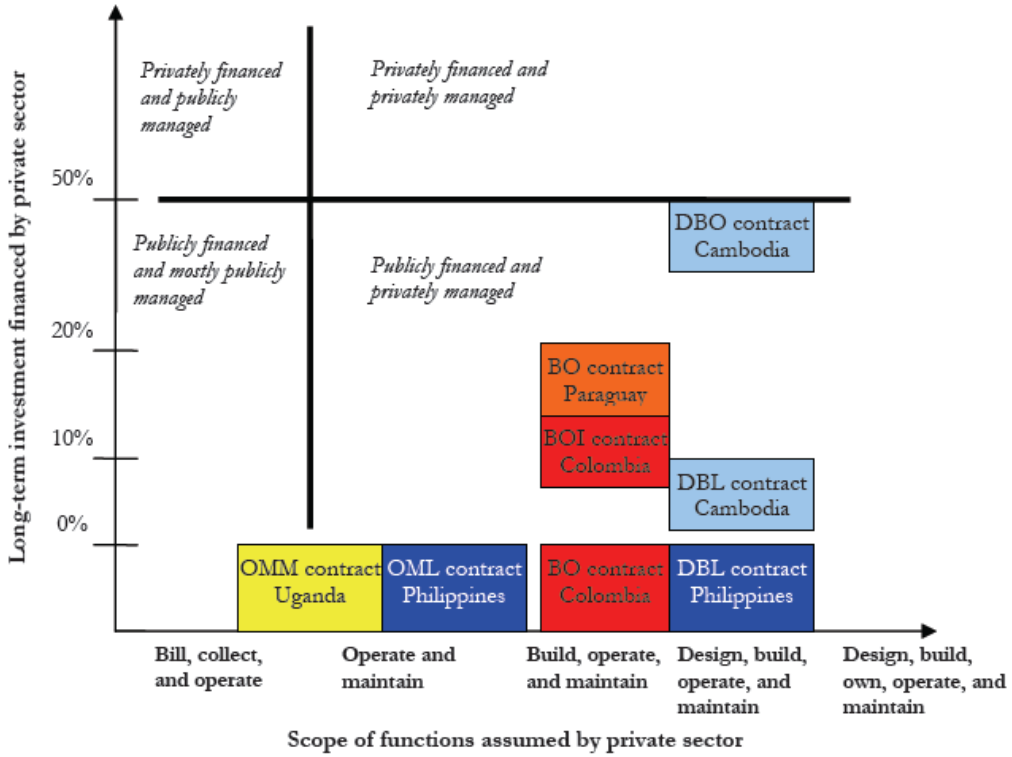
The emergence of formal service provision

Where no water and sanitation services are provided by a utility, people still need these services and in many cases, they turn to informal service providers. Informal service providers give a rudimentary service and usually a costly one. The fact that people have to pay for such services means that there is considerable potential to replace these services with small, locally based concessions and operations contracts, sometimes working as sub-contractors for incumbent utilities. A survey by the World Bank (Triche T, Requena S & Karuiki M (2006) Engaging local private operators in water supply & sanitation services. Water Supply & Sanitation Working Notes, No 12, December 2006, World Bank, Washington DC, USA.) considers how local private operators can be brought in to address these service gaps. A variety of operational models supported by the World Bank in five countries in Asia, Africa and Latin America were examined.

Country	Contracts	People served
Cambodia	18	133,000
Colombia	20	1,242,000
Paraguay	6	28,000
The Philippines	22	83,000
Uganda	10	173,000
Total	**76**	**1,659,000**

These are not headline grabbing contracts. As the figure below shows, the intensity of private sector participation is appreciably more constrained than in the capital intensive, concessional models usually associated with the World Bank.

Allocation of financing and management mechanisms



Source: Triche T, Requena S & Karuiki M (2006)

Approximately 1.6million people (21,800 people per contract) have been connected to these services, a small proportion of the global PSP coverage, but in the context of these countries and markets, a significant figure. The survey ended in September 2005 and may not reflect the current performance of the contracts. To date, their performance has been encouraging. It is notable that in none of these cases is the operator exposed to foreign currency perturbations. Indeed, financing risks were generally limited, with only the BO contracts in Paraguay and the DBO contracts in Cambodia having private operators carrying a partial financial risk.

The effective tariffs charged ranged from USD0.39-0.50 per m^3. In all cases, these were developed with affordability in mind. With some exceptions, there was no minimum water consumption. In Paraguay, a lower actual tariff with a high minimum usage per month meant that the real tariff of USD0.20 per m^3 was in fact USD0.48 per m^3 as water used was usually less than the minimum.

Second tier companies continue to emerge

The next step up is companies being identified as holding individual contracts.

In previous editions, we have noted some smaller, local players. This is an attempt to list local companies which have gained formal PPP contracts. The initial survey identified 97 companies in 17 countries. This excludes companies with joint ventures with the major international companies (e.g. the Eurasian Water Partnership in the Russian Federation, which is a Veolia joint venture). In this edition, 104 companies have been identified (some of those initially identified have been taken over or have left the sector). Further details about companies (population served and so on) will be included in the country entries.

The number of companies here operating internationally is small. One was identified operating in China (North American Envirotech), Vitens (the Netherlands) in Ghana, Aguas de Portugal (Portugal) in Brazil and Mozambique and NTR (Denmark) in the Maldives. Vitens and Aguas de Portugal are public companies, but these activities were gained as PPP projects on competitive tenders.

The impact of these companies ought to be put into their global context. The 778 contracts covered in the Envisager database that relate to companies with full entries in the Yearbook cover 603.2million people with an average of 775,000 people per contract, compared with 32.0million people covered by the 156 contracts held by these companies, with an average of 212,000 people per contract. 95% of people served by PSP contract awards identified here have been by the 150 companies with entries in the Yearbook, with 5% served by the other 104 companies listed below.

Smaller company list

Project Country	Company	Parent Country
Argentina	Benito Roggio e Hijos	Argentina
Argentina	Conteras Hermanos / Esuco	Argentina
Argentina	Phoenix / Sagua Intl / Simali	Argentina
Argentina	Sagua International	Argentina
Argentina	Sudamerica de Aguas	Argentina
Brazil	Aguas de Portugal	Portugal
Brazil	Aguas de Santo Antonio	Brazil
Brazil	Aguas de Tucurui	Brazil
Brazil	Aguia Branca	Brazil
Brazil	Carioca Christiani-Nielsen	Brazil
Brazil	Construtora Gautama	Brazil
Brazil	Construtora Nascimento	Brazil
Brazil	Emissao Engenharia	Brazil
Brazil	Emp Sul-Americana de Montagem	Brazil
Brazil	Empresa de Saneamento de Nobres	Brazil
Brazil	Global Enghenharia	Brazil
Brazil	Globalbank Consulting	Brazil
Brazil	Hidrogesp	Brazil
Brazil	Materia Perfuracao de Pocos	Brazil
Brazil	Matonense de Saneamento	Brazil
Brazil	Novacon	Brazil
Brazil	Obrecht Engenharia Ambiental	Brazil
Brazil	Perenge Engenharia	Brazil
Brazil	Primaverra do Leste	Brazil
Brazil	Telar	Brazil
Brazil	Villa Nova Engenharia	Brazil
Chile	Grupo Hurtado	Chile
Chile	Hidroscan	Chile
Chile	Vicuna	Chile

China	Chongqing Kanda Env	China
China	CNA Group	China
China	Dalian Dongda Env Eng	China
China	DKLS Industries Bhd	China
China	Hainan Runda Ind	China
China	Hana Corp	China
China	Hong Yuan Ju	China
China	Jiangsu Taizhou Water	China
China	Jinan Shifangyuantong	China
China	Lianheruitong Water	China
China	Long Quan Group	China
China	North American Envirotech	USA
China	Qingdao Huaou	China
China	R&F Properties Group	China
China	Rong Group	China
China	Shanghai Fudalefumen	China
China	Shanghai Qingyue Inv	China
China	Sino-Dutch Water Investment Co	Netherlands
China	United Envirotech	China
China	Wai Kee Holdings	China
China	Weihai Dean Water Eng	China
China	Yiqi Group	China
Colombia	Acuasasa	Colombia
Colombia	Acueductos y Alcantarillados Sostensibles	Colombia
Colombia	Aguas de la Costa	Colombia
Colombia	Aguas de la Guajira	Colombia
Colombia	Aguas de la Mojana	Colombia
Colombia	Aguas de la Ribera	Colombia
Colombia	Aguas del Llano	Colombia
Colombia	Aguas Kpital	Colombia
Colombia	Aguascol	Colombia
Colombia	Conhydra	Colombia
Colombia	Consorcio Almafama	Colombia
Colombia	Construcciones Insaca	Colombia
Colombia	Consultores de Desarrollo / Hidrotec	Colombia
Colombia	Emas / Ingenieria Sala	Colombia
Colombia	Empresa de Aguas de Giradot	Colombia
Colombia	Francisco Velasquez Inginieria	Colombia
Colombia	Grupo Colombo-Cubano	Colombia
Colombia	Grupo Empresarial Energic	Colombia
Colombia	Grupo Hydros	Colombia
Colombia	Ingenieria Sala	Colombia
Colombia	Ingenieria Total	Colombia
Colombia	Operadores de Servicos	Colombia
Colombia	Presea	Colombia
Colombia	SIE de Colombia	Colombia
Colombia	Unisaguas	Colombia
Ecuador	Leonardo Armijos Luna	Ecuador
France	Alteau	France
France	Sogedo	France
France	STURNO	France
France	Ternois Epuration	France

Georgia	Multiplex Solutions	Switzerland
Ghana	Vitens	Netherlands
Indonesia	PT Buana & PT Dewata Arta Kharsima	Indonesia
Kenya	Gauff Ingenieure	Germany
Maldives	NTR / HOH	Denmark
Mexico	Atlatec	Mexico
Mexico	Bufete	Mexico
Mexico	Coplata	Mexico
Mexico	Grupo Protexa	Mexico
Mexico	Solaqua / TCS Enterprises	Mexico
Mexico	Wheelabrator / Coplata	USA
Mozambique	Aguas de Portugal / Mazi Mozambique	Portugal
Philippines	DM Consunji	Philippines
Poland	Aquarius	Poland
Russia	Alfa Group	Russia
Russia	Alpha-Eco Group	Russia
Russia	Eurasian Water Partnership	Russia
Russia	Russian Utility Systems	Russia
Russia	Syzranvodokanal	Russia
South Africa	Amanz' aBantu Services / Uzinzo	South Africa
Thailand	EGCO	Thailand
Uruguay	STA / Benencio	Uruguay
Venezuela	SNC Lavalin	Canada

REFLECTIONS ON RECENT EXPERIENCES BY INTERNATIONAL PLAYERS

These comments are edited and updated from a background paper the author prepared for the United Nations for its 2008 Trade and Development Report (UNCTAD (2008) TDR 2008: Commodity Prices, Capital Flows and the Financing of Investment, UNCTAD, Geneva). References can be found at the back of this Yearbook.

What are the pros and cons regarding PSP and international water companies? Using PSP in this context allows for the mobilisation of new sources of funding and management experience and therefore assists Governments struggling to mobilise new sources of funding. Against this is the inherent need for companies to make suitable returns on their investments and the need to balance the returns made against the benefits accrued by the government and the risks carried by both sides in undertaking such a contract.

The role of PSP in attaining national development plans

The motivation for PSP lies in the gap between the ambitions of international initiatives such as the UN's 'Development Decade for Safe Water and Sanitation' (1981-90) and the ability to deliver their objectives. The Decade was a success in that the estimated proportion of people in urban areas with access to safe water rose from 75% to 95% (WHO, 2000), but in terms of access to water in developing economies the UN noted that another 961million people would require access to improved water in urban areas by 2015 (UN 2005). PSP played a minimal role in the 1981-90 Decade (Owen, 2007). The UN Millennium Development Goals (Goal 7 target 9 – to halve the number of people without access to safe drinking water by 2015) and the World Water Vision (universal access to improved water and sanitation by 2025, WSSCC, 2000) have been drawn up to maintain the momentum towards improving access to water, along with the UN's 'Water for Life' Decade of action 2005-15. The reason for the continuing challenges lies in population growth and urbanisation, along with increasing demand for urban water from sources that have either been contaminated or are facing over-abstraction.

Commodities and efficiency

By commoditising water, (treating it as an economic good and charging to recover the costs of service provision) funding can be made available for improving water services and its prudent use is encouraged. Private sector participation has been used by a number of countries in order to support attaining these objectives. The reasoning behind this has been access to new sources of funding along with the scope for improved efficiency of service delivery, linked to a series of performance targets. Between 1995 and 2005, World Bank supported PSP and Privatisation (in Chile) projects involved investment of USD12.8billion for water only contracts and USD26.8billion for water and sewerage contracts (World Bank 2005). There are a number of studies pointing towards efficiencies attained by the private sector, for example, research by Europe Economics (Europe Economics 2003) for Ofwat the England & Wales' water regulator found that 'privatised infrastructure companies have reduced unit operating expenditure by some 1.25 to 3.5% per annum more than might have been expected in the absence of a "privatisation effect" … greater efficiency following privatisation and the introduction of incentive regulation.' Indeed, the report identified a scope for 1.5-3.0% per annum real base operating and capital maintenance expenditure and 2.0-4.0% per annum real base service operating expenditure from 2003-13, 14-24 years after the companies were originally privatised.

PSP as a public health driver

Another factor favouring PSP can be its impact on public health Galiani et al (2005) found that child mortality in Argentina fell by 5-7% during the 1990s in areas of Argentina where water services were run by the private sector compared with those where services were still run by the public sector, with a 24% fall in the poorest municipalities. It is evident that such an outcome will only take place when suitable mechanisms exist to ensure affordability and prevent disconnections for non-payment taking place.

As noted by Budds & McGranahan (2003) the 1992 Dublin principles were influential in establishing a sympathetic climate towards PSP. Principle 4 states that 'Managing water as an economic good is an important way of achieving efficient and equitable use, and of encouraging conservation and protection of water resources (WMO 1992).

Concessions and local capacity building

A number of cases have emerged where water concessions have been used to enable a country to develop its water manage capabilities with the aim of becoming a regional centre. In the Philippines, Manila Water having been listed on its local bourse is now being developed to participate in bulk water projects in the Philippines and water O&M contracts in Asia (Manila Water, 2006). Morocco's ONEP seeks to develop the country's experience with PSP so that the country can in turn become a regional leader in O&M and technical support projects in Western Africa (ONEP 2006). ONEP's experience comes from its relationship with the LYDEC concession serving Casablanca and a number of other concessions, with LYDEC again having been listed on its local course.

The need for attractive contract exit routes

To date, four concessions which were awarded to international companies have seen a local initial public offering (IPO): EMOS (Chile, 2002-04), LYDEC (Morocco, 2005), Tallinna Vesi (2004) and Manila Water (Philippines, 2006), along with a mooted IPO for Maynilad Water (Philippines, originally proposed for 2008). An IPO was envisaged for Aguas Argentinas, before contract conditions deteriorated inexorably. A local IPO transfers at least part of the shareholding in the contract from international to local hands and devolves corporate activities towards the local level. They can also act as a material boost to local bourses because a well managed water utility is typically regarded as an attractive, low risk investment.

Pro-poor policy implementation

There is a considerable debate about the applicability of rising block tariffs (Casablanca and Malaysia,) versus the use of direct subsidies (Chile and Macao). Rising block tariffs work on the principle of low water usage per account having a low fixed cost per unit of water, which rises as the user consumes more. This is meant to mean that water for necessity is relatively cheap and

water for luxury is relatively expensive. In practice, rising block tariffs are distorted as everybody benefits at the lower end so that the upper end needs to compensate for this. But better off people may have private wells (Aquafed 2007); while group purchases by less well off people will mean they are buying water at a higher price (HDR 2006). In Chile, government intervention ameliorated problems when, after demonstrations in April 2001, the government started a 'water stamps' scheme to allow low-income residents to recover part of their water fees (Castro, 2006).

In Manila and Jakarta a regulatory environment was implemented that makes it worthwhile for the concession company to invest in low cost approaches towards serving informal and less well off communities. This has become a powerful tool for service extension, providing a basic access to households and household groups to a continual supply of fully potable water. The company needs to be able to afford it within the context of the concession and the deliverables need to justify these incentives, as the returns for these projects will typically be lower than for providing water to more well off customers.

Experiences to date suggest that there is a greater scope for companies in addressing the poorer people in a city which has some wealth (e.g. informal settlements and less well off districts) than a city with a low overall capacity to finance service development and extension. For example, Manila Water serves both the city's business districts as well as substantial informal settlements. The objection to this approach is that it effectively constitutes 'cherry picking' of the most attractive contracts (Budds & McGranaghan, 2003).

The challenge of connecting informal settlements

It is the author's contention that for a municipal government, there may be no particular incentive to provide adequate water access for their informal settlements. Its inhabitants are effectively disenfranchised and offer no political benefits to the supplier. For the private sector, their political importance is immaterial; when people are willing to pay a fair price for suitable water supplies within a suitable regulatory framework, there is scope to develop a business case for doing so.

Access to and hours of water supply before and after the contract

Contract	**Households with piped water**		**Hours supply/day**		**Period**
(Operator)	**Before**	**After**	**Before**	**After**	
Amman, Jordan (Suez)	90%	100%	4	9	2000-05
Barranquilla, Colombia (Tecvasa)	60%	89%	19	23	1990-05
Cartagena, Colombia (Agbar)	74%	95%	17	24	1995-05
Senegal (SAUR)	59%	73%	16	22	1995-05
Zambia (SAUR)	100%	100%	13	18	2000-04

Riskong K, Hammond M E & Locussol (2007)

Do companies contribute towards service extension?

Given the importance attached to service extension as a justification, an estimate of the number of people actually connected by the leading international water companies is of some importance. The following table is based on publicly available data on the performance of a number of major water concessions. In a number of cases, such as Thames Water in Jakarta, updated numbers have not recently been made available.

Service extension and the international players, 1995-2007 (million new people served)

Suez	11.0
Veolia	6.5
United Utilities	2.5
Bouygues	1.0
Thames	0.5
Others	0.8
Total	22.3

In reality, full reporting of service extension data has not taken place. It is likely that the real figure is between 25.0 and 27.5million people via a smaller number of connections. In addition, population growth within a contract's operating area means new connections being made and more people served per connection, but these will not usually be classified as service extension. Service extension also excludes people being provided water by bulk water provision and water treatment contracts, where the company is mobilizing new water resources but is not responsible for distributing water to the customers.

Suez has provided additional access to water for nearly 8million people in developing countries and a further 1.8million via standpipes in South Africa by 2005 and 9.2million home connections and 1.8million standpipe connections by 2007 (Suez, 2007 & Aquafed, 2007). While Veolia supplies water to 9million people in developing economies in Africa and Asia excluding China, including 3.5million people who have benefited from new household and standpipe connections[1] (Veolia, 2007).

International companies have played a significant role both in the global impact of water PSP in developing economies and in assisting to deliver service extension. But in the context of the needs of the Water & Sanitation Millennium Development Goals, let alone the World Water Vision, it can be argued that they need to be encouraged to make a greater contribution. These are some personal observations of the author.

Some water PSP case studies in service extension

Casablanca – block tariffs and service extension

In 1997, Lyonnaise des Eaux de Casablanca (LYDEC) lead by Suez (France) was awarded the 30 year Urban Community of Casablanca (UCC) concession contract. During 1998-06, LYDEC's water and sewerage activities accounted for 30-35% of LYDEC's turnover and 60-70% of investment, reflecting the need to upgrade and extend the city's water and sewerage services. By 2004, leaks generating 25million m^3 pa of water losses had been repaired, equivalent to the water needs of 800,000 people.

Service development	1997	2002	2005
Water connections	440,000	590,000	710,000
Unaccounted for water	38.9%	27.7%	22.2%

Application of cross subsidies is via block tariffs. Block tariffs are based on consumption per month, with the first $8m^3$ costing 2.92 Mdh/m^3 (USD0.39) and subsequent usage above this figure rising in thee stages to 13.25Mdh/m^3 (USD1.79) for water above $40m^3$ per month.

Most of the water (649million m^3 out of 814million m^3 in 1999) is bought from ONEP, the National Drinking Water Administration, for 3.95Mdh/m^3 (USD0.53) meaning that water for essential use is directly subsidised by LYDEC. As a result, 50% of customers pay less than USD3 per month. At the start of 2007, 145,000 low income households without adequate access to water and sanitation were identified. LYDEC plans to connect them by 2010 at a total cost of USD137million.

14% of LYDEC's equity was sold on the Casablanca Bourse on 18th July 2005, 80% of the shares being bought by local investors. Suez continues to hold 51% of LYDEC, with the remaining 35% being held by Moroccan institutions.

Sources: Djerrari, F (2003) Best practice in urban water resource management: Contribution of LYDEC in Casablanca, World Bank Water Week, Washington DC, USA, 4-6th March 2003
De Cazalet, B (2004) The role of Private Sector Participation in developing the water sector in the Mediterranean Region: The example of Casablanca, FEMIP Expert Committee, Amsterdam 25-26 October 2004.

Cluzeau C & Mathys A (2007) Morocco: OBA Subsidies to Water & Sanitation Connections in Poor Peri-urban Areas - The GPOBA pilot and the full scale INMAE project in the Greater Casablanca
Suez Environment (2006) Sustainable Development Report 2005

Manila Water – serving formal and informal communities in Manila

Metro Manila covers 11.5million people in four cities and 37 municipalities, with the population growing at 3% each year and its population is expected to double by 2025. 40% of those within the area currently live below the World Bank's definition of the poverty line. The privatisation of MWSS was arranged by the World Bank's IFC to mobilise USD6billion of investment for upgrading and expanding the water distribution system and in the longer term, to install a modern sewerage and sewage treatment infrastructure. MWSS was split into two zones, each with a 25 year BOT contract. MWSS remains as a regulatory overseer for the concession holders for the life of the contracts.

The concession for the eastern sector was awarded to the Manila Water Company (MWC) a joint venture between Ayala (Philippines) and International Water (originally Bechtel (USA) and United Utilities (UK) with Bechtel leaving in 2002) who started their concession in 1998. Since the concession started, the number of people served in the zone has increased from 3.5 to 5.0million. By 2022, it is estimated that the zone will have 8.5million people. In 2007, the concession was extended for a further 10 years to 2032.

Manila Water	1997	2007
Population	4.6million	5.3million
Households served	325,000	986,000
Access to water supply	58%	99%
Access to 24 hour supply	26%	99%
Staff / 1,000 connections	9.8	1.7
Billed water (MLD)	440	1,040
Non revenue water	63.0%	23.9%

All water supply targets set by the IFC have been met or exceeded to date. In March 2005, the company was listed on the Philippine Stock Exchange, 41% of the shares held by outside investors, 32% by Ayala of the Philippines, 19% by International Companies (United Utilities of the UK and Mitsubishi of Japan) and 7% by the World Bank's IFC.

The Tubig Para Sa Barrangay (TPSB) programme is designed to extend services into the barrangays (informal settlements) in the zone. It allows several poor families in depressed areas to share the cost of a single MWC water meter. By January 2008, 644 projects had completed, connecting a total of 1.3million people; 1.02million by the end of 2006 and a further 260,000 during 2007. Between 2008 and 2012, the company plans to connect a further 1.0million people in Rizal Province to the north of its central concession area. At the start of the programme in 1998, there were 39,000 cases of diarrhoea in the service area, compared with 22,000 in 2007 and 25,000 in 2006.

TPSB programme	2000	2002	2004	2006	2007
Total household connections ('000)	401	470	556	892	986
TPSB connections ('000)	27	63	123	170	214
TPSB served population ('000)	166	383	740	1,020	1,300

Vended water typically costs 100 pesos per m^3, seven times higher that charged by Manila Water under the scheme. During 2004, a 36% reduction in infant related mortality due to diarrhoea occurred due to the improved availability of potable water in the zone. 99.6% of water supplied by Metro Manila satisfied potable water standards in 2004 and has seen a 100% compliance rate between 2005 and 2007.

Manila Water (2005) Sustainability Report 2004
Manila Water (2006) Sustainability Report 2005

Manila Water (2007) Sustainability Report 2006
Manila Water (2008) Annual Report 2007

Bolivia: Low cost approaches in La Paz and political priorities

In 1997 a 30 year water and sewerage concession for La Paz & El Alto, serving 1.48million people was awarded to Aguas de Illimani (AISA). The consortium was led by Suez of France (55%), along with Bolivian and Argentinean investors.

AISA's contract in La Paz was specifically designed to pre-empt affordability concerns. By using labour provided by customers, the cost of connecting poor areas has been reduced. While 45% of the population of La Paz live below the poverty line, the proportion in El Alto is 73%. For low income families in El Alto, the connection charge was up to USD315 against the Government standard connection fee of USD455. Connection costs in El Alto are repaid by the community over five years via an interest free loan, allied with micro credit for internal plumbing. Community involvement (e.g. choice in siting pipes) was paramount, along with gaining community support from the outset. Similar projects only took place where at least 60% of the community supports them. Families not connected to the network pay an average of USD4.78 per month for water (against an average of USD1.55per month for connected families) at USD2.38 / m^3. This data was collected in District 7 during December 2004. During 2004, 373,000 people were connected to drinking water supplies.

Coverage and people served by new connections, 1997-2004

	1997	2004	Connected	New connections
La Paz	92%	100%	174,000	30,000
El Alto	82%	98%	199,000	57,000
Suez (2005a)				

By the end of 2005 a total of 97,031 families (608,000) people had been connected to the water network (Suez 2006). Service delivery and affordability under the concession can be judged by contrasting AISA's performance in 2003 with that of SEMAPA, the utility serving Cochabamba, the city which cancelled a water concession in 2000.

2003 performance	AISA	SEMAPA
Drinking water coverage	98.85%	68.72%
Average water availability	23.96 h/day	14.40 h/day
Tariff (USD)	USD0.22 / M^3	USD0.27 / M^3
Tariff (BOL)	BOL 13.32 / M^3	BOL 24.50 / M^3

Source: Superintendencia de Saneamiento Basico (SISAB) cited in Suez (2005a)

Rates are determined by SISAB, the Government regulator. In La Paz and El Alto (and some other cities including Santa Cruz), they are calculated in USD while in Cochabamba, they are calculated in BOL. Using bilateral funds provided by the Swiss Government and USD0.4million from AISA, additional domestic connections have been provided to areas outside El Alto's service area.

The current status of the contract is unclear because of protests that AISA is not connecting enough people outside the contract's service area (an estimated 200,000 people have moved to these areas in recent years from the countryside) and changes in the tariffs due to the depreciation of the Boliviano against the US Dollar.

In January 2006, Bolivia's President Morales created a water ministry charged with renationalising water operations. The La Paz and El Alto concession was targeted, as the sole major concession in Bolivia. Abel Mamani, the water minister, previously ran Fejuve, the anti private sector pressure group operating in La Paz and El Alto.

Sisab, the Bolivian basic services regulator was meant to produce an audit about AISA's performance to justify the concession's rescindition. It is understood that this audit had shown that AISA has performed at least to expectations. Indeed, Sisab gave AISA an A+ rating in April 2006 and qualified it as Bolivia's "best firm" (BNA 2006). AISA handed over the concession in October 2006.

Business News Americas (2006) Fejuve prepares to take over Aisa, BN Americas 7th September 2006
Suez (2005b) Activities and Sustainable Development Report 2004
Suez (2005a) 'Aguas de Illimani's achievements' February 2005
Suez (2006) Water for Alll

PART 2: COUNTRY ANALYSIS

ARGENTINA

Economics (2006)	
GNI per capita	USD5,150
GNI per capita (PPP)	USD15,390
GDP in Agriculture	9%
GDP in Industry	35%
GDP in Services	56%

Regulation and management

Communities with a population of more than 15,000 are covered by the Programa Nacional de Optimización, Rehabilitación y Ampliación de Servicios de Agua Potable y Alcantarillado Claocal (PRONAPAC). This programme seeks to provide universal water provision and sewerage services on a financially self-supporting basis through the encouragement of private sector participation and is being supported by the World Bank. The Programme for Drinking Water and Sanitation (Préstamo BID857-OC/AR) covers communities with a population of 500-15,000. It seeks to develop a suitable level of service to be provided by the municipalities. For smaller communities, the Basic Drinking Water and Sanitation Programme (PASPAyS) is concentrating on public health concerns.

Population	
2007 (million)	38.4
2020 (million)	44.5
Urbanisation in 2007	91.8%
Urbanisation by 2020	93.8%
Urbanisation by 2050	96.0%

Urban Data (2004)	
With improved drinking water	98%
With household drinking water	NA
With improved sewerage	83%
With household sewerage	NA
With 2^0 sewage treatment	10%

Private sector participation

Until 2002, PSP was at the heart of the government's plans for universal water and sewerage coverage in urban areas. In 2004, some 16.2million of the people living in urban areas of Argentina (33million people) were served by the private sector, excluding the cancelled Tucuman concession (0.8million people). Over the next four years, this picture has changed.

Development of water and sewerage, 1980-2001

Census year	Wate	Sewerage
1980	60	34
1991	68	33
2001	78	42

In Argentina PSP was supported by the World Bank and IMF reforms and a pro PSP policy under Carlos Menem. Argentina underwent a financial crisis during the 1980s which meant that new investment was not possible and this in turn encouraged a PSP programme. The utility serving Buenos Aries was seen as performing poorly with 45% distribution losses (Zerah and Graham, 2001), excessive staffing and management hampered by political appointments and political intervention (Lindfield, 1998). The World Bank supported the development of a PSP Commission and the Government set up ETOSS, a regulatory agency (Lindfield, 1998). During the same time, smaller concessions were developed and awarded to local companies such as Latin Aguas.

Freshwater	
Annual availability (1998)	694.0km^3
Per capita	19,212m^3
Annual withdrawal (1985)	28.6km^3
Domestic (1987)	16%
Industrial (1987)	9%
Agriculture (1987)	75%

Groundwater	
Annual availability (1998)	128.0km^3
Per capita	3,543m^3
Annual withdrawal (1975)	4.7km^3
Domestic (1987)	11%
Industrial (1987)	9%
Agriculture (1987)	72%

A shift from international to regional players

Since 2000, South Water of Argentina bought out the Azurix stakes in the SAUR led consortia. Another local company, Latin Aguas has become a major regional player, operating three concessions in northern Argentina.

The World Bank's International Centre for Settlement of Investment Disputes (ICSID) ruled in July 2006 that the Argentine authorities are to pay USD165million compensation to Azurix (now Enron) for the cancellation of the Buenos Aires contract in 2002. This is 29% of the USD565million Azurix claimed for the USD438million concession fee paid in 1999 and capital works carried out.

Veolia and Tucuman – Political change and contract change

Generale des Eaux (now Veolia) was awarded the Companhia de Aguas del Aconquija (CAA) concession for water and sewerage services to the city of Tucuman in 1995. The contract was awarded by the Province's governor, a Peronist. During the first two years of the contract, CAA repaired facilities at 400 sites, boosting potable water treatment capacity by 15%. In early 1996, a new governor was elected, who adopted an anti-PSP approach. When Veolia sought to have the concession's tariffs raised to cover investment work, the governor encouraged residents not to pay their bills and sought to have the concession rescinded. In December 1996, under the aegis of the World Bank's International Centre for the Settlement of Investment Disputes (ICSID) and central government an agreement was reached and signed in April 1997. This was subsequently modified by the Province on a unilateral basis. In consequence, Veolia cancelled the contract in October 1998, at a loss of Fr190million (USD44.7million). Veolia filed a USD100million suit against the government and the ICSID arbitration panel has examined the case.

Buenos Aires – The 'British Invasion' backfired

In June 1999, Azurix (the water services subsidiary of Enron, USA) paid USD438.6million for a 90% holding in the concession company for two of the three regions of the Province of Buenos Aires. The British Management (from Azurix's Wessex Water subsidiary) arrived on the anniversary of Britain winning the Falkland War and the local media referred to this as the 'British Invasion'. During 2000, there were problems with contaminated water in Bahia Blanca. Azurix Buenos Aires agreed with the provincial regulatory agency not to bill residential customers for water services for a 50 day period during which the taste and odour of supplied water were allegedly unacceptable. These problems cost the company USD5.4million in revenues and additional costs. In March 2001, the dispute was apparently settled, with Azurix accelerating USD30million in spending to eliminate the problem. In October 2001, Azurix announced that it was withdrawing from the concession due to continuing problems with the provincial government. In February 2002, Azurix cancelled its contract with the Buenos Aires province, handling over the concession to the operational company.

Aguas Argentinas – Foreign currency debt versus local currency tariffs

Suez and Aguas de Barcelona's consortium won the bidding for the central Buenos Aires concession in April 1993 with a bid 27% below the previous municipal tariff. The AA consortium took over a network with 45% distribution losses, providing water to 70% and sewerage for 58% of the city's 9million inhabitants. Suez gained a majority holding of the concession in November 1998 when Sociedad Comercial Del Plata (SCP) sold its 10.8% stake to Suez and Agbar. In 1993, total investment for the first five years was intended to be USD1,200million. By the end of 1999, USD750million had been invested in AA's infrastructure. In 2001 Aguas Argentinas extended potable water and sewerage coverage in low-income areas as part of the company's USD190million investment during the year. Potable water access has already been connected to 22,000 residents.

The Aguas Argentinas contract was based on performance targets (connections, levels of service, metering) rather than capital spending. A price formula was drawn up, which would be reviewed every five years (Lindfield, 1998). But ETOSS was staffed by former OSN employees and not formally qualified for their new roles. It has been suggested that the monitoring process was politically motivated (Zerah and Graham, 2001).

In 1994, a tariff rise of 13.4% was imposed because the infrastructure condition was found to be worse than expected. Since 1996, AA and ETOSS went into a series of contract renegotiations over bill collection and charging. By 2001, it appears that AA was experiencing financial problems and from 2001, ETOSS imposed a series of fines relating to AA's performance as the company reduced spending in the wake of the 2001 economic crisis and the 2002 peso devaluation. Between 2003 and 2005, further renegotiations took place but were inconclusive and the contract was handed back in 2006 (Castro, 2006). Capital spending was being held back to retain the contract, as the economic crisis ruled out compensatory tariff increases as stipulated in the contract. In July 2004, an interim debt restructuring agreement was drawn up to create the basis for a normalisation of the contract in 2005. However, at in September 2005, Suez announced that it would be exiting Aguas Argentinas. Suez and Agbar sold their stakes in Aguas Argentinas to the municipality in 2006.

In 2001-02, the economic crisis exposed the danger of having a major concession based upon foreign currency debt. The collapse in the value of the Peso against the Dollar and the Euro forced Suez and Agbar to make write downs against these contracts. Suez had EUR480million in hard currency debt in Argentina at the end of 2001, the great majority relating to water investments. The company recorded a EUR80million loss on currency translations in 2001, along with releasing EUR118million in provisions. A further write-down of EUR500million (net of minorities and tax) was made in June 2002. In July 2004, an interim debt restructuring agreement was drawn up to create the basis for a normalisation of the contract in 2005. Agbar made a write down of EUR55million for its water activities in Argentina in 2002. In December 2003 Agbar wrote off all direct and indirect investments in Argentina and constituted provisions of EUR216million to cover the maximum loss that the Argentine operations might cause in the future.

MAJOR CITIES			
City	**2005**	**2015**	**Status**
Buenos Aires	12,550,000	13,067,000	Aguas Argentinas, 1993-2006
Cordoba	1,423,000	1,552,000	Water and sewerage PSP, 1997
Rosario	1,186,000	1,280,000	Water provision BOT, 1995-2006
Mendoza	876,000	956,000	Water provision BOT awarded in 1998
Tucumán	781,000	868,000	Water provision BOT, 1997-98

Politics and the Peso Crisis

The Aguas Argentinas, Aguas Provinciales de Santa Fe and Aguas Cordobesas concessions have all been particularly affected by the 2002 Peso Crisis. Meanwhile, the Aguas del Gran Buenos Aires concession was cancelled in July 2006. According to the provincial government, after six years of the concession, 71% of the people in AGBA's concession region lack sewer connections and 64% drinking water. The province's state water company Aguas Bonaerenses (ABSA) will now run the concession. SAUR renegotiated its Mendoza concession (the government currently holds 20% of the concession and in 2008 announced that it would like to acquire a further 20%) and the Catamarca concession may be revived. Proactiva's 30 year Catamarca concession was awarded in 2000 and rescinded in 2005. The provincial government is currently looking for a 10 year renewable concession for the 200,000 people served by Aguas del Valle. It is expected that the concession will be awarded to a local group.

Private sector contracts awarded (Please see relevant company entry for details)		
Location	**Contract**	**Company**
Missiones	30 year water and sewerage concession	Urbaser
Balacarse	20 year water and sewerage concession	Camuzzi
La Planta	30 year water and sewerage concession	South Water
Bahia Blanca	30 year water and sewerage concession	South Water
Conurbano	30 year water and sewerage concession	Aguas de Gran Bilbao
Mendoza	95 year water provision BOT	Obras Sanitarias de Mendoza
Escobar	Water provision concession	Aguas de Valencia
Laprida	Concession, water & sewerage	Aguas de Laprida
Balacarse	Concession, water & sewerage	Aguas de Balacarse
Rioia	Concession, water & sewerage	Aguas de La Rioia
Salta	Concession, water & sewerage	Aguas de Salta
Corrientes	Concession, water & sewerage	Aguas de Corrientes

Problems endure

Buenos Aires' Aysa, was unable to satisfy demand at the beginning of 2008, due to insufficient service expansion investments. In essence the re-nationalised entity continues to face the problems experienced in 2006, when the Aguas Argentinas' contract ended.

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company**	**Population served**		
	(country)	**Water**	**Sewerage**	**Total**
Camuzzi	Veolia (France)	45,000	45,000	**45,000**
Conurbano	AGB (Spain)/Sideco (Argentina)	1,700,000	1,700,000	**1,700,000**
OS de Mendoza	SAUR (France)	1,200,000	880,000	**1,200,000**
AgVal	Aguas de Valencia (Spain)	150,000	0	**150,000**
Aguas de La Rioia	Latin Aguas (Argentina)	201,000	122,0000	**201,000**
Aguas de Salta	Latin Aguas (Argentina)	1,017,000	675,000	**1,017,000**
Aguas de Corrientes	Latin Aguas (Argentina)	634,000	473,000	**634,000**

Sources:

Castro J P (2006) Water Services in Latin America: Public or Private? (Discussion of Four Case Studies). MSc Thesis, Erasmus University, Rotterdam

Lindfield M R (1998) Institutions, Incentives and Risk Preparing Markets for Private Financing of Urban Infrastructure. The Australian Housing and Urban Research Institute. Brisbane, Queensland University of Technology / Erasmus University Rotterdam

Zerah M H & Graham K (2001) The Buenos Aires Concession: The Private Sector Serving the Poor. In Asia, WASP-S. (Ed.) New Delhi, WSP.

AUSTRALIA

Economics (2006)	
GNI per capita	USD35,990
GNI per capita (PPP)	USD34,060
GDP in Agriculture	3%
GDP in Industry	27%
GDP in Services	70%

Water resources

Australia has the lowest percentage of rainfall as run-off, the lowest amount of run-off, the least amount of water in rivers and the smallest area of permanent wetlands in the world. In addition, the country has the most variable rainfall and stream flow in the world, with inland waterways characterised by high turbidity (sediment loading) and salinity. The country is characterised by a dependence on groundwater resources and the over-development of its main river basins. As for renewable resources, 20% are fully utilised, and 15% of supplies come from groundwater resources.

In much of inland Australia, groundwater is often the only practical water supply for the pastoral and mining industries and their associated communities. The Great Artesian Basin is of critical importance over a large area of eastern Australia. In the Perth region, groundwater constitutes about two-thirds of total water use and about 30% of the water supplied by the Western Australian Water Corporation. Australia has the highest per capita water storage of all countries, because of the variable rainfall. Australia's storage capacity in major reservoirs totals some 81,000GL, or 3.7 times the developed resource. The bulk of water storage is concentrated in a few very large reservoirs. Australia's 10 largest reservoirs hold about 50% of national capacity. In New South Wales, the 10 largest reservoirs contain 90% of that state's storage volume. In 75% of lakes and reservoirs, chlorophyll levels are regarded as excessive. There is a clear link between the concentration of phosphorus in these waters and the amount of chlorophyll (or algae) present.

Australia's National Dryland Salinity Program estimates that over 20% of surface water resources in South Australia are too saline for human consumption. Lost water resources are valued at around AUD100million each in some local supply catchments. Other costs attributed to salinity are AUD130million per year in lost agricultural production and AUD100million pa in damage to infrastructure. An AUD300billion national water grid linking the wet northern regions of Australia with the dry south was unveiled by private sector groups in 2004. The idea would be to create a self-sufficient water management scheme for Australia that would be developed through optimising water resources and reuse while minimising losses. The water grid would have annual running costs of around AUD6billion.

Water use

Total water use of Australia's major cities remained static between 1991 and 1998 despite a 12% increase in the total number of properties supplied. If the effects of the drought in 1998 were accounted for, the overall water usage would have declined. User-pays pricing and demand management is delivering benefits in improving the efficiency of water use in urban communities. Unaccounted for water in Australian urban water networks is relatively low at 16% of total deliveries. Unaccounted for water includes unmetered supplies such as street flushing and fire fighting, together with leakage.

Water usage in an average household of 2.8 people ranges from 263,000L pa for Sydney to 700,000L pa for Darwin. Water is mainly used outdoors, with 30–55% spent mostly watering lawns and gardens. For example, water use in Darwin is about 700,000L pa for detached houses but 323,000L pa for flats without gardens.

Australia is wasting 92% of its city runoff water and 86% of its effluent water. The Commonwealth Scientific and Industrial Research Organisation (CSIRO) believes that storm water, treated sewage effluent, treated industrial discharges and household laundry and bathroom wastewater, could be used for irrigation of city parks, verges, ovals and other horticultural uses, along with a number of industrial processes, for cooling water, and for toilet flushing. Between 1998 and 2002, the re-use of effluent has doubled to 14%, due to AUD300million (USD163million) investment around the country. Savings of USD1-5 for every 10 kilolitres of water recycled are achievable.

Population	
2007 (million)	20.1
2020 (million)	23.3
Urbanisation in 2007	88.6%
Urbanisation by 2020	90.6%
Urbanisation by 2050	93.8%

Management

A national strategic framework for water reform was agreed through the Council of Australian Governments in February 1994. This created a structured programme of reform measures to achieve more efficient and sustainable water resource use. State and territory governments have prime responsibility for water resource management and implementation of the reforms. The Federal Government has a complementary role in the reform process in providing leadership and facilitating implementation, in the interest of promoting national outcomes. The reforms were implemented over the period to 2001, covering both rural and urban areas and include measures in relation to water pricing, water entitlements and trading, environmental requirements, institutional reform, public consultation and education, and research. Good progress has been made in implementing the reforms in the short time since they were agreed.

In 2003, the Senate environmental committee announced the recommendation of the creation of a national policy. This would set targets for regulating and improving supplies, set efficiency standards, prepare management guidelines and coordinate monitoring and funding arrangements. Suitable pricing levels need to be set to encourage conservation. While Australia is the world's driest continent, the average price for domestic water is AUD1.64per m^3 (USD0.93), materially below the level charged in Japan, the UK and most of northern Europe. Perth was expected to need additional sources of potable water by 2005, Brisbane and Melbourne by 2015 and Canberra by about 2017.

Water property rights systems are being addressed by the state governments under a framework of national principles. Transferable water entitlements are being developed so that they can be traded like any other commodity. In a system of transferable entitlements, water rights can also be bought or reserved to protect the environment. This market is discussed in some detail below. Most water agencies are adopting a full 'user pays' system, charging for water at close to its true supply cost, whereby all water consumed must be paid for. Environmental costs are based on a set of national principles on water for ecosystems and measures to promote integrated catchment management approaches. State governments have undertaken activities to promote water trading and initiated action to progress interstate water trading. Issues relating to groundwater management are also being examined through a national framework, as is management of stormwater and wastewater resources. Water quality is being addressed through the National Water Quality Management Strategy (NWQMS), which seeks to achieve a nationally consistent approach to water quality management, while allowing flexibility to respond to differing regional circumstances. The National River Health Program (NRHP) is developing the first national biological monitoring system for Australia's rivers, for the assessment of river health and related management action and State of the Environment reporting. Irrigation accounts for 70% of diverted river waters, with much of the remainder used for domestic consumption.

The AUD2billion National Water Initiative unveiled in 2006 seeks to secure water supplies up to 2032 through appropriate water pricing, ensuring that water entitlements are secure and tradable, along with interstate water trading and developing scientifically-based and transparent water planning, water resource accounting and the integrated management of water resources. The priority is to minimise losses and allocate existing water from the rural sector more efficiently through trading and improved price signalling rather than building dams or plant.

Urban Data (2004)	
With improved drinking water	100%
With household drinking water	N/A
With improved sewerage	100%
With household sewerage	N/A
With 2^0 sewage treatment	86%

PSP plans

According to the Australian Council for Infrastructure Development in 2003, since 1993, more than USD1,100million of public-private partnership contracts have been signed in the water industry. PSP is being carried out on a state by state basis, with a wide range of approaches and attitudes. Major water and sewerage projects currently under consideration number 12 and have a combined capital expenditure of AUD2.7billion. In Victoria, the State is seeking to privatise its water services in the medium term, while the 2003 Constitution (Water Authorities Bill) and the Water Legislation Bill are currently being debated to see if the private sector ought to be excluded from asset ownership. Currently, water resources are managed by three separate entities. Melbourne Water, the wholesale company for the city of Melbourne is currently to stay in state hands, with O&M outsourcing contracts being developed. This state is seen as the leader in market development terms. South Australia is seeking a BOOT approach. The Labor Party seeks to demonstrate that assets are returned to public ownership after a given time. In this context, United Water's (UW) AUD1,500million 15 year BOOT for Adelaide is non-contentious, given that UW's contract calls for a 20% fall in operating costs. Canberra is expected to privatise its water provision services in the medium term. Western Australia is developing a partnership basis, since it seeks to avoid too much contracting out, so that the municipalities hold on to their intellectual knowledge. The State of Queensland has restricted PSP to one contract (Noosa) to date and Brisbane Water remains a council entity. In New South Wales, Sydney Water has been corporatised and bulk water provision is carried out by the private sector (see city study below). The AUD1,200million sewerage scheme is open to tender, and various bids have been received, including one from Sydney Water.

The cost of asset extension and enhancement

The replacement value of Australia's municipal and industrial water supply systems are estimated at AUD44billion, with a further AUD37billion for sewerage. While the quality of this infrastructure has been seen as improving in recent years by the engineering profession, none is seen as in a good condition (an 'A' rating, with 'B' being fair, 'C' poor and 'D' very poor):

Condition of water infrastructure, 1999–2005

	1999	2001	2005
Water	C-	C	B-
Wastewater	D-	C-	C+
Stormwater	N/A	D	C-

Source: Engineers Australia (2005) 2005 Australian Infrastructure Report Card & The Institution of Engineers, Australia (1999) A report card on the nation's infrastructure

Spending on water and sewerage engineering and water storage systems such as dams is forecast to rise by 6.5% per annum in the long term:

Water and sewage engineering costs, 1996–2012 (AUDm)

1996-00	Actual	5,002
2000-04	Actual	6,768
2004-08	Forecast	10,201
2008-12	Forecast	13,139

Source: Construction Forecasting Council (www.cfc.acif.com.au), September 2005 forecasts

Freshwater	
Annual availability (1998)	343.0km^3
Per capita	18,596m^3
Annual withdrawal (1985)	15.1km^3
Domestic (1987)	65%
Industrial (1987)	2%
Agriculture (1987)	33%

Companies noted

Along with Suez, Veolia and UU a number of local players have been identified. Actew, a publicly held utility and the private Australian Gaslight Company have formed a JV Actew AGL, Australia's first multi utility entity. Actew retains ownership of Australia Capital Territory's (ACT's) water and sewerage assets, with the JV being responsible for service provision. United Group acquired the Maffra contract from RWE in 2004 and seeks to develop its BOT activities.

Groundwater	
Annual withdrawal (1983)	2.0km^3
Domestic (1983)	0%
Industrial (1983)	23%
Agriculture (1983)	77%

The cost of taboos

In July 2006, a referendum rejected plans to recycle wastewater in Toowoomba. The AUD73million scheme was intended to pioneer the use of treated effluent as the town's main water supply. The town of 92,000 has no river and securing water supplies by conventional means are set to increase water costs by at least 50%.

The cost of sustainability

In May 2008, the government announced that it would commit AUD12.9billion pledged to protect water supplies in the face of climate change under its 'Water for the Future' programme. This includes AUD1.5billion in new urban water investment to help secure water supplies for homes and businesses; AUD1.0billion for the National Urban Water and Desalination Plan, AUD250million for the National Water Security Plan for Cities and Towns, and AUD250million for the National Rainwater and Greywater Initiative. A further AUD5.8billion will be invested in a rural water programme (including AUD1billion for water resource and recycling initiatives serving towns with less than 50,000 people and AUD450million for developing national water accounts and monitoring programmes) and another AUD3.1billion will be set aside to purchase some 30% of the country's water rights to put back in the Murray Darling Basin waterways.

Projects identified by Suez in 2007

Water reuse

Eastern water Reuse (Victoria) - 68billion L/year for AUD1.570billion (EUR965million)
Western Sydney Reuse (NSW) - 18billion L/year for AUD300million (EUR184million)
Hoxton Park Reuse (NSW) - 3billion L/year for AUD60million (EUR37million)
Rouse Hill ext. Reuse (NSW) - 47billion L/year for AUD52million (EUR32million)
Adelaide Reuse (SA) - 16billion L/year for AUD60million (EUR37million)

Desalination

BHP Olympic Dam RO (SA) - 24billion L/year for AUD300million (EUR184million)
Sydney 1 RO (NSW) - 45billion L/year for AUD650million (EUR400million)
Sydney 2 RO (NSW) - 135billion L/year for AUD350million (EUR215million)

Suez believes that AUD7.4billion in projects are due to be put to tender in the medium term for water reuse and desalination.

MAJOR CITIES			
City	**2005**	**2015**	**Status**
Sydney	4,331,000	4,701,000	Corporatised, private bulk water provision
Melbourne	3,626,000	3,933,000	SE Water O&M
Brisbane	1,758,000	1,946,000	PSP under consideration
Perth	1,474,000	1,627,000	PSP desalination contract
Adelaide	1,134,000	1,230,000	One water & sewerage PSP

Sydney Water becomes State Water

In July 2004, Sydney Water was corporatised and renamed State Water. It will have an independent regulator and has been ordered to attain cost savings of AUD1.7billion (EUR966million) between 2004 and 2014. The entity has suffered from years of project delays, especially related to management problems. Sydney's Waterplan 21, the development blueprint for achieving sustainable water consumption by 2021 has been scaled back due to the abandoning of proposals for industrial water recycling, citing inadequate demand and funding cutbacks. The pipeline was to have taken effluent from upgraded treatment plants in the satellite cities of Liverpool and Glenfield. By 2010, the government had aimed to recycle 83million L, but this target is now expected to be lowered. Sydney Water is increasing spending on its pipe network by 35% to AUD38million (EUR23.16million) pa, along with pipe inspections costing a further AUD36million (EUR21.9million). Around 200 leaks a day spring from the 21,000km of secondary pipes linking mains to households, while the overall rate of leakage was 10.7% as of in February 2004, or 188 Ml/day. About 7,000km of mains are inspected annually, with about 4,000km repaired each year, saving an estimated 38.8 megalitres of water each day. By June 2005, this saving is expected to rise to 60 megalitres.

Private sector contracts awarded (Please see relevant company entry for details)		
Location	**Contract**	**Company**
Noosa	Sewerage BOT	Australian Water Services
Sydney	Water treatment BOT	Australian Water Services
Brisbane	Sewage treatment DBO	AWG
Sydney	Water treatment BOT	North West Transfield
Melbourne	Water treatment BOT	North West Transfield
Melbourne	Water & wastewater services	Utility Services
Adelaide	Rural water treatment BOO	International Water
Noosa	Water provision BOT	CGE Australia
Adelaide	Water and sewerage concession	United Water
Ballarat	Water treatment BOOT	United Water
Ballarat	Sewage treatment BOT	United Water
Victoria	Water provision to four towns	Aqua Tower
Townsville	Water provision	United Utilities Australia
Perth	Desalination	Australian Water Services
Pimpama	Wastewater treatment	Australian Water Services

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
AWS	Suez (France)	1,000,000	35,000	**1,035,000**
United Water	VE (France)	1,310,000	1,200,000	**1,310,000**
CGE Australia	VE (France)	564,000	11,000	**675,000**
NW Transfield	United Utilities (UK)	530,000	0	**530,000**
International Water	United Utilities (UK)	189,000	0	**189,000**
UU Australia	United Utilities (UK)	N/A	N/A	**N/A**
Utility Services	Leighton (Australia)	1,300,000	1,300,000	**1,300,000**
Aqua Tower	Cheung Kong Infra (Hong Kong)	50,000	0	**50,000**

Water trading in the Murray River Basin

Water trading has been used to encourage the optimal use of water for agricultural purposes in Australia, especially in the Murray-Darling River Basin in Victoria. Permanent and spot rights are traded on an exchange; the former giving the bidder the right to use the water in perpetuity, the latter is used to meet seasonal shortfalls.

Permanent water trade by volume is considerably less in volume than temporary trade, but the price paid is higher, due to the nature of permanent water transfer and is much less affected by the seasonal allocations within authorities. These water licence values have risen from AUD180 per Ml in 1994 to more than AUD2,000 per Ml. In wet years with full dams, irrigators gain a 100% allocation and utilise all the water covered by the licence. But in dry years, governments can reduce allocations. Prices are related to seasonal supply and demand, which also varies from year to year. Likewise, price is affected by the availability of water rights on the market.

Murray Irrigation Limited, spot prices, 1994-2008

Season	Total value AUDmillion	Average AUD/ML	Low AUDML	High AUD/ML
1998-99	0.83	15.33	6	65
1999-00	2.24	37.68	21	85
2000-01	1.12	15.49	8	30
2001-02	2.85	40.82	20	75
2002-03	12.64	228.09	100	350
2003-04	5.71	70.13	50	150
2004-05	4.97	73.35	44	200
2005-06	4.21	44.59	34	140
2006-07	12.28	370.73	70	800
2007-08	7.85	680.04	200	1,100

Murray Irrigation Limited, permanent entitlements, 1996-2008 (to 24th July 2008)

Year	Entitlements	AUD per entitlement Low	High
1996	1,168	213	300
1997	1,512	252	338
1998	1,816	270	450
1999	1,155	400	415
2000	1,679	280	420
2001	310	360	375
2002	2,914	190	450
2003	3,724	300	500
2004	1,717	407	550
2005	2,496	540	600
2006	6,499	550	800
2007	14,752	500	1,100
2008	19,514	525	1,123

Murray Irrigation Limited regulates the provision of water to 2,400 farms in southern New South Wales. Water rights and permanent entitlements worth in the region of AUD80million have been traded over the past 12 years.

Nationally, in 2001-02, 92% of water rights trading were for temporary allocations, reflecting the need for specific water provision services at a given time, rather than for general allocation allowances.

Sources:

Construction Forecasting Council (www.cfc.acif.com.au), September 2005 forecasts Source:

Engineers Australia (2005) 2005 Australian Infrastructure Report Card

The Institution of Engineers, Australia (1999) A report card on the nation's infrastructure

Suez (2007) Suez Environment in Australia, Press Kit, April 18th 2007

BANGLADESH

Economics (2006)	
GNI per capita	USD480
GNI per capita (PPP)	USD2,340
GDP in Agriculture	20%
GDP in Industry	28%
GDP in Services	52%

Management

Water policy is managed by the Ministry of Water Resources, with a National Water Council responsible for all inter-ministerial cooperation. The National Water Plan, started in 1983, concentrated on flood control and an integrated water management policy was developed in 1995, leading to a National Water Policy and National Water Management Plan being adopted in 1998. These took into account municipal water supply and sewerage issues for the first time. The Policy aims to change traditional service delivery and increase sector capacity by decentralisation, user participation in planning, development, and operation and maintenance through local government and community-based organisations. The 2004 National Water Management Plan aims for 100% basic water supply and sanitation coverage in towns and rural areas by 2015. Government coverage targets for piped water supply in urban areas are 70% by 2010 and 90% by 2015, with 100% coverage to at least a basic minimum service level by 2010.

Population	
2007 (million)	139.2
2020 (million)	181.2
Urbanisation in 2007	26.6%
Urbanisation by 2020	33.9%
Urbanisation by 2050	56.4%

Water provision

In 1998, 87% of people in Bangladesh were within 150m of a tubewell and 97% of the population had what was seen as access to safe water for drinking. However, tube wells have their own problems. 22% of the 7million tubewells in use suffered from arsenic contamination, along with bacterial contamination in 22% of shallow and 9% of deep tubewells.

According to the World Bank 95% of Bangladesh's population has access to safe drinking water and almost half of the population has access to improved sanitation. The water data below is for urban household connections, which are appreciably less developed. However, Bangladesh cannot meet the Millennium Development Goal (MDG) target on sanitation if sanitation coverage is not raised by 9.5% a year. During the first half of the 1990s, sanitation coverage increased by 7.5% pa. It has slowed down in the past decade and indeed urban coverage fell from 55% to 51% between 2000 and 2004 due to rapid urbanisation. There was a fall in urban water coverage from 83% to 82% during this period for the same reason.

The World Bank noted in December 2005 that urban water requirements are set to rise from 10,000million litres a day to over 35,000million litres in the future.

Urban Data (2004)	
With improved drinking water	82%
With household drinking water	24%
With improved sewerage	51%
With household sewerage	7%
With 2^0 sewage treatment	0%

Water spending plans and performance

The 2001 National Water Management Plan seeks to spend USD17.9billion on water and sanitation between 2001 and 2025, with USD1.5billion pa budgeted for the first five years. Revenues cover 64% of O&M costs, with revenue collection at 60-85% efficiency, with total non-revenue water at 40-60%. No city is able to offer 24 hour water service as a norm.

Freshwater	
Annual availability (1998)	1,357.0km^3
Per capita	10,940m^3
Annual withdrawal (2000)	79.4km^3
Domestic (2000)	3%
Industrial (2000)	1%
Agriculture (2000)	96%

Groundwater	
Annual availability (1998)	34.0km^3
Per capita	274m^3
Annual withdrawal (1990)	3.4km^3
Domestic (1979)	13%
Industrial (1979)	1%
Agriculture (1979)	86%

City Study: The Dhaka Water and Sewerage Authority

Dhaka needs a minimum of 1.6billion L of water a day against a theoretical capacity of 1.35billion L a day and an actual production of 1.26billion L. Electrical problems mean 40% of the city's 370 wells do not work, while 600km of water pipes out of 2,000km need to be replaced. Average water consumption is 119l per capita per day, costing USD0.40 per m^3. In 1991, 59% of the population received piped water from 90,000 household connections and 1,200 communal taps. In 2005, DWASA served 75% of the city, including 5.5million with piped water (75% with continuous service) and 0.5million through public pipes. Dhaka's population is growing by 6% a year, of which 40% end up in the slums. The 2.5million people living in slums are not connected to the water system as they are not registered as landowners. Since 2000, the government has deployed the army to stop the theft of water supplies in the capital. Under the 1998 master plan, USD500million in investments have been identified for the period to 2013. The World Bank water treatment loan of USD80million has run into difficulties because of currency problems, so bilateral loans are being sought.

Of the city's population, 20% were connected to sewerage in 1984, rising to 44% by 1991, due to the World Bank supporting a secondary sewerage expansion project. By 2002, this had fallen to 30% due to population expansion, with 10% of effluents being treated. Dhaka's sewerage system currently serves 27% of the population. The World Bank estimates that up to USD8billion will be needed for the water supply and sewerage system over the next 20 years. Dhaka's effluent treatment capacity is 120,000m^3 a day, but only 50,000m^3 reaches the plant because the main sewer pipe is broken. The Fourth Dhaka Water Supply and Sanitation Project includes a USD3,159million scheme to improve Dhaka's sewerage network by 2020.

The water table in Dhaka is falling by 3m per annum due to over-abstraction from 444 deep tubewells, which supply 88% of the city’s demand.

Veolia, Grameen and water micro finance

The 2006 Nobel Peace Prize winner, Muhammad Yunus has formed a joint venture between Grameen Bank and Veolia Water to provide water to poor rural communities in Bangladesh. Grameen-Veolia Water Ltd is 50% owned by Veolia Water AMI (Africa, Middle East, India) and 50% by Grameen Healthcare and aims to bring drinking water to more than 100,000 people for a total investment estimated at EUR500,000 (USD790,000). At the end of 2008, the first plant that is currently in the planning stage, will supply water suitable for cooking and drinking to 25,000 inhabitants of Goalmari, a village 100km from Dhaka.

MAJOR CITIES			
City	**2005**	**2015**	**Status**
Dacca	12,430,000	16,842,000	N/A
Chittagong	4,114,000	5,707,000	N/A
Khulna	1,494,000	2,048,000	N/A

Sources:
ADB – APDF (2007) Asian Water Development Outlook 2007: Country Paper – Bangladesh, ADB, Manila
'Water of strife', John Vidal, The Guardian, G2, 27/03/2002.

BELIZE

The state held Water and Sewage Authority (WASA) was privatised in 2001. 10% of the shares in Belize Water Services Ltd (BWS) WASA's successor company were acquired by the Belize Social Security Board, 7.3% by the public and the remaining 83% was acquired by Cascal. BWS is responsible for urban and adjacent areas in Belize, accounting for in excess of 50% of the country's population. Belize had a population of 236,000 in 2002, 48% living in urban areas. The Water Law of 1970 gave WASA the right to manage all water services in Belize. In 1995, WASA handed over its involvement in rural areas to the ministry of rural development. BWS remains actively involved in these areas in a support capacity. In August 2005, these shares were bought back by the government in August 2005 for USD24.9million. These shares were subsequently sold to local and international investors for USD25.4million. As part of the original repurchase agreement, Cascal was awarded an O&M contract for BWS.

Three of the nine urban districts have sewerage (Belize City, Belmopan and San Pedro). Water in the island of San Pedro is provided through a desalination system provided by Consolidated Water. The San Pedro rate is subsidised by the government. In San Pedro, water costs BZD0.20 per gallon for the first 1,000 gallons per month. In Belize City the fee is BZD0.10. There is typically a 20% higher cost for regions where sewerage services are provided. Outside these areas, the typical rate is BZD0.075.

Distribution losses have been cut from 53% by BWS in 2001 to 38% in 2005 with the long term aim of achieving 10-15%. In 2002, water sales by volume grew by 12.5% on the completion of the Belize City Water Expansion Project and by an average of 7.5% pa between 2002 and 2005. BWS had 39,400 customers in 2005. Metering and billing is carried out on a monthly rate nation-wide. Potable water is formally provided to 90% of the country, including all urban dwellers. 59% of the urban population had access to sanitation in 1994.

Private Sector contracts awarded (Please see the relevant company entry for details)		
Location	**Contract**	**Company**
Belize	Urban water & sewage services, BOT	Cascal
San Pedro	Water provision, 23 year BOT	Consolidated Water

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
Cascal	Biwater (UK)	125,000	70,000	**125,000**
Consolidated	Consolidated Water (USA)	7,000	0	**7,000**

BOLIVIA

Economics (2006)	
GNI per capita	USD1,100
GNI per capita (PPP)	USD2,890
GDP in agriculture	14%
GDP in industry	26%
GDP in services	60%

Water and sewerage services

In 1988, 89% of the urban population had access to piped water, with 32% having indoor taps. 70% had access to sanitation, including 42% with flush lavatories. Water provision on the city level was fairly consistent in 1998, but there were appreciable differences in sanitation and sewerage coverage.

	Piped water	Indoors
La Paz	97%	44%
Santa Cruz	83%	25%
Cochabamba	82%	59%
Oruro	96%	25%

	Sanitation	Flush
La Paz	68%	65%
Santa Cruz	95%	20%
Cochabamba	81%	61%
Oruro	45%	37%

In December 2002, Bolivia launched a five-year, USD496million drinking water and sanitation project, aiming to extend drinking water to some 2.1million people (USD154million) and sewer infrastructure to about 2.3million people (USD265million), plus USD77million in capacity building and technical assistance. Aguas de Illimani was meant to invest USD30million in the plan.

Population	
2007 (million)	9.0
2020 (million)	11.6
Urbanisation in 2007	65.2%
Urbanisation by 2020	71.0%
Urbanisation by 2050	82.2%

Cochabamba: the beginning of the end

The Cochabamba concession process was a direct result of political support and multilateral funding. President Sanchez, during his rule from 1993-97, promoted PSP. The World Bank provided a USD14million loan to Cochabamba which was linked to promoting PSP and in October 1999, the Drinking Water and Sanitation Law (Law 2029) was passed enabling PSP to take place. SEMAPA, the municipal water utility provided water for four hours a day and had a record of poor and limited service. There is no evidence of local companies playing a lead role in water PSP in Bolivia.

The concession in Bolivia involved a 15-17% guaranteed US dollar rate of return, with exchange risk covered by tariffs. This was one of the reasons for the concession's swift collapse. The Cochabamba concession attracted a single proposal, which was then developed through negotiation. Aguas de Tunari was awarded the concession in October 1999 with the concession starting in January 2000. Law 2029 meant that the concession covered all water resources in its area and all actual and potential customers had to connect to the system and well owners were obliged to use the company's water irrespective of their ability to pay. No public consultation was taken either over the law or the concession process. Contract disputes were to be dealt with through the International Centre for the Settlement of Investment Disputes, the International Chamber of Commerce and the United Nations Commission on International Trade Law.

In April 2000, there was a week of rioting that left one dead and 175 injured after violent protests against the PSP. IWL withdrew from the project as a result. In January 2000 Aguas del Tunari increased prices by 20% as stipulated by the government. Part of this increase was imposed by the government to recoup previous project costs. Since 2000, investment in water infrastructure has been

frozen, due to the refusal of the protestors to allow charges for water. The Bolivian government acquired 80% of Aguas de Tunari from Abengoa (25%) and International Water (Bechtel and Edison, 55%) for USD0.25 in 2006. This ended the dispute between the parties.

Urban data (2004)

With improved drinking water	95%
With household drinking water	90%
With improved sewerage	60%
With household sewerage	39%
With 2^0 sewage treatment	11%

La Paz & El Alto: the end of the beginning?

In January 2006, Bolivia's newly elected President Morales created a water ministry charged with renationalising water operations. Suez's La Paz and El Alto concession was targeted, as it is the only major concession in Bolivia. Abel Mamani, the water minister previously ran Fejuve, the anti private sector pressure group operating in La Paz and El Alto.

Sisab, the Bolivian basic services regulator was meant to produce an audit about AISA's performance in order to justify the concession's termination. It appears that this audit has been withheld by the government, as previous audits have shown that AISA has performed at least to expectations. Indeed, Sisab gave Aisa an A+ rating in April 2006 and qualified it as "Bolivia's best firm". AISA agreed to hand over the concession in October 2006 and it was handed over in January 2007.

Bolivar battles on, with Spain's assistance

The political changes have been reflected in a fall in water finance. Annual investment in water and sewerage was USD48-69million between 1996 and 1999 and USD65million in 2000. Between 2001 and 2006, it has ranged between USD22-50million pa.

Bolivia's "Water, belonging to all and for all" declaration of 2007 states that "no one owns water; water belongs to the state and its protection, preservation and development is the responsibility of all inhabitants". In May 2007, Bolivia withdrew from the World Bank's International Centre for the Settlement of Investment Disputes (ICSID) and the ICSID convention. This is the arbitration mechanism for international disputes. The Bolivian government is expecting to sign a potable water and irrigation financial cooperation agreement with Spain to ensure that most of the USD1.5billion Water Fund for Latin America announced by Spain in 2007 will go to Bolivia. Bolivia intends to invest USD621million in 2008 for potable water services, water resources management and irrigation.

Freshwater	
Annual availability (1998)	300.0km^3
Per capita	38,625m^3
Annual withdrawal (date)	1.4km^3
Domestic	22%
Industrial	20%
Agriculture	48%

MAJOR CITIES			
City	**2005**	**2015**	**Comments**
La Paz	1,533,000	1,817,000	Water and sewerage in limbo
Santa Cruz	1,352,000	1,932,000	N/A

Another area of dispute

In April 2000, Bolivia's Ductec paid USD46million for the concession to distribute water from the Silala River/Springs. The company has been seeking to charge Chilean companies for using the water downstream where it flows into Chile. The Chilean companies claim that this water is from Chile and refuse to pay the USD4million pa that Ductec seeks. Ductec is threatening to build a dam which would divert the water away from Chile unless it is paid. In 2004, Chile's president Ricardo Lagos said that if technical and geological studies prove that the source is in Bolivia and thus not an international water, Chile would be willing to negotiate rates. In essence, this is a reverberation of the 1879 War of the

Pacific, when Bolivia lost its Pacific seaboard to Chile. Water, as ever, is thus used as a tool in international diplomacy.

Private sector contracts awarded (Please see the relevant company entry for details**)**		
Location	**Contract**	**Company**
Silala Springs	Water rights and provision concession	Ductec

Private sector company operations (Please see the relevant company entry for details**)**				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
Ductec	Ductec (Bolivia)	N/A	0	**N/A**

Sources:

Castro J P (2006) Water Services in Latin America: Public or Private? (Discussion of Four Case Studies). MSc Thesis, Erasmus University, Rotterdam

Dalton G. (2001) 'Private sector finance for water sector infrastructure: what does Cochabamba tell us about using this instrument?' Water Issues Study Group, School of Oriental and African Studies (SOAS), University of London (Occasional Paper No 37, 2001).

Harris C (2003) Private Participation in Infrastructure in Developing Countries: Trends, Impacts, and Policy Lessons. World Bank Working Paper No. 5. World Bank, Washington DC

Slattery K (2003) What Went Wrong? Lessons from Cochabamba, Manila, Buenos Aires, and Atlanta. Water & Wastewater Annual Privatisation Report, The Reason Foundation. Los Angeles USA

World Bank & PPIAF (2006) Approaches to Private Participation in Water Services: A Toolkit, Appendix A. World Bank, Washington DC

BRAZIL

Economics (2006)	
GNI per capita	USD4,730
GNI per capita (PPP)	USD8,800
GDP in Agriculture	5%
GDP in Industry	31%
GDP in Services	64%

Regulation and legislation

In 2000 the Brazilian Government passed a law to establish the Agência Nacional de Águas (ANA), a new federal regulatory agency responsible for the implementation of the National Water Resources Policy and for co-ordinating the National System of Water Resources Management. The agency will have financial and administrative autonomy, and will be linked to the Ministry of the Environment. In Brazil, there are 27 state water and sewage companies serving 89million people (72% of the urban population) in 3,823 municipalities (69% of the total).

Each of the 26 states and the Federal District manage water under state jurisdiction. At the river basin level, 43 Basin Committees have been established to date, 39 of these at state level and 4 in basins of rivers under Federal jurisdiction. Around 50% are found in the south east. The Water Law of 1977 established the principle of decentralised and participatory management, with a discussion on the best management practices with local users. A law on pricing provisions has been adopted in 14 states and in the Federal District, with the aim of full cost recovery through billing. One of the main strategies of the National Sanitation Policy is to improve the level of efficiency of service providers and co-ordination of public and private efforts in order to optimise the upgrading and expansion of service cost without incurring excessive costs.

In March 2004, Brazil's lower house approved a bill aimed at promoting public-private partnerships in water and wastewater. If fully enacted, the bill will require projects to have an environmental license and guarantees on the part of the private sector in the form of bid and performance bonds. The Sao Paulo state government is understood to be planning to create a state controlled company, Companhia Paulista de Parcerias, which would manage public-private partnership projects. In June 2004, a law (10.881/2004) was passed regulating contracts for river water use between companies and municipal water works and the National Water Agency (ANA). Water basin committees will receive authority to set up water companies or choose a company to manage the water in their area. This will encourage water basin regions to start charging for river water.

In 2005, Brazil approved a national water resources plan (PNRH) for 2006-16, which is designed to secure water supplies to people currently unserved, while safeguarding some of the world's richest aquatic life. The National Water Resources Plans aims to double the number of inhabitants served with potable water and sewage systems between 2005 and 2015. The plan details the current water resources in the country and projects a scenario with targets for 2020, with guidelines for a greater rationalisation of the country's water supplies.

Population	
2007 (million)	183.9
2020 (million)	219.2
Urbanisation in 2007	85.2%
Urbanisation by 2020	89.5%
In urban agglomerations, 2050	93.6%

National Plans

The national sanitation regulation bill aims to encourage state sanitation utilities and private sector players operate in by putting the responsibility of sanitation regulation on states, but also allows for the responsibility to be delegated to municipalities, or shared between states and municipalities.

In 2007, Lei 11.445/07 para o saneamento básico (water and sanitation services law) went into action, with the aim of increasing investments to provide universal access to water and sanitation, while allowing for flexibility regarding account circumstances and the ability of people to pay for these services. A Program for the Acceleration of Growth (PAC) was also launched, for upgrading Brazil's infrastructure. USD205billion will be provided by state owned companies and the private sector and USD30billion by the Federal Government. This plan includes raising sewerage connections nationally

from 35% to 75% by 2018. The PAC will invest BRL38.3billion (USD23.5billion) in basic sanitation by 2010. The water and sewerage department of the cities ministry believe that the sector needs an BRL200billion (USD123billion) investment.

Brazil's government plans to expand potable water services to 87% of the country and to have sewerage services reaching 55% of the population by 2010. This will, cost BRL11billion a year. Of that total, some BRL1billion will come from the national budget, BRL2billion from the PPI pilot investment programme, and at least BRL3billion from the federal workers' unemployment insurance fund (FGTS). More than BRL3billion would come from another fund, the FI-FGTS. According to a report by the Instituto Trata Brasil released in April 2008, Brazil needs to invest BRL11billion in basic water and sanitation services every year for 20 years, while the government plans to invest BRL10billion per year, starting in 2008, but only for the next four years.

Infrastructure development

The table below outlines the regional development of water, sewerage and sewage treatment in Brazil in 1991. The column for treated sewage refers to the percentage of sewage collected that is subject to treatment.

%	Water	Sewerage	Treated
North	82%	4%	24%
N East	87%	16%	72%
S East	93%	57%	32%
South	96%	18%	33%
West	87%	35%	40%
Total	**91%**	**35%**	**38%**

The National Sanitation Policy seeks to develop universal access to water and sewerage services in urban areas, with at least 80% of effluents subject to treatment by the year 2010. In 1995, 15.6% of urban sewage effluents were treated.

Water supply

	1970	1980	1997
Urban	61%	79%	91%
Rural	3%	5%	20%

Sewerage

	1970	1980	1995
Urban – network	22%	37%	48%
Urban – septic tanks	25%	23%	23%
Rural – network	1%	2%	3%
Rural – septic tanks	3%	7%	11%

In 1995, 92.8% of water produced and distributed through the domestic supply network was treated. Studies in 2000 by the Ministry of Health and BNDS, the state development bank, found that 18,250 people die each year as a result of inadequate basic sanitation, with 65% of all infant admissions to hospital as a result of infections related to solid or liquid waste.

According to the Ministry of Cities in 2003, Brazil needs to invest around USD62billion in sanitation and water supply programs by 2020 to meet urban service needs. 45million Brazilians who live in urban and rural areas do not have access to water supplies. More Brazilians had telephone lines, refrigerators and television sets in 2002 than access to a proper sewage system, a government study showed.

Urban Data (2004)

With improved drinking water	96%
With household drinking water	91%
With improved sewerage	83%
With household sewerage	53%
With 2^0 sewage treatment	20%

Market structure and the private sector

Water and sewerage services to urban areas are provided through two contract types. They can either be granted through concessions to state sewerage companies for 25 to 50 years or by direct management through autonomous departments. In some cases, the latter is provided with assistance from the Ministry of Health via the National Health Foundation.

	Water	Sewerage
Total	**7,327**	**1,544**
Concessions	4,753	686
Direct mgt	2,024	583
Assisted by MFH	625	185

There are 27 concession companies (County Water and Sewerage Service companies), all of whom serve more than 100,000 people and supply water to 78% of the urban population and sewerage services to 64%. Contracting out to the private sector as opposed to commercialisation and the partial flotation of municipal concession holders remains at an early stage. In total, there are some 1,350 water and sewerage entities in Brazil, of which 32 were operated by the private sector in 2005 and by 2008 there were 40 private companies provide sanitation services to about seven million people in 63 Brazilian municipalities. This excludes companies which have been partially privatised through share issues such as SABESP.

Problems affecting other entities are not going away and in 2008 state-run water and sewage utilities gained BRL600million to assist in financing projects, purchase equipment and improve management. At least 11 of the 25 Brazilian state-run waterworks companies are in serious financial distress.

Brazil's leading water entities (BRLmillion, 2005)

Companhia de Saneamento Basico do Estado de São Paulo – Sabesp	4,397.1
Companhia Estadual de Aguas e Esgotos – Cedae	1,506.3
Copasa	1,194.4
Companhia de Saneamento do Parana – Sanepar	1,031.7
Companhia Rio Grandense de Saneamento – Corsan	753.7
Empresa Baiana de Aguas e Saneamento – Embasa	573.9
Companhia de Saneamento de Goias – Saneago	448.7
Companhia de Saneamento Ambiental do Distrito Federal – Caesb	443.0
Companhia Pernambucana de Saneamento – Compesa	420.5
Companhia de Aguas e Esgotos do Ceara – Cagece	335.5

Source: *Valor Economico* August 2005, cited in COPASA's February 2006 IPO document

Freshwater	
Annual availability (1998)	5,190.0km^3
Per capita	31,424m^3
Annual withdrawal (1990)	54.9km^3
Domestic (1987)	21%
Industrial (1987)	18%
Agriculture (1987)	61%

Financing service extension

The estimated cost for investments necessary to develop an urban water supply, sewerage and sewage treatment service network is BRL50billion (USD20billion) by 2017. The government estimates that Brazil requires overall investments of BRL178billion (USD81.1billion) by 2025. Of this total, approximately BRL110billion is needed to provide universal sewage collection and treatment.

CEF, Brazil's federal bank announced in 2005 that Brazil needed to spend BRL10billion (USD4.4billion) pa to attain broad sewerage and sewage treatment coverage. The difficulty here is that Brazil's monetary council only allows municipal and state entities to raise new loans where they are currently unable to finance them. CEF is seeking to encourage specific concessional contracts with state water authorities for the funding and management of new wastewater treatment works. In order to support this, a BRL3.43billion (USD1.55billion) fund was launched in 2006 by the government that will be used to guarantee payments

USbillion	Water	Sewage	Total
Invested, 1970-98	11.0	6.0	17.0
Needed, 1999-10	5.6	25.4	31.0

PPP for smaller scale water and sewerage projects are being encouraged by the government through a bill introduced in May 2006 which opens up expressions of interest regarding areas where 50million people are currently unserved. Bahia state is currently looking at tenders for a public-private partnership covering sewerage services. Sabesp's Alto Tietê water supply PPP has to increase water treatment capacity by 50% at one of the main water treatment plants in the São Paulo metropolitan region at a cost of BRL270million.

Groundwater	
Annual availability (1998)	1,874.0km^3
Per capita	11,347m^3

Private sector players

The three main private sector partnerships are at least holding their own in Brazil. In 2005 Copasa increased its number of water concessions from 595 and sanitation services from 152 in 2004 to 608 and 170, respectively. In the same period Sanepar renewed nine municipal contracts and gained one additional 30-year concession for water supply and sanitation services in the municipality Bom Jesus do Sul, with operations in 343 of the state's 399 cities. Rio de Janeiro's Nova Cedae anticipates an IPO in 2009.

According to Valor Econômico (BN Americas 3rd September 2008) the private sector currently operates 9.8% of services in Brazil's basic sanitation sector, compared with 6% of services in 2006 and 7.5% in 2007. The increase in 2008 is for 3.2million people via seven new contracts. The report states that the private sector aims to cover 30% of the market in 10 years.

Company	State	Population served	Water connections
CEDAE	Rio de Janeiro	9,700,000	1,500,000
CESAN	Esprito Santo	1,700,000	353,000
COMPESE	Pernembuco	5,100,000	1,000,000
EMBASA	Bahia	6,800,000	1,600,000
Municipal			
Campo Grande	Mato Grosso do Sul	607,299	146,112
Cuiaba	Mato Grosso	539,692	105,883
Itu	Sao Paulo	34,404	112,000
Novo Hamburgo	Rio Grande do Sul	44,210	192,274
Vareza Grande	Mato Grosso	36,217	192,979

Waterworks concessionaire Aguas de Niterói has invested BRL148million (USD70.1million) since 2001 to extend water and sanitation services in Niterói, the second biggest city in Brazil's Rio de Janeiro state. Aguas de Niterói won the 30 year Niteroi concession in 1999, and since opening operations the company has increased the supply of potable water from 46% in 1999 to 100% today; the concessionaire also collects and treats 75% of the city's sewage, up from 20% in 1999 and well above the national average. Besides building the wastewater treatment plants, major investments have included the installation of infrastructure to expand the potable water supply and sewage collection.

Brazil – Local concession projects			
Municipality	**Concessionaire (operator)**	**Population**	**Comments**
Aracatuba, SP	Sanear (Amafi, Multiservice)	157,467	Sewerage
Birigul, SP	Aquaperola (Isratec, Hidroge)	84,016	Bulk water
Cajamar, SP	Aguas de Cajamar (Multiservice)	33,707	Water
Campos, Rio	Aguas de Paraiba (Cowan)	350,000	Water & sewerage
Itu, SP	Cavo Itu (Cavo, Camargo Correa)	112,939	Sewerage
Jau, SP	Aguas de Marigada (Multiservice)	97,354	Water
Jau, SP	Consorcio SR Almeida, Silec	97,354	Sewerage
Jundiai, SP	Cia Saneamento de Jundiai	288,644	Sewerage
Mairinque, SP	Cia Agua (Grupo Villanova)	35,000	Water & sewerage
Marilia, SP	Aguas de Marilia (Hidroge)	173,841	Bulk water
Mineiros do Tiete, SP	Saneciste	9,462	Water & sewerage
Niteroi, Rio	Aguas de Niteroi (Cowan, Carioca)	448,736	Water & sewerage
Ourinhos, SP	Aguas de Esmeralda (Multiservice)	79,148	Bulk water
Ourinhos, SP	Telar Engineering	79,148	Sewerage
Paranagua	Aguas de Paranagua (Castilho)	110,000	Water & sewerage
Pereias	Novacon	4,850	Water & sewerage
Petropolis, Rio	Aguas do Imperador (Cowan)	263,838	Water & sewerage
Regia dos Lagos I, Rio	Aguas de Juturnaiba (Cowan)	200,000	Water & sewerage
Regia dos Lagos II, Rio	Prolagos (ADP, Monteiro Aranha)	-	Water & sewerage
Ribeirao Preto, SP	Ambient (CH2M Hill, Rek)	450,960	Sewerage
Salto, SP	Saneciste de Salto (Saneciste)	100,000	Sewage treatment
Tuiuti, SP	Ribeirao Pantano Tuiuti (Novacom)	3,000	Water & sewerage

Source: Adapted from Global Water Report, p11, 204, 08-10-2004

Earth Tech's Brazilian subsidiary Multiservice gained a 25 year DBO contract for water supply and sewerage to Nova Friburgo in Rio de Janeiro. 170,000 people are served, with 10% metered. Universal water metering is planned by 2005. Water and sewerage for the resort of Dos Lagos had a PPP with a 25 year concession being awarded in 1998. The resort holds 600,000 people in the holiday season. Hochtief, Preussag and RWE's RRE of Germany were originally involved, but withdrew from the consortium in April 1999. ProLagos (PEM Enghenaria and Monteiro Aranha Participacoes of Brazil) will now hold the concession, with a capex of USD181million.

MAJOR CITIES			
City	**2005**	**2015**	**Status**
Sao Paulo	18,333,000	20,535,000	SAPESP partially floated
Rio de Janeiro	11,469,000	12,770,000	CEDAE flotation postponed
Belo Horizonte	5,304,000	6,354,000	COPASA floated in 2006
Porto Alegre	3,795,000	4,096,000	N/A
Recife	3,527,000	3,830,000	N/A
Brasilia	3,341,000	4,282,000	N/A
Salvador	3,331,000	3,950,000	EMBASA PSP under way
Fortazela	3,237,000	3,850,000	N/A
Curitiba	2,908,000	3,581,000	N/A
Campinas	2,634,000	3,003,000	N/A
Belem	2,043,000	2,524,000	N/A
Grande Vittoria	1,613,000	1,974,000	N/A
Santos	1,634,000	1,890,000	N/A
Manaus	1,645,000	2,059,000	Manuas Saneamento sold to Suez in 2000
Goiânia	1,898,000	2,372,000	N/A
Natal	1,035,000	1,253,000	N/A
Grande Sao Luis	990,000	1,192,000	N/A
Sao Jose de Campos	972,000	1,560,000	N/A
Catarinense	936,000	1,131,000	N/A
Maceió	1,116,000	1,391,000	N/A
Joâo Pessoa	918,000	1,087,000	N/A
Teresina	872,000	1,029,000	N/A

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	**Contract**	**Company**
Dos Lagos	25 year water and sewerage concession	ProLagos
Nova Friburgo	25 year concession, water and sewerage	Multiservice-engenharia
Jau	25 year DBFO, wastewater	Multiservice-engenharia
Sabesp	Sale of 49% of Sao Paulo's stake 1994-04	Sao Paulo / SABESP
Sanepar	Sale of 30% of Sanepar by Parana	Andrade Gutierrez
Manuas	Water & sewerage concession	Suez
Brusque	Deep shaft STW BOT	Cejen
Campo Grande	Water and sewerage concession	Aguas Guariroba
Minas Gerais	Sale of 30% of COPASA in 2006	COPASA

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
SABESP	San Paulo municipality	22,600,000	18,300,000	**22,600,000**
Aguas de Limeira	Suez (France)	256,000	256,000	**217,000**
Sanepar	Andrade Gutierrez (Brazil)	8,136,000	3,892,000	**8,136,000**
COPASA	Minas Gerais	11,300,000	5,700,000	**11,300,000**
Manuas Saneamento	Suez (France)	1,400,000	1,200,000	**1,400,000**
Cejen	Sacyr Vellehermoso (Brazil)	0	200,000	**200,000**
ProLagos	Aguas de Portugal (Portugal)	600,000	600,000	**600,000**
Multiservice-engenharia	Earth Tech/Tyco (USA)	180,000	300,000	**300,000**
Aguas Guariroba	Bertin-Equipav (Brazil)	730,000	124,000	**730,000**

CAMBODIA

During 1998-99, the Ministry Industry, Mines and Energy awarded four local private sector contracts to secondary towns in the country. These contracts were awarded to local operators under unsolicited bids and the operators' identities have not been revealed. While labelled as BOT contracts, they are in fact being operated as full concessions with operating lives of 23-40 years. In each case, the number of people served refers to the percentage of the town's population that is actually connected. According to Castalia, these contracts have performed to expectations, although no provision has been made for access to poorer households. Coverage in Cambodia's other 19 secondary towns ranges from 5-9%.

Cambodia – Local projects			
Project	**Operator**	**Population**	**Comments**
Banteay Meanchey	N/A	8,000	Commenced 1998, 8% of households connected
Kompong Speu	N/A	8,000	Commenced 1997, 20% of households connected
Kien Svay	N/A	1,000	Commenced 1998, 2% of households connected
Takeo	N/A	2,000	Commenced 1997, 6% of households connected

Urban Data (2004)

With improved drinking water	64%
With household drinking water	36%
With improved sewerage	53%
With household sewerage	23%
With 2^0 sewage treatment	0%

A National Water Resources Policy was adopted in 2004, with legislation on Water Resources Management being passed in 2007. 2015 targets are for 80% safe water coverage and 74% with safe sanitation. USD114million is budgeted for water and sanitation projects from 2007 to 2009.

Phnom Penh's: Water Supply Authority has 147,000 connections covering 83% of the city and was corporatised in 1996. Between 1996 and 2001 it received USD100million of donor assistance from the ADB, the World Bank, JICA, and the French Government. This has resulted in non-revenue water falling from 72% in 1993 to 6% by 2005 and water provision rising from 10 to 24 hours per day, along with universal metering.

There are currently no wastewater collection systems in Cambodia. There is a pilot project underway for one area of Phnom Penh which is funded by the World Bank (approved in April 2003). However, funding for sanitation and hygiene promotion and activities has generally been limited in Cambodia, and has not been a priority in budget allocation. Research on the sector shows that, if they can afford to, most residents invest in on-site sanitation (i.e. construct pit latrines and septic tanks). In contrast, poor families use river banks and canals for excreta disposal. As a result, Cambodia has one of the highest infant mortality and morbidity rates in the world caused by water-related contamination.

Sources

ADB – APDF (2007) Asian Water Development Outlook 2007: Country Paper – Cambodia, ADB, Manila

Andrews, C. & Yñiguez, C. (eds) 2004. Water in Asian Cities: Utilities' Performance and Civil Society Views. ADB, Manila, Philippines

Castalia (2004) Sector Note on Water Supply and Sanitation for Infrastructure in East Asia and the Pacific Flagship, Review by Castalia for the World Bank, ADB and JIBC.

Garn, M., Isham, J. and Kähkönen, S. (2000) "Should We Bet On Private or Public Water Utilities In Cambodia? Evidence on Incentives and Performance from Seven Provincial Towns" Middlebury College Economics Discussion Paper 02-19, Vermont, USA

CANADA

Economics (2006)	
GNI per capita	USD36,170
GNI per capita (PPP)	USD34,610
GDP in Agriculture	3%
GDP in Industry	31%
GDP in Services	66%

Regulation

Canada has 9% of the world's renewable water resources and 20% of the world's freshwater when its glaciers are included, while accounting for 0.5% of the world's population. 60% of Canada's freshwater drain north, while 90% of the Canadian population lives in the South, where pollution and escalating demand are increasing pressure on freshwater resources.

The Federal Water Policy (1987) encourages full-cost pricing of all water use. The territorial or municipal governments set water fees for water use in communities. Provincial legislation such as the 1996 Alberta Water Act promotes water conservation, strengthens licensing and restricts interbasin diversion. Other federal legislation includes the Canada Water Act (1970), the International River Improvements Act (1955), the Canadian Environmental Assessment Act (1996), the International Boundary Waters Treaty Act (1911), the Canadian Environmental Protection Act (1988) and the Navigable Waters Protection Act (1993).

Population	
2007 (million)	32.0
2020 (million)	36.4
Urbanisation in 2007	80.3%
Urbanisation by 2020	82.0%
Urbanisation by 2050	87.9%

Sewerage service penetration reached 75% in 1994, with 93% of the effluents collected by the sewerage network receiving treatment, compared with 85% in 1991.

Development of sewage treatment, 1981-1996

	1981	1986	1991	1996
None	N/A	N/A	N/A	N/A
Primary	25.0%	27.0%	32.0%	33.0%
Secondary	25.0%	23.0%	25.0%	24.0%
Tertiary	14.0%	13.0%	18.0%	18.0%

The target is to provide 100% of the population with potable water and with 100% sanitation coverage. In 1998, 90% of the population had access to potable drinking water, with 85% served by sewerage and some 80% of collected sewage effluents treated to at least the secondary level. Before usage approximately 81.5% of drinking water receives some form of treatment.

For the municipal sector, providing a complete water supply service plus secondary waste treatment in all municipalities is estimated to cost from CAD50 to CAD90billion. This includes the cost of upgrading, renovation, expansion, and associated operating costs. The estimated value for the municipal water utility systems is about CAD110billion. In May 2001, the Federation of Canadian Municipalities estimated that over CAD16.5billion will be needed to upgrade the water infrastructure over the next 10 years. CAD5.6billion has been allocated for Federal support between 2000 and 2005.

Summary of water and wastewater capital spending surveys

Source & date	Period	CADbillion	Comments
Peat Marwick (1994)	1995 – 2015	41	Additional spending
FCM / McGill (1996)	1997 – 2007	80–90	New & upgraded infrastructure
NRTEE (1996)	N/A	38–39	Maintain extant services
CWWA (1997)	1997 – 2012	88	New & upgraded infrastructure

Sources:

Peat Marwick (1994) "Introduction to Public-Private Partnerships" Proceedings of the 23rd Annual Technical Symposium and Exhibition of the Water Environment Association of Ontario, Toronto ON;

(FCM & McGill): Federation of Canadian Municipalities and McGill University (1996) Report on the State of Municipal Infrastructure in Canada. Ottawa ON;

(NRTEE): National Round Table on the Environment and the Economy (1996) State of the Debate: Water and Wastewater Services in Canada. Ottawa ON;

(CWWA): Canadian Water and Wastewater Association (1997) Municipal Water and Wastewater Infrastructure – Estimated Investment Needs 1997-2012. Ottawa ON

In 2003, it was found that water leakage in Montreal was 37% against the national average of water system losses of 13%. According to PriceWaterhouseCooper, updating the system will cost the city CAD$4billion over 20 years.

Urban Data (2004)	
With improved drinking water	100%
With household drinking water	100%
With improved sewerage	100%
With household sewerage	96%
With 2^0 sewage treatment	72%

Water usage

Between 1991 and 1994, daily municipal water use fell by 3.3% in per-capita terms and fell overall despite a 2% increase in the amount of the municipal population receiving water services, over the same period. This decrease is a result of declines in commercial and industrial uses; probably because of the recession and a reduction in economic activity.

Municipal water use, by sector (1994)

Domestic	52%
Industrial	17%
Commercial	18%
Distribution losses	13%

Total daily residential water use increased slightly and continued to account for more than half of all municipal water use in 1994. On a per person basis, daily residential water use fell from 334L per person in 1991 to 331L per person in 1994, a decrease of just under 1%. In 1994, Canadian households paying for water by volume used 263L per person per day, 39% less water than households paying a flat rate, which used 430L per person per day. The percentage of Canada's municipal population with water meters increased from 52.4% to 54.3% between 1991 and 1994.

Freshwater	
Annual availability (1998)	2,849km^3
Per capita	94,373m^3
Annual withdrawal (1991)	45.10km^3
Domestic	11%
Industrial	80%
Agriculture	9%

Prospects for the private sector

While the private sector is typically regarded as having a minimal role in Canada's water and sewerage services, the reality is that of a steadily increasing presence. In the wake of the Walkerton tragedy, in which polluted water killed seven people in Ontario in 2000, a number of national and regional plans have been carried out. It was evident that the municipality has run down its water testing and network maintenance operations to cut costs. In 2004, Ontario's Liberal government indicated that private-sector participation may be considered in the wake of rising capital spending needs and some fatal service shortcomings.

The proposed Safe Drinking Water Act will require mandatory licensing of all water testing laboratories and owners of municipal water systems and tighten standards for drinking water treatment and distribution. A proposed Sustainable Water and Sewage Systems Act will require municipalities to recover the full cost of water and sewer services from consumers.

Aquatech has been in operation since 1981 and has 50 water and wastewater contracts covering 0.8million people. The company believes that it controls 60% of the private sector market share in Canada. There are three smaller operations in Canada, mainly operating at the O&M level.

Ontario's provincial government commissioned an expert panel to write a report in 2005 which recommends that the private sector is considered in future policy options. The report recommends that counties, single tier municipalities and regional municipalities prepare business plans on how they will amalgamate water systems within their boundaries to achieve greater cost efficiencies. In Ontario, the number of water or wastewater facilities operated by private firms increased from 26 in 1998 to 42 in 2001. By 2006, one service provider estimated that between 50 and 75 Ontario systems were privately operated.

Groundwater	
Annual availability (1998)	369.60km^3
Per capita	12,241m^3
Annual withdrawal (1990)	1km^3
Domestic	43.3%
Industrial	14.2%
Agriculture	42.5%

MAJOR CITIES			
City	**2005**	**2015**	**Status**
Toronto	5,312,000	5,938,000	N/A
Montréal	3,640,000	3,897,000	N/A
Vancouver	2,188,000	2,389,000	N/A
Ottawa	1,156,000	1,262,000	N/A
Edmonton	1,015,000	1,118,000	N/A
Calgary	1,058,000	1,193,000	N/A

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	**Contract**	**Company**
York	Water strategy development	US Water
Moncton	20 year water provision PPP	US Filter
Toronto	15 year wastewater DBO	US Filter
Brockton	5 year water & wastewater O&M	US Filter
Haldimand	Wastewater O&M	US Filter
Lake Huron	10 year water O&M	Azurix NA

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
US Filter	VE (France)	127,000	1,238,000	**1,331,000**
Aquatech	Aquatech WMS (Canada)	88,000	768,000	**800,000**
US Water	AWW (USA)	600,000	0	**600,000**
Azurix NA	AWW (USA)	420,000	0	**420,000**

SOURCE:

A breath of fresh air (2007) Market Solutions for Improving Canada's Environment, Fraser Institute, Canada

Ontario Government (2005) Watertight: The Case for Change in Ontario's Water and Wastewater Sector, Ontario, Canada

CHILE

Economics (2006)	
GNI per capita	USD6,980
GNI per capita (PPP)	USD11,270
GDP in Agriculture	6%
GDP in Industry	47%
GDP in Services	48%

Development of regulation

Urban water provision and sewerage services have been in continuous development over the past 150 years. By the end of the 1970s, a large number of public services delivered drinking water or collected wastewater in the main cities of Chile, whose urban population then was 8.5million. Services were provided by the municipality, along with a number of private companies delivering drinking water and providing sewerage services in the upper part of the city. Sewerage was seen as under-developed and there were no sewage treatment works. As sewerage tariffs were notably low, any extension of sewerage coverage was entirely dependent on government funding. In 1977, water and sewerage activities were integrated on a regional basis. Two semi-autonomous utilities were created, EMOS in the metropolitan region and ESVAL, along with 11 regional services. A regulatory body, SENDOS, reporting to the Ministry for Public Works was also established. During the 1980s, EMOS started to contract out some maintenance activities.

The PSP process in Chile has been a relatively gradual one. The regulations enacted in 1988 outlining full cost recovery for water utilities and setting the state's responsibilities in overseeing a contract meant that the capacity building processes were taking place a decade before the PSP process formally began. During the 1990s, Santiago (and the other 11 Chilean water utilities) were commercialised with, at the outset, full PSP in mind. While the process was open to local companies, the larger contracts, especially Santiago were developed to attract TNCs.

In Chile, Aguas Andinas is regulated by SISS, which is in turn monitored by the Ministry of Public Works. SISS can impose fines for non-compliance. Tariff disputes between AA and SSIS are to be resolved through a panel of experts mediating between the propositions. AA has recourse to the national courts in legal disputes with SISS. Coverage targets are monitored annually and reviewed every five years within the context of a 15 year investment plan. These plans are made available to the public.

While water and sewerage coverage increased, the low level of tariffs did not allow these services to grow in terms of maintenance of the new systems and in terms of maintenance, rehabilitation and replacement of old systems. As a result, in 1989 a set of laws and regulations were passed and a regulatory body, totally separated from operational activities, was created. The reform also included laws that allowed the selling of EMOS and ESVAL to the private sector.

EMOS and ESVAL were transformed into corporatised entities and their shares entrusted to CORFO, a government body. The companies follow regulations applied to private companies, although their annual budget has to be approved by the Finance Ministry. From 1990 to 1995, their tariffs rose by 70% so as to eliminate central government subsidies and to enable capital spending to be enhanced. During this period, urban water and sewerage coverage reached the highest levels of Latin America. The first sewage treatment works were built at the beginning of the 1990s, the first in Santiago being built in 1992.

Since 1995, the government has concentrated on encouraging the PSP of major water and sewerage entities through a series of share sales. In 2001, the government has shifted from outright PSP (asset sales on the England & Wales WaSC model) to 30 year BOT concessions. MOP, the public work's ministry, will have a new regulator created during 2007, along with a revised concession legislation designed to improve the transparency of the process.

The Chilean Government set 2006 as the target date for all wastewater to be treated governed by standards relating to the discharge of industrial wastewater. Decree 90 required 760 industries to submit reports by the end 2005 about their discharges.

15 water utilities raised their water tariffs by more than 3% from November 2005 in line with inflation. The increase can result from inflation, variations in the country's tariffs decree, new tax indexes or higher costs due to wastewater treatment, among other factors. Every time any of these factors

accumulates an increase of more than 3%, utilities are entitled to raise their tariffs. In contrast, 22 water utilities lowered their rates on items such as potable water and sewerage services in 2006. For example, Aguas Andinas's rates will fall by between 2.37% and 3.53% depending on location. The rates decrease is based on SISS's examination of the different costs for national and imported products and supplies of each utility, which is reviewed every five years. Chile's water rates are defined every five years by a decree.

Population	
2007 (million)	16.1
2020 (million)	18.6
Urbanisation in 2007	88.2%
Urbanisation by 2020	91.0%
Urbanisation by 2050	94.2%

Development of services

Capital spending in 1995 in US dollar terms has only recently picked up. In 1960-65, USD400million was spent, falling steadily to USD200million in 1976-80. In 1981-85 it recovered to USD325million, easing to USD325million in 1986-90 before reaching USD839million in 1991-95.

%	Water	Sewerage	Treatment
1965	53.5	25.4	0.0
1970	66.5	31.1	0.0
1975	77.4	43.5	0.0
1980	91.4	67.4	0.0
1985	95.2	75.1	0.0
1990	97.4	81.8	8.0
1995	98.6	89.2	14.0
2000	N/A	N/A	31.0
2004	99.7	98.4	72.0

Chile needs USD2.5billion in capex in the medium term for water treatment and distribution (USD1.4billion), wastewater treatment (USD400million) and sewerage (USD700million). EMOS forecasts that it will need USD2billion over 20 years so as to ensure the development of its sewerage network and its sewage treatment system. Three sewage treatment works are to be constructed in the medium term, so as to link in with the city's sewerage network, as described below. Broadly speaking, Chile will need to spend USD5-6billion in order to develop a universal sewerage and sewage treatment service in the longer term.

The government approved a bill in 2004 which will permit the granting of concessions for storm sewerage systems. MOP announced in 2006 that USD2.6billion was needed to complete Chile's rainwater management systems for cities with more than 50,000 people, with USD690million required in Santiago.

Aguas Andinas is implementing a USD477million investment plan by 2010 for completing its sewerage coverage programme, including USD197million for the construction of the Los Nogales wastewater treatment plant, which is scheduled to begin operations in 2010. Nationally, SISS expects wastewater treatment to rise from 77.5% in 2005 to 81% in 2006. Longer term targets are 98.8% for 2010 and 99.4% for year 2015.

Urban Data (2004)	
With improved drinking water	100%
With household drinking water	99%
With improved sewerage	95%
With household sewerage	89%
With 2^0 sewage treatment	72%

Freshwater	
Annual availability (1998)	468.0km^3
Per capita	31,570m^3
Annual withdrawal (1985)	21.4km^3
Domestic (1987)	5%
Industrial (1987)	11%

Agriculture (1987)	84%

Groundwater	
Annual availability (1998)	140.0km^3
Per capita	9,444m^3

Rainwater management is the next area for PSP

According to a study carried out the Chilean construction chamber's (CChC) specialists, investment in sanitation and rainwater management infrastructure during the 2006-10 period will total USD3.7bn, while the amount invested during the 2008-12 period should be at least USD4.5bn. The government has indicated that PSP will be used as a tool to finance and manage these investments.

Santiago and Chile's 12 Regions

Region	Contract Type	People served (2005)	Date of PSP	Average water consumption per client
I	BOT	411,586	2003	212.4 M^3 pa
II	BOT	461,333	2003	212.4 M^3 pa
III	BOT	231,357	2004	198.0 M^3 pa
IV	BOT	486,891	2003	180.0 M^3 pa
V	Privatised	1,372,910	1998	180.0 M^3 pa
Metropolitan	Privatised	4,934,120	1999	289.2 M^3 pa
VI	Privatised	With VIII	2000	With VIII
VII	BOT	571,047	2001	182.4 M^3 pa
VIII	Privatised	2,075,720	2000	205.2 M^3 pa
IX	BOT	535,317	2003	177.6 M^3 pa
X	Privatised	510,899	1999	190.8 M^3 pa
XI	BOT	69,719	2004	187.2 M^3 pa
XII	BOT	127,615	2003	228.0 M^3 pa

Region	Company	2004 Revenues USDmillion	Concession Company	Owners
I	ESSAT	31.5	Aguas de Altiplano	Grupo Solari
II	ESSAN	48.2	Aguas de Antofagasta	Grupo Luksic
III	EMSSAT	14.2	Aguas Chañar	Hidroscan / Icfal / Vecta
IV	ESSCO	29.2	Aguas de Valle	Vicuña / Fernández León
V	ESVAL	100.5	ESVAL	Grupo Hurtado
Metropolitan	EMOS	326.9	Aguas Andinas	Agbar
VI	ESSEL	See VIII	ESSBIO	Southern Cross
VII	ESSAM	28.7	Aguas Nuevo, Sur, Maule	Southern Cross
VIII	ESSBIO	111.1	ESSBIO	Southern Cross
IX	ESSAR	25.9	Aguas Araucania	Grupo Solari
X	ESSAL	38.1	ESSAL	Iberdrola
XI	EMSSA	5.8	Aguas Patagonia Aysen	Hidroscan / Icfal / Vecta
XII	ESSMAG	11.6	Aguas Magallanes	Grupo Solari

Source:

SSIS data, published in Santander Investment (2006) IAM: Swimming in Safe Waters, Santander, 9th March 2006, Santiago, Chile

MAJOR CITIES			
City	**2005**	**2015**	**Status**
Santiago	5,683,000	6,191,000	EMOS privatised in 1999

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
ESSAM	RWE (Germany)	571,000	560,000	**571,000**
EMOS	Aguas Andinas (Chile)	4,934,000	4,900,000	**4,934,000**

ESVAL	Consorcio Financiero (Chile)	1,372,000	1,280,000	**1,372,000**
ESSCO	Consorcio Financiero (Chile)	486,000	475,000	**500,000**
ESSEL	Southern Cross (USA)	600,000	600,000	**600,000**
ESSBIO	Southern Cross (USA)	1,500,000	1,500,000	**1,500,000**
ESSAL	Aguas Andinas (Chile)	511,000	475,000	**511,000**
ESSAT	Aguas Nuevas (Chile)	411,000	390,000	**411,000**
ESSAR	Aguas Nuevas (Chile)	535,000	520,000	**535,000**
ESMAG	Aguas Nuevas (Chile)	127,000	125,000	**127,000**
ESSAN	Antofagasta (Chile / UK)	461,000	455,000	**461,000**
Biwater	Biwater (UK)	10,000	10,000	**10,000**
Bayesa	Biwater (UK)	0	300,000	**300,000**
Aguas Decima	Agbar (Spain)	120,000	90,000	**120,000**
Aguas Quinta	Agbar (Spain)	200,000	150,000	**200,000**
Aguas Cordillera	EMOS (Chile)	315,000	295,000	**315,000**

Source:

World Bank & PPIAF (2006) Approaches to Private Participation in Water Services: A Toolkit, Appendix A. World Bank, Washington DC

CHINA

Economics (2006)	
GNI per capita	USD2,010
GNI per capita (PPP)	USD7,740
Agriculture	12%
Industry	47%
Services	41%

Legal Framework

The State Council is responsible for official government policy and sets national priorities and objectives. The State Council's "*Circular on Strengthening Urban Water Supply, Water Saving, and Water Pollution Prevention and Control (2000)*" set the policy agenda for the 2000–10, by (i) improving water supply planning and promoting water conservation; (ii) enforcing the "Law on Water Pollution Prevention and Control" by aiming for at least 60% urban wastewater treatment rate by 2010; (iii) promoting market-oriented tariff reforms to help attract private capital; and (iv) improving sector governance and regulation. It's "*Decision on Reforming the Investment System (2004).*" aims to promote non-government investment in new areas of the economy, including municipal public utilities and encourages enterprises to raise capital through the debt and equity markets, while relaxing the government's review process for new investments.

The State Council's document 34, *the Circular on accelerating the reform of water price, promoting water saving and protecting water resource (2004)*, defines four major components of water price for the first time: water resource tariff, water fee for hydro project, charge for water supply and charge for wastewater treatment and emphasises the need to adjust the water supply price to a rational level.

The 2002 Water Resource Law

This law has been in effect since 1st October 2002 and marks a significant tightening of the 1998 Water Resource Law, introducing a Department of Water Administration run by the State Council as an overall manager of water policy for the country. All water abstraction requires permitting and a suitable consumption fee. The OECD notes that the Water Law "opens the way for integrated driver basin management, stakeholder participation and the use of market mechanisms in water management".

Formal tariff charging started in 1985. Water provision is subsidised in order to ensure its universal availability in urban areas. This applies both to piped water and water provided by vendors. The State Council's document 34, the Circular on accelerating the reform of water price, promoting water saving and protecting water resource (2004) emphasises the need to adjust the water supply price to a rational level, moving from an average tariff accounting for 0.5% of household expenditure up to 1.5% (Browder 2007).

The Government has passed 13 water laws since 1989, along with a framework water law in 1985 including: The Water Act (1988), The Management Stipulation of Urban Water Conservation (1989) and The Water Consumption Quota Measure (1989). The 11th five year plan (2006-10) seeks to mobilise CNY1 trillion (USD143billion) for water and wastewater projects. Official targets are for water coverage in cities to be at least 95% in 2010, up from the current 91%.

The State Council's "Decision on Reforming the Investment System (2004)" aims to promote non-government investment in new areas of the economy, including municipal public utilities and encourages enterprises to raise capital through the debt and equity markets, while relaxing the government's review process for new investments. The 2002 Water Resource Law "opens the way for integrated driver basin management, stakeholder participation and the use of market mechanisms in water management".

A diversion?

The South to North Water Diversion Project is designed to transfer water from the Yangtze River in the water rich south to the water poor north of the country. The disparity between population and water resources is such that 80% of water resources are in the Yangtze River Valley, compared with 54% of China's population and 35% of arable land. 44% of the population live to the north of the valley, but they only have 15% of water resources. The project was first proposed by Mao Zedong in 1952 and was due to be completed by 2010. Construction in fact started in 2002 and will continue into

the mid 2030s, at a cost of at least USD60-65billion. More than 2,500km of canals will be built, in three separate projects.

The USD24billion Three Gorges Dam project being constructed along the Yangtze River demonstrates the challenges involved in projects of this scale. In 2004, more than 700million tonnes of sewage and industrial wastewater was discharged into the Yangtze River basin. The 660-kilometre reservoir system started holding water in 2004, and without suitable measures, will trap effluents from cities upstream. In 2004, the State Environmental Protection Administration (SEPA) assessed its Three Gorges Anti-Water Pollution Plan. To date, 93% of industries have yet to achieve zero emissions or emission recycling, against an aim of reducing industrial pollution in the Three Gorges Reservoir by 30% by 2005. Indeed, 35% of projects had yet to start and 75% of facilities continue to discharge effluents at their pre-plan levels. 320 wastewater treatment works are due to be built by 2010 at a cost of CNY40billion (USD5billion), but this will only cover 85% of effluents discharged and further investment will be needed for sewerage systems.

Water and sewerage development		
	1980	**1993**
Piped water (billion m^3/pa)	8.83	45.02
Domestic (billion m^3/pa)	3.39	12.83
Access to piped water	81.4%	93.1%
Sewage removal (m t/pa)	16.43	31.68
Sewer pipes (km/1000)	0.24	0.45

Tariffs, cost recovery and tariff reform

Water provision has been subsidised in order to ensure its universal availability in urban areas, with formal tariff charging only starting in 1985. Currently, water tariffs account for 0.5% of household expenditure and there is no effective constraint upon its consumption. In 2004 the ministry of water resources estimated that China's economy is 85% below the global efficiency average in water consumption. This is in part due to outdated plant and management techniques, but mainly as a result of artificially low water fees.

Profitability of municipal water utilities

1997 (531 cities)		**2004 (661 cities)**		
Profits	**Average for all**	**Category I**	**Category II**	**Category III**
>10%	10%	0%	7%	4%
0% - 10%	48%	38%	41%	32%
0% - -10%	16%	33%	18%	26%
> -10%	23%	29%	33%	38%

High capital spending since 1997 and the cost of servicing new debt have eroded the general profitability of these services. Indeed, these services are currently making a loss in a majority of cities. This is only partly accounted for by factors such as tariffs. It is evident that if bills are not paid, this erodes revenues and profits as do excessive management, staffing and operating costs.

Water tariffs and tariff reform

Until recently, water tariffs did not reflect their actual costs. This is in the process of altering due to a number of drivers that have emerged in recent years. All domestic urban water users are metered, either directly through household or apartment connections or through a meter serving their entire apartment block. The table below summarises water tariffs by city category, tariff changes over the past decade.

Weighted average water supply tariffs by category of city (CNY/m^3)

City	**1997**	**2004**	**Change**
Category I	1.00	1.72	72%
Category II	0.93	1.33	43%
Category III	0.85	1.24	46%
National average	0.93	1.37	47%

According to the National Development and Reform Commission, average tariffs in the 36 large and medium sized cities rose by 10% during 2005 to CNY2.09 per m^3 including CNY1.55 per m^3 for water and CNY0.54 per M^3 for wastewater.

The water industry generates revenues of CNY60-70billion pa, which is anticipated to rise to CNY150-200billion by 2010 as tariff reform drives tariffs to CNY6.00 per m^3.

Tariffs in 2005

CNY per M^3	Conventional water		Reclaimed water	
	Domestic	Industrial	Domestic	Industrial
Beijing	3.7	5.6	1.0	1.0
Tianjin (central)	2.9	4.6	1.1	1.3

Population	
Total 2007 (million)	1,296.2
Total 2020 (million)	1,423.9
Urbanisation in 2007	42.2%
Urbanisation by 2020	53.2%
Urbanisation by 2050	72.9%

Urban water in China

The table below highlights the effect of increased tariffs on domestic water usage, whereby despite an increase in domestic users from 273million in 2002 to 322million in 2006, the volume of domestic water supplied increased from 15.0billion m^3 to 15.9billion m^3.

Urban water usage in China, 2002-06

Billion m^3 pa	2002	2003	2004	2005	2006
Industry	20.9	20.9	21.1	21.0	22.2
Public services	6.2	6.8	6.8	7.1	6.4
Domestic supply	15.0	16.4	16.5	17.3	15.9
Total	46.6	48.4	48.9	50.1	54.1
Consumption (l/day)	213	215	212	204	190
Users (million)	273	295	303	327	322

Urban Data (2004)	
With improved drinking water	93%
With household drinking water	87%
With improved sewerage	69%
With household sewerage	50%
With 2^0 sewage treatment	26%

Water quality and quantity

In 2004 the Ministry of Water Resources estimated that China's economy is 85% below the global efficiency average in water consumption. This is in part due to outdated plant and management techniques, but mainly as a result of artificially low water fees. The Ministry of Construction and the Beijing municipality, acting under the authority of the State Council, have issued rules aimed at rationalising water tariffs to encourage efficiency.

Currently, over 400 out of the leading 600 Chinese cities are short of water, with Beijing and Tianjin, the national capital and a major port city in the north, at a critical moment of water shortage. Meanwhile, rural people in some arid areas also have to endure acute water shortage, either for farming or drinking.

China discharged 43-50billion m^3 of wastewater in 2000-2001 (various estimates), including 20billion m^3 of industrial wastewater. The annual increase in effluent discharge estimated at 2.4million m^3 pa in 1999. 63% of rivers tested in 1998 were at or below class four (bad to very bad, equivalent to abiotic) on China's five-tiered water-quality scale. Of urban water sources, 90% are also polluted. In 1997, China spent 1% of its national budget on environmental protection. Water shortages in cities cause a

loss of an estimated USD11.2billion (CNY120billion) in industrial output, while the impact of water pollution on human health has been valued at USD3.9billion (CNY41.73billion).

At the end of 2000 (9th Five Year Plan) there were 427 Waste Water Treatment Works ("WWTWs") in China, including 282 to secondary standard, with a total treatment capacity of 14.75million m^3 per day. USD3.6billion was spent on building 317 municipal Wastewater Treatment Works in 1998-2002, via internal treasury bonds. At the end of 2002, there were 452 WWTWs in operation, with a capacity of 31million m^3 per day. China recycled 40% of its urban wastewater, compared with 75-80% in developed economies. Treatment capacity is to exceed 30million m^3 per day by the end of the 10th Five Year Plan in 2005. In addition, USD2.6billion will be spent cleaning up Beijing's water system.

Since 2001, all 699 cities and urban areas with a population of more than 500,000 are meant to develop appropriate sewage treatment facilities for 60% of effluents by the end of the 10th Five Year Plan (2001-2005). All cities are meant to charge a sewage treatment levy by the end of 2003. Shanghai, Jiangsu and Zhejiang and the other main industrialised cities will have 50% of facilities at a cost of USD9billion, treating 22million m^3 of effluent per day. In June 2003, the State Environmental Protection Administration (SEPA) announced that China's treatment capacity will double from 25million m^3 pa to 58million m^3 pa by 2005, with an investment of USD14.5billion. In total, USD36billion is to be spent between 2000 and 2010 on WWTWs. In 2001-2005 (10th Five Year Plan), 375 WWTWs are to be built.

In rural areas, 500million people have access to tap water, with 106million having improved sanitation facilities. The country's rural areas have seen 674,000 waterworks built along with 48.91million wells. By the end of 2000, 880million Chinese rural residents, or 92.4% of the country's rural population, had improved water services, with 106million rural dwellers having modern toilets, taking the incidence of such toilets in rural areas to 44.8%. However, WHO estimates for 2000 point to 66% and 27% coverage respectively.

Municipal water services in China

China's municipal water services (the services provided in urban areas) can be characterised as having a notably high connection density (people served per km of water mains), a high metering penetration, but a low proportion of water used being provided by the utilities (46% against 68-80% in Brazil, Russia and the UK) and a poor payment collection rate. [WB, 2007, p12]

Service development and city size

Category		Number	Population million)	Water Supply coverage (%)	Wastewater treatment (%)
I	Population > 2million GNP/Cap >USD3,000	21	90	93%	61%
II	Population 0.5-2.0million GNP/Cap USD1,500-3,000	331	201	91%	38%
III	Population < 0.5million GNP/Cap <USD1,500	310	58	86%	21%

Municipal wastewater treatment has increased from 15% in 1990 to 52% by 2005 with a 65% target by 2010

Freshwater	
Total (1998, km^3)	2,800.0
Per capita (1998, m^3)	2,231
Withdrawals (1980, km^3)	525.5
For domestic use (1987)	5%
For industry (1987)	18%
For agriculture (1987)	77%

Estimates of Chinese urban sewerage treatment capacity and technology/equipment market:

	1996-2000	2001-2005	2006-2010	2011-2015
Treatment rate (%)	10.8	22	35	50
Treatment capacity (M tons/day)	10.4	22.2	38.7	60.3
Current capacity (M tons/day)	N/A	10.4	22.2	38.7
Construction required (M tons/day)	N/A	11.8	16.5	21.6
Investment for construction (billion Rmb)	9.0	14.1-17.6	19.8-24.7	25.8-32.3
Yearly operation cost (billion Rmb)	1.6-2.5	3.3-5.3	5.8-9.9	9.0-14.5
Technology / equipment market size (billion Rmb)	N/A	4.9-7.9	6.9-11.1	9.1-14.6

Source: China Environmental Protection Industry Association 2001.

Total forecast spending on environmental protection:

9th five year plan, 1996	2000	USD43billion
10th five year plan, 2001	2005	USD84billion
11th five year plan, 2006	2010	USD157billion
12th five year plan, 2011	2015	In preparation

It is understood that the 12th five year plan will seek to increase urban sewage treatment to at least 60% and preferably to 70-80%. It will also need to address water scarcity issues in tandem with further urbanisation and industrial development.

China has earmarked USD33billion of the five year plan's spending on water and wastewater treatment projects between 2001 and 2005. Under the 10th five year plan, 11% of funding is earmarked from central government, 34% from local and provincial government and 55% from industry. But by the end of 2002, just 28% of the plan had been realised and current expectations are for 70% of planned total to be realised by the end of 2005.

It is understood that the 2006-11 period seeks to mobilise CNY1trillion (USD125billion) for water and wastewater projects. This includes CNY330billion on sewage treatment projects for the 278 cities that currently do not have them and CNY320billion for the two main pipelines for the South-North Water Transfer Project. Official targets are for water coverage in cities to be at least 95% in 2010, up from the current 91% and around 70% of wastewater, 28billion m^3 pa will be treated.

Planning and paying for water and wastewater infrastructure

Because water provision is officially regarded as a commercial activity, it is not accounted for on the 11th Five-Year Plan [WB, 2007, p34], but as the World Bank points out, where the private sector is not involved and tariffs do not cover costs, significant state and municipal funds will still be required. In contrast, detailed forecasts for investments in wastewater services have been prepared.

Wastewater investments in the 11th Five-Year Plan

Area	CNYBillion	%
Water reuse	9	3%
Rehabilitation	11	4%
Sludge	43	14%
Wastewater treatment plants	49	16%
Sewerage network	188	63%

World Bank estimates of water and wastewater spending in China:

CNYbillion	8th – 10th Five Year Plans	11th Five-Year Plan
	1991-05	2006-10
Water Supply	200	160
Wastewater	230	270
Total	400	430

This represents a more then tripling of the rate of expenditure seen in the previous fifteen years. Further significant spending can be expected in the future as urbanisation continues, along with the

impact of continued economic development and the broader adoption of water intensive domestic goods.

Global Water Intelligence estimates that operating spending on municipal water services will rise from USD4.65billion in 2007 to USD10.88billion by 2016, with operating spending on municipal wastewater services rising from USD4.20billion to USD5.95billion during that period.

PSP and politics

Private sector participation in water and wastewater services in China has been enabled by legislation such as the 1984 PRC Water Pollution Prevention Law and the 1988 PRC Water Law and subsequently by various laws governing such aspects as Contract Law (1999).

The Ministry of Construction ("MOC's") 2000 “Circular on Accelerating the Marketisation of Urban Utilities” encourages domestic and foreign investment in urban public utilities through a variety of ownership arrangements such as sole ownership, joint ventures, or partnerships. The joint “Circular on Accelerating the Commercialisation of Urban Wastewater and Solid Waste Treatment” by the MOC, the National Development Reform Commission and the State Environmental Protection Agency in September 2002 provided specific references to wastewater treatment plants and promotes arrangements such as build-operate transfer (BOT), joint ventures with municipal utilities, and transfer-own transfer (TOT) contracts.

The Chinese Government formally opened the national urban utility market to domestic and overseas investors in 2003. Domestic and foreign investors would be allowed to invest alone or cooperate with local authorities or enterprises. The ministry would further promote charges for sewage and refuse treatment in 2003, and deepen the price reform of water supply, so as to establish a price system adapted to the market economy.

The Ministry of Construction’s 2004 *“the Administrative Method of Urban Utilities Concessions”* was meant to fully establish the legal status of concession contracts, but may need to be further developed regarding the legal status of contracts, the imbalance between the enterprise and the government and limitation of its applicability.

Water provision is subsidised in order to ensure its universal availability in urban areas. This applies both to piped water and water provided by vendors. The supply of water has deteriorated both in terms of availability and the quality of the water provided because of the lack of funding. On average, water accounts for 0.5% of household expenditure. In consequence, domestic water use in urban China is at an appreciably higher level than is currently sustainable. There have been a number of developments at the municipal level designed to eliminate subsidies, while ensuring that water services are both of a higher quality and affordable (up to 1.5% of average household expenditure).

The State Development Planning Commission (SDPC) has announced that urban residents and enterprises will pay higher prices for excess water consumption by the end of 2005, and sewage processing fees will be charged throughout the country by the end of 2003, on the basis of cost recovery.

At the end of 1999, Chinese and expatriate companies served 11million people against 15million being served by international players. More recently, water and sewerage PSP has moved forward at a dramatic rate. Since 2000, contracts serving a further 21million people have been awarded to international companies, while contracts serving 36million people have been awarded to Chinese and expatriate companies.

International companies seeking to enter this market need official support from at least one of the main Beijing government bodies. The State Planning Commission (SPC) approves BOT projects. The Ministry of Construction (MOC) approves STW construction and operation projects inside cities, having been involved with the private sector since 1993 with the water and sewerage sectors. The Ministry of Water Resources (MWR) is responsible for non-urban areas. While the MWR is still responsible for major infrastructure projects, it is much less powerful than the MOC, and therefore the MWR is not seen as important when seeking international BOT proposals. The State Environmental Protection Administration (SEPA, formed in 1998) looks after STWs and industrial effluent treatment projects. The NEPA works with provincial EPAs, which are essential partners for sewerage and sewage treatment BOT projects. To date, all such projects have in fact remained in state hands, whilst mobilising finance from international multilateral agencies.

Groundwater	
Total recharge (1998, km^3)	870.00
Per capita (1998, m^3)	693
Withdrawals (1985, km^3)	75.0
For agriculture (1985)	54%

Chinese private sector players

Three broad approaches are being used by the private sector in China. Firstly, international companies working with joint ventures or through specialist funds. Joint ventures are Sino-French Holdings (Suez and New World), and the leading dedicated fund is the China Water Company, which is held by RWE (49%), Temasek Holdings (Singapore Government) and Hong Kong Land (Jardine) or the setting up of Chinese owned private sector companies. Restrictions on returns by foreign owned and controlled entities have meant that stakes in ventures such as Thames Water's Shanghai water treatment project have been sold back.

Secondly, a major expatriate Chinese market has developed. To date this has mainly come from 'expatriates' in Hong Kong and from Malaysia and Singapore. The development of this market outside Hong Kong has taken place since 2000.

The largest market in terms of recent developments is that of nationally based Chinese companies. These can either work on their own or in partnership with international companies. To date six examples of the third approach have been identified. One, Shenzen Overseas Chinese Town Co is indirectly concerned with the sector, concentrating on the development of tourist facilities for Shenzen, including water services. The Suzhou New District Hi-Tech Industrial Co Ltd carried out the development and operation of water, road, gas and power services for the city's Hi-Tech Industrial Development Zone. Shenyang Public Utility is responsible for most of Shenyang's water provision. Three others (Shanghai Lingqiao Tap Water Co, Shanghai Municipal Raw Water and Wuhan Sanzheng Industry Co Ltd) are primarily concerned with water provision projects and services. In all cases, a majority of the company's shares continue to be directly or indirectly in state or municipal hands.

By the end of July 2004, contracts covering 31million people have been awarded to Chinese companies, along with 16million through expatriate Chinese companies. International companies serve 36million, in all cases through joint ventures. However, at the end of 1999, Chinese and expatriate companies served 11million against 15million being served by international players. Thus while Chinese and expatriate companies have privatised services affecting 36million more people since 2000, international players have moved more modestly ahead with 21million people.

Companies noted

Water treatment facilities constructed by Degremont (Suez) and Purac (AWG) in China serve 100million and 40million people respectively. These companies have been active in the market since the 1970s and effectively pioneered the return of western engineering concerns to the country.

MAJOR CITIES			
Population	2005	2015	**Status**
Anshan	1,611,000	1,864,000	PSP (Dalian Dongda)
Anshun	822,000	922,000	N/A
Baotou	1,920,000	2,473,000	PSP (Epure)
Beijing	10,717,000	12,850,000	Various projects
Benxi	1,000,000	1,144,000	N/A
Changchun	3,046,000	3,765,000	Wastewater BOT
Chengde	1,429,000	1,700,000	N/A
Changsha	2,451,000	3,169,000	Wastewater TOT
Chengdu	4,065,000	4,637,000	VE has a water treatment & provision BOT
Changzhou	1,249,000	1,623,000	Water management JV
Chifeng	1,238,000	1,490,000	N/A
Chongqing	6,363,000	7,258,000	Bulk water and wastewater BOT
Dailan	3,073,000	3,664,000	Water treatment BOT
Daqing	1,594,000	2,067,000	Water treatment BOT
Datong	1,763,000	2,285,000	N/A
Dongguan	4,320,000	5,370,000	Bulk water concession

MAJOR CITIES			
Population	2005	2015	**Status**
Fushun	1,456,000	1,653,000	N/A
Fuxin	807,000	866,000	N/A
Fuyu	1,068,000	1,244,000	N/A
Fuzhou	2,453,000	3,172,000	PSP (Cascal)
Guangzhou	8,425,000	10,420,000	Various water and WW contracts
Guiyang	3,447,000	4,446,000	N/A
Handan	1,535,000	1,992,000	Wastewater BOT
Hangzhou	2,831,000	3,656,000	Wastewater BOT
Harbin	3,695,000	4,392,000	Water treatment BOT
Hefei	1,916,000	2,481,000	Two PSP projects
Henyang	973,000	1,211,000	N/A
Heze	1,318,000	1,519,000	N/A
Huaian	1,243,000	1,441,000	Beijing Capital
Huaianan	1,420,000	1,664,000	One water treatment JV
Huhehaote	998,000	1,057,000	Water management project
Hunjiang	798,000	925,000	N/A
Huzhou	1,203,000	1,417,000	Two PSP projects
Jiamusi	969,000	1,230,000	N/A
Jiaxing	954,000	1,160,000	N/A
Jilin	2,255,000	2,918,000	N/A
Jingmen	1,228,000	1,403,000	Two water and one WWTW BOT
Jinan	2,743,000	3,184,000	Seven water BOTs
Jining	1,143,000	1,397,000	N/A
Jinzhou	925,000	1,118,000	N/A
Jinxi	2,268,000	2,988,000	N/A
Jixi	947,000	1,106,000	N/A
Kaifeng	848,000	1,015,000	N/A
Kunming	2,837,000	3,406,000	Water treatment BOT
Lanzhou	2,788,000	1,938,000	Veolia Environnement
Leshan	1,411,000	3,117,000	N/A
Linqing	1,009,000	1,288,000	N/A
Linyi	2,035,000	2,387,000	Partnership agreement for water supply
Liuan	1,647,000	1,948,000	N/A
Liupanshui	1,149,000	1,149,000	N/A
Liuzhou	1,409,000	1,829,000	Two wastewater treatment plants
Louyang	1,664,000	2,031,000	N/A
Mianyang	1,322,000	1,689,000	N/A
Mudanjiang	1,171,000	1,522,000	N/A
Nanchang	2,188,000	2,913,000	Wastewater BOT
Nanchong	2,046,000	2,649,000	One bulk water BOT
Nanjing	3,621,000	4,151,000	Industrial water BOT, wastewater BOT
Nanning	2,040,000	2,641,000	N/A
Neijiang	1,441,000	1,670,000	N/A
Ningbo	1,810,000	2,345,000	N/A
Pingxiang	905,000	1,178,000	N/A
Qingdao	2,817,000	3,248,000	Water & wastewater BOTs
Qiqihar	1,607,000	1,877,000	N/A
Shanghai	14,503,000	17,225,000	A wide range of contracts & companies
Shantou	1,495,000	1,980,000	N/A
Shenyang	4,720,000	5,377,000	Shenyang Public Utility floated in 1999
Shenzhen	7,233,000	8,958,000	Bulk water PSP
Shijiazhuang	2,275,000	2,943,000	UNDP commercialisation project under way
Suining	1,401,000	1,621,000	N/A
Suqian	1,258,000	1,422,000	One WWTW BOT
Suzhou	1,849,000	2,396,000	PSP for industrial development zone
Taian	1,598,000	1,858,000	N/A
Taichung	1,033,000	1,281,000	N/A
Taiyuan	2,794,000	2,863,000	N/A
Tangshan	1,825,000	2,176,000	N/A

MAJOR CITIES			
Population	2005	2015	**Status**
Tianjin	7,040,000	8,119,000	Various major projects
Tianmen	1,676,000	1,946,000	Water BOT
Tianshui	1,199,000	1,946,000	N/A
Tongliao	855,000	1,036,000	N/A
Wanxian	1,963,000	2,438,000	N/A
Weifang	1,498,000	1,822,000	WWTW BOT
Wenzhou	2,212,000	2,862,000	Water treatment BOT
Wuhan	7,093,000	8,204,000	Wuhan Sanzheng Industry Holding
Urumqi	1,562,000	1,905,000	Various projects
Wuxi	1,646,000	2,135,000	Two WWTW BOTs
Xian	3,926,000	4,559,000	Water treatment BOT
Xiangxiang	863,000	1,081,000	N/A
Xiantao	1,528,000	1,772,000	N/A
Xianyang	1,072,000	1,355,000	WTW BOT
Xiaoshan	1,130,000	1,164,000	N/A
Xinghua	1,587,000	1,677,000	N/A
Xintai	1,334,000	1,378,000	One WWTW BOT
Xinyu	870,000	1,096,000	N/A
Xuanzhou	851,000	987,000	N/A
Xuzhou	1,960,000	2,566,000	Four BOTs
Yangchen	789,000	1,029,000	Two BOTs
Yantai	1,991,000	2,578,000	N/A
Yichun (H'ang)	785,000	849,000	N/A
Yichun (Jiangxi)	961,000	1,127,000	Water treatment and WWTW BOTs
Yixing	1,129,000	1,195,000	N/A
Yiyang	1,313,000	1,572,000	PSP currently under consideration
Yonzhou	991,000	1,128,000	N/A
Yueyang	847,000	880,000	N/A
Yulin	1,060,000	1,379,000	N/A
Yuyao	876,000	950,000	N/A
Yuzhou	1,226,000	1,357,000	PSP WWTW project being tendered for
Zaoyang	1,210,000	1,418,000	N/A
Zaozhuang	2,096,000	2,458,000	N/A
Zhangilakou	1,001,000	1,248,000	N/A
Zhangjiangang	936,000	1,056,000	N/A
Zhanjiang	1,514,000	1,905,000	One water BOT
Zhaodong	783,000	948,000	N/A
Zhengzhou	2,590,000	2,989,000	Bulk water BOT
Zibo	2,982,000	3,517,000	China Everbright JV
Zigong	1,087,000	1,260,000	One WWTW BOT

The 109 cities forecast in 2003 to have a population in excess of 1million by 2015 is a significant increase on the number in the 1996 UN urbanisation assessment. This in turn rose to 114 in the 2007 assessment. This is due to better data as well as major cities such as Shenyang fragmenting into several autonomous entities. It is also of interest to note that there has been some scaling back of the 2015 population forecasts since the 2001 edition of the Pinsent Masons Water Year Book.

City Study: Shanghai

The Shanghai Water Resources Bureau operates the city's water and sewerage services. All of the urban area's 7,496,500 people are supplied with piped water via 1,499,300 connections, using an average of 193L of water per day. All connections are metered, with the quality of water generally being regarded as low although water treatment works nominally account for 104% of water demand. There is no surcharge for sewerage services. Water costs USD0.13 per m^3, with no price adjustment made for the volume used. Shanghai's main challenges are developing its infrastructure for continued growth, industrialisation and water pollution.

Greater Shanghai saw the construction of 31 WWTWs between 1980 and 2002 at a cost of CNY10billion, treating 44% of the 5.40million m^3 of effluents generated each day. There are plans for 27 more, including 14 between 2001 and 2006, with two major works in construction. The Zhuyuan

Wastewater Treatment Plant, 1.70million m^3 per day is being constructed and operated (20 years) by Youlian Enterprise Development Company and two other private players. CNY0.87billion is to be invested in the project, which started in 2002. The contract is for the operation of the Shanghai Zhuyuan No 1 Sewage Treatment Factory. YEDC, along with two other private companies, will invest CNY870million (EUR107million), raising its capacity to 1.7million tonnes per day during the contract period. The Bailonggang Wastewater Treatment Plant will handle 1.2million m^3 per day at a cost of CNY060billion. Both were expected to be in service by the end of 2003.

In 1995, a consortium led by Thames Water and Bovis (P&O) was awarded a 20 year. BOT contract to build and manage a water treatment plant at Da Chang, generating 0.4million m^3 of potable water per day. In 2002, the State Council issued a note requiring all fixed return water contracts held by foreign entities to be restructured. Thames Water subsequently sold its stake in the venture back to the municipality.

A second water treatment plant is currently being upgraded by Degrémont, on a stand-alone basis. In addition, Shanghai has two semi-private water companies. The Shanghai Lingqiao Tap Water Co. distributes water to the Pudong district of the city of Shanghai. The Shanghai Municipal Raw Water Co Ltd abstracts water from the Yangtze and Huangpu rivers for treatment at the Shanghai municipality's water treatment stations. The company builds and operates the pumping stations, canals and reservoirs necessary for the bulk water provision to the city. Shanghai also aims to become an 'oriental water metropolis' with the municipal government promising a USD50million investment by 2008. This year, the city plans to build water rings linking the Dianpuhe River to Suzhouhe River and Huangpujiang River via Xinjing Port and West River, developing them as new scenic spots combining sightseeing, tourism and shopping, according to the director.

Shanghai – Guaranteed returns are not guaranteed

In 1995, a consortium led by Thames Water and Bovis (both of the UK) were awarded a 20 year Build Operate & Transfer contract to build and manage a water treatment plant at Da Chang in Shanghai, generating 0.4million m^3 of potable water per day. The facility provides drinking water for 2million people, having entered service at the end of 1997. The USD70million construction project was operated on a 50:50 basis and called Bovis Thames (Shanghai). In early 2002, Thames Water bought out its joint venture partner.

In 2002, the State Council passed a law requiring all fixed return water contracts held by foreign entities to be restructured. In the case of Bovis Thames (Shanghai), the contract was based around a 12% guaranteed return. Guaranteed returns are still allowed for Chinese companies. Thames Water subsequently sold its stake in the venture back to the municipality. It is understood that Thames Water made a nominal profit on the share sale.

City Study: Beijing (Peking)

The Beijing Municipal Water Works Co. and the Beijing Water Resources Bureau operate water and sewerage services. The city's population of 5,769,600 has 1,153,920 connections, with 95% of the population receiving piped water. The average water consumption is 149L per capita per day. Water quality is regarded as poor, partly because of the contamination of the groundwater resources that supply 69% of current needs. In 1991, water prices were increased from CNY0.25 per m^3 to CNY0.45 per m^3 for industrial and commercial customers and from CNY0.12/m^3 to CNY0.30/m^3 for domestic customers. There are a total of 194,000 water meters, 175,000 for domestic customers and 14,000 for industrial and commercial customers. Distribution losses are officially estimated at 7.5% although in reality they are approximately 28%.

Year	1993	1996	2000
Capacity (million m^3 per day)	1.90	2.30	3.00
Demand (million m^3 per day)	1.95	2.50	3.10

In Beijing, 60% of the city was served by sewers in 1993, with the other 40% served by night soil carriers. In 1991, 3.6% of the city's sewage was treated, which increased to 18.5% in 1992. Officially, six WWTWs currently handle 50% of the city's effluents. Two WWTWs handle 1.6million m^3 per day; 85% of the total treated. In September 2003, bids were invited for five new local WWTWs with a combined capacity of 0.16million m^3 per day. One further WWTW was built, with the aim of 87% of effluents being treated by the start of the 2008 Olympiad, or 2.62million m^3 per day. The Beijing Gaobeidian Sewage Treatment Plant will be the largest in China.

In the Greater Beijing area, the total abstraction was 3,564million m³ pa in 1992, and is forecast to rise to 5,140million m³ by 2020. Groundwater is heavily used for agriculture (1,447million m³ pa) and it is estimated that groundwater over-abstraction is currently running at 2,000–2,700million m³ pa. Because water is scarce across Northern China, there is little scope for increasing the use of the Miyun and Guanting rivers, which flow in the region. The total water availability is currently at 400m³ per capita pa. Water demand was expected to outstrip supply by 70% during 1991-2000. As a consequence, in November 1992, fees for water supply were fixed to usage, along with quotas for water usage. The current emphasis is to boost water supplies via upgrading and expanding the Number 9 Water Treatment Plant. The municipality is playing off various sources of funding for this project. In addition, World Bank funding is being sought for upgrading the Gao Bei Dian Treatment facility. The Beijing No 10 treatment plant, awarded to AWG, is to cost USD300million, covering 15% of the city by the time it enters service.

In June 2001 a CNY22billion (USD2.6billion) plan was started to ease water shortages in the capital city within five years. It involves 20 projects for water resource development, pollution protection, rain and flood water utilisation, building of water-saving and ecological agricultural developments around the reservoir areas and water quality monitoring. In total, Beijing anticipates spending USD12billion in the run up to the 2008 Olympics to improve its environmental performance. This includes an increase in sewage treatment from 45% in 2000 to 90% by 2007, with treatment capacity rising from 1.26million tonnes per day to 2.62million tonnes per day through USD870million being spent on seven large plants, and USD750million on 15 smaller facilities. Prior to the construction of four facilities in the past few years, there was effectively no sewage treatment in the city.

PSP contracts noted

The list below is not comprehensive. As the edition went to press, 331 contracts had been noted in China, plus one each in Hong Kong and Macao.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	**Contract**	**Company**
Changtu	30 year O&M, water provision	Sino French Holdings
Wanzhou	30 year O&M, water provision	Sino French Holdings
Zhongstan	22 year O&M, water provision	Sino French Holdings
Zhengzhou	30 year O&M, water provision	Sino French Holdings
Baoding	20 year O&M, water provision	Sino French Holdings
Lianjing	30 year O&M, water provision	Sino French Holdings
Chongqing	30 year build & manage, water provision	Sino French Holdings
Tianjin	35 year concession, water provision	Sino French Holdings
Tanzhou	30 year O&M, water provision	Sino French Holdings
Guangzhou	30 year O&M, water provision	Sino French Holdings
Gaozhou	30 year O&M, water provision	Sino French Holdings
Sanya	30 year O&M, water provision	Sino French Holdings
Nanchang	28 year O&M, water provision	Sino French Holdings
Shanghai	Pudong, industrial water JV	Sino French Holdings
Sanya	35 year concession, water provision	Sino French Holdings
Qingdao	25 year BOT, water provision	Sino French Holdings
Chongqing	25 year BOT, wastewater treatment	Sino French Holdings
Shenyang	30 year O&M, water provision	Shenyang Public Utility
11 cities	25 year BOT, sewage treatment	Sound Group
4 cities	25 year BOT, water treatment	China Water Company
Hexian	20 year j.v. operation	AWI
Changli	30 year water and sewerage contract	Earth Tech
Guangzhou	20 year DBFO, sewage treatment	Earth Tech
Shanghai	50 year O&M, water services	VE
Chengdu	18 year BOT, water provision	VE
Tianjin	20 year ‘concession’, water provision	VE/Marubeni
Zunyi	35 year concession, water treatment	CGE Zunyi Water
Shanghai	20 year ‘concession’, water provision	Shanghai Fengxian Saur Water
Beijing	23 year BOT, water treatment	AWG
Tiazhou	18 year BOT, bulk water provision	AWG
Harbin	O&M, water treatment plant	Bouygues
Foshan	25 year BOT, wastewater treatment	Aquamundo
Chongqing	25 year BOT, wastewater treatment	Aquamundo

Private sector contracts awarded (Please see the relevant company entry for details)		
Liuzhou	25 year BOT, wastewater treatment	Global Green Tech
Deqing	15 year BOT, water treatment	Globe Environment
Nanjing	Industrial wastewater treatment BOT	Nanjjng Sembcorp Suiyu
Dao Bin Shan	23 year water treatment BOT	Shenfei Dayen
Shenyang	Water and wastewater treatment BOT	Shenfei Dayen
Beijing	Industrial water & wastewater treatment	Shenfei Dayen
Beijing	20 year sewage treatment BOT	Kerry Utilities
Jiangmen	Wastewater treatment BOT	AGEPSG
Nanchong	Water treatment concession	Berlinwasser International
Xian	Water treatment BOT	Berlinwasser International
Shanghai	20 year wastewater treatment BOT	Youlian
Beijing	Wastewater treatment BOT	Beijing Capital
Four cities	Water treatment plant BOTs	Cathay International Water
Shenzen	Bulk water concession	GDI
Donnguan	Bulk water concession	GDI
Nanhai	Water supply	Nanhai Development
Nanjing	Wastewater treatment BOT	SIHL
Zhanjiang	Bulk water treatment BOT	SIHL
Xiamen	Water & wastewater concession	SIHL
Hanzhong	Water BOT	Interchina
Qinhuangdao	Wastewater BOT	Interchina
Xianyang	Water BOT	Interchina
Ma'anshan	Wastewater BOT	Interchina
Nanchang	Water supply	Jiangxi Hongcheng Waterworks
Nanchang	Wastewater BOT	BWB (VE)
Shandong	Water operations	Salcon Water
Yichun	30 year water BOT	PBA Holdings
Zun Yi	35 year wastewater BOT	VE
Yuanping	Wastewater & water reuse BOT	Sino-Dutch WIG
Zhumadian	Water supply	China Water
Shandong	Wastewater	Salcon
Danyang City	30 year wastewater treatment BOTs	AEH

City Study: Guangzhou (Canton)

The Guangzhou Water Resources Bureau serves 92% of the central area's 2,914,300 people through 728,575 connections. All water connections are metered. Of the city's sewage was treated in 1998, against an official target of 25%. In consequence, 2.7million tonnes of untreated effluent only 10% are discharged into the Pearl River daily and the local authority regards the river as biologically dead. A 7% 'Environment Tax' is levied in hotels, but there is no indication of how these funds are used. In 2002 Earth Tech was awarded a USD120million DBO contract that over two phases will treat 0.4million m^3 of wastewater per day, or 15% of the current total discharge.

Universal service provision in Macao

In contrast to Hong Kong, where water management and provision remains under municipal control, the former Portuguese colony of Macao had two PSPs for its water and sewerage services between 1985 and 1993. In 1996, the colony renewed the 1988 water provision concession for the Macao Water Supply Company (SAAM), for a further 25 years. The contract serves some 600,000 people via 169,460 domestic customer connections. This was awarded to Sino-French Holdings, the joint venture between Suez (France) and New World Infrastructure (Hong Kong) who holds 85% of SAAM's equity.

Since 1982, non revenue water in Macau has fallen from 40% to 11% by 2005 while rising from 27% to 37% in Hong Kong. While water prices as charged in Hong Kong and Macau are level pegging at HKD4.2 per m^3 (0.54), since 1997 (MOP 4.39 / m^3 for Macau since 1999, HKD0.55), the actual cost of water services in Hong Kong are HKD11.0 per m^3 (HKD1.41) resulting in Hong Hong's services making a loss compared with SAAM's 28% return on equity in 2004.

The water network has been extended from 127km in 1985 to 526km by 2005, with 90% of the original network having been replaced and the rest refurbished. The number of metered connections

also increased from 61,000 to 192,843, including 23,363 commercial, industrial and government accounts.

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
Shenfei Dayen	Dayen (Singapore)	0	125,000	**125,000**
Kerry Utilities	PPB (Malaysia)	0	1,000,000	**1,000,000**
Nanjing Sembcorp Suiyu	Sembcorp (Singapore)	0	0	**0**
AGEPSG	Guozhen EP (China)	0	5,000,000	**5,000,000**
Berlinwasser International	Marubeni (Japan)	0	2,000,000	**2,000,000**
Pinang Water	PBA (Malaysia)	500,000	0	**500,000**
Sino French Holdings	Suez (France)	12,900,000	1,500,000	**14,400,000**
Vivendi Water	VE (France)	18,250,000	455,000	**20,050,000**
Sound Group	Sound Group (PRC)	0	5,000,000	**5,000,000**
China Evergreen	Evergreen (China)	250,000	0	**250,000**
Shanghai Lingqiao Tap Water	Shanghai municipality	N/A	0	**N/A**
Shanghai Municipal Raw Water	Shanghai municipality	N/A	0	**N/A**
Shenyang Public Utility	Shenyang municipality	5,750,000	0	**5,750,000**
Suzhou New District	Suzhou municipality	100,000	0	**100,000**
Wuhan Sanzheng Industry	Wuhan municipality	N/A	0	**N/A**
AWI	Awg (UK)	3,760,000	0	**3,760,000**
Earth Tech	Tyco Intl (USA)	150,000	750,000	**750,000**
Shanghai Fengxian Saur	Bouygues (France)	3,500,000	0	**3,500,000**
China Water Company	RWE (Germany)	1,900,000	2,500,000	**4,400,000**
Cheung Kong Infrastructure	Privately held (PRC)	N/A	N/A	**N/A**
Global Green Tech	Global Green Tech (HK)	N/A	800,000	**800,000**
Aquamundo	Amiantit (Saudi)	N/A	400,000	**400,000**
Globe Environment	Darco (Singapore)	1,200,000	0	**1,200,000**
Cathay International Water	Cathay Intl (HK)	4,000,000	0	**4,000,000**
Beijing Capital Group	Beijing Capital (China)	12,000,000	5,500,000	**12,000,000**
GDI	GDI (HK)	1,500,000	0	**5,800,000**
Nanhai Development	Nanhai Development Co	1,100,000	0	**1,100,000**
SIHL	Shanghai Ind. Holdings	7,500,000	4,000,000	**8,500,000**
CGE Zunyi Water	VE (France) / Citic	500,000	0	**500,000**
Interchina	IH (HK)	900,000	900,000	**1,800,000**
Jiangxi Hongcheng W'works	J H Waterworks	1,550,000	0	**1,550,000**
PBA Holdings	PBA (Malaysia)	250,000	0	**250,000**
Salcon Water	Salcon Eng (Malaysia)	1,250,000	0	**1,250,000**
Zun Yi	VE (France)	0	600,000	**600,000**
Tianjin Capital Env Protect	Tianjin Environ (China)	1,200,000	11,350,000	**11,350,000**
Xin Jiang Hui Tong	Xinjiang HT (China)	380,000	0	**380,000**
Xinjiang Urban Const	Xinjiang Urban (China)	N/A	N/A	**N/A**
Sichuan Guangan AAA	AAA Public (China)	N/A	N/A	**N/A**
Shenzhen Kondarl	Shenzhen Kondarl (China)	N/A	N/A	**N/A**
Shanghai Young Sun	Shanghai YS (China)	0	800,000	**800,000**
Shanghai Urban Construction Group	Shanghai UCS (China)	0	3,000,000	**3,000,000**
Qianjiang Water Resources	Qianjiang WR (China)	500,000	0	**500,000**
Ningbo Fuda Company	Ningbo Fuda (China)	750,000	0	**750,000**
Anhui Water Resources Development Co	Anhui Water Resources Development Co (China)	N/A	N/A	**N/A**
Panyao	Asia Environment Holdings (Singapore)	1,000,000	1,000,000	**1,200,000**
Boustead Singapore	Boustead (Singapore)	100,000	0	**100,000**
Sino-Dutch WIG	Rabobank (Netherlands) / GreenTech Eng (China)	150,000	250,000	**250,000**

Sources:

ADB (2005) Final report on major issues and recommendations of PPP in the water sector in China, Asian Development Bank, Manila

Browder G J (2007) Stepping Up: Improving the performance of China's urban water utilities. The World Bank, Washington, USA

EIU (2007) China Hand, Economist Intelligence Unit, London

GWI (2007) Global Water Market 2008: Opportunities in Scarcity and Environmental Regulation, GWI, Oxford, UK 2007

Lam, P-L (2003) A comparative study of water utilities in Hong Kong and Macau. Asian Water, December 2003, pp 19-22.

Lee, S. (2003) The Transformation of the Shanghai Water Sector in the Reform Area: Social Actors and Institutional Change. PhD Thesis, SOAS, London University

Macao Water (2005) Colours of Water, Colours of Life, 2004 Annual Report & Accounts

Macao Water (2006) 2005 Annual Report & Accounts

Macao Water (2007) 2006 Annual Report & Accounts

OECD (2007) OECD Environmental Performance Reviews: China, OECD, Paris

SEPA (2002-2006) Report on the State of the Environment in China, 2002, 2003, 2004, 2005 & 2006 ,StateEnvironmentalProtectionAgency,Beijing

COLOMBIA

Economics (2006)	
GNI per capita	USD2,740
GNI per capita (PPP)	USD7,620
GDP in Agriculture	12%
GDP in Industry	34%
GDP in Services	54%

PSP plans

PSP has been supported since 1994, starting with Law Number 142 of 1994. This Law provides incentives for private firms to join local and regional authorities in the task of upgrading water, sewerage and sewage treatment services. In reality, PSP remained the exception until the passing of Law Number 226 of 1995. This established the basic rules for approval of each programme. This Law gives the company's employees and retirees, as well as other employee-owned cooperatives, unions and organisations, the first option to purchase the entity.

Population	
2007 (million)	44.9
2020 (million)	55.0
Urbanisation in 2007	74.2%
Urbanisation by 2020	78.0%
In urban agglomerations, 2050	86.0%

Legal framework and service delivery

Municipal water and sewerage entities serving a population in excess of 8,000 have been identified as potentially suitable for private sector management and investment. The Law on Environmental Principles (Law Number 99 of 1993) lays out various environmental and public health service objectives, which are to be administered by the Ministry of the Environment. A Vice Ministry of Water and Sanitation was created in 2006 to focus on policy development and implementation.

A report by the Instituto de Hidrología, Meteorología y Estudios Ambientales, warns that 70% of Colombia's population may face water shortages within the next 15 years if water resources are not properly managed. Drought has already caused water shortages in 7 cities in Valle del Cauca, Huila, Boyaca, Norte de Santander and on the Atlantic coast. The three largest cities in Colombia, Bogotá, Medellin and Cali, officially have a service coverage of around 94% for piped water and 87% for sewerage.

Superservicios, the public service regulator found in 2005 that 7.6million people were supplied with water unfit for human consumption in 2005, including 84% of the people served by systems for less than 10,000 residents (6.7million) against 4% served by larger systems (0.9million people). 28.5million people, or 62% of the population in 2005 was served by 206 suppliers covering 312 municipalities.

Colombia's Agua Transparente programme was launched in 2008, aiming to control the funding used in water projects and the implementation of initiatives, as well as supervising tenders related to water projects, in an effort to avoid corruption. This is in conjunction with USD599million being invested in waterworks in five departments during 2008. The government expects all 32 departments to have master water plans, covering water for human consumption, irrigation and industrial activities as well as sewerage and wastewater treatment, by 31 December 2008.

Urban Data (2004)	
With improved drinking water	99%
With household drinking water	96%
With improved sewerage	96%
With household sewerage	90%
With 2^0 sewage treatment	8%

In 2006, the water minister said that Colombia will have to invest some COP8.29trillion (USD3.46billion) in 2007-2010 to improve water and sewerage services. This is required to raise urban potable water coverage to 98.5% by 2010. In 2005, Colombia provided USD654million in

funding. Colombia's government aims to provide 95% water coverage and 85% sewerage coverage in all urban areas by 2010.

The Vice-Ministry of Water and Sanitation has budgeted USD5.2billion for 2008-10, including USD820million during 2008. The government plans to boost the proportion of people with access to water and sewerage in urban areas to more than 90% by the end of the decade. The government aims to hand over the management of urban water services in the provinces to private companies or corporatised entities through concession contracts over 20 or 25 years, via auctioning the concession contracts to private companies, which will commit to carrying out an investment plan over the ensuing two years of the current programme. The operating companies are expected to spend USD1.84billion out of the total USD5.2billion required.

In October 2008, it was announced that Colombia plans to invest USD14.1billion on water and sewerage services between 2007 and 2019, including USD9.6billion on urban water and sewerage. By 2019, it is intended that 50% of all sewage will be treated.

USDbillion	2007-10	2011-15	2016-19
Urban water & sewerage	2.7	3.7	3.2
Total water spending	4.5	5.4	4.2

Source, BN Americas, 1st October, 7th October & 13th October 20098

In 2006 Bogotá applied for World Bank financing to support a USD60million urban upgrading program, the bank reported on its website. Nearly half of Bogotá's population still lives in informal settlements where they lack basic services and need improved housing, the bank said.

In 2003, the World Bank has approved a USD16million loan supporting the Bogota Urban Services Project, which aims to improve water and sewerage services, particularly for residents in low-income areas. EAAB, the municipal utility will address efficiency and service quality issues through cost reductions and support greater private sector participation in its operations. At the same time, EAAB appointed three companies to undertake service operations in five areas of the capital. Aguas Capital, Agua Azul and EPM Bogota Aguas will cover the five zones. The agreements will run for five years and are worth an estimated USD127million in total.

Concession awards to date

According to the International Labour Organisation (ILO), by 1998 there had been two privatisations prior to the 1994 law and a further 10 since then. 15% of the population was served by private companies in 2006 and in 2004, out of the 1,500 urban water service provision entities, 125 were private sector players and 48 mixed public-private entities.

In 2006 Aguas Cappital was awarded a COP600billion 15-year contract to operate potable water and sewerage services in Cúcuta city in Colombia's Norte de Santander department. Aguas Cappital's bid for the contract was based on an average water rate of COP30,000 (USD12.83) for consumption of 19 m^3 per month.

Freshwater	
Annual availability (1998)	1,070km^3
Per capita	28,393m^3
Annual withdrawal (1987)	8.9km^3
Domestic (1987)	59%
Industrial (1987)	4%
Agriculture (1987)	37%

Groundwater	
Annual availability (1998)	510.0km^3
Per capita	13,533m^3

MAJOR CITIES			
City	**2005**	**2015**	**Status**
Bogota	7,594,000	8,900,000	Sewage treatment BOT rescinded
Cali	2,514000	2,963,000	Privatisation plans potentially revived
Medellin	3,058,000	3,522,000	N/A
Barranquilla	1,857,000	2,042,000	Privatisation under development
Bucaramanga	1,019,000	1,201,000	N/A
Cartagena	954,000	1,152,000	N/A
Cucuta	852,000	1,012,000	Privatisation under development

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	**Contract**	**Company**
Bogota	Water O&M	Aguazul Bogota
Santo Dominigo	Water O&M	Aguazul Bogota
Santa Marta	20 year water and sewerage concession	Tecvasa
Barranquilla	17 year urban services concession	Tecvasa
Cartagena	25 year water and sewerage concession	Agbar
Monteria	20 year water provision concession	Proactiva
Tunja	20 year water provision concession	Proactiva

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
Agbar	Agbar (Spain)	726,000	726,000	**726,000**
Tecvasa	Tecvasa (Spain)	1,770,000	1,770,000	**1,770,000**
Proactiva	FCC (Spain)/VE (France)	480,000	272,000	**480,000**
Aguazul Bogota	ACEA (Italy)	3,900,000	0	**3,900,000**

Source:

GWI (2008) Colombia kicks off USD5.2billion water upgrade plan, GWI, July 2008

Superintendencia de Servicios Sanitarios (SSPD) (2008). Sistema Único de Información, SSPD, Bogota, Colombia

World Bank (2008) Desarrollo Económico Reciente en Infraestructura (REDI) en Colombia, World Bank

COSTA RICA

Costa Rica had a population of 4.2million in 2002, 60% living in urban areas. The Instituto Costarricense de Acueductos y Alcantarillados (AyA) is the state water authority. AyA provides potable water to 90% of the country's population, including 99% coverage in urban areas. In the metropolitan area, 69% of the population with potable water also have adequate sewer systems. On a national level, 45% of the population with potable water also have adequate sewer systems. In contrast, 5% of wastewater receives any form of treatment.

In 2003, a project sponsored in 2002 by the Inter-American Development Bank (IADB) to upgrade and manage wastewater service infrastructure in San José was cancelled. The project is now expected to be relaunched by the World Bank. It sought to expand and rehabilitate the sewerage system in a metropolitan area of San José. Under the concession approach, the project would have required an estimated USD280million to upgrade the infrastructure and build a major WWTW with the financing provided by a mix of international institutions and commercial banks. Following a change of government in 2002, there was a change in the management of AyA, which gave opponents the opportunity to derail the project. The current proposals are understood to focus on a DBO project, rather than an outright concession. Finance would come from a World Bank loan.

Historically, over 60% of the finance for capital projects came from the government, but this is being reduced to 40% through improved operational efficiency and tariff collection. Between 1990 and 2006, USD203million were invested in water supply and sanitation infrastructure. In 2002 AyA proposed a sector modernization program running to 2020 which envisages maintaining urban water coverage while urban sewerage coverage to 89% by 2020. Total capital spending (including rural services) will be USD1.6billion, some USD80million per year.

CUBA

Population	
2007 (million)	11.2
2020 (million)	11.4
Urbanisation in 2007	75.6%
Urbanisation by 2020	77%
Urbanisation by 2050	84.4%

Water and sewerage services

In 1996, piped water was provided to 97.9% of the urban population and 75% of the rural population. The 2000 target was for 99.9% coverage for urban areas and 100% coverage for rural areas against 95% and 78% respectively in 2004. Sewerage covered 94.6% of the urban population and 78.2% of the rural population in 1996. Coverage targets for 2000 were 99.9% and 98.9% respectively, against 99% and 95% in 2004. 22% of urban sewage effluents are treated at five secondary sewage treatment works.

Urban data (2004)	
With improved drinking water	95%
With household drinking water	82%
With improved sewerage	99%
With household sewerage	50%
With 2^0 sewage treatment	15%

Capital spending plans

In 1996, the government announced that it was aiming for the treatment of all urban sewage effluents over the next ten years at a total cost of USD643million for rehabilitating the extant sewerage system and sewage treatment works, plus a further USD747million for service extension. Total capex needs for water provision are estimated at USD1.5billion.

Freshwater	
Annual availability (1998)	34.5km^3
Per capita	3,120m^3
Annual withdrawal (1990)	5.2km^3
Domestic	49%
Industrial	0%
Agriculture	51%

MAJOR CITIES			
City	**2005**	**2015**	**Status**
Havana	2,189,000	2,151,000	Agbar O&M

Urban water and sewerage

1981	Piped water	Indoors	Sanitation	Flush
Havana	100%	90%	98%	97%
Santiago de Cuba	96%	76%	97%	62%
Camaguey	88%	63%	97%	57%
Holguin	64%	40%	92%	37%

Groundwater	
Annual availability (1998)	8.0km^3
Per capita	720m^3
Annual withdrawal (1975)	3.8km^3

Agbar and privatising Havana's services

Interagua formed Aguas de La Habana, a JV with the Cuban Government in 1999, for two water management contracts currently serving 500,000 people, with an eventual coverage of 1,400,000 people. The contracts serve La Havana and the resorts of Cayo Coco and Varadero. Water supply

systems in Havana were renovated for 298,000 people in 2001-02. The 25 year water management contract for Havana is being supported by a USD24.7million loan by Agbar. Revenues are USD9million pa for 115million m^3 of water provided annually.

Service development in Varadero and Havana

Varadero	**1994**	**2006**
Population covered	95%	100%
Hours service/day	18	24
Number of connections	5,000	11,000
Havana	**2000**	**2006**
Population covered	95%	100%
Hours service/day	8	10
Number of connections	327,000	365,000

Source:

Presentation by José María Tura, General Manager of Aguas de La Habana to Agbar conference "Five international examples of environmental management in the service of the citizens" on 19th June 2007.

ECUADOR

Economics (2006)	
GNI per capita	USD2,840
GNI per capita (PPP)	USD4,400
GDP in Agriculture	6%
GDP in Industry	46%
GDP in Services	48%

International support

In 1999, the Municipal Water and Wastewater Company of Quito started a USD170million service provision upgrade project to provide improved water and sewerage for 600,000 people. The work is being supported by a loan from the IADB. The IADB is also providing USD41million out of USD51million being spent on water and sewerage rehabilitation work in Guayaquil by Ecapag.

Population	
2007 (million)	13.0
2020 (million)	16.0
Urbanisation in 2007	65%
Urbanisation by 2020	97%
In urban agglomerations, 2050	82%

A tradition of municipalities operating as autonomous entities has in turn held back the regulation required to drive forward investment. Attempts since 1996 to create a national water regulator have been thwarted. Water losses are 40-50% and in one case 70% or even higher, including illegal connections. Due to local political pressure municipal utilities are unwilling to increase rates to replace pipes.

Urban Data (2004)	
With improved drinking water	82%
With household drinking water	70%
With improved sewerage	94%
With household sewerage	62%
With 2^0 sewage treatment	0%

Freshwater	
Annual availability (1998)	442km^3
Per capita	34,950m^3
Annual withdrawal (1985)	15km^3
Domestic (1987)	12%
Industrial (1987)	6%
Agriculture (1987)	70%

The Guayaquil concession

A 30 year concession for water and sewerage services for the city of Guayaquil was gained by International Water's Interagua in 2000. Water provision by Empresa Cantonal de Agua Potable y Alcantrillado de Guayaquil (Ecapag) will rise from 63% in 2000 to 95% by 2011, with 55,238 new connections in poor areas during the first five years and sewerage coverage increasing from 53% to 90% by 2020. The Inter American Development Bank provided a USD30million loan in 2001 for the initial works programme in 2002-03. Although the privatisation of Quito's services has been considered on an informal basis in recent years, political constraints remain an obstacle. From June 2006, an extra USD30million is being invested by Interagua on an additional 8.56km of pipelines beyond the concession contract. This has been enabled by higher than expected tax revenues for telephone services.

Groundwater	
Annual availability (1998)	134km^3
Per capita	10,596m^3

Service provision in the main cities

	Piped water	Indoors	Sanitation	Flush
Quito	85%	70%	97%	93%
Guayaquil	61%	41%	95%	42%
Cuenca	96%	86%	95%	93%
Machala	63%	42%	92%	76%

MAJOR CITIES			
City	**2005**	**2015**	**Comments**
Guayaquil	2,387,000	2,975,000	Water & wastewater PSP
Quito	1,514,000	1,839,000	PSP under consideration

Ecuador's president-elect Rafael Correa announced in 2006 that the government needs to invest some USD3billion. Responsibility for this will be handed over to provincial governments, which will request the corresponding loans from the state bank. PSP has been ruled out for the time being.

Overall, 68% of the urban population in 1999 was considered to have access to safe drinking water and 48% to have adequate sanitation. It is of interest to note that the connection to indoor taps and lavatories in many medium sized towns is higher than in Quito or Guayaquil. Some 5% of Quito's sewage effluents are subject to treatment.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	**Contract**	**Company**
Samborondón	Water & sewerage services	Tecvasa
Guayaquil	Water & wastewater concession	ECAPAG

Empresa Metropolitana de Alcantarillado y Agua Potable (Emaap), Quito's water utility intends to award a USD600million 20 year water and power BOT, to supply the city with water and power via a 109km water channel from the Valle Vicoso River to its Bellavista water treatment plant. The population of Quito is forecast to double by 2020. The Inter-American Development Bank approved a USD40million loan to Emaap in September 2002 to support the first phase of a USD110million programme to expand water and sanitation services and reduce flooding and landslides. This will enable Emaap to extend water and sewerage service to low-income sectors of the population. Manta (Manabi Province) is seeking to privatise Eapam, its water utility, which serves 200,000 people. Guayas and Pinchincha Provinces are also examining PSP options.

It is currently anticipated that a 30 year concession for Emaap will be awarded in 2007, with four bidders pre-qualified with a minimum investment of USD185million being required.

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
Tecvasa	Tecvasa	100,000	100,000	**100,000**
ECAPAG	Edison (Italy)	2,500,000	2,500,000	**2,500,000**

INDIA

Economics (2006)	
GNI per capita	USD820
GNI per capita (PPP)	USD3,800
Agriculture	18%
Industry	28%
Services	55%

Politics and Government

The pace of progress is summed up by the National Water Resources Council, which was formed to address urgent state and national water issues. It has met four times since 1983 and no decisions have yet been made on updating the 1988 national water policy.

India's National Water Policy of 2002 places drinking water as its chief priority (ADB, 2007). The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) aims to channel USD12billion of central funding into 63 identified cities between 2006 and 2012, with an emphasis on urban infrastructure planning and capacity building and O&M cost recovery by 2012. India aims to achieve 100% urban water coverage during its 11th Five Year Plan (2007-12).

India originally planned to have universal access to water by 1997, the 50th anniversary of its independence. According to WHO and UNICEF data, urban water coverage was 81% in 1991 and 89% in 2004, while the 2001 Census of India found 50% of households had a tap within their premises, 19% with a tap near their premises and 16% had access to a hand pump. The revised National Water Policy of 1987 was adopted by the National Water Resources Council on 1st April 2002. It states that "adequate drinking water facilities should be provided to the entire population" (Article 8) and that PSP "should be encouraged…wherever feasible" (Article 13). Source: ADB (2007) Country Paper: India. Asian Water Development Outlook, ADB, Manila

For cities, water and sewerage policy is carried out at three levels: central government, the member states and city government. Central government directs overall policy. The Ministry of Environment and Forests (MEF) oversees the Central Pollution Control Board (CPCB) and the National Rivers Conservation Directorate (NRCD). The CPCB is backed by the 1974 Water (Prevention and Control of Pollution) Act and sets national environmental standards (individual states are free to exceed them) and policy. Each State Pollution Control Board in turn reports to the CPCB, while being responsible for ensuring compliance with the government's environmental law. The Water (Prevention and Control of Pollution) Cess Act 1977 compels specified industries to pay fees to the relevant State Pollution Control Boards for water consumed. The 1995 Water Information Act puts the centralisation of water data on a statutory basis. The NRCD is involved in the various River Action Plans designed to improve the water quality of India's 14 main water basins.

The MUD (Ministry of Urban Development) advises all state level plans. It examines proposals and provides guidance. Plans, when approved are forwarded to the Ministry of Finance and the Dept of Economic Affairs for external support, for example via the World Bank and the Asian Development Bank, along with the ODA on a more local basis. Cities are autonomous from central government with regard to privatisation policy. The MUD is positive about privatisation on an O&M and BOT basis, reflecting their concern about the pace of sanitation projects. The cities of Delhi, Bombay (Mumbai), Calcutta, Hyderabad, Bangalore and Madras can set their own tariffs.

The MUD water provision targets are 110L/day for cities and 270L/day for Delhi. In 1992, it was found that the average per capita water supply for Class I towns (100,000 and above) was 147L/day and 78L/day for Class II towns (50,000 to 100,000).

Only connect?

The Indian Government is considering a scheme to link 37 of the country's rivers into the canal network at a cost variously estimated in 2003 at USD116-200billion against an estimate of USD68billion in 1995. To date, nine years of feasibility studies have taken place and construction would take a further 14 years to complete. Bangladesh has raised objections about the losses that the project would entail.

Population	
Total 2007,million	1,049.5
Total 2020million	1,246.4
In urban areas 2007	29.2%
In urban areas 2020	34.3%
Urbanisation by 2050	55.2%

Infrastructure development

According to the Ministry of Rural Development, 1.2million out of 1.4million villages, or 89% had access to water in 2002, with INR340billion (EUR7.45billion) having been spent on various drinking water projects across the country. The UNICEF 2000 estimate for access to safe drinking in rural areas in India was 79%. The Government had set a target of providing universal rural drinking water connections by March 2005, drinking water for the urban population by March 2007 and improved sewerage for 75% of the urban population by March 2007.

According to the WHO/UNICEF reports in 2004 and 2006, this is most unlikely as data from the Governmental Planning Committee of India found that the coverage of rural water in 1991 was about 55% and in 2004 it had risen to just above 73%.

Water and sanitation, India (million people)

	1991 Coverage	**1991 Uncovered**	**2004 Coverage**	**2004 Uncovered**
Rural Water	55.54%	44.46%	73.2%	26.8%
	348.8million	279.2million	542.4million	198.6million
Rural Sanitation	6%	94%		
	38million	596million	No data	No data
Urban Water	81.38%	18.62%	89%	11%
	176.6million	40.4million	267million	33million
Urban Sanitation	44%	56%	63%	37%
	124million	158million	189million	111million

Data from the 2001 Census of India is still being processed, but information on household connections has been released.

Urban households: Sanitation

Water closet	46.1%
Pit latrine	14.6%
Other latrine	13.0%
Internal sanitation	73.7%
Closed drainage	34.5%
Open drainage	43.4%
No drainage	22.1%

Urban households: Drinking water

Tap	68.7%
Hand pump	16.2%
Other	19.1%
Tap – within premises	49.7%
Tap – near premises	15.1%
Tap – away	3.9%

For Class 1 cities, 73% of water is abstracted from surface water, 23% from groundwater and 4% from combined sources. For cities in major river basins, these are 68%, 30% and 2% respectively, and for cities in coastal areas, 87%, 3% and 10%. Overall, 32% of usable groundwater resources are currently being extracted.

Spending on water and sanitation has increased in recent years and this trend is set to continue. The estimated cost will be INR204,898million, with INR83,506million coming through the World Bank and INR18,060million from Hudco. Both the timings and the costs are likely to be on the optimistic side,

with universal access to potable water unlikely before 2015 and sanitation taking another decade. The real cost for access to water is likely to be in the region of INR400-800billion and a further INR500-1,000billion for sanitation and wastewater treatment.

Urban Data (2004)	
With improved drinking water	95%
With household drinking water	47%
With improved sewerage	59%
With household sewerage	25%
With 2^0 sewage treatment	3%

City utility performance

A study co-sponsored by the Asian Development Bank in 2007 has provided a significant amount of data about water and sewerage services in India's leading cities.

Water service coverage

Coverage	**Availability**	**UFW**	**Metering**	
	(%)	**(hours/day)**	**(%)**	**(%)**
Ahmadabad	74.5	2.0	N/A	3
Amritsar	75.7	11.0	57	4
Bangalore	92.9	4.5	45	96
Bhopal	83.4	1.5	N/A	0
Chandigarh	100	12.0	39	79
Chennai	89.3	5.0	17	4
Coimbatore	76.1	3.0	41	100
Indore	77.3	0.8	N/A	0
Jabalpur	75.2	4	14	0
Jamshedpur	74.4	6.0	13	1
Kolkata	79.0	8.3	35	0
Mathura	70.0	2.0	N/A	0
Mumbai	100.0	4.0	13	75
Nagpur	91.5	5.0	52	40
Nashik	92.6	3.5	60	80
Rajkot	98.1	3.5	23	0
Surat	77.4	2.5	N/A	2
Varanasi	77.7	7.0	30	0
Vijayawada	70.5	3.0	24	6
Visakhapatnam	49.2	1.0	14	1
Average	81.2	4.3	32	25

Water production and people covered

	Water production (m^3 per day)	Connections	People served
Ahmadabad	623,836	556,734	3,716,624
Amritsar	171,005	127,786	804,455
Bangalore	923,090	486,850	4,978,330
Bhopal	258,000	105,012	1,418,460
Chandigarh	381,280	139,300	1,150,000
Chennai	623,836	344,079	2,364,725
Coimbatore	228,400	113,762	799,000
Indore	83,000	159,104	1,700,000
Jabalpur	175,115	46,260	790,000
Jamshedpur	370,110	38,800	458,000
Kolkata	971,560	262,839	3,948,000
Mathura	38,172	24,643	238,000
Mumbai	3,200,000	309,226	13,000,000
Nagpur	608,220	265,231	2,227,990
Nashik	310,000	127,562	1,250,000
Rajkot	143,836	183,879	983,000
Surat	554,685	310,836	2,954,000
Varanasi	270,000	114,907	1,243,000
Vijayawada	131,833	78,298	600,000
Visakhapatnam	228,451	85,668	750,000

Sewerage and sewage treatment

Sewerage services are defined as operating on two levels. 'Sanitation' refers to lavatories with a two septic tank composting system. 'Sewerage' refers to mains sewerage. Access means at least a public lavatory in the same street.

The sewerage connection figure stated refers only to the 212 Class I cities (a population of 100,000+, covering 102.9million people in 1988). In class 1 cities, 20% of effluents are treated (13% secondary and 7% primary). In Class II cities (50,000-100,000), covering a further 20.7million people, 0.4% sewage is subject to primary treatment and 1.7% to secondary treatment. There are no other identified sewage treatment works in India. Overall, 8 out of 3,119 towns and cities have complete sewerage and sewage treatment services. 20% of towns and cities have partial service coverage.

In 2002, 20% of people in urban areas had access to water-flush toilets connected to a sewerage system and 14% use water-borne toilets connected to septic tanks or leach pits. In rural areas, 20% have access to sanitary toilets.

Informal examinations of the 14 major river basins in the 1990s found that 30% of their length is of I-II quality and 70% is of III-IV quality. Some sources maintain that the 70% figure refers to Class IV only. Sewage effluents are estimated to account for 75% of the wastewater volume and 50% of the total pollution load.

The politics of PSP

India's exceptionalist tradition means that the onus lies with foreign investors to argue the merits of their proposals in Indian terms. The National Rivers Conservation Directorate is willing to support BOT bids as part of its future policy. A number of states and cities, including Harayana state, Calcutta and the Ganges Basin are understood to be keen to look at STW BOTs. In contrast, the Government seeks private sector investment first in the area of drinking water.

The Congress Party has indicated that it supports international involvement for drinking water provision and sewage treatment projects. As part of the 2004 budget, the Government announced plans for a desalination plant in Chennai. This would be the first of a series of such plants to be built near Chennai, the coastal capital city of the southern Indian state of Tamil Nadu in 2004. The project will be financed through a public-private partnership. The INR10billion (USD217.39million) plant would have a capacity of around 300millionL per day. It was also emphasised that public-private partnerships will be encouraged for the expansion of water supply and sanitation. A Board for

Reconstruction of Public Sector Enterprises (BRPSE) will advise the Government on the measures to be taken to restructure PSEs, including cases where disinvestment or closure or sale is justified.

The Accelerated Rural Water Supply Programme (ARWSP) has been allocated INR26billion in 2004-05. It will focus on renewal of water sources and on serving uncovered and partially covered habitations. The Urban Water Supply Programme will also spend INR1.5billion in 2004-05 on projects in 2,151 small towns.

The BJP at the national level has also stated that it supports the PSP of utilities, allied with foreign investment. Local BJP administrations such as the Mumbai Municipal Council will not necessarily support PSP. The Left Front remains ambiguous about foreign investment. Their stance is that foreign investors ought to demonstrate that India will benefit from their actions. The *swadeshi* (self-reliance) approach is losing favour, with only a small proportion of middle-income families supporting it.

Outsourcing work in progress

Progress has been made in some areas. Involving the private sector in the contracting out of operation and maintenance (O&M) work has been gathering in popularity in India. In Madras, contracting out sewerage O&M since 1993 has resulted in savings of 20%. In Ajmer (Rajasthan), a service contract for water piping, pumping and treatment O&M has been regarded as a success, while Hyderabad has contracted out staffing for water treatment O&M work. Proposals for private sector management in Goa and the cities of Tirupur and Dewas are also currently under active consideration. The partial PSP of Tirupur's services has suffered from severe underfunding to date. The Tirupur water provision BOT was meant to get the go-ahead in March 1999, but has suffered from delays. This is due to a lack of support from industrial customers, who prefer irregular supplies of tankered water than the INR45 per 1,000L to be charged. The INR11.6billion project involves bulk water provision, followed by water distribution and sewerage with a 30 year concession period. The Goa project is for abstracting water at source, transporting it 60km to a reservoir and handing it over to the municipality. In addition, the management of the sewerage network will be put out to private sector operation. This project has been under development since early 1997.

In Bangalore leakage detection and strategic planning is partially outsourced and private detectives – paid only by results – are employed to detect illegal water connections. Similarly Chennai Metro has also shared its use of service contracts. Such cities say they have contracted out between 50% and 100% of the management of water treatment plants, pumping stations and wastewater treatment plants and that this has generated cost savings of between 10% and 50%.

Freshwater	
Total (1998, km^3)	**1,850.00**
Per capita (1998, m^3)	1,896
Withdrawals (1990, km^3)	500.0
For domestic use (1987)	5%
For industry (1987)	3%
For agriculture (1987)	92%

Water supply and demand

If current trends over the next 50 years continue, the Tata Energy Research Institute (TERI) predicts that India's rivers and lakes will no longer be able to meet the demand for water from the country's 1.57billion people. Water availability per person has already gone down from 6,000m^3 in 1947 to 2,000m^3 in 1997 and could fall to 760m^3 by 2047. India currently has a national average of 2,464m^3 per capita, although in some regions it is as low as 411m^3. India will become a water-scarce nation by 2050 unless urgent steps are taken that go beyond government capital investment in irrigation projects. In three agro-ecological zones (Western plains and Kachch, Northern plains, and the Bengal and Assam plains), the availability of water in 2047 will be less than 75% of the demand. Although the greatest demand for water will still come from agriculture, domestic water demand will increase from 20,000million m^3 in 1997 to about 41,000million m^3 per year in 2047. Moreover, the demand will be concentrated in the cities and will be for water of higher quality.

Demand by industry

1970	6million Ml
1990	15million Ml
2000	30million Ml
2025	120million Ml

Pricing

Water was traditionally seen as God's gift both by Hindus and Muslims. This means that there is considerable pressure at the local and rural level for it to be provided as a free (or nominally priced) resource, especially for domestic use. The 74th constitutional amendment gives local authorities the responsibility for planning, operating, maintaining and upgrading water supply, sewerage and sanitation services. Funds have to be raised by the authority, which also has the right to determine and enforce its own charges. In many cases, attempts to start operating water services on a self financing basis have focused on using higher industrial charges to cross subsidise domestic fees. Given the small size and uneven distribution of India's industry, this approach has not met with great success to date.

Economics; operating spending, income and capital spending

O&M spend pa	Revenues pa (INRmillion)	5 year Capex (INRmillion)	(INRmillion)
Ahmadabad	318	223	1,189
Amritsar	224	172	212
Bangalore	3,414	4,255	1,918
Bhopal	283	100	21
Chandigarh	548	404	526
Chennai	1,388	3,127	17,343
Coimbatore	111	135	543
Indore	881	165	543
Jabalpur	104	62	200
Jamshedpur	328	532	188
Kolkata	1,229	260	2,954
Mathura	28	9	88
Mumbai	4,284	8,789	7,581
Nagpur	424	562	953
Nashik	215	182	809
Rajkot	149	92	792
Surat	368	N/A	N/A
Varanasi	183	141	65
Vijayawada	104	91	80
Visakhapatnam	412	525	1,667

The Water (Prevention and Control of Pollution) Cess (Amendment) Bill introduced in 2003 seeks to strengthen the financial resources of pollution control boards and promote water economy by factories. The tax was last increased in 1991, resulting in a rise in annual income from INR81.3million to INR637.8million in 2000. The new charges are expected to bring in around INR2billion a year. State Pollution Control Boards will receive 80% of tax revenues, with Delhi retaining the balance for the central pollution control agencies. The tax will be applicable to all industries, except hydropower and seeks to encourage water conservation.

Delhi's fundamental financial challenge

Annual operating costs for the Delhi Jal Board (DJB) have gone up from INR2.76 billion (USD61million) in 1998 to INR7 billion (USD154.7million) by 2003. DJB has annual revenues of INR2.30billion (USD50.8million) and debts of INR36 billion (USD795million) and INR16.2billion (USD357.8million) in interest liability. Legislation will be sought in order to establish a Delhi Water Regulatory Commission, the first such water structure to be formed in any Indian state. About 85% of water supplies serve residential consumers who pay INR0.53 (GBP0.006) per m^3. As 75% of municipal connections are unmetered, there is a need to consider metering before tariff rationalisation

can be implemented. The unregulated private sector thrives under these conditions in Delhi, with 1,200 private tankers INR100 (USD2.20) per m^3. Although DJB will be corporatised, politicians have ruled out any material private sector involvement.

Groundwater	
Total recharge (1998, km^3)	**350.00**
Per capita (1998, m^3)	359
Withdrawals (1979, km^3)	150.2
For domestic use (1979)	3%
For industry (1979)	1%
For agriculture (1979)	96%

The private sector and privatisation

The Eighth Five Year Plan aimed for expenditure for water and sanitation services to increase from 0.56% to 3.80% of total public sector expenditure, with a total public sector outlay on water supply and sanitation for urban areas of INR57.6billion. The total investment requirements for water supply and sanitation based on various reports indicate that an investment of INR254.9billion is required for 100% coverage of urban water supply and sanitation. In consequence, there is a broad realisation that private sector financing and management is now needed in India. The average annual investment on O&M of urban water supply and sanitation systems has been estimated at INR23.87billion (for a population of 217million at INR110 per capita).

In 2002, the Tata Energy Research Institute recommended that the state of Gujarat considered some form of PSP in seeking to meet its INR8,600million spending needs for basic urban water supply. The institute believes that all PSP models are applicable under current state laws.

In 2003, the state government of Karnataka examined privatising urban drinking water supply and Jharkhand issued a notice seeking private investor participation of in water supply in Ranchi, Dhanbad, Chas, Mango and Adityapur towns.

Bulk water provision projects proposed to date

City	Cost (INRmillion)	Type	Security	Status
Bangalore, Karnakata	13,000	BOOT	State guarantee	Evaluation stage
Cochin	4,000	BOT	State guarantee	Abandoned
Hyderabad, Andhra Pradesh	5,000	BOOT	State guarantee	Abandoned
Panjum, Goa	3,000	BOOT	State guarantee	Re-evaluation
Pune, Maharashtra	7,500	BOT	Debt from state	Abandoned
Tirupur, Tamil Nadu	15,000	BOT	State guarantee	Operational
Chennai, Tamil Nadu	10,000	BOT	State guarantee	Evaluation stage

Indian companies noted

Four contract awards to Indian companies have been identified, three of which are in operation.

IVRCL [1]: Alandur wastewater treatment

First STP Private Ltd (95% held by IVRCL) is a JV with VA Tech Wabag. It is developing a 12,000m^3 per day (4.4million m^3 pa) WWTW at Perungudi for Alandur Municipality, where IVRCL has installed the underground sewerage system. The WWTW has been completed and the households need to be connected to the system by the municipality.

IVRCL [2]: Chennai desalination

In August 2005, IVRCL was made the preferred bidder for the INR5billion contract to build a 100million L/day water desalination plant for Chennai Metro Water Supply & Sewerage Board, and operate it for 25 years. This is India's first desalination project, the completion of which has been delayed to 2008 over funding and political issues.

BHEL: Chennai WWTW

In September 2003, BHEL gained a wastewater treatment construction and operations contract in Chennai. The INR364million (USD7.9million) contract was awarded by the Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB). Construction will take 18 months, with the facility entering service by early 2005. BHEL will also look after Operation and Maintenance (O&M) of the plant for ten years, post commissioning. The sewage treatment plant will have its own power plant which will be run by biogas, generated within the facility, making it self-sufficient and lowering operating costs.

Larsen & Toubro: Visakhapatnam bulk water

In Andhra Pradesh, work has started on the Visakhapatnam Industrial Water Supply Project. This is a 55.5km pipeline from the River Godavari to augment the 153km Yeleru Left Bank Canal. Some 15% of the output is going to domestic consumers. These are subsidised by Visakhapatnam Municipal Corporation for three years, charging INR8 per m^3 against an actual cost of INR24 per m^3. Larsen & Toubro has a 32 year concession for operating the pipeline, with equity financing from the municipality (Andhra Pradesh Industrial Infrastructure Corporation) and from the private sector; L&T Holdings and PSL Holdings, with a permitted return of 15% over the concession. Political changes in Andhra Pradesh may threaten the project.

Radius: Cancelled bulk water project

In 1998, Radius Water Company signed a 22 year BOT contract to deliver 4millionL of water a day to a 23km industrial belt along the Seonath River in Chattisgarh state. The state wishes to terminate the contract, which was signed two years before Chattisgarh became a separate state from Madhya Pradesh (*Source: GWR, 170, 2003*). Some INR250million has been spent by Radius Water to date, but it is alleged that water demand is materially below what had been expected. In April 2003, the state of Chattisgarh cancelled the concession.

MAJOR CITIES			
Population	**2005**	**2015**	**Status**
Agra	1,511,000	1,892,000	N/A
Ahmadabad	5,120,000	6,298,000	Considering private sector involvement
Allahbad	1,152,000	1,420,000	N/A
Asanol	1,257,000	1,584,000	N/A
Amristar	1,151,000	1,444,000	N/A
Aurangabad	1,048,000	1,336,000	N/A
Bangalore	6,462,000	7,939,000	Bulk water project under development
Bhopal	1,644,000	2,046,000	N/A
Bombay (Mumbai)	18,336,000	22,645,000	Political opposition to private sector for now
Calcutta (Kolkata)	14,299,000	16,798,000	N/A
Chandigarth	928,000	1,170,000	N/A
Coimbatore	1,618,000	2,005,000	N/A
Delhi	15,048,000	18,604,000	One water treatment BOT
Dhanbad	1,189,000	1,477,000	N/A
Durg-Bhilainagar	1,043,000	1,305,000	N/A
Faridabad	1,298,000	1,685,000	N/A
Ghaziabad	1,236,000	1,634,000	N/A
Guwahati	932,000	1,174,000	N/A
Gwalior	940,000	1,156,000	N/A
Hubli-Dharwad	855,000	1,054,000	N/A
Hyderabad	6,115,000	7,420,000	Bulk water scheme abandoned
Indore	1,913,000	2,413,000	N/A
Jabalpur	1,231,000	1,519,000	N/A
Jaipur	2,747,000	3,470,000	N/A
Jamshedpur	1,238,000	1,542,000	JUSCO (asset owning, privatised since onset)
Jodhpur	951,000	1,181,000	N/A
Kanpur	3,018,000	3,718,000	N/A
Kochi (Cochin)	1,463,000	1,785,000	Bulk water scheme abandoned
Kozhikode (Calicut)	924,000	1,119,000	N/A
Lucknow	2,566,000	3,180,000	N/A
Ludhiana	1,571,000	1,954,000	N/A

MAJOR CITIES			
Madras (Chennai)	6,915,000	8,092,000	Desalination & wastewater treatment projects
Madurai	1,254,000	1,514,000	N/A
Meerut	1,328,000	1,662,000	N/A
Mysore	852,000	1,049,000	N/A
Nagpur	2,350,000	2,885,000	Considering private sector involvement
Nashik	1,381,000	1,769,000	N/A
Patna	2,029,000	2,578,000	N/A
Pune (Poona)	4,409,000	5,524,000	Bulk water scheme abandoned
Rajkot	1,185,000	1,513,000	N/A
Ranchi	989,000	1,247,000	N/A
Solapur	1,002,000	1,263,000	N/A
Srinagar	1,087,000	1,353,000	N/A
Surat	3,557,000	4,623,000	N/A
Thiruvananthapuram	926,000	1,118,000	N/A
Tiruchchripalli	915,000	1,123,000	N/A
Vadodara	1,675,000	2,077,000	N/A
Varanasi (Benares)	1,303,000	1,589,000	N/A
Vijayawada	1,094,000	1,341,000	N/A
Viskhapatnam	1,465,000	1,804,000	Bulk water transfer

International contract awards

Ondeo Degremont: Water treatment BOT

Ondeo Degremont gained a 10 year BOT contract for a 0.635million m^3 per day treatment plant at Sonia Vihar in New Delhi in 2001. The contract is worth INR2billion (EUR50million). It is understood that the contract is now in operation.

UUI: Tirupur bulk water BOT

The Tirupur project is now in operation. The USD220million BOT (including USD140million in construction cost) water scheme, first proposed in 1994, aims to deliver 0.185million m^3 per day, two-thirds of which will go to supply about 1,000 Tirupur textile mills, the rest to domestic customers supplied through the municipal corporation. Industrial customers will pay INR45 per m^3 and domestic customers INR5 per m^3, replacing around 400 water tankers. The BOT is being operated by Mahindra Realty and Infrastructure Developers Ltd, and United Utilities International, with funding from a USD222million rupee-denominated debt and equity package.

Degremont: Chennai water O&M

Degremont was awarded a contract for the construction of the 530,000m^3/day of drinking water treatment plant serving 4million people for the Chennai Metro Water Supply and Sewerage Board in July 2005. The total cost of EUR25.2million is being financed with EUR6.6million from a French State protocol and EUR18.7million from the Tamil Nadu Urban Finance and Infrastructure Development Corporation. This is India's largest water treatment works and the first to be fully operated by Suez. The operating contract runs from 2007-14.

Veolia: joint venture with Doshion

Veolia has been actively seeking to enter the Indian water contract market since the mid 1990s. The company entered into a joint venture with Doshion, an Indian water engineering company with revenues of USD50million in 2007. Doshian Veolia Water Solutions (70% Doshian, 30% Veolia Water) was formed in 2008 to provide a more effective market entry strategy.

Forthcoming contracts

GWI (July 2008) notes three PSP contracts currently under development:

Guwahati (Assam) – an urban water supply system, sewerage system and stormwater drainage system for the Guwahati Metropolitan Development Area at a total cost of INR17.6billion. This includes a new 107,000m^3/day water treatment plant and distribution network at a cost of INR2.8billion.

Bhilwara & Soniyana industrial water supply (Rajasthan) – to supply water to existing industries in the city of Bhilwara, and to develop integrated water supply and effluent treatment for a new textile park at Soniyana. USD70million of the projected USD100million is to be provided by the private sector.

Jalore (Rajasthan) – a water distribution system for the towns of Jalore and Barmer and another 256 villages in western Rajasthan, providing a total of 80,000 m^3/day for USD200million.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	**Contract**	**Company**
Tirupur	30 year bulk water BOT	UUI
Delhi	10 year water treatment BOT	Ondeo Degremont
Visakhapatnam	32 year bulk water concession	Larsen & Toubro
Alandur	10 year WWTW BOT	First STP
Chennai	10 year WWTW BOT	BHEL
Chennai	25 year desalination BOT	Chennai Water Desal
Chennai	7 year water treatment O&M	Ondeo Degremont
Kolkata	30 year BOT	JUSCO
Jamspedpur	Asset owning	JUSCO
Jamshedpur	4 year O&M	JUSCO
Hamldia	25 year BOT	JUSCO

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company**	**Population served**		
	(country)	**Water**	**Sewerage**	**Total**
UUI	United Utilities (UK)	600,000	0	**600,000**
Ondeo Degremont	Suez (France)	5,000,000	0	**5,000,000**
Larsen & Toubro	Larsen & Toubro (India)	500,000	0	**500,000**
First STP	IVRCL (India)	0	100,000	**100,000**
Chennai Water Desal	IVRCL (India)	1,000,000	0	**1,000,000**
BHEL	BHEL (India)	0	100,000	**100,000**
JUSCO	Tata Steel (India)	1,030,000	530,000	**1,030,000**

Sources:

ADB (2007) 2007 Benchmarking and Data Book of Water Utilities of India. Ministry of Urban Development, ADB, Manila

Munjee, N. (2000). Privatisation of water & sewerage projects in India. Presentation to IBC, Financing of Water & Sewerage Projects, IMB, London.

Narain, S (2002). Water & Wastewater International, 17 (2), 27-28.

Global Water Report 185, December 2003, pp 103

Global Water Report 191, March 2004, p5

INDONESIA

Economics (2006)	
GNI per capita	USD1,420
GNI per capita (PPP)	USD3,950
Agriculture	12%
Industry	42%
Services	46%

Water resources and degradation

Indonesia has abundant water resources along with rapid urbanisation and a minimal water provision and sewerage infrastructure. Water supplies to cities have been affected by catchment degradation, conflicts between urban and agricultural use, untreated sewage and the lack of regulation of the discharge of industrial effluents.

Effluent discharge into river systems

(m t/pa, 1993)	Volume	BOD
Industry	900	1,349
Domestic	1,653	517
Total	2,533	1866

While there are significant groundwater resources available for urban areas, there is no reliable data as to how compromised these have been by excess abstraction, saline ingress and excreta contamination.

Population	
Total 2007 (million)	217.6
Total 2020 (million)	255.9
In urban areas (2007)	50.4%
In urban areas (2020)	62.6%
Urbanisation by (2050)	79.4%

Urban water services

Less than 50% of the population has access to safe water, falling to 30-50% in urban areas. Sewerage facilities serve only 5% of the urban population. 30% of urban households had direct access to water in 2004. There are 306 PDAMs (municipal water utilities), 60% serving less than 10,000 customers. Of samples taken in 1990, 40% showed contamination. Average distribution losses are 40%. Tariffs typically cover 70% of operating costs. Indonesia had 37% non-revenue water in 2004.

The 2009 targets for urban and rural water supply coverage are 66% (from 41% in 2004) and 30% (from 8% in 2004), to serve 45.8million and 27.3million people, respectively. Of the total 318 PDAMs (water companies) in the country, 44 are considered financially healthy while 164 need financial help.

Urban Data (2004)	
With improved drinking water	87%
With household drinking water	30%
With improved sewerage	73%
With household sewerage	2%
With 2^0 sewage treatment	1%

Politics and environmental legislation

Prior to 1992, there was no functional national water policy. The Ministry of Public Works and the provincial governments are meant to be responsible for water laws. Two general water related Acts have been passed but these are seen as having little practical value. These are the Act of the Republic of Indonesia No 4 of 1982, concerning basic provision for the management of the living environment, and the Government Regulation of the Republic of Indonesia No 20 of 1990, concerning the control of water pollution.

Environmental issues are now covered by Bapedal (Environmental Impact Management Agency), which is a non-ministerial government agency, reporting directly to the President. A programme to control the pollution of 24 main rivers in 1989 failed because there was no effective monitoring, while regulations concerning industrial effluent discharges are non-enforceable.

The 1995-99 Repilita VI (Sixth Five Year Plan) allocated USD1.38billion to urban and rural water provision, with the aim of reducing distribution losses to 25% for large towns/cities and 30% for medium and small towns. Water provision is to be improved for 22million people in urban areas, with 30,000L/sec (946million m^3 pa) with 20,000 villages being connected, reaching 16.5million people in rural areas. With the exception of projects that have involved the private sector, economic and political factors are understood to have militated against these plans.

In 1999, the anti-corruption law, Law 28/1999, was passed. This law provides the legal basis for the anti-corruption commission to require public officials in sensitive positions to declare their assets prior to assuming their posts and to agree to have their assets open to an official audit during and after their term. The Government has also formed several working groups to draft a presidential decree on improved procurement procedures designed to improve the implementation of public projects.

The Ministry of Settlement and Infrastructure's water resource bill was passed in March 2004. It seeks to operate with water supplies regarded as a commercial good.

The 2004 New Water Resources Law is designed to improve water provision from its current state where 30% of the urban population have tap water, 30% of municipal water entities (PDAMs) do not employ an accountant and 70% of them are facing serious debt difficulties. Legislation passed in 2006 aims to allow PDAMs to restructure their debts and to seek full cost recovery through tariffs. The Medium Term Development Plan for 2005-09 aims to develop infrastructure through improved operational efficiency and PSP. Progress is held back by local politicians opposing tariff reform and using extant PDAM revenues for unrelated projects (ADB, 2007).

Water requirements

USD3 billion has been spent on urban water supply projects since 1970, but much of this money has been misappropriated. In 2001, water production was 91,000 L/sec.

Bulk water sales (l/sec)	1990	2010
Household taps	16,331	99,000
Public taps	916	4,000
Non domestic	7,008	83,000
Total sales	24,255	186,000
Available supply	52,000	248,000
Distribution losses	53%	25%

Indonesia's proximate water provision needs have been estimated as requiring USD7.8billion, with the majority of funding for medium and large cities coming from international agencies (for example the IFC and ADB) and the private sector. In the mid 1990s, the Government aimed for 80% of its urban population to have piped water at the household level by 2000. Likewise, in 1997, the Government stated that it sought to have 85-100% of households connected to suitable sanitation services by 2003 against 52% in 1996. Neither target has been met. The Government is currently seeking USD4billion for current projects. The current rates of sewerage network development would reach the 85% target in 90 years, at a cost of 3trillion Rupiah.

Sewage treatment coverage

City	Connections	% coverage
Bandung	90,000	20%
Cireon	18,800	32%
Jakarta	2,300	3%
Medan	7,400	2%
Surakata	8,000	13%
Tangerang	9,800	4%
Yogyakarta	10,100	10%

Source: Indonesia: Overview of Sanitation and Sewerage Experience and Policy Options; EASUR, World Bank, 2002.

Currently, sewerage services access 0.49million people in Jakarta. In total, 0.7million m^3 of effluent is discharged into the river network per day. Currently, just 3% of the city's sewage is treated, or a total of 210,000 people. Golden Grid (New South Wales and Sydney Water) is seeking to develop a 25 year BOT. Currently 9% of the population has no facilities and 6% use communal blocks.

Until the 2001 Water Pollution Control Regulation, wastewater from households was not defined as a water pollutant. Subsequently, municipalities have been made responsible for managing it.

Freshwater	
Total (1998, km^3)	**2,530.0**
Per capita (1998, m^3)	12,251
Withdrawals (1987, km^3)	74.3
For domestic use (1987)	6%
For industry (1987)	1%
For agriculture (1987)	93%

Politics and PSP

Water PSP was at first mooted to pay government debts as well as to alleviate water provision and pollution problems. In 1994-95, there was a belief that water and sewerage were not in the end going to undertake PSP, but severe flooding in Jakarta during 1996 brought matters to a head.

Some 27-30 BOT contracts have been under consideration since 1996. In general, these have been advancing slowly. Deregulation started to take place in 1994-95, after Government Regulation No. 20 opened the water sector to private investors. International companies are expected to carry out all necessary consulting and fieldwork before any proposals are submitted. To date, six BOT and concession awards have been made. The rate of progress has been slowed by political change, but it is anticipated that up to 10 more project awards can be expected to be made in the next five years. Currently, bulk water projects for Palembang, Bandung, Surabaya, Ujungpandang and Manado are being prepared for offer to the private sector. A total investment of USD314million is needed for these projects.

Groundwater	
Total recharge (1998, km^3)	**226.0**
Per capita (1998, m^3)	1,094

MAJOR CITIES			
Population	**2005**	**2015**	**Status**
Jakarta	13,215,000	16,822,000	Water services PPP (two sectors)
Bandung	4,126,000	5,338,000	Under consideration for 2003
Surabaja	2,735,000	3,453,000	Under consideration since 1994
Medan	2,287,000	2,981,000	Bulk water provision PPP
Ujung Pandang	1,284,000	1,688,000	N/A
Palembang	1,733,000	2,270,000	N/A
Malang	964,000	1,273,000	N/A
Badar Lampung	915,000	1,595,000	N/A
Semerang	967,000	1,273,000	Under consideration
Tegal	933,000	1,233,000	N/A

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	**Contract**	**Company**
Jakarta (East)	Privatisation of water provision services	Thames Water
Jakarta (West)	Privatisation of water provision services	Suez
Medan	25 year water supply BOT	Suez
Sidoarjo	25 year water supply BOT	VE/RWE
Talang Kepala	20 year water concession	Cascal
Batam Island	25 year water concession	Cascal

Indonesia – Local projects			
Project	**Operator**	**Population**	**Comments**
Jambi	PT Noviantana	427,500	25 year water BOOT, 1998
Serang Timur	PT Sarana Tirta Rejeki	N/A	25 year water BOT, 1997
Kota Legenda	PT Purta Alvita	N/A	25 year water BOT, 1995
Kaw Industri Hundai	PT Aristirta Tarumba	N/A	25 year industrial water BOT, 1994
Cikarang Baru (Kab. Beksai)	PT Graha Buana Cikarang	N/A	25 year water BOT, 1994
Serang Utara	PT Sauh Bahtera	N/A	25 year water BOO, 1993
Kemang Patama (Kab. Beksai)	PT Kemang Patama	N/A	25 year water BOT, 1993
Bali Water Supply Project	PT Tirta Arta Buana Mulia	N/A	20 year water Greenfield BOT, 1992

Source: Castalia (2004) Sector Note on Water Supply and Sanitation for Infrastructure in East Asia and the Pacific Flagship, Review by Castalia for the World Bank, ADB and JIBC.

City Study: Jakarta

Water and sewerage services are administered by Persuahaan Air Minuum Dki Jakarta (Pam Jaya), which in turn awarded 25 year water supply concessions to RWE/Thames (East Jakarta) and Suez (West Jakarta) in 1997. The contracts became operational in January 1998. In 1993, the city area's population of 8,350,000 was served by 320,000 connections, with water available for 19 hours per day. All connected properties were metered, with distribution losses of 54%. The main water networks were constructed in the 1940s. Spending on infrastructure had collapsed in the 1960s as the Suharto regime diverted assets away from public spending. In 1993, 30% of the population received water supplies directly from Pam Jaya and 16% via public taps. Private wells and vendors supply the rest of the population.

Under the 1997 privatisation plans, connections were set to rise to 70% by 2002, with all supplied by 2022, with 80% paying for these services. By 2002, the actual connection rate was only 50%. Even so, progress has concentrated upon low earning households:

Household connections	**1997**	**2002**
Total	**505,000**	**610,000**
Low income houses	25,500	59,230

Because of the effects of Suharto's downfall and the Asian financial crisis in 1998, agreement on price rises has been deferred in exchange for capital spending deferrals. Suez has sought to extend its initial investment period from 5 to 10 years. PT PAM Lyonnaise Jaya has repaired 241km of pipes, reducing leakage from 65% to 52%, along with 230 miles of new pipes. The aim is to increase the customer base by 10% pa from the current level of 2.4million.

Rates were increased in 1998 by 20%, 35% in 2001, 40% in 2003 and by 30% in 2004. A cross-subsidy system continues to be applied. By 2002, there were still approximately 40,000 illegal connections, due to water being provided by corrupt staff. Distribution losses had been reduced from 60% in 1997 to 49% by 2002. In return for the new rate increases, a stricter reporting regime will be put into place, along with new leakage reduction targets.

To date, RWE has invested USD46million in the East Jakarta concession and Suez at least USD50million with the West Jakarta concession. However, water delivery in terms of quality and quantity appears to have failed to improve in the intended manner. This is partly due to the poor quality of water available to the concession companies and in part because of financial constraints imposed by inflation since 1997. It is understood that RWE has been losing USD1million a month for about two years, due to the delays in the tariff rebasing procedure.

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company**	**Population served**		
	(country)	**Water**	**Sewerage**	**Total**
Lyonnaise des Eaux	Suez (France)	3,500,000	0	**3,500,000**
TWI	RWE (Germany)	2,700,000	0	**2,700,000**
Generale des Eaux	VE (France)	500,000	0	**500,000**
Cascal	Biwater (UK)	540,000	0	**540,000**

Distribution losses in the main cities

PDAM	**Location/Province**	**Leakage**
JAYA	Jakarta	45%
Kodya Bandung	West Java	45%
Kodya Semarang	Central Java	39%
Kodya Kediri	East Java	26%
Tirta Marta	Yogyakarta	32%
Halmahera Tengah	Maluku	35%
Tirta Monpase	North Aceh	40%
Tirta Musi	Palembang, South Sumatra	37%

Major urban water authorities

PDAM	**Population**	**Connections**	**Population covered**
PAM DKI JAYA, Jakarta	9,696,000	610,000	33%
Kota Surabaya, East Java	2,864,100	256,637	45%
Kota Bandung, West Java	2,613,292	141,435	28%
Kota Semarang, Central Java	1,415,400	118,099	42%
Kota Bogor, West Java	673,880	47,495	36%
Tirta Marta, DI Yogyakarta	483,862	32,702	34%
Nota Manado, North Sulawesi	441,900	31,666	36%
Kodya Denpasar, Bali	390,410	49,208	63%
Kota Cirebon, West Java	297,397	50,019	85%
Kota Salatiga, Central Java	144,483	17,995	63%
Kota Magelang	123,000	18,757	77%
Kota Pare-Pare, South Sulawesi	115,900	10,926	48%

Sources:

ADB (1999). Good governance and anticorruption: the road forward for Indonesia. Asian Development Bank, Consultative Group on Indonesia, July 1999.

ADB – APDF (2007) Asian Water Development Outlook 2007: Country Paper – Indonesia, ADB, Manila

Seshagiri, G.V. (2001). Asia Water, 17 (11) p 6-10.

'The riddle of Jakarta' GWI, September 2004, pp 21-23.

JAPAN

Economics (2006)	
GNI per capita	USD38,410
GNI per capita (PPP)	USD33,150
GDP in Agriculture	2%
GDP in Industry	30%
GDP in Services	68%

Legislation and management

Water management is guided by the 1958 Water Works Act (amended 2001). The Water Pollution Control Law passed in 1960 allows for the monitoring of and enforcement of standards relating to the discharge and treatment of household and industrial effluents. The Basic Environment Law passed in 1993, defines government responsibilities and overall aims for environmental protection, which were incorporated into the 1994 Basic Environment Plan. This plan sets out a series of targets for water and effluent treatment and the expansion and upgrading of Japan's sewerage and sewage treatment network. The Law for the Preservation of Drinking Water Supply Quality in Headwaters was passed in 1994. The Japanese Environment Agency is mainly concerned with pollution monitoring and carrying out research work. In 1995, domestic water tariffs accounted for 90.2% of service provision costs. In theory, water services to agriculture are self financing, but the payments do not cover all actual costs, with sewerage fees accounting on average for only 60% of costs.

Water and sewerage services turnover in 2000 was JPY5,600billion (USD45billion), with capital spending of JPY6,500billion (USD52billion) making Japan the largest water market in the world. This implies that there is a deficit of USD7 billion per annum purely in capital spending terms. An average bill of USD360 per capita also implies that there is significant scope for efficiency gains.

Population	
2007 (million)	127.8
2020 (million)	126.7
Urbanisation in 2007	66.3%
Urbanisation by 2020	69.4%
Urbanisation by 2050	80.1%

Water supply entities

Size of System	Number	People served
500,000+	21	39,720,000
100,000-500,000	183	37,850,000
20,000-100,000	613	26,230,000
5,000-20,000	1,131	11,200,000
Below 5,000	9,370	6,650,000

Water supply entity	Number
Public	11,127
Private (100+ people)	3,784
Bulk water	110

In addition, there are 4,760 sewerage and sewage treatment systems, ranging from river basin systems to rural schemes.

Urban Data (2004)	
With improved drinking water	100%
With household drinking water	98%
With improved sewerage	100%
With household sewerage	N/A
With 2^0 sewage treatment	75%

Sewage treatment development

Year	1984	1987	1990	1996
Tertiary	0%	0%	2%	8%

Secondary	30%	36%	42%	50%
Primary	9%	0%	0%	0%

Infrastructure development

Nationally, 95.5% of people are connected to piped water supply. The low level of sewerage in Japan (54% in 1995) marks the country from the rest of the industrialised world. In the 13 major cities, 96% were connected to sewerage, compared with 42% for the rest of Japan. Septic tanks for example, remained commonplace in Tokyo until the 1980s. As much of the water and sewerage network has been developed since the 1960s, it is generally in good condition.

	1978	**1988**	**1993**
Flush lavatories	46%	66%	76%
Sewerage	31%	39%	47%

The 8th Five Year Plan for Sewerage Construction ran from 1996 to 2000, and aimed to lay the foundations for a modern sewerage and sewage treatment infrastructure.

	1995	**2000**	**2010**
Connected to sewerage	54%	66%	90%
Effluents recycled	27%	35%	60%
Tertiary treatment	4%	12%	90%

By 2006, sewerage coverage was 69% with a target of 72% for 2007. Capital spending on sewerage in recent years has averaged JPY3,400 billion pa (USD2.7 billion), 60% of sewerage and 30% on wastewater treatment works. The water supply extension programme has been budgeted at JPY1,900billion. When including industrial effluents, 62% of wastewater was treated in 1995.

65% of sewerage and sewage treatment capital spending is eligible for central Government subsidies; at a rate of 50% for sewerage and 55% for sewage treatment works.

Sewage system development in 2006

	JPY billion	**USD billion**
Total project cost	2,283	19.0
Eligible for subsidy	1,480	12.3
Subsidies paid	786	6.6

Sewer charges covered 197.9% of O&M costs in 2004, but this falls to 55.8% after accounting for the cost of bond redemptions. Average sewerage charges are less than those for water because of the impact of the capex subsidies.

Charge (2000)	**JPY per 20 m^3**
Water	3,083
Sewerage	2,442

Freshwater	
Annual availability (1998)	547.0km^3
Per capita	4,344.0m^3
Annual withdrawal (1990)	91.4km^3
Domestic (1987)	19%
Industrial (1987)	17%
Agriculture (1987)	64%

Environmental and service shortfalls

Since 1995, Tokyo has been experiencing water shortages both in late summer and during the winter. This is due to inadequate water storage and distribution facilities in the region.

River water quality	**1989**	**1991**	**1996**
Good-Fair	69%	75%	74%

In 1997, bathing and coastal waters were at their lowest quality since the 1970s, with a fall in the quality of lakes also noted. Eutrophication in service reservoirs has affected drinking water supplied to 14million people in recent years.

Groundwater	
Annual availability (1998)	185.0km^3
Per capita	1,469m^3
Annual withdrawal (1990)	13km^3
Domestic (1987)	29%
Industrial (1987)	41%
Agriculture (1987)	30%

PSP and private sector players

The traditional resistance towards privatising Japan's water or sewerage services and its reticence towards foreign companies is being eroded by the country's mounting debt problems and the need to make water and sewerage services cover their costs. Another factor has been the lack of impact that Japanese companies have, in consequence, made in the privatisation of water and sewerage services globally. The only cases where they have been noted are as equity partners in extant consortia. For example, Mitsubishi holds 5% of the United Utilities consortium serving eastern Manila and is AWG partner for the Beijing No 10 water BOT. Marubeni also has a JV with VE for a variety of projects in China and other East Asian economies. Marubeni is Vivendi's JV partner for the Chengdu BOT water supply project in China. Mitsui and Sumitomo both have a 7.5% stake in Thames Water's Izmit project in Turkey.

While all urban water and sewerage services are in municipal hands, a degree of O&M outsourcing for sewage treatment works has been in place since 1953. It is not managed by the private sector in the conventional sense, but through a series of one year management outsourcing contracts. The sewage treatment O&M market was worth USD4billion pa in 1997, of which USD1billion pa was operated by private sector operators.

Market breakdown for sewage treatment O&M in public and river basin sewage systems

Municipal operators	38%
Ebara	10%
Nihon HELS Industry	21%
Other private operators	31%

According to industry sources in Japan, this market is expected to grow by 50% in the medium term.

Since 1999 three developments have made the rest of the sector more attractive to the private sector. In 1999, legislation was passed allowing the use of private finance in water and sewerage projects, although to date this has in reality been limited to the use of PFI projects for their design and build capabilities. In 2000, legislation was introduced to encourage the consolidation of water and sewerage entities to improve their cost effectiveness. This has subsequently evolved to allow one city to operate another city's services. In 2001, guidelines were introduced to encourage multi year O&M contracts at sewage treatment works. In consequence, strategic alliances are being developed in anticipation of the opening up of the rest of the Japanese market:

Japan Water	Nihon HELS/Mitsubishi
J-Team	Ebara/Nippon Jogesuiodo Sekki Co
Hitachi Public Services	Hitachi
Marubeni Vivendi	Marubeni/Veolia
Thames Water Japan	RWE/Mitsui

There is much more private sector involvement in industrial water services than for municipal water services. Sumitomo Metal has been operating a 155,000m^3 per day industrial WTP at Wakayama since 2002 and in March this year.

A 5.5 year O&M contract for Geihoku, a town of 3,000 people, is the first medium term PSP contract in Japan. Geihoku's nine water supply systems are now operated by J-Team, a venture between Ebara and Nippon Jogesuiodo Sekkei (NJS) a water consultant. In November 2002, Japan Water, a 50:50 JV between Mitsubishi and Nihon HELS, Japan's largest sewage treatment operations

company, won the first O&M contract for water services for the city of Miyoshi (population 40,000). Japan Water will operate the city's water treatment and distribution infrastructure for 5.5 years.

In Saitama prefecture to the north of Tokyo, the local government currently supplies 2.5million m^3 per day of treated bulk water and some industrial water. Due to budget constraints, the prefecture chose to contract out the operation of a new 150,000m^3 per day WTP. Japan's most comprehensive PSP scheme to date is currently under consideration. The city of Wakayama to the south of Osaka has commissioned a feasibility study to replace three old plants with a new 92,000m^3 per day facility at a cost of JPY24billion (USD205million). In addition, the renewal of a sludge treatment line at the Okubo WWTP will be implemented in the form of a 20-year BOT contract.

In August 2006, Veolia Water gained two three year wastewater treatment management contracts, the first in Saitama Prefecture, near Tokyo (52,000m^3 per day), and the second in Hiroshima (247,000m^3 per day). These contracts cover almost a million people and will generate total of EUR23million. These are the first management contracts to be awarded to international players. In April 2007, VE gained a three year O&M contract for a 283,000m^3/day wastewater treatment plant serving 500,000 people in Chiba, which will generate total revenues of EUR17.8million.

In July 2007, Veolia Water Japan and J-Power (Japan's Electric Power Development Co) acquired Fresh Water Mike, a water management unit of Mitsui Mining Co. This company, now named Fresh Water Service Co provides water services for half of the households in Omuta, Fukuoka Prefecture and the neighbouring Arao in Kumamoto Prefecture.

MAJOR CITIES			
City	**2005**	**2015**	**Status**
Tokyo	35,197,000	35,494,000	N/A
Osaka	11,268,000	11,309,000	N/A
Nagoya	3,179,000	3,202,000	N/A
Kitakyushu	2,800,000	2,830,000	N/A
Sapporo	2,508,000	2,539,000	N/A
Kyoto	1,805,000	1,805,000	N/A
Hiroshima	2,044,000	2,045,000	Wastewater O&M
Sendai	2,224,000	2,240,000	N/A

Sources:

ADB – APDF (2007) Asian Water Development Outlook 2007: Country Paper – Japan, ADB, Manila

Ministry of Environment, Web Site.

Testar, J.T. (2002). Asian Water 18 (5), 7-9.

Japan edges towards PSP. Global Water Intelligence, July 2002, pp10-13

PSP in Japan. Global Water Intelligence, September 2003, pp14-15

KAZAKHSTAN REPUBLIC

Economics (2006)	
GNI per capita	USD3,790
GNI per capita (PPP)	USD7,780
Agriculture	7%
Industry	39%
Services	54%

Water resources

Total water resources in an average year are estimated at 100.5km^3 with 46km^3 suitable for use. There is an average shortage of 6.6km^3 pa, rising to 18.3km^3 in a drought year. Water use has been falling since 1991 (36.91km^3) with the move from Soviet-led cotton irrigation projects to a more sustainable agricultural policy. In consequence, the 1996 level of usage was 32.72km^3. In terms of seasonal and geographical availability, water remains a severe constraint on development.

Population	
Total 2007 (million)	15.0
Total 2020 (million)	14.9
In urban areas (2007)	57.6%
In urban areas (2020)	62.3%
Urbanisation by (2050)	75.9%

Water pollution

Effluent discharges of polluted water into rivers fell from 0.34km^3 pa in 1991 to 0.23-0.24km^3 in 1993-95. Total wastewater discharges in 1994 were 6.04km^3, with 5% from domestic sources, 24% from agriculture and 71% from industry. Of the 10 main river basins in 1996, one (Ural) was classified as extremely polluted (Grade 7), one (Ertys) as highly polluted (Grade 6), one (Satysu) as polluted (Grade 5), one (Nura) as rather polluted (Grade 4), three (Syr-Darya, Ili and Karatal) as moderately polluted (Grade 3) and three (Shu and Talas) as clean (Grade 2).

The Aral Sea is arguably the greatest global environmental catastrophe to date. Its problems are described in the country entry on Uzbekistan.

As for groundwater, 15.86km^3 is assessed as suitable for use, including 10.80km^3 of brackish water, for industrial use. Groundwater pollution from mineral extraction, industry and petrochemicals is widespread.

Urban Data (2004)	
With improved drinking water	97%
With household drinking water	89%
With improved sewerage	87%
With household sewerage	78%
With 2^0 sewage treatment	50%

Political responses

The Ministry of Ecology and Natural Resources has drawn up a series of priority projects for 1998-2000, along with a long-term plan for 1998-2030. Planning is carried out within the National Environmental Action Plan for Sustainable Development of the Republic of Kazakhstan (NEAP/SD). The Water Code of the Republic of Kazakhstan was introduced in 2003, setting water charging schemes and water and effluent treatment standards. The Association of Vodokanals (the 46 water utilities) are also regulated by the 2004 Law on Water Supply and Drainage.

Almaty is having a USD800million upgrade of its water supply system, 70% of which is in poor condition. This includes KZT30billion (USD240million) on a 55km ring main due to be completed by 2010. Urban water tariffs range from KZT20-41/m^3. Between 2002 and 2006, Central Government allocations for water services were KZT36.4billion, with Local Government providing a further KZT8.6billion.

Drinking Water Branch Program spending / budget

Period	KZTbillion	USDmillion
2002-04	33.2	266
2005	17.7	142
2006-10	255.3	2,040

Freshwater	
Total (1998, km^3)	**75.42**
Per capita (1998, m^3)	4,484
Withdrawals (1996, km^3)	33.7
For domestic use (1993)	2%
For industry (1995)	17%
For agriculture (1995)	81%

Urban water services

Per capita water use in urban areas ranges from 25-500L/day (Almaty 251L/day) against a range of 15-320L/day in rural areas. 18.6% of urban drinking water samples taken in 1994 failed on hygiene grounds.

Water coverage for the five major cities is generally good, ranging between 76% and 100%, with 24 hour availability where covered. Sewerage coverage ranges from 38% to 98%. Outside Almaty (NRW of 10%), non revenue water ranges from 29-35%. O&M costs are broadly met in these cities by water revenue charges.

According to the draft State Programme on Poverty Reduction for 2003-2005, 75% of the population is connected to a water network. The use of alternative sources is increasing; between 1997 and 1998 alone, the percentage of people using decentralized sources increased from 16 to 23%, in part due to 22% of water pipelines not functioning. Between 1990 and 1997 the proportion of piped water failing water quality standards rose from 9% to 26% and approximately 50% of the population drinks water that fails salinity and hardness standards. In rural areas about 9% of the population have access to piped water.

Groundwater	
Total recharge (1998, km^3)	**35.87**
Per capita (1998, m^3)	2,133
Withdrawals (1996, km^3)	3.91
For domestic use (1996)	58%
For industry (1996)	28%
For agriculture (1996)	14%

Private sector involvement

Since 1993, the Government has sought to encourage international investment along with privatisation proposals. The World Bank (Kazakhstan joined the IFC in 1993) provided USD16.5million out of USD20.9million for initiating the long term upgrading of the city of Atyrau's Vodocanal water and sewerage systems in June 1999. Kazakhstan's environmental legacy and its low population density have limited private sector investment to date, except where it is related to the petrochemical industry. Both the Asian Development Bank and the European Bank for Reconstruction and Development are active in the country, concentrating on financial institutions and the petrochemicals industry

MAJOR CITIES			
Population	**2005**	**2015**	**Status**
Almaty	1,156,000	1,183,000	Partial PSP in some suburbs

Cascal's activities in Almaty

In 1998, Biwater (Cascal) was awarded a five year O&M contract for water and sewerage services in the Kaselen suburbs of Almaty. During the first year of the contract, there was major improvement in service quality, with water provision going from 4-6 hours per day to a 24 hour service. Billing was only introduced once the water provision service was seen to have improved. A 25% collection rate

has been improved to 90%, partly since the police services became involved in the procedure. The contract is now profitable on an operating basis and Cascal has an option to buy the suburb's water company at a nominal price.

VE enters Almaty and Astana and leaves Almaty

VE was awarded two contracts in March 2000. (1) A 30 year water management contract for Almaty which has yet to start due to contractual problems. (2) A USD40million contract for 51km water pipeline and pumping station renovation for the new capital Astana (population 320,000, to grow to 690,000 by 2020).

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	**Contract**	**Company**
Kaselen (Almaty)	O&M for water management	Cascal
Astana	Water management	VE

Japanese aid for Astana

In 2003, the Japan Bank for International Cooperation signed a loan agreement for JPY21,361billion (USD180million) with the government of Kazakhstan to develop Astana's water supply and sewerage systems.

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
Cascal	Biwater (UK)	N/A	0	N/A
VE	VE (France)	N/A	0	N/A

Source:

ADB – APDF (2007) Asian Water Development Outlook 2007: Country Paper – Kazakhstan, ADB, Manila

MALAYSIA

Economics (2006)	
GNI per capita	USD5,490
GNI per capita (PPP)	USD11,300
Agriculture	8%
Industry	52%
Services	40%

Water and sewerage provision

(million)	1990	%	2000	%
Urban	9.17	96%	12.65	99%
Rural	5.93	67%	7.33	87%
Total	15.10	80%	22.20	92%
Leakage		43%		37%
Sewerage		42%		79%

In 1994, 5% of the population had secondary treatment and 5% primary treatment, with access to some form of sanitation having risen from 70% in 1980 to 94%. During that period, access to potable water actually fell from 80% to 78%. This reflects a period of rapid population growth and urbanisation, whereby resources were fully committed towards keeping up with developments in urban areas, along with the higher relative cost of installing piped water compared with basic sanitation measures.

Population	
Total 2007 (million)	24.9
Total 2020 (million)	31.5
In urban areas (2007)	69.6%
In urban areas (2020)	78.5%
In urban agglomerations (2050)	87.9%

River quality and pollution

Industrial development and urbanisation, allied with a minimal sewage treatment infrastructure has resulted in a dramatic deterioration in river water quality in recent years. In consequence, a number of rivers are now unsuitable as sources of drinking water and are affecting further development.

Quality by river	1987	1996
Clean	49%	28%
Polluted	47%	43%
Very polluted	3%	29%

By 1998, only 25% of rivers were classed as clean. Domestic sewage accounted for 65% of the BOD load, agricultural effluent 27% and industry 8%. Johor is regarded as the state with the most polluted rivers, followed by Penang and Pahang. In recent years, data on inland water quality has been volatile. Thus an improvement between 1994 and 1995 has been countered by a significant deterioration since 1995. It is likely that this is in part accounted for by the assessments being based on overall river quality, thus making year-on-year comparisons more volatile.

Urban Data (2004)	
With improved drinking water	100%
With household drinking water	98%
With improved sewerage	95%
With household sewerage	41%
With 2^0 sewage treatment	16%

Regulatory framework

Malaysia's framework legislation is laid out in the Environmental Quality Act, 1974 (127, Amendment A953 in 1996), which outlines the Ministry of the Environment's powers and objectives. Specific legislation includes the Waters Act, 1989 (418) and the Sewerage Services Act, 1993 (508).

Government, planning and PPP

The traditional role of the Government, via the Public Works Dept. (PWD), is the supply of funding and planning of water projects in the states. Individual states are supposed to levy fees which pay for basic O&M, with all extra work funded by central government. This used to be in the form of grants, now it has been turned into 0% interest loans. Loans are approved by the Federal Government. The Government has much experience of working with the private sector for evaluating problems and projects, especially in the use of external consultants. Tariff charges are decided by state governments.

The Government thus now regards water and sewerage as a commercial area. Its PSP or commercialisation has to be approved through economic planning units. Until 2004, no open bids took place and thus came through private sector proposals, with no competitive bidding. This is how Indah Water gained its nation-wide sewerage contract.

In 2005, the Federal Government assumed joint responsibility with the state Governments for the overall management of water services in Malaysia. The National Water Services Commission (NWSC) Act and Water Services Industry Act (WSIA) were also passed as a framework of legislation for the sector based upon corporatising the state held and operated services, along with setting up the Water Asset Management Company (WAMCO) as a government agency to hold the Facility License under the WSIA and facilitate process of transformation into new water supply industry regime.

Current treatment capacity of MYR10,730 is adequate for current demand, but needs to be expanded to meet future growth, with 62 water resource projects earmarked for 2000-50. Water consumption in Malaysia grew by 8% a year between 1981 and 2001 because of population growth, industrialisation and urbanisation and is forecast to rise by an estimated 4% a year until 2010.

Water demand	MYR
2000	9,655
2020	20,338
2050	31,628

Malaysia is to spend RM50 billion (USD3.2billion) on upgrading water and sewage services between 2005 and 2010. At the same time, a systematic approach to the award of PSP contracts is to be adopted. This is a response to the ad hoc manner in which previous contracts have been awarded. It is unclear how extant contracts would be affected. This means that new contracts such as the proposals in Selangor and Sabah are unlikely to be awarded until an independent regulator is established and a suitable tendering process is in place.

Planned capital spending on water only, 2000-50

Period	MYRmillion
2000-10	22,180
2011-20	15,421
2021-30	6,921
2031-40	6,371
2041-50	1,220
Total	51,933

Freshwater	
Total (1998, km³)	456.0
Per capita (1998, m^3)	21,259
Withdrawals (1998, km^3)	12.7
For domestic use (1993)	23%
For industry (1993)	30%
For agriculture (1993)	47%

PSP and priorities

Malaysia prefers full concession awards, wherever possible, allied with long concession periods, with 20-60 years being usual practice. Regulation is to be agreed upon within the terms of the individual contract, with government input with respect to health and environmental matters dealt with on an ongoing basis.

Making water bills commercial remains a sensitive issue, as demonstrated by the political fallout over revising sewerage tariffs after PSP. Pressure for PSP in water services at the state government level is coming from the need to recover increased costs. Typically, states sell about 35% to 40% of the water produced. Metering is common for all household connections, but there have been a number of problems with the reading of meters. Low water prices mean that there is little illegal abstraction. Water tariffs in Malaysia will be increased from MYR0.50 per m^3 (EUR0.14) in 2002 to MYR1.49 (EUR0.42) by 2006 and to MYR2.25 (EUR0.62) by 2011. Tariffs are amongst the lowest in South East Asia, and cannot cover costs as 8 out of 17 state water providers ran a deficit in 1998. For example, the Selangor Government spends MYR1billion (EUR300million) on operational costs and collects MYR200million (EUR60million) from consumers. These costs are set to rise in order to cover investments in "analytical instruments and monitoring systems" as a result of a stricter standards laid down in the Safe Drinking Water Act.

During the 1970s, 19 master plans were unveiled in order to implement the National Sewerage Development Programme. By 1990, only nine of these had even been partly implemented because of limited funds. In consequence, the 1993 Sewerage Services Act was passed in accordance with the National Privatisation Policy, to mobilise funds and management.

According to Dr Lim Keng Yaik, the Minister of Energy, Water and Communications, in January 2006 the Suruhanjaya Perkhidmatan Air Negara (Span / National Water Services Commission, NWSC) will explicitly support PSP through creating a suitable regulatory background for investment. All State held (through the Water Asset Holding Co) water companies will eventually be corporatised and owned by the various state governments, which will then decide whether they want to continue with their concession agreements or float their shares on Bursa Malaysia. Current concessions, such as in Johor and Selangor, should be for their respective state governments to decide whether they want to continue with the concession agreements. The Minister intends to use the model used by the Penang Water Supply Corporation, in being listed on Bursa Malaysia. The proposed Water Assets Holding Company, will be a business entity owned by the Finance Ministry and run as a full-cost-recovery company over a span of 40-50 years.

Access to sanitation	1970	1980	1990
Household sewerage	3%	4%	5%
Septic tank	17%	22%	37%
Flush latrine	3%	30%	45%
Other latrines	59%	26%	6%
None	18%	16%	6%

Malaysia's sewerage is covered by the previously privately operated Indah Water Konsortium (IWK). IWK has found that it is much harder to force people to pay for sewerage as part of bills than it is to force them to pay for water. It remains usual to have the sewerage component as a top up on the water bill. The State Water Authority cannot compel the customer to pay the sewerage component of the bill. IWK had debts of MYR700million by 2000. The government took it over for MYR200million.

Water supply operating expenditure and revenues in 2005 (MYRmillion)

State	Expenditure	Revenues	Net result
Kedah	129.0	163.1	+34.1
Sarawak [1]	36.6	25.4	-11.3
Labuan	18.0	11.0	-7.0
Perlis	18.6	12.8	-5.8
Pahang	149.1	103.8	-45.3
N Sembilan	114.4	163.5	+49.1
Sabah	295.3	255.8	-39.4
Perak	185.5	231.5	+46.0
Kuching (Sarawak)	61.6	75.6	+14.1
Sibu (Sarawak)	24.0	24.0	0.0
Malaka	113.2	115.8	+2.6
LAKU (Sarawak)	44.7	53.2	+8.5
SATU (Terengganu)	81.8	80.8	-1.0
Selangor [2]	1,510.9	1,417.6	-93.3
Johor	460.7	610.1	+149.3
Kelantan	42.7	57.6	+14.8
Pulau Pinang	129.8	163.1	+34.1

[1] Excluding LAKU, Kuching and Sibu
[2] Excluding Kuala Lumpur and Putrajaya

The private sector continues to encounter problems with low tariffs and poor tariff collection. In 2001, private sector expenditure was MYR2.76billion while revenue was MYR2.23billion. In 2003, the Federal Government announced that it is to take over the management and financing of water supply projects from the country's states, after some states revealed they were having cash flow problems relating to their infrastructure work. In Selangor, the state owns private water companies and contractors some MYR3.9billion. Only four of Malaysia's states made profits from the sale of water in 2001.

Groundwater	
Total recharge (1998, km³)	71.0
Per capita (1998, m^3)	3,310
Withdrawals (1993, km³)	0.4
For domestic use (1993)	50%

MAJOR CITIES			
Population	**2005**	**2015**	**Status**
Kuala Lumpur	1,405,000	1,696,000	Bulk water PPP

Water contract type by state in 2007

PWD – Division of the Publis Works Department
WWD – Waterworks Department
WB – Water Board
Corp – Corporatised bodies
PSP – Private sector participation

State	Type	Comments
Kedah	PWD	One concession for part of the state
Sarawak	PWD	N/A
Labuan	PWD	N/A
Perlis	PWD	N/A
Pahang	WWD	N/A
N Sembilan	WWD	One O&M contract for part of the state
Sabah	WWD	N/A
Perak	WB	Two contracts for part of the state
Kuching (Sarawak)	WB	N/A
Sibu (Sarawak)	WB	N/A
Malaka	Corp	One concession for part of the state
LAKU (Sarawak)	Corp	N/A
SATU (Terengganu)	Corp	N/A
Selangor	PSP	Two BOT contracts
Johor	PSP	Concession
Kelantan	PSP	Concession
Pulau Pinang	PSP	Divestiture

Contracts by type noted in 2007

Divestiture
Penang (PBA)

Full Concession
Johor (SAJ),
Kelantan (Air Kelantan)

BOT, BOOT etc
Selangor: SSP2 Puncak Niaga, SSP3 SPLASH
Sabah: JETAMA, TIMATCH, Lahat Datu
Perak: MUC, Innovest Lyonnaise
Johore: Equiventures

Management Contracts
Puncak Niaga, ABASS, SPLASH, Taliworks,
Air Utara, Encorp Utilities, Southern Water

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	**Contract**	**Company**
Johor-Barhu	BOT contract, water supply	Suez
Kota-Kinabalu	BOT contract, water supply	Suez
Perak	BOT contract, water supply	Suez
Ipoh, Perak	Concession, water supply	Intan Utilities/VE
Selangor	Concession, water supply	Puncak Niaga/VE
Malacca	Concession, water supply	VE
Johor	O&M/Concession, water	SAJ Holdings
Kertih	20 year industrial water outsourcing	VE
Penang	BOT, water treatment	PBA
Kedah	Concession, water supply	Taliworks
Selangor	Concession, water supply	SPLASH
National contracts	Industrial effluent treatment	Eco Water
Negeri Sembilan	10 year water distribution	Salcon O&M

City Study: Kuala Lumpur

Water provision is managed by the Selangor Waterworks Department. The central area of the city has a population of 1.145million, all of which are served by a total of 0.675million connections. Metering is commonplace. In 1993, the average domestic tariff was USD0.327per m^3, compared with a cost of water production of USD0.627 per m^3. In consequence, cross subsidies come from domestic and industrial water users paying more then the economic cost. Water quality is considered to be fair, with the treatment capacity in 1993 covering only 39% of water produced for the city. Another problem is

low water pressure. 25% of the city is currently covered by a sewerage system, with the rest using septic tanks. Treatment of effluents is understood to be minimal.

As a result, there has been a gradual privatisation of water and sewerage services for the city since 1993. Sewerage has been taken over by Indah Water, which in turn is gradually developing a network of sewage treatment works. Bulk water provision comes in part from the privatisation of Selangor's water services to Puncak Niaga and Vivendi. The privatisation of actual water services to the city is now actively under consideration. As noted above, billing and commercial versus developmental concerns are the main issues that need to be resolved before the formal contract award process takes place.

Conflict Study: Raw water supplies to Singapore

A series of agreements drawn up between Singapore and Malaysia from 1927 to 1990 set out terms for the provision of bulk water from Johor to Singapore until up to 2061. These tariffs have become the subject of a dispute initiated by Malaysia. The water infrastructure has been developed by Singapore, which is also responsible for its operational costs. Under the 1961 agreement, Malaysia supplies Singapore with raw water at MYR0.03 per 1,000 gallons and Singapore in turn supplies Malaysia with treated water at MYR0.50 per 1,000 gallons at a rate whereby both tariffs are effectively cancelled out.

Malaysia is currently proposing that from 2011 it will provide Singapore with treated water (from the facilities developed by Singapore) at a cost put at MYR0.45-0.60 per 1,000 gallons in 2000-01, rising to MYR3.00-8.00 during 2002, before negotiations broke down. The state of Johor aims to become self sufficient for treated water by 2004, thereby decoupling the import/export element of the original agreement. Singapore is currently reducing its dependence on imported water from Malaysia through wastewater reclamation ('NEWater') and desalination and is considering proposals to pipe in water from Indonesia.

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company**	**Population served**		
	(country)	**Water**	**Sewerage**	**Total**
CGE Utilities	VE (France)	600,000	0	600,000
Ondeo	Suez (France)	1,565,000	0	1,565,000
SAJ Holdings	RWE (Germany)	2,600,000	0	2,600,000
Intan Utilities	Intan Utilities (Malaysia)/VE	600,000	0	600,000
Puncak Niaga	PN/Central Plus (Malaysia	7,100,000	0	7,100,000
Taliworks	Tailworks Bhd (Malaysia)	500,000	0	500,000
PBA Bhd	PBA Bhd (Malaysia)	1,450,000	0	1,450,000
SAJ	Ranhill Bhd (Malaysia	3,400,000	0	3,400,000
Eco Water	Eco Water (Malaysia)	N/A	N/A	N/A
SPLASH	KSB (Malaysia)	0	0	0
Salcon	Salcon (Malaysia)	500,000	0	500,000

Sources:

Keong, L M (2002). Asia Water, 18 (2), p 8-11.

Malaysian Water Association: Malaysia Water Industry Guide 2002

Malaysia's big moment. GWI, March 2004, pp 19-21

Companies fear curbs in new bills. GWR 240, April 2006

MWAMC (2007) Financial Initiatives For Water Industry Reform. Presentation by Malaysia's Water Asset Management Company at Water Malaysia 2007, Kuala Lumpur, May 2007

MEXICO

Economics (2006)	
GNI per capita	USD7,870
GNI per capita (PPP)	USD11,410
GDP in Agriculture	4%
GDP in Industry	27%
GDP in Services	69%

Regulation and national plans

The National Commission for Water (Conagua) is responsible for developing and enforcing a series of five year water plans. The current plan (PROMMA) runs from 2001-2006 and aims to provide potable water to 89% of the population with 65% of household wastewater being treated. The Commission for Water and Drainage for Metropolitan Areas is responsible for water and sewerage management in urban areas. The major laws are the General Law on Environmental Protection (1988 and revised in 1996), and the National Water Law (1992 and supplemented by the 1994 Regulations for the National Water Law). The Ministry for Social Development has imposed taxes for effluent discharges. The National Water Law also introduced the concept of tradable water rights.

The 2001-06 National Water Plan:

	2001 Actual	2002 Actual	2006 Plan
% connected to piped water	88%	88%	89%
% connected to sewerage	76%	77%	78%
Wastewater treated [1]	23%	28%	41%
Water & pollution permit compliance	7%	26%	100%
Levies, fees & taxes (MXNmillion)	6,150	6,337	7,094

[1] The original PNH 2006 wastewater target was 65%.

Source: PNH 2006, in OECD (2003) OECD Environmental Performance Review: Mexico

Inland water quality	2000
Good	5%
Fair	22%
Poor	49%
Bad	24%

25% of the country's surface has adequate water supplies, which enjoy 82% of the rainfall. Most of the population lives in the arid areas. According to the Environment Minister in 2001, Mexico has 60% less water per capita than 50 years ago, 73% of its supply is contaminated and 93% of its rivers are polluted.

Population	
2007 (million)	103.8
2020 (million)	124.7
Urbanisation in 2007	76.5%
Urbanisation by 2020	80.7%
Urbanisation by 2050	87.6%

Water provision and public health

In Mexico City, water connections were 92% (64% indoors) and access to sanitation was 90% with 68% having access to flush lavatories. By 1995, water and sewerage connections were 98% and 94% respectively.

Urban water and wastewater services

	1991	1995	2000
Piped water	76%	87%	87%
Sanitation	75%	67%	73%
Sewage treatment	N/A	25%	24%

Under Mexico's Standard NOM-001-ECOL-1996, all 139 municipalities with more than 50,000 people and industrial sites with a BOD5/suspended solids generation of more than 3t/day are meant to have appropriate wastewater treatment by 2000. As of 2002, 24% of the population was connected to a sewerage system, with 27% of sewage collected being treated at 978 WWTWs, with 11% being treated to primary standard and 16% to secondary standard. Meanwhile, 5.4km^3 pa of industrial wastewater is generated, with 15% treated (34% primary, 62% secondary & 4% tertiary) at 1,405 WWTWs, but only 503 operating in compliance with national standards.

Effluent treatment, 1994-1999

(m^3/second)	1994	1998	1999
Effluent discharge	261	291	320
Installed cap	42	63	67
Operating cap	32	41	42
Effective cap	14	29	N/A
Effluent treated (%)	12	14	13

A water treatment programme was started in 320 municipalities in 1991 to reduce the risk of cholera. This involved 95% of municipal piped drinking water being chlorinated along with the prohibition of the discharge of untreated sewage effluents for market gardening. Only 30% of drinking water is fully treated. 225 out of 1,018 regional water treatment plants were in need of repair in 2001. Distribution losses are between 40-48%.

Urban Data (2004)	
With improved drinking water	100%
With household drinking water	96%
With improved sewerage	91%
With household sewerage	80%
With 2^0 sewage treatment	5%

Investments and service plans

Current income at USD1,503million pa accounts for 42% of required financial resources. Money and management are at a premium. One challenge for municipal performance is that authorities typically last three years and water managers just two. Thus there is little management or political continuity. In addition, high levels of debt and the inability to generate cash for loan repayments meant that just 21 states and six municipal water works met the Mexico's Federal loan criteria in 2003. The International Monetary Fund is disbursing USD1billion in loans for water and sewerage projects, with USD1.4billion being allocated to water and sanitation projects by the Ministry of Cities and total Government spending set to be in the region of USD1.66billion, compared with USD800million in 2003.

USDmillion	2001-06	2007-12	2013-25
Capex	11,911	10,131	20,184
Opex	9,487	10,644	25,562
Total	21,398	20,775	46,796
Total – annualised	3,566	3,463	3,900

Various estimates point towards USD58-89billion being required over a 25 year period to achieve universal and sustainable access to water and sanitation. While total spending has been boosted to USD2.2billion pa since 2003, it is evident that further investment is needed.

	2000	2025 BAU	2025 SG
Urban unaccounted for water	44%	44%	24%
Drinking water service coverage	88%	88%	97%
Sewerage service coverage	76%	76%	97%
Wastewater treated	23%	60%	90%
Investment (MXNbillion pa)	14	16	30

BAU = Business As Usual Scenario, SG = Sustainable Growth Scenario
Source: PNH 2006, in OECD (2003) OECD Environmental Performance Review: Mexico

Goals for the National Water Commission (2001-2006)

Measure	2001	2004	2006 Goal
Population with potable water service	88%	89.4%	89%
Population with sewerage service	76%	77.4%	78%
Rural areas with potable water service	69%	71%	71%
Volume of wastewater treated as % of wastewater collected	25%	31.1%	46%
Verification of wastewater quality discharges to ensure compliance with NOM-ECOL-001-1996	10%	96.7%	100%
River basin councils functioning autonomously	1	16	25
Autonomous Technical groundwater committees	4	41	41
Number of inhabitants protected against floods (1000's)	364	3,371	1697
Amount collected for water rights and fines (Million EUR)	478	581	610

Source: CNA, 2005

A series of measures to help preserve water supplies has been launched in a move that could help Mexico pay its Rio Grande river water debt to the USA under the 1944 treaty. A deal reached by U.S. and Mexican Governments earlier in 2003 said the two countries will invest in water conservation measures and mandates the modernisation of the water infrastructure, aiming to achieve greater efficiency in water use. Mexico also seeks to boost the amount of treated and reused wastewater from one-third of output to two-thirds by 2006.

Other challenges stem from Mexican politics and their several legacies. Since the 2000 elections ended 71 years of rule by the Institutional Revolutionary Party, there has been a piecemeal transition from a centralised state to one with more local decision making, but without an effective transfer of operations. While in constitutional terms, water belongs to the state, this does not allow for the economic and environmental opportunity costs involved when water is transferred from one state to another or to Mexico City. Meanwhile, up to half of users do not pay for the service, health regulations stipulate that at least a minimal supply must be maintained to domestic non-payers.

Freshwater	
Annual availability (1998)	375.40km³
Per capita	3,729m^3
Annual withdrawal (1991)	77.8km³
Domestic	17%
Industrial	5%
Agriculture	77%

Politics and privatisation

Mexico has a long tradition of private sector water contracts. Concessions were awarded in Pueble, Saltillo and Monterrey in 1855, 1899 and 1904 respectively. In the 1920s there were 20 concessions in operation. Since the 1940s, these were taken over by the state. Privatisation in Mexico was revived in the wake of the 1992 National Water Law. At the same time, Federal support for water and sewerage services in the provinces was eased to encourage the commercialisation of the services. After strong progress between 1992 and 1994, economic problems have meant that progress in subsequent years has been piecemeal.

Many of the current generation of privatisation contracts were awarded shortly before the 1994 Peso crisis, which caused problems with regards to the quality of earnings in hard currency terms. Contracts such as Biwater's sewage treatment BOT in Puerto Vallarta have suffered from the inability of anticipated tariff increases to be imposed. Companies such as Biwater have concentrated on working within new financial constraints to deliver high service quality with the longer term in mind. 50 wastewater treatment BOT contracts were awarded up to the end of 1999. In 2001, twelve were operational (with a PE of 6million), while 20 have been cancelled and twelve are under re-negotiation.

Azurix entered the market in 1999 by buying out private sector stakes in two concessions. Azurix's activities were sold to Suez in 2002. Likewise VE has gradually increased its holding in its Omsa JV from 33% in 1993 to 50% by 1998. From 2003, the Government aims to award concessions for 180 cities with a population over 50,000. This will cover water treatment and provision services, with 49%, 51% and 100% stakes being available. In reality, five BOT contracts awards were identified in 2003

and a further four in the year to date. Even so, a marked increase in local companies bidding for contracts points towards healthier conditions than for some time.

Groundwater	
Annual availability (1998)	139.0km³
Per capita	1,450m^3
Annual withdrawal (1985)	24.0km³
Domestic	13.2%
Industrial	23.0%
Agriculture	63.8%

Privatising sewage treatment

Private sector involvement is also being sought for wastewater treatment. 16% of Mexico's sewage treatment capacity is handled by the private sector, involving a total investment of USD400million (the 1999 figures are Government estimates).

Sewage treatment in Mexico, 1994-99	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
Effluent discharge (m^3/s)	261	272	277	284	291	320
Installed treatment capacity (m^3/s)	42	48	51	57	63	67
Operating treatment capacity-nominal (m^3/s)	32	41	33	39	41	42
Operating treatment capacity-adequate (m^3/s)	14	17	20	25	29	N/A
Effluent treated (%)	12	15	12	13	14	13
Treatment operating adequately (%)	33	35	39	44	46	N/A

Between 2000 and 2005, the level of wastewater treatment in Mexico rose from 23% to 36%. This was due to MXN1.4billion (USD1.08billion) in wastewater treatment plants over the period, 38% from the federal government and state and 46% from municipal authorities, with the private sector providing 16% of the costs. The aim in 2005 was to increase sewage treatment to 42% by 2009.

Conagua is seeking for all of Mexico's wastewater to be treated by 2012 through a combination of municipal, state and federal funding and management, along with financing from the private sector to make up needed amount. 19million m^3 per day of wastewater was discharged in 2007, of which 36% was treated. 3.5million m^3 per day of wastewater is collected in Mexico Valley (Mexico City and 18 surrounding cities in Mexico state), where treatment facilities are severely lacking. To reach full treatment over the next six years, the number of treatment plants in the country would need to nearly double, adding 1,500 plants to the 1,600 plants currently in operation.

MAJOR CITIES			
City	**2005**	**2015**	**Status**
Ciudad Juárez	1,540,000	2,008,000	N/A
Culiacán	812,000	931,000	N/A
Guadalajara	3,968,000	4,456,000	N/A
Leon de los Alta	1,481,000	1,785,000	Sewerage BOT
Mérida	939,000	1,097,000	N/A
Mexicali	860,000	1,015,000	N/A
Mexico City	19,411,000	21,568,000	Four water management contracts awarded
Monterrey	3,596,000	4,140,000	N/A
Puebla de Zarago	1,824,000	1,861,000	Water and sewerage PSP
Querétaro	947,000	1,185,000	N/A
San Luis Potosi	946,000	1,103,000	N/A
Tijuana	1,649,000	2,194,000	N/A
Toluca	1,5457,000	1,770,000	N/A
Torreon	1,072,000	1,200,000	N/A

Case study: Siapa

Guadalajara's municipal utility Sistema Intermunicipal para los Servicios de Agua Potable y Alcantarillado (Siapa) plans to spend USD700million on improving water and wastewater services over the next 25 years. This will cover drinking water and wastewater management for the 3million people in Guadalajara, Zapopan, Tlaquepaque and Tonala. Water will be brought from Lake Chapala, leakage will be reduced and seven WWTPs will be built. Support will come from the Japanese

Government and the Inter-American Development Bank. In addition, the municipality's investment grade debt rating will be used to mobilise new debt when cash flow allows.

Siapa provides drinking water to 93% of the Guadalajara region and wastewater services to 89%. It had revenues of MXN1.5billion (USD140million) in 2002 and is profitable, with a steadily improving debt profile. Finances have been improved by adopting fixed tariffs to avoid metering abuse and charging for wastewater services. Siapa spent USD50million in 2002 implementing a plan to measure water leakage in order to control and improve water pressure.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	**Contract**	**Company**
Aguascalientes	30 year water and sewerage concession	Caasa (Omsa)
Cancun	30 year water and sewerage concession	DHC
Chiuahua	10 year sewage treatment BOT	Atlatech (Cygsa)
Culiacan	Sewage treatment facility concession	TECSA
León	Sewage treatment work BOT	Suez
Matamoros	Industrial effluent treatment BOT	Suez
NE Mexico City	10 year water management contract	Industrias del Agua
NW Mexico City	10 year water management contract	Servicos de Agua Potable (Omsa)
Pemex	4 industrial WWTW plants for Pemex	CYDSA
Puebla	Sewage treatment facility concession	TECSA
Puebla	Water and sewerage concession	Omsa
Puerto Vallarta	15 year sewage treatment BOT	CTAPV
Saltillo	25 year water and sewerage concession	Empresa Paramunicipal
SE Mexico City	10 year water management contract	Tecnologia y Servicos del Agua
SW Mexico City	10 year water management contract	Agua de Mexico
Torreón	Sewage lagoon BOT	Suez
Xalapa	Water & sewerage DBFO	Mitsui
Orizaba	Water & sewerage DBFO	Mitsui
Morelia	Water & sewerage BOT	Aquasol
Pachuca	Water & sewerage BOT	Aquasol
San Luis Potosí	Wastewater BOT	Degremont/Suez

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
CTPAV	Cascal (UK/Ned)	0	300,000	**300,000**
Industrias del Aguas	Suez (France)	2,000,000	0	**2,000,000**
DHC	Suez (France)	430,000	430,000	**430,000**
Suez	Suez (France)	0	2,100,000	**2,100,000**
Omsa	VE (France)	5,980,000	3,450,000	**5,980,000**
Agua de Mexico	United Utilities (UK)	2,000,000	0	**2,000,000**
T y S del Agua (TECSA)	Suez (France)	2,800,000	0	**2,800,000**
Aguas de Cancun	Suez (France)	383,000	383,000	**383,000**
CYDSA	CYDSA (Mexico)	N/A	N/A	**N/A**
Empresa Paramunicipal	Agbar (Spain)	650,000	650,000	**650,000**
Mitsui	Mitsui (Japan)	400,000	500,000	**500,000**
Aquasol	Aquasol (Mexico)	0	500,000	**500,000**

Sources:

Mexico Water Report (2006) Submission for the 4th World Water Forum, Mexico City, Mexico

OECD (2003) OECD Environmental Performance Review: Mexico. OECD, Paris, France.

World Bank (2002). Private Solutions for Infrastructure In Mexico. Country Framework Report for Private Participation in Infrastructure. World Bank and Public-Private Infrastructure Advisory Facility.

MONGOLIA

Mongolia is characterised by the extreme contrast between the urbanised areas, which accounted for 64% of the country's 2.7million population in 1998 and the rest of the country, where low-density nomadic pastoralism remains commonplace. In the central region there are substantial water resources, partly in the form of large, fast flowing streams. However, in the desert south, western and eastern provinces, the water resources are much scarcer and are generally of poorer quality with increasing salts and diminishing water levels in groundwater tables, streams and lakes. In 1999, 70% of the urban population had access to improved drinking water and 30% to sewerage.

Political change brings the prospect of change

The Communist administration lost the 1996 general election to the Democratic Coalition, ending 72-years of one party rule. In consequence, Mongolia is seeking to expand its international activities, especially with economies other than the former Soviet Union and the People's Republic of China. A privatisation programme was started in 1997, which may well embrace urban water and sewerage services but there are no significant developments to date.

Water resource management

The Ministry of Nature and the Environment is responsible for water resource use, management and development strategies. Under the Ministry there is an Agency for Environment Protection, which maintains national co-ordination and monitoring of the water resources. The Governor's offices of the Aimag and municipalities are responsible for water supply and wastewater treatment. The Mongolian Law on Water was enacted in 1995.

Water resources management, monitoring and controls have failed to maintain water quality and supply, and generally have only documented the loss of resource reserves and quality. High rates of leakage are usual, while inefficient supply systems generate higher flows that in turn overwhelm sewage treatment systems. In addition to the waste of water, this overloads the sewage system and more than doubles the electricity requirements for operating the water supply pumps. Agricultural, rural, residential and industrial uses of groundwater in Gobi, and western and eastern Mongolia, are contributing to low water table levels and increasing salinity levels. There is an urgent need to improve water monitoring activities throughout the country. Water quality tests have been conducted in 14% of the country's 20,000 bored wells, although a number are currently known to be contaminated. Actions to improve the supply and reduce the waste/leakage of water in urban areas include the introduction of meters for each apartment block in Ulan Bator (Ulaanbaatar) and a graduated, steeply rising tariff for excessive per capita consumption of water. In addition, the World Bank is supporting an emergency leak repair programme through a USD39million loan in 1996 and has financed a series of service improvements that were completed in 2001, including a new service reservoir for Ulan Bator. The ADB organised a USD8.5million aid and loan package in 1997 to provide improved water supply to 125,000 people living in informal settlements in five provincial capitals.

Water and sewerage services

In 1996, 20% of domestic and industrial effluents, or 119.2million m^3 were treated in 121 sewage treatment works, with 35million m^3 of wastewater discharged into the natural surface water without any treatment. There is no recycling of wastewater. In total, some 70% of urban sewage is treated, while domestic wastewater in rural areas is mostly discharged into the environment without treatment. The overall sewerage coverage is about 25%.

In the capital Ulaanbaatar, 90% had access to safe drinking water in urban areas and 74% to sanitation in 1995. Identified areas of concern in 1997 included an emergency leakage repair programme, allied with water metering on at least the apartment block level. Distribution losses in Ulan Bator have been estimated at 60%.

NEPAL

Water resources

In general, water availability is good, with 8.02% of available resources being abstracted in 1995. While coverage in rural areas has improved from 1.58million (11%) in 1980 to 6.95million (38%) in 1990 and 10.70million (60%) by 1994, continued urbanisation has resulted in a fall in coverage in urban areas from 0.71million (80%) in 1980 to 1.20million (75%) in 1990 and 1.33million (64%) by 1994. There are no recognised sewerage facilities.

Water management

Water policy is overseen by the Ministry of Water Resources and the Department of Water Supply and Sewerage. Water and sewerage services in urban areas are operated by the Nepal Water Supply and Sanitation Corporation (NWSSC). In rural areas, including Kathmandu Valley, water projects are carried out at the village level, with financial and technical assistance from the Asian Development Bank and various international aid organisations. The NWSSC is regarded as being seriously under funded, and is therefore having problems in maintaining its current assets, let alone expanding them. Pro Public (an environmental and human rights NGO) has brought a number of cases against the NWSSC demanding improved accountability, the elimination of alleged corrupt practices and the effective implementation of the 1992 Water Resources Act, which sets standards for drinking water quality that to date have not been met. In August 1999, a case at the Supreme Court brought by Pro Public, resulted in a ruling demanding that Nepal's Ministry of Environment set national standards for sewage and effluent levels in water. This ruling follows an earlier decision commanding the Government to ensure that sewage is treated prior to discharge into the two main rivers that flow through the Kathmandu Valley. The 1997 Environment Protection Act makes the Government responsible for setting acceptable pollution reduction targets.

The NWSSC operates in the urban areas of the Kathmandu Valley, providing water to 85% of urban areas (140,934 connections), but only 20% of urban areas are connected to its sewerage network. Total water demand in the valley is estimated at 160 Ml/day and growing at 6% per annum, but water production varies between 90-130 Ml/day according to the season. 24 hour supply is understood to be the exception, alongside distribution losses of 30-40% and a bill collection rate of 70%. The USD464million Melamchi Water Supply Project is intended to augment supplies by 0.27million m^3 per day by 2009 but has been delayed by the Maoist insurgency in the Melamchi River area.

PSP in the Kathmandu Valley

Since 1997, the World Bank has been encouraging the Government of Nepal to consider proposals for the award of a ten year management lease contract for water and sewerage services for the Kathmandu Valley. The award process was revived during 2001 alongside two acts designed to enable PSP to take place. The Drinking Water Supply Act and the Drinking Water Monitoring and Tariff Fixation Commission Act were passed in 2002.

In 2003, the Asian Development Bank (ADB) gave a USD1.4million technical assistance grant to support water and sanitation sector reform in the Kathmandu Valley, including the establishment of the National Water Supply Regulatory Board (NWSRB) and the Kathmandu Valley Water Authority, and a private sector participation scheme, this time based on an O&M contract. Japan has also provided a grant of JPY927million (USD7.57million) for improvements to the water supply system in the Kathmandu Valley. A six year, extendible O&M contract, linked to USD100million in capital spending and USD15million in loans from the ADB was prepared for the end of 2004. Five international companies expressed interest in the proposal against one for the 2002 proposal. In September 2005, it emerged that Severn Trent Water gained the Kathmandu contract, as the sole bidder after three other pre-qualified companies (Gelsenwasser, SAUR and Biwater International) withdrew their bids. The project subsequently went on ice again. The project for serving 1.5million people in the Kathmandu valley is due to proceed again in 2008, after the Asian Development Bank (ADB) approved lower costs from USD464million to USD317.3million. The ADB will provide a loan of USD137million for the project, with the Government of Nepal contributing USD90.6million. Again, the PSP status is unclear.

Sources:
Global Water Intelligence, October 2001, pp 10-11.
Asian Water, March 2004, pp 10-13.

NEW ZEALAND

Economics (2006)	
GNI per capita	USD27,250
GNI per capita (PPP)	USD27,220
GDP in Agriculture	8%
GDP in Industry	26%
GDP in Services	66%

Legislation

The Resource Management Act 1991 emphasises the intrinsic values of ecosystem biodiversity and quality as a central component in water management, with the emphasis changing from multiple-use management to environmentally sustainable management. The Ministries of Health and the Environment produce water quality guidelines and standards, with the former responsible for monitoring drinking water supplies. The Sustainable Land Management Strategy, adopted by the Government in 1996 has concentrated on agricultural impacts on water quality. The allocation of water and groundwater management systems is the current area of government concern.

Population	
2007 (million)	4.1
2020 (million)	4.4
Urbanisation in 2007	86.4%
Urbanisation by 2020	88.1%
Urbanisation by 2050	92%

Inland water quality

The Pupu Springs on the South Island have been described as possibly the clearest freshwater in the world. Their vertical clarity has been surpassed only at a few sites in Antarctic sea waters.

Good	40%
Fair/Poor	40%
Bad	20%

10-40% of New Zealand's lakes suffer from some degree of eutrophication. More than 90% of the eutrophic lakes are in the North Island and these are usually linked to agricultural run-offs.

Water Resources and Water Rights

According to the New Zealand Business Council for Sustainable Development, a significant proportion of the water rights as currently allocated will be fully used by 2012. However, between 20% and 80% of water already allocated for commercial use is not being used at any one time, having been allocated on a first-come, first-served basis. In the decade to 2007, 6% of water rights were transferred, reflecting the difficulties of transferring water entitlements under the 1991 Resource Management Act. Allowing 12-22% of water rights to more easily be transferred where they can be more effectively used would generate NZD180-330 million pa.

Source: Aqualinc Research Ltd (2008) Sustainable Freshwater Management – Towards an Improved New Zealand Approach, Prepared for the New Zealand Business Council for Sustainable Development, August 2008

Water provision

There are 1,638 community drinking water supplies, serving 85% of the population. Of these, 7% (serving 54% of the population) are considered safe, while a further 2% (serving 5% of the population) are of borderline safety. However, 19% (serving 18% of the population) have an unsatisfactorily high risk of contamination. The remaining 71% of water supplies (serving 8% of the population) have not been graded because they are in communities of less than 500 people. Approximately 15% of the population are not connected to community supplies.

Until the mid 1990s, demand for water was increasing steadily throughout New Zealand. From 1970 to 1990 the amount used by people in Wellington and Auckland increased by 25% and 32% respectively.

Since the Auckland water crisis of 1993, and the adoption of water conservation strategies, Auckland's water use has reverted to early 1980s levels or around 300L per day, 21% down on the 1988 figure of 380L per day.

Urban Data (2004)	
With improved drinking water	100%
With household drinking water	100%
With improved sewerage	95%
With household sewerage	88%
With 2^0 sewage treatment	95%

Development of sewerage services

In 1950, New Zealand had five sewage treatment plants. By 1997 there were 220, with 80% of households connected to them. Surveys in 1976 and 1981 showed that just over 60% of the population were connected to sewerage treatment plants. Around 17% of the population had their sewage discharged untreated, mostly into the sea, and around 20% were not connected to a sewerage system at all, but relied on septic tanks. In the intervening decade, the percentage connected to treatment plants is believed to have risen to about 80%, while those discharging untreated sewage are less than 5%. Some 15–20% of people probably still use septic tanks.

Freshwater	
Annual availability (1998)	327.0km³
Per capita	88,859m^3
Annual withdrawal (1991)	2.0km³
Domestic (1987)	46%
Industrial (1987)	10%
Agriculture (1987)	44%

Spending needs and infrastructure performance

While the municipal water and wastewater systems are regarded as being fairly comprehensive, much of the infrastructure is in need of replacement or rehabilitation (for example, urban non-revenue water was 16% in 2003) and wastewater treatment facilities need to be upgraded to secondary standard, along with developing a suitable storm water management system. In 2003, 9% of urban water quality was seen as unsatisfactory by the Ministry of Health and 3% was of marginal quality.

In addition, water demand is expected to rise by 20% between 2001 and 2021, along with wastewater generation increasing by 21.5%. (Source: PWC (2004) Ministry of Economic Development, Infrastructure Stocktake, PWC, New Zealand). The government believes that the water and wastewater systems need NZD5billion to be modernised in the medium term. Watercare, the Adelaide utility that serves 32% of New Zealand's urban population for water and 24% for wastewater, publishes an annual Asset Management Plan covering current capital spending and forecast capital spending for the next two decades:

Water and wastewater capex costs, 2005–2026 (NZDm)

	2005	**2006-16**	**2016-26**	**2006-26**
Water supply	42	170	215	486
Wastewater	27	698	578	1,276
Total	**69**	**868**	**793**	**1,762**

Sources: Watercare Services Limited, AMP 2006/07, 2005; Watercare Services Limited (2005) Annual Report for 2005

Groundwater	
Annual availability (1998)	198.0km³
Per capita	53,804m^3

MAJOR CITIES			
City	**2005**	**2015**	**Status**
Auckland	1,148,000	1,240,000	Partial sewerage PPP

Privatisation & PPP

New Zealand has to date adopted a somewhat ad hoc approach to privatisation and PPP. Two project-related contracts have been awarded, but the Government has stated that it is currently against privatising services for a city as a whole. It is likely that in the medium term, any further privatisations will be linked to sewerage expansion and upgrading schemes.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	**Contract**	**Company**
Pakapura District	Water and sewerage concession	United Water
Ruapehu	Water and sewerage BOT	United Water
Thames-Coromandel	Water and sewerage BOT	United Water
Wellington	Sewage treatment DBO	United Water

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
United Water	VE (France)	81,000	251,000	251,000

PAKISTAN

Economics (2006)	
GNI per capita	USD770
GNI per capita (PPP)	USD2,500
Agriculture	20%
Industry	27%
Services	53%

PSP and politics

The Government was elected in February 1997 on a mandate for encouraging the PSP of various utilities and industries under the auspices of the PSP Commission. The PSP programme was temporarily halted with the suspension of foreign aid and finance to Pakistan in May 1998 following the resumption of nuclear testing by Pakistan and India. IMF and ADB lending to Pakistan was resumed in January 1999. However, the IMF is concerned about the financial difficulties of the Water and Power Development Authority, where it believes that the Government needs to finalise restructuring plans and restart its PSP programme once economic conditions allow.

In 2003, the United Nations (UN) recommended that water needs to be priced to reflect its cost in Pakistan and to end agricultural cross subsidies. The UN said 56% of the population had access to safe drinking water and 24% had adequate sanitation. Some degree of private sector participation was called for, but no further details were given. The Pakistan government approved six water development projects worth USD1.7billion (EUR1.5billion) in September 2003.

Population	
Total 2007 (million)	152.1
Total 2020 (million)	211.7
Urbanisation in (2007)	35.7%
Urban by (2020)	42.8%
Urbanisation by (2050)	63.7%

The environment and politics

In September 2003, General Musharraf called for Pakistan's four provinces to develop an integrated plan for using water from the Indus, which flows through Sindh, the North West Frontier and Punjab, and to agree on the construction of at least two major dams on the river. This may have significant repercussions with India, which also uses the river. One site at Kalabagh is under consideration, while a feasibility study for a reservoir at Bhasha in the northern region would be completed in 2004.

A National Conservation Strategy was set out in 1992, with a ten year investment plan. The plan has been found to be poorly defined and probably over-ambitious in terms of affordability and its ease of enforcement and monitoring. The 1983 Environmental Protection Ordinance is currently under revision.

The federal Environmental Protection Agency (EPA) is seen as weak in comparison with Government departments that are seen to oppose environmental and public health related measures. The EPA in particular is lacking suitable monitoring and enforcement powers.

In 1998, an Environmental Protection Council was set up, but it does not include members of the provincial environmental protection agencies and thus has little concrete effect with regards to influencing Government policy. This is demonstrated by the fact that the Government's 1988-2003 Perspective Plan did not include environmental or public health concerns.

Urban Data (2004)	
With improved drinking water	96%
With household drinking water	49%
With improved sewerage	92%
With household sewerage	40%
With 2^0 sewage treatment	1%

Environment and public health issues

In Baluchistan province, the groundwater table is decreasing by 2-3 metres every year as a result of a prolonged 3 year drought and wasteful irrigation methods. In Sindh province, the Council of Karachi's Industrial Associations (CKIA) estimates that industries are losing production worth PKR100million (EUR2.1million) daily due to the shortage of water. In 2002, 45% of the rural population had access to clean water. In 1987, 51% of the urban population and 6% of the rural population had access to sanitation. In 2002, 38% of the population as a whole had access to piped water, but there are considerable reservations about its quality. 60% of infant mortality is understood to occur because of waterborne diseases.

City	Rawalpindi	Karachi	Lahore
Population	1,500,000	15,000,000	5,500,000
Coverage – water	85%	82%	88%
Coverage – sewerage	35%	60%	84%
Hours of supply per day	11-15	1-10	16-23
Non revenue water	30%	30%	42%
Billing collection efficiency	64%	25%	77%

Data on environmental degradation is thin. The World Bank believes that industrial effluent pollution loading increased 6-10 times between 1963 and 1988 at a time when GDP increased threefold. In 1992 there were three sewage treatment works in Pakistan, two of which were understood to be operating intermittently. 36% of groundwater resources are considered highly saline.

Freshwater	
Total (1998, km3)	248.0
Per capita (1998, m^3)	1,678
Withdrawals (1991, km3)	155.6
For domestic use (1991)	2%
For industry (1991)	2%
For agriculture (1991)	97%

Pakistan is moving towards market based approaches for abating water pollution and optimising water availability. Groundwater is free while water provision to industry and agriculture is subsidised.

Plans and priorities

The 2005 National Environmental Policy is based on the Water Sector Strategy that aims to see the sustainable management of water resources in Pakistan by 2025 through universal water provision and 80% sewerage coverage in urban areas along with all urban areas having access to treated water from 2015.

40% of water supplied to Lahore does not undergo treatment and 60% of effluents in the city receive no form of treatment. Non revenue water in Islamabad currently runs at 60%. In Karachi, wastewater connection rates are below 60% and of this, less than 30% receives any form of treatment. The sewerage system in Karachi has had little investment since 1965, but under the Karachi Master Plan 2020 the city seeks to have a 90% sewerage connection by 2020, with 100% of wastewater effluents treated.

The Pakistan Water Sector Strategy anticipates total spending of USD8billion between 2003 and 2011. 0.1% of GNP was spent on sanitation in 2004-05. It is anticipated that the private sector spending share will be 50% of the total sum outlined below.

PKR billion	
Public sector environment projects	
2000-05	7
2005-10	28
Clean Drinking Water for All	
2005-08	10
2006-07	4
Other spending	
Total allocation	120
2004-05 spend	7
2006-07 budget	9

Groundwater	
Total recharge (1998, km³)	55.00
Per capita (1998, m^3)	372
Withdrawals (1980, km³)	45.00
For agriculture (1980)	89%

The private sector and water services

The move towards a legal system based upon Shariah Law poses certain problems with regards to commercialising water provision, but this needs to be set against the condition of Pakistan's service infrastructure and the need to upgrade it. In addition, there have been recent calls by a number of Islamic scholars to recognise that the provision of water carries a monetary value. To date, the only formal PSP proposals have been for Karachi's water and sewerage services.

Companies seen

Seven firms pre-qualified in February 1998 to submit tenders for the proposed privatisation of the Karachi Water and Sewerage Company: Anglian Water International (AWG), Biwater International (Biwater), Hyder, Thames Water, International Water (United Utilities), Générale des Eaux (VE) and Suez. Biwater has been awarded one USD14million construction contract to increase and improve potable water supplies to Karachi, including two water treatment works and a pumping station serving 30% of the city.

MAJOR CITIES			
Population	**2005**	**2015**	**Status**
Karachi	11,608,000	15,155,000	PPP proposals stalled
Lahore	6,289,000	8,271,000	PPP under consideration
Faisalabad	2,494,000	3,326,000	N/A
Peshawar	1,240,000	1,669,000	N/A
Gujranwala	1,440,000	1,937,000	N/A
Rawalpindi	1,770,000	2,371,000	N/A
Multan	1,452,000	1,944,000	N/A
Hyderabad	1,392,000	1,864,000	N/A
Islamabad	1,068,000	1,854,000	N/A

In 2006 Veolia Water gained a design-build contract to develop sewage treatment facilities for the Capital Development Authority of Islamabad. The EUR25million contract involves rehabilitating the two extant facilities and the construction of a new plant and is being supported by the French government. The two extant plants have a combined PE of 135,000 and the new facility will have a PE of 200,000.

Source:

ADB – APDF (2007) Asian Water Development Outlook 2007: Country Paper – Pakistan, ADB, Manila

REPUBLIC OF PANAMA

In 1999, Biwater was awarded a 30 year BOOT concession for bulk water provision to Laguna Alta for 350,000 people in Panama City. Aguas de Panama began operating the USD25million Laguna Alta bulk drinking water plant in 2003. The 20million gallons per day facility will serve the residents of the La Chorrera, Arraijan and Capira areas, west of the Panama Canal. Laguna Alta will supply a minimum of 15million gallons per day for the first three years of the 30 year concession, and 20million gallons per day for the remaining 27 years. Biwater has built eight water treatment plants in Panama since 1982, but this is the first PSP contract in the country.

Panama City's water and sewerage services, along with other urban areas in the republic may have a PPP in due course. The Inter-American Development Bank is providing a USD45million loan for preparing the restructuring of Panama's water and sewerage services. Instituto de Acueductos y Alcantarillados Nacionales (IDAAN) is to be opened to private sector participation for financing and management, with 51% of its stock to be held by a strategic private investor for water provision and sewerage. The total loan package is for USD65million, with local funding of USD20million.

This concession will involve serving a population of over 2.7million inhabitants for the next 30 years. This will require an investment of USD50million in the first five years and another USD90million over the following 25 years. In all, around PAB21,000million will be invested during the total concession period. As a counterpart, the annual billing foreseen for the services rendered is approximately USD80million (almost PAB12,000million at the current rate of exchange and more than PAB300,000million during the entire concession). Although ten companies and consortia expressed interest in the concession and six qualified for the formal bidding process in 2000, little subsequent progress has been made.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	**Contract**	**Company**
Laguna Alta	30 year water BOOT	Biwater

Panama revived plans in 2005 to clean up the Panama Bay along with developing Panama City's sewer network. The first phase will involve designing pumping stations, a WWTW and separate drainage networks for rainwater and sewage and will focus on the older parts of Panama City, serving an area of around 500,000 inhabitants. In 2005, a USD263million plan for sewerage and sewage treatment for Panama Bay was drawn up by IDAAN with support from the IADB and the JBIC with private funding anticipated. This will cover sewerage (USD52million), bulk wastewater transport (USD43million), sewage treatment and disposal (USD156million), systems rehabilitation (USD7million) and a storm sewerage system (USD5million).

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
Biwater	Cascal (UK)	350,000	0	**350,000**

PARAGUAY

Empresa de Servicios Sanitarios del Paraguay (Essap), owned by the Paraguayan Government, is the sole provider of piped water and sewerage services in all towns and cities with populations of 4,000 people or more. Essap supplies a total of 250,000 people, chiefly in Asuncion and the surrounding towns. 42% of the population in these towns are connected to piped water, and 35% to the sewerage network. In Asuncion, the connection rates are 86% for water and 68% for sewerage. As a result, most of water provision is in fact carried out by private vendors.

Since 1997, the government has been preparing for the PSP of Essap. A national regulatory agency was set up to oversee Essap and to see how medium sized firms can support its activities through semi-independent sewerage projects. Essap is under consideration for PSP, a project supported by the World Bank since 1999. It would need to pay off the company's USD500million in debts and to mobilise finances for its belated service expansion. A standby financing facility provided by the IMF in 2003 is currently being renegotiated, on the condition that various PSP initiatives, including one covering Essap, are developed. While the IMF seeks full PSP in most cases, Essap will be allowed to develop a concessional or O&M type contract. The general aim appears to be to attract private investment towards Essap by 2008.

Paraguay's national environmental sanitation service, Senasa, is planning to spend USD26million supplying 450 communities with drinking water, sources say. Work recently began and drinking water is expected to reach residents in July. The project is a part of Senasa's USD55.7million fourth rural water supply and sanitation project land its USD17.1million small-communities drinking water supply and sanitation program. The World Bank approved a USD40million loan in 1997 for the former and the Inter-american Development Bank approved a USD12million loan in 2001 for the latter.

PERU

Economics (2006)	
GNI per capita	USD2,920
GNI per capita (PPP)	USD6,080
GDP in Agriculture	7%
GDP in Industry	34%
GDP in Services	60%

Service provision

In 1990, 49% of urban households were supplied with piped water (38% with inside taps) and 60% with sanitation, including 51% with flush lavatories. A survey of 12,314 households in urban areas found 75% had piped water and 58% had flush lavatories. The coastal cities of Peru (notably Lima) are characterised by increasingly severe water shortages due to low rainfall in their regions. In cities, 70% of connections have 10 hours of daily supply, and 20% have more than 20 hours. The water pressure in 70% of the districts does not meet the recommended standards. In 2004, 82% of urban households had their own water supplies. Sewage treatment in urban areas rose from 13% in 1997 to 22% in 2004.

Population (2004)	
2007 (million)	27.6
2020 (million)	34.2
Urbanisation in 2007	71.3%
Urbanisation by 2020	73.6%
Urbanisation by 2050	82.5%

Regulatory background

Peru has adopted legislation that supports both the private sector and decentralisation. Under this legal framework, the action of the state will be redirected from complete responsibility for water allocation and the construction and operation of water development projects to a role of mainly support and control, entrusting private users with the responsibility for managing water use. The Water Law of 1995 also allows for the marketing of water rights. The law has been influenced by the 1981 Chilean water law, which seeks to minimise the Government's role in public interest elements and to rely on regulation and market forces. Peru's Pacific Coast watersheds have been organised into five autonomous entities (Privatisation Plans table below).

Peru's congress passed a new bill amending the 1996 public water utilities (EPSs) management law in June 2006 with the aim of improving conditions for investment and to bring water rates up to date. This legislation aims to mobilise USD540million in investment in concession projects. Peru's 41 EPSs have USD1.62billion in debt, of which a third is to the former national housing fund Fonavi. The measure would forgive this public debt for the utilities to redirect this money to investing in infrastructure works.

Urban Data (2004)	
With improved drinking water	89%
With household drinking water	82%
With improved sewerage	74%
With household sewerage	67%
With 2^0 sewage treatment	10%

Sedepal

The privatisation of Sedepal, which provides water and sewerage services to 5million out of Lima's 6.67million people, was intended to be the follow-up to Aguas Argentinas. A 30 year concession contract was drawn up, with investment demands being USD600million in the first five years and USD1billion in the first ten. In preparation, 406,000 water meters were installed. Since it was first formally mooted between 1995 and 1996, it has been bitterly opposed by anti-privatisation elements. During 2004, various moves towards a partial flotation of Sedapal were made, along with attempts to outlaw private investment in the entity.

Sedepal started a PEN1.98billion (USD606million) project in late 2006 to expand Lima's water distribution to an additional one million people. This is being supported by a 15.8% tariff increase

proposed by Sunass, the utility's regulator. The Sedepal concession contract is unlikely to be developed before 2007, after a series of delays during 2006. The concession program was initially designed to improve Sedapal's commercial operations, reducing costs and facilitating mobilising funds for further investment.

Freshwater	
Annual availability (1998)	40.0km³
Per capita	1,641m³
Annual withdrawal (1990)	19.0km³
Domestic	7%
Industrial	7%
Agriculture	86%

Services in the main cities

1991	**Piped water**	**Indoors**
Lima	94%	85%
Arequipa	91%	67%
Trujillo	78%	69%

In 1998, piped water in Lima cost USD0.15-0.30 per m^3 against up to USD3.00 per m^3 for water supplied by vendors. As a result, while piped water customers use on average six times as much water, their bills are lower.

Water and sewerage coverage in Peru, 2005

2005	**Water**	**Sanitation**
SEDAPAL - Lima		
Large utilities (9)		
Medium utilities (20)		
Small utilities (16)		
Small municipalities (490)		
Urban		
National		

According to SUNASS, Peru's basic services regulator, USD3.8billion is needed to achieve full water and sewerage coverage in urban areas. Peru's Ministry of Housing and Sanitation in 2005, believes that the country needs to spend USD4.05billion to reach its 2015 urban water and wastewater treatment goals for 2015.

Service	**2005 coverage**	**2015 coverage**	**Capex cost**
Water	81%	87%	USD1.24billion
Sewerage	68%	84%	USD1.39billion
Wastewater treatment	22%	100%	USD1.13billion

According to SUNASS, Peru's basic services regulator, USD3.8billion is needed to achieve full water and sewerage coverage in urban areas. Peru's Ministry of Housing and Sanitation in 2005, believes that the country needs to spend USD4.05billion to reach its 2015 water and wastewater treatment goals for 2015.

Service	**2005 coverage**	**2015 coverage**	**Capex cost**
Water	76%	82%	USD1.48billion
Sewerage	57%	77%	USD1.46billion
Wastewater treatment	22%	100%	USD1.13billion

During the 1990s, USD200 to 400million was spent by the Government each year on expanding water and sewerage services, but this fell to about USD40-50million pa since 2000.

Sewerage in the main cities

1991	**Sanitation**	**Flush**
Lima	87%	83%
Arequipa	70%	66%

Trujillo	74%	56%

Groundwater	
Annual availability (1998)	303.0km³
Per capita	12,219m^3
Annual withdrawal (1973)	2.2 kkm³
Domestic	25%
Industrial	15%
Agriculture	60%

PSP plans

Five PSPs have been in preparation since 2000:

Company	**Connections**
SEDAPAL	1,081,000
SEDAPAR	147,000
EPS GRAU	141,000
SEDALIB	102,000
EPSEL	96,000

These PSP proposals to some extent represent a wish list, since the PSP of Sedapal remains dependent on political circumstances. In May 2002, there were violent demonstrations in Arequipa when the Government went ahead with its auction of the power utilities Egasa and Egesur.

In 2005 the Peruvian government agreed the first of 45 concessions for water and sewerage contracts. The concession award process is now set to start during the second half of 2006 with the aim of completion by mid-2007 at the time. Along with Sedepal, the main concession proposals include:

Main Concessions	**(USD)**
Piura EPS and Paita EPS	130million
Huancayo EPS	110million
Water treatment plant in Huachipa	130million
“Water for all" programme	170million

The Ministry of housing, construction and sanitation advised BN Americas (29th September 2008) that USD5billion will be invested in public-private partnerships for developing water and sanitation projects during the 2006-11 period, with the aim of providing basic services to the entire population. This includes some USD462million being invested in five potable water and wastewater treatment plants outside the Lima region by 2011 (BN Americas, 2nd October 2008).

MAJOR CITIES			
Population	**2005**	**2015**	**Status**
Lima	7,186,000	8,026,000	N/A

After submitting the only bid, Brazilian construction firm Odebrecht has won the 20-year concession to develop the Olmos water supply and hydroelectric project in Lambayeque department. Odebrecht will construct the first stage of the dam as well as the tunnel which will transport water to the irrigated areas. The project will take water from the Huancabamba River to generate electricity and help irrigate 30,000ha in the Olmos area. The Peruvian government is providing roughly half of the money for the USD140million project, and Odebrecht will supply the rest. Odebrecht’s concession only covers the first stage of the project, but once complete, the project aims to supply 2,050million m^3 pa of water, to be able to generate 600 megawatts of electricity and to irrigate more than 150,000ha for agricultural production.

Peruvian-Argentine consortium Latin Aguas Concyssa was awarded the 30 years Emfapa concession for Tumbes, Zarumilla and Contraalmirante Villar in October of 2005. In Tumbes, where water supply used to be available on average six hours a day, some areas now have 20 hours of water supply a day, while other areas with 2-4 hours of supply now have 4-8 hours a day. The consortium has increased production at Tumbes’ El Milagro water treatment works by 90%. Emfapa serves 180,000 urban customers, providing 68% and 32% water and sewerage coverage respectively.

Consorcio Agua Azul, which operates the Cono Norte (Río Chillón) concession saw profits fall by 77% in 2005 to PEN2.85million (USD855,000) due to exchange rate losses and high interest costs. Sales eased by 0.42% to PEN36.1million and operating profit fell 3.35% to PEN18.5million. Consorcio won a 27 year BOT concession in 2000 for Río Chillón, which supplies water to Sedapal. The contract may be extended to 33 years at the concessionaire's request.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	**Contract**	**Company**
Cono Norte	27 year water concession	Aqua Azul
Tumbes	30 year water & sewerage concession	Latin Aguas Concyssa

ProInversión, the state investment promotion agency is seeking bidders for a concession covering the Sedam Huancayo water utility in central Junín department. Huancayo has some 400,000 people serviced by 52,527 potable water connections and 50,722 sewerage connections. The concessionaire would have to invest some USD100million over 30 years to maintain and expand potable water and sewerage services.

Four bidders have pre-qualified for the concession of Peru's Piura and Paita basic service utility (EPS). Bidders include Argentine-Peruvian consortium Latin Aguas-Concyssa, Concesionario de Aguas de Piura (Colombia's Conalvias and Cuba's Técnica Hidráulica), Spanish-French consortium Proactiva-Medio Ambiente, and Conhydra-Odinsa, from Colombia. The water utility requires a USD130million investment, of which USD70million will be financed by a loan from the Japan Bank for International Cooperation.

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
Aqua Azul	ACEA (Italy)	800,000	0	**800,000**
LA Conc	Latin Aguas (Argentina)	180,000	80,000	**180,000**

Source:

WSP / Ministry of Housing, Construction and Sanitation (2008) Evaluation of Small-scale Providers of Water Supply and Sanitation Services in Peru. World Bank, Lima, Peru

PHILIPPINES

Economics (2006)	
GNI per capita	USD1,420
GNI per capita (PPP)	USD5,980
Agriculture	14%
Industry	33%
Services	53%

Water services

In 1980, 45% of the population had access to the water supply. In 1987, 63% had access to safe water, with 31% via piped water; 86% in Metro Manila, 55% in other urban areas and 62% in rural areas. The term 'safe' with regards to drinking water is open to debate. Just over 36% of the country's river systems were classified as sources of public water supply in 2003 and up to 58% of groundwater sampled is bacteriologically contaminated and needs treatment. Approximately 31% of illnesses monitored for a five-year period were also caused by water-borne sources. 1,000 out of each 100,000 people die each year because of diarrhoea, one of the highest known rates in the world.

Access to services	1980	1987	1993
Access to safe water	45%	63%	81%
Access to sanitation	56%	69%	72%

Sewerage services

The only major sewers cover 8% of the metro Manila area, (all discharged untreated). Small sewerage systems exist in Davao (central area population 850,000), Zamboanga (442,000), Cebu (610,000), Cauayan (340,000) and Isabela (district population 1.08million). Sanitation coverage is currently 65% rural, 85% urban. In 1980, 56% of the population had access to sewerage or septic tanks. By 1987, 69% had safe sanitation, 15% unsafe sanitation and 16% none. 52% of BOD discharged was via domestic sewage, with 48% from industrial sources.

	1994	2000
Diarrhoea morbidity	1.0%	0.4%
% access to sanitation	78.2%	93.0%
% access to safe water	87.0%	100.0%

Sewage treatment coverage

City	People served	% coverage
Metro Manila	1,010,000	8%
Bagulo City	5,300	2%
Zamboanga City	3,700	1%
Vigan City	1,360	3%
Bacolod City	2,020	1%
Cauayan, Isabela	4,000	2%
Davao City	1,161	1%

During the late 1990s and early 2000s, sanitation accounted for 3% of water related spending. Spending of PHP158billion will be required if 50% of the urban population is to have adequate sanitation services by 2015.

Population	
Total 2007 (million)	81.6
Total 2020 (million)	103.3
In urban areas (2007)	64.2%
In urban areas (2020)	72.3%
Urbanisation by (2050)	83.9%

PSP and priorities

The National Water Crisis Act (Republic Act No. 8041) was passed in June 1995. This recognised the Government's past shortcomings in water provision and is aimed at improving both the extent and quality of water provision. Sewerage remains a relatively low priority outside Manila, apart from industrial discharges that directly impinge upon drinking water quality. The Act superseded previous legislation and the Philippine Water Code (1979), whereby private customers were given the highest priority. This formed the basis for the Manila concession award process. PSP is allied with the intention of the country becoming a potential regional centre for the environmental services sector. The Government has put a higher priority on PSP for bulk water supply and sewerage, along with solid and hazardous waste management than for water distribution systems except in areas of greater shortages.

PSP has been spurred by the passing of the National Water Crisis Act and the realisation that previous plans have not begun to address public health concerns. The Philippines want ideas for technology transfer as well as straightforward projects, seeing themselves as a potential regional centre for the environmental services sector. The Philippines are keen to privatise bulk water supply and sewerage, along with solid and hazardous waste management. The Government was less keen on privatising the actual water distribution system except in areas of greater shortages. A broadly based award process for urban sewerage and bulk water provision concessions is now under way, although it is developing appreciably more slowly than when first unveiled in 2002.

Urban Data (2004)	
With improved drinking water	87%
With household drinking water	58%
With improved sewerage	80%
With household sewerage	7%
With 2^0 sewage treatment	0%

Environmental management and laws

The National Water Resources Council (NWRC) is a semi-autonomous entity under the Department of Public Works and Highways (DPWH). The DPWH is responsible for the major water and sewerage projects and also for rural services. The Metropolitan Water and Sewerage System (MWSS), serves Manila. Major cities have separate service entities, while small towns are managed via a collective organisation. The Department of Environment and Natural Resources (DENR) is responsible for implementing legislation and carries out environmental management work along with the Environmental Management Bureau (EMB). The core items of legislation are: Water Usage and Classification (1978) with revised Water Quality Criteria (issued in 1990 DENR Administrative Order No. 34). Effluent Regulations 1982 (revised 1990 DENR Administrative Order No. 35).

The Clean Water Act of 2004 (implemented in 2005) attempts to consolidate what has been a highly fragmented set of regulations. The most influential of these was the 1995 Philippine Water Crisis Act, which paved the way for the Manila concessions. The 2004 President's Priority Program on Water (P3W) runs from 2004-10 and seeks to improve access to water by 50% with an emphasis on informal settlements (ADB, 2007), with an overall water coverage of 92-96% by 2010. However, with the urban population growing by 2 million pa urban water coverage has fallen from 95% in 1990 to 87% by 2004.

Freshwater	
Total (1998, km³)	323.0
Per capita (1998, m^3)	4,476
Withdrawals (1990, km³	55.4
For domestic use (1987)	8%
For industry (1987)	4%
For agriculture (1987)	86%

Groundwater	
Total recharge (1998, km³)	180.0
Per capita (1998, m^3)	2,494
Withdrawals (1980, km³)	3.9
For domestic use (1980)	0%
For industry (1980)	50%
For agriculture (1980)	50%

Water companies noted

Biwater, United Utilities, VE and Suez are all active in the Philippines. Benpres Holdings of the Philippines, George Kent Holdings (Malaysia) and Brown & Root (USA) have all been seeking contracts, the former building on its role in the MWSS privatisation.

In August 1999, Benpres was awarded the first solicited bid outside Manila. This was a PHP70million 15 year DBO for the Laguna water system serving the town of Magdalena. Benguet Corp gained a second contract in 2005, a 25 year management contract with the Baguio Water District, Benguet to deliver 50,000m^3 per day to Baguio City in North Luzon. Benguet is using water from its former open pit in Antamok, seven kilometres from Baguio City, which acts as a reservoir and will develop and operate a dedicated water treatment plant. PHP3billion in funds is being raised for the project.

Manila Water Company has formed a consortium with Stateland Inc and Vicsal Development Corp to develop the bulk water supply in Carmen for supplying water to areas served by Metro Cebu Water District. This is a PHP2billion project for supplying an additional 46,000m^3 per day to Metro Cebu from the Luyang River in Carmen town in north Cebu province. MCWD currently supplies 153,000m^3 per day against a demand of 215,000m^3 per day.

Philippines – Local projects			
Project	**Operator**	**Population**	**Comments**
Calapan, Mindoro	Calapan Water Development Co	106,000	25 year Concession, started in 1991
Lopez-Jaena	Pamatong	25,660	Design, Build, Lease contract started in 2002
Calamba	Pamatong	281,000	Design, Build, Lease contract started in 2002

Source: Castalia (2004) Sector Note on Water Supply and Sanitation for Infrastructure in East Asia and the Pacific Flagship, Review by Castalia for the World Bank, ADB and JIBC.

MAJOR CITIES			
Population	**2005**	**2015**	**Status**
Metro Manila	10,686,000	12,917,000	MWSS (two zones)
Davao	1,327,000	1,680,000	Proposals under development

City PSP study: Manila's MWSS

The Metropolitan Water and Sewerage System (MSWW), was founded in 1972. Metro Manila is a conurbation in the true sense. The area covers 11.5million people in four cities and 37 municipalities, with the population growing at 3% each year. The population of Manila is expected to double by 2025. 40% of those within the area currently live below the World Bank's definition of the poverty line. Water coverage was 53% in the 1970s, 70% in the 1980s and 80% 1993/94. Water losses of 65% in 1986 were cut to 58% in 1991 and 56% in 1992. Some of this comes via water theft and illegal connections. The MWSS sewage system was built from 1904-11 and designed to cover 500,000 people. 11% of the population were connected to sewerage services in 1990 and 16% (828,000 in central Manila and a further 56,000 in Makat) in 1993. Sewage goes to a long sea outfall.

The PSP of MWSS was arranged by the IFC to mobilise USD6billion of investment for upgrading and expanding the water distribution system and in the longer term, to install a modern sewerage and sewage treatment infrastructure. The MWSS has been split into two zones, each taking over the existing assets, with each responsible for improving these and adding new assets. The contracts are to be run on a 25 year BOT basis. MWSS remains as a regulatory overseer for the concession holders for the life of the contracts. The IFC set the following performance targets:

Water distribution	**1998**	**2001**	**2006**
Coverage	67%	85%	100%
Water availability	**1998**	**2006**	**2006**
(Hours/day)	16	24	24
Sewerage	**1998**	**2023**	**2023**
Coverage	3%	83%	83%

The contract awards to Suez (Maynilad Water) and United Utilities (Manila Water) represent the largest water and sewerage PSP in Asia to date. Each adopted differing pricing patterns:

Operator	**PHP/m^3**	**USD/m^3**
MWSS (in 1997)	8.78	0.33
UU/Ayala (eastern)	2.32	0.09
Suez/Benpres (western)	4.97	0.19

The subsequent performance of these two contracts is examined in detail in the company entries. Following the re-nationalisation of Maynilad Water (Suez continues to hold 16% of the company), 11 companies and consortia requested the Maynilad Water re-PSP bidding documents and five formally submitted bids: DMCI Holdings Inc, & Metro Pacific Investment Corp. (Philippines), Manila Water, Marubeni Corp (Japan), Noonday Asset Management Asia Pte. Ltd (Singapore) and Karunakaran Ramchand (India). Maynilad Water was sold to the DMCI / Metro Pacific consortium – see the company entry on Metro Pacific Investments.

DMCI Holdings Inc, First Pacific Co. Ltd. (Hong Kong) and Metro Pacific Investment Corp. (First Pacific, USA)
Manila Water Co., Inc.
Marubeni Corp. (Japan)
Noonday Asset Management Asia Pte. Ltd (Singapore)
Karunakaran Ramchand (India)

MWSS is selling its 83.97% stake in Maynilad Water for at least PHP3billion (USD56million), along with the winner providing a USD30million performance bond and the assumption of USD300million in Maynilad's debt. Manila Water has been allowed to bid for Maynilad, in contrast to the 1996 process when no consortium was allowed to control more than one concession.

Manila Water – serving formal and informal communities in Manila

Metro Manila covers 11.5million people in four cities and 37 municipalities, with the population growing at 3% each year and its population is expected to double by 2025. 40% of those within the area currently live below the World Bank's definition of the poverty line. The privatisation of MWSS was arranged by the World Bank's IFC to mobilise USD6billion of investment for upgrading and expanding the water distribution system and in the longer term, to install a modern sewerage and sewage treatment infrastructure. MWSS was split into two zones, each with a 25 year BOT contract. MWSS remains as a regulatory overseer for the concession holders for the life of the contracts.

The concession for the eastern sector was awarded to the Manila Water Company (MWC) a joint venture between Ayala (Philippines) and International Water (originally Bechtel (USA) and United Utilities (UK) with Bechtel leaving in 2002) who started their concession in 1998. Since the concession started, the number of people served in the zone has increased from 3.5 to 5.0million. By 2022, it is estimated that the zone will have 8.5million people. In 2007, the concession was extended for a further 10 years to 2032.

Manila Water	**1997**	**2007**
Population	4.6 million	5.3 million
Households served	325,000	986,000
Access to water supply	58%	99%
Access to 24 hour supply	26%	99%
Staff / 1,000 connections	9.8	1.7
Billed water (MLD)	440	1,040
Non revenue water	63.0%	23.9%

All water supply targets set by the IFC have been met or exceeded to date. In March 2005, the company was listed on the Philippine Stock Exchange, 41% of the shares held by outside investors,

32% by Ayala of the Philippines, 19% by TNCs (United Utilities and Mitsubishi of Japan) and 7% by the World Bank's IFC.

The Tubig Para Sa Barrangay (TPSB) programme is designed to extend services into the barrangays (informal settlements) in the zone. It allows several poor families in depressed areas to share the cost of a single MWC water meter. By January 2008, 644 projects had completed, connecting a total of 1.3million people; 1.02million by the end of 2006 and a further 260,000 during 2007. Between 2008 and 2012, the company plans to connect a further 1.0million people in Rizal Province to the north of its central concession area. At the start of the programme in 1998, there were 39,000 cases of diarrhoea in the service area, compared with 22,000 in 2006 and 25,000 in 2006.

TPSB programme	**2000**	**2002**	**2004**	**2006**
Total household connections ('000)	401	470	556	909
TPSB connections ('000)	27	63	123	169
TPSB served population ('000)	166	383	740	1,020

Vended water typically costs PHP100 per m^3, seven times higher than that charged by Manila Water under the scheme. During 2004, a 36% reduction in infant related mortality due to diarrhoea occurred due to the improved availability of potable water in the zone. 99.6% of water supplied by Metro Manila satisfied potable water standards in 2004 and has seen a 100% compliance rate between 2005 and 2007.

Sources:
Manila Water (2005) Sustainability Report 2004
Manila Water (2006) Sustainability Report 2005
Manila Water (2007) Sustainability Report 2006
Manila Water (2008) Annual Report 2007

Maynilad Water Services (MWSI) – foreign currency exposure challenges

Suez's Maynilad Water Services, Inc. (MWSI) was awarded the western half of the Metro Manila (MWSS) water distribution concession in August 1997. MWSI is tasked to transform the operation of a 119-year old water utility into an efficient and modern water distribution system, aside from setting up sanitation and sewerage systems. MWSI is meant to supply potable water 24 hours a day to approximately 6million people in the western zone by 2007.

MWSI had suffered from a foreign exchange crisis. The problems arose when MWSI took on 90% (USD800million) of MWSS' foreign debt, which between 1997 and 2000 doubled in Peso terms from PHP20billion to PHP40billion (USD946million) due to the Peso's weakness. Although MWSI gave notice to halt the concession in March 2003, continuing arbitration and associated legal processes have meant that it continued to run under the 1997 structure. The November 2003 and April 2004 agreement would have resulted in a write-off of PHP3.8billion (USD89.8million), PHP3.2billion in equity and PHP629million in debt (USD75.7million and USD12.1million respectively) and the loss of control in MWSI.

Water services	**1997**	**2005**
Non-revenue water	60%	69%
Households served	466,000	660,000
Water production (million L/day)	1,600	2,209
Water service coverage	63%	85%

Despite the financial problems, the concession has made some progress. The 194,098 new individual household connections include 74,266 in urban poor communities. Maynilad's high non-revenue water rate is in part due to the 1996 bid documents identifying only 2,500km of pipelines in the West Zone, when there were in fact 3,700km.

On April 29, 2005, MWSI and its bank creditors, along with the MWSS executed a Debt Capital and Restructuring Agreement. As part of this, MWSS acquired 83.97% of the shares of MWSI, with Suez holding the remaining shares. In return, the creditors released it from loan obligations worth a total of USD220million. MWSS took over the operations of MWSI in January 2006 and in November 2007 they were acquired by a consortium led by DMCI Holdings Inc, and Metro Pacific Investment Corp of the Philippines. A partial flotation of Maynilad Water is planned for late 2008.

The chief difference between the two concessions had been that Manila Water enjoys a customer base underpinned by industrial and commercial customers who were in a position to ride out the challenges posed by the currency crisis of 1997-98. In both cases, it is evident that significant work has been made in terms of improving network efficiency and service coverage.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	**Contract**	**Company**
Clark EZ	Development of industrial zone services	CGE Utilities
Forto Bonifacio	Development of industrial zone services	CGE Utilities
Kailangan	15 year water services management	Benguet
Baguio	25 year bulk water provision	Benguet
Magdalena	15 year DBO for water services	Bayan Water
Manila (east)	Privatisation of MWSS	Manila Water Company
Manila (west)	Re-privatisation of MWSS	In preparation
Subic Bay	Development of services for new town	Subic Water
Carmen	Bulk water provision	Manila Water Company

Project proposals

The government continues to ponder tenders for the PHP3.7billion (USD67million) Laguna Lake bulk water supply BOT project intended to supplement Metro Manila's potable water supply. The scheme would supply at least 0.4million m^3 of potable water 24 hours a day to Metro Manila and adjoining areas.

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
Subic Water	Biwater (UK)	370,000	370,000	370,000
CGE Utilities	VE (France)	10,000	0	10,000
Bayan Water Services	Suez (France)	131,000	0	131,000
Benguet	Benguet (Philippines)	277,000	0	277,000
Manila Water Co	UU (UK) / Ayala (Philippines)	5,200,000	500,000	2,500,000
Maynilad Water	Suez (France)	4,300,000	700,000	4,300,000

Sources:

ADB – APDF (2007) Asian Water Development Outlook 2007: Country Paper – Cambodia, ADB, Manila

ADB (2007) Country Paper: Philippines. Asian Water Development Outlook, ADB, Manila

Philippines Environment Monitor 2003. The World Bank

SINGAPORE

Service provision

Effectively, all of Singapore's 4.5million people are connected to the water and sewerage system. All water and sewerage services are managed by the Public Utilities Board (Water Department). The scarcity and cost of water limits average household consumption to 168L per capita per day. Distribution losses have fallen from 11% in 1988, to 8% in 1990 to the current level of 6% since 2005. Drinking water quality is of a high standard.

99% of the population is linked to the sewerage network. Singapore has 2,000km of sewers, 122 pumping stations and six sewage treatment works (with sea outfalls). These sewage treatment works handle 90% of sewage effluents, 50% to secondary standard and 40% to primary standard. The Ministry of the Environment spent USD2.7billion on sewerage facilities between 1992 and 2003, as these facilities are expanded and upgraded to secondary and tertiary standard.

Three water treatment works are being upgraded between 2002 and 2010 at a total cost of USD107million, along with a 60million gallon per day expansion of the main plant at an additional USD115million. In addition, USD332million has been spent developing and expanding four storm water treatment and reclamation schemes. Water fees for domestic customers relate to water usage per month so as to encourage water conservation. In addition, there is a separate sewerage charge.

Water resources

Singapore remains broadly dependent on imported water from Malaysia's Johor state, with 60% of water resources piped in this way. The first water agreement with Malaysia expires in 2011 (signed with Johor state in 1961) and the second water agreement with Malaysia expires in 2061 (signed with Johor state in 1962). Malaysia is seeking to revise the 1961 agreement, which guaranteed water at USD0.008 per 1,000 gallons until 2061 to USD1.40 per 1,000 gallons or more, despite being operated by Singapore. In response, Singapore aims to reduce its dependence on Malaysia for water through a series of desalination plants and wastewater recovery schemes. Singapore believes that it can increase its internal share of water resources from 67% to 90% through a series of efficiency and recovery measures along with further desalination plants. It aims to be self-sufficient from 2061. From 2009, all lavatories will have to be dual flush models.

PUB – operating performance, 2004-06

	2004	**2005**	**2006**
Access to safe drinking water		100%	100%
100%			
Access to adequate sanitation	100%	100%	100%
Drinking water compliance	99.92%	99.94%	99.96%
Unaccounted for water (UFW)	5.0%	5.0%	4.5%
Potable water sales (000 m^3 per day)			
- Domestic	686	694	702
- Industrial	517	512	528
- Total	1,203	1,206	1,230
Water treated (000 m^3 per day)	1,369	1,352	1,399

An agreement signed by Singapore and Indonesia in 1991 allows the two countries to jointly develop a water transfer system capable 4,546,100m^3 of water per day to supply both Singapore and Indonesia. Water would be transferred via two undersea pipelines of 450kilometres between Riau's Kampar River (250km) and Bintan Island and Singapore (200km). It is likely that PSP would be involved, with Darco having taken an early interest in these proposals.

Singapore's "Water For All" policy is based on "Four National Taps" [1] local catchment, [2] imported water, [3] NEWater and [4] desalinated water. 3 reservoirs will be developed in addition to the current 14 by 2009. In addition, the proportion of water from NEWater is set to rise from 7% in 2006 to 30% by 2011 through two additional facilities. Domestic water consumption was 158L/day in 2006, down from 162L/day in 2004 and PUB aims to ease this to 155L/day by 2012.

PSP of water provision

In 2002, Singapore's Hyflux (70%) and Suez Ondeo (30%) gained a 20 year BOT contract to build Singapore's first desalination plant that will supply Singapore with 136,000m³ of water per day by 2005, 10% of Singapore's anticipated water demand of 1.25-1.36million m³ per day by that time. This is equivalent to the water needs of some 350,000 people. Ondeo subsequently sold its stake to Hyflux as part of their debt reduction strategy and this stake was sold on to Tamasek Holdings, the Government's private sector investment company.

Two PSP projects were awarded in 2005-07, covering the fourth and fifth NEWater reclaimed water projects:

The Ulu Pandan facility entered service in 2007, delivering 116,000m^3 of NEWater per day and 46,000m^3 per day of industrial water. The 20 year DBOO was awarded to Keppel Integrated Engineering in 2005.

The Changi NEWater DBOO attracted six bids, with Sembcorp Utilities offering a first year price of SED0.30 per m^3. The facility will have a 70,000m^3 per day capacity from 2009, rising to 190,000m^3 per day from 2010.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	**Contract**	**Company**
Changi	Changi NEWater, 25 year DBOO	Sembcorp
Ulu Pandan	Ulu Pandan NEWater, 20 year DBOO	Keppel
Tuas	Singspring desalination, 20 year BOT	Hyflux

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
Sembcorp	Sembcorp (Singapore)	350,000	0	
Keppel	Keppel (Singapore)	700,000	0	
Hyflux	Hyflux (Singapore)	350,000	0	

Sources

Ministry of the Environment & Water Resources (2007) Key environmental Statistics 2007, MEWR, Singapore

PUB (2007) PUB Annual Report 2007, PUB, Singapore

SOUTH KOREA

Economics (2006)	
GNI per capita	USD17,690
GNI per capita (PPP)	USD23,800
Agriculture	3%
Industry	40%
Services	57%

Sewerage and water quality

River water quality has improved since 1988: between 1994 and 1997, KRW5.6trillion (USD4.6billion) was spent on water pollution control, including the construction of 52 sewage treatment works.

Population	
Total 2007 (million)	48.1
Total 2020 (million)	49.4
Urbanisation in (2007)	81.2%
Urbanisation by (2020)	97%
Urbanisation by (2050)	96%

Management

The Environment Administration (founded 1980) was upgraded to ministerial status as the Ministry of Environment in 1990, with specific bureaux for water and sewerage opened in 1994. The Pollution Prevention Act (1963, revised 1971) was replaced by the Environmental Preservation Act in 1997, which in turn has become the framework for 24 separate Acts between 1990 and 1997, including three relating to water quality and sewerage and two for water resources management. The main legislation is contained in the Water Quality, Water Supply and Sewer Systems Acts. Green Vision 21 (1996-2005) is aimed at forming a comprehensive environmental compliance programme for the country. Water Vision 2020 (2006-20) seeks to address regional imbalances in water supply and demand, primarily through decreasing overall demand by 2.4billion m^3 pa through water management efficiency and water reuse.

Urban Data (2004)	
With improved drinking water	97%
With household drinking water	96%
With improved sewerage	N/A
With household sewerage	65%
With 2^0 sewage treatment	85%

Infrastructure plans

The Comprehensive Measures for Water Management is due to run between 1996 and 2011. A total budget of KRW90.9trillion has been allocated (USD75billion) for these projects. This includes KRW28.9trillion (USD24billion) for environmental improvements by 2005, including KRW26.9trillion (USD23billion) for the construction of 224 sewage treatment works. In addition, 43,786km of new sewage pipes are to be laid.

"Green Vision 21" was a USD68.2billion master-plan for upgrading the country's industrial and municipal environmental management between 1995 and 2005. This was followed in 2003 by a USD19billion plan which is to be completed in 2007. The government is expected to announce another long-term environmental plan, with a larger budget, that will carry on the initiatives of Green Vision 21 from 2006 to 2015. Overall spending on water pollution control was some USD6.0billion in 2004 (including industrial and O&M). Green Vision 21 aims for 95% access to piped water nationally and 80% sewerage and 80% sewage treatment by 2011, with a higher rate for urban areas.

Development of water sewerage systems

	People served (million)		System capacity 1000 gallons/day)	
	Water	**Sewerage**	**Water**	**Sewerage**
1995	38.82	24.42	22.91	11.45
1997	39.61	28.60	23.96	15.04
1998	40.19	31.10	25.70	16.62
1999	40.95	32.54	26.59	17.71
2000	47.93	33.84	26.34	18.40

The figures below are from the 1997 interim assessment.

	Piped Water	Potable Water	Sewage Treatment
1995 (actual)	83%	43%	45%
2001 (planned)	90%	85%	65%
2011 (forecast)	95%	90%	80%

It is understood that a fundamental restructuring of water supply and sewage services will take place in 2005, based on the creation of seven full water services public companies: KOWACO (national), Seoul, Pusan, Inchon, Daejeon, Daegu, and Gwangju. This aims to enable the Korean water services industry create players in the market to compete with companies active in Asia. However, institutional settings to support the restructuring are weak, with issues such as water pricing, reduction of water leakage, and systematic management of water supply still needing technical as well as institutional support.

Freshwater	
Total (1998, km³)	66.1
Per capita (1998, m^3)	2,887
Withdrawals (1992, km³)	23.7
For domestic use (1987)	26%
For industry (1987)	11%
For agriculture (1987)	63%

PSP prospects

Private sector involvement and funding in the construction of water treatment facilities was permitted in 1994. This has been extended to allow BOT contracts, including foreign companies if they work in partnership with Korean companies. VE and Suez have gained sewage treatment contracts, VE has also gained a comprehensive effluent management contract with Hyundai, its South Korean partner company. VE anticipated being involved in the construction of 26 sewage treatment works for a total of USD1billion. The two contracts signed to date involve USD344million of capital spending. While water treatment plants have yet to be privatised, this remains possible. Water treatment plants built by Degremont account for 20% of drinking water in Seoul and 80% of Busan's.

Groundwater	
Withdrawals (2005, km³)	3.7
For domestic use (2000)	48%
For industry (2000)	6%
For agriculture (2000)	45%

MAJOR CITIES			
Population	**2005**	**2015**	**Status**
Seoul	9,645,000	9,545,000	PSP under consideration
Pusan	3,554000	3,534,000	Sewage treatment PPP
Inchon	2,620,000	2,712,000	Sewage treatment PPP
Taegu	2,511,000	2,551,000	PSP under consideration
Taejon	1,453,000	1,516,000	N/A
Kwangchu	1,436,000	1,449,000	N/A
Songnam	955,000	994,000	N/A
Ulsan	1,056,000	1,097,000	N/A
P'ohang	790,000	1,275,000	N/A
Puch'on	745,000	724,000	N/A
Suwon	1,168,000	1,511,000	N/A
Ansan	984,000	2,230,000	N/A

City Study: Seoul

20million people live in Seoul and the Han River basin, accounting for nearly half of the country's population. Industrial development and population increases resulted in a consistent decline in raw water quality for the Seoul between 1990 and 1997. The 1997 Act relating to Water Resource, Water Quality Improvement and Local Resident Support in the Han River watershed was implemented to improve the quality of water entering the Paldang reservoir and the Han River, which supply 12million tonnes of water per day to the city. Wastewater treatment is to be improved from 59% to 82% by 2005 at a cost of KRW2.7trillion (USD2.3billion), partly financed by a water use charge system that aims to raise KRW200billion (USD167million) pa. In addition, the proportion of liquor and telephone taxes that are allocated to water and wastewater projects is being raised from 21% in 1997 (equivalent to USD500million pa) to 30% by 2003.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	**Contract**	**Company**
Kumdan	20 year sewage treatment BOT	VE/Hyundai (Korea)
Inchon	20 year sewage treatment BOT	VE/Hyundai (Korea)
Pusan	28 year sewage treatment BOT	Suez/Hanwha (Korea)
Yangju	24 year sewage treatment BOT	Suez/Hanwha (Korea)

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
Suez	Suez (France)	0	900,000	900,000
VE	VE (France)	0	410,000	410,000

Source:

MOCT (2007) Water Resources in Korea 2007, MOCT, Seoul

SRI LANKA

Management

In 1980, the National Environment Act (NEA) was passed and the Central Environment Agency (CEA) was formed. The CEA was given enforcing powers through an amendment of the NEA in 1988, which has been exercised since 1990. The drinking water supply system is managed by the National Water Supply and Drainage Board (NWSDB). NWSDB is run on a commercial basis and currently operates 287 water supply schemes.

Water investments and plans

The Government has set a target of total coverage by water supply and sanitation by the year 2010 through its National Programmes. This was revised to 85% access by 2010 in 2005. Water supply had reached 70% coverage by 1994, with sanitation at 50% coverage by the same time. In rural areas sanitation projects are implemented by different agencies with donor assistance, while urban areas have been somewhat neglected. 3.7million people (21%) live in the urban areas in Sri Lanka, of which an estimated half resides in the low income settlements. The infant mortality rate in these areas is between 32 to 54 per 1,000 live births, compared to the national average of 19.4%.

Proposals for new investments average USD61 per capita in the Western Region (including the capital, Colombo) which already has the highest existing sewerage coverage of 73%, whereas per capita investments in the Southern Region, for example, are proposed at USD8 per capita which presently has only a 47% coverage.

	Monthly consumption (m^3)		Monthly bill (Rs)	
	2000	**2001**	**2000**	**2001**
Greater Colombo	22.40	21.95	199.62	235.17
Regions	17.70	16.50	133.02	125.67
Average	19.67	19.15	154.27	178.95

Revenue collection started in 1982 and since the 1990s, these have been used to encourage water conservation. As a result of the progressive billing scheme, per capita daily consumption has decreased from 200L per day in 1995 to 140L in 2003 with the medium term of reducing this to 100L. Tariff collection rates between 1993 and 2001 have been between 89% and 99%.

Non revenue water, 2001	NWSDB overall	Colombo City
Leakage	23%	25%
Free supplies (standpipes)	4%	15%
Illegal connections	4%	8%
Metering errors	4%	5%
Total	35%	53%

PSP pondered

The World Bank is seeking to reform the water sector, along with private sector participation, so as to achieve the Sri Lankan Government's aim of "safe drinking water for all" by 2010. This would require an annual investment of USD200million for 10 years. In 2003, the World Bank provided a USD39.8million grant for improving access to drinking water and sanitation for 940 villages in war-affected areas of Sri Lanka. Over the past 10 years, the annual allocation has been USD100million, of which USD80million had been annually disbursed.

Private sector involvement and finance ought to be mobilised according to the World Bank, with wealthier people, who are connected to the capital Colombo's sewerage system, being made to pay the operation and maintenance (O&M) costs of a proposed new system, and not the state. In reality, this all-or-nothing approach towards PSP has probably resulted in the postponement of appropriate contracts being put into place. Instead of seeking O&M contracts for populations of 50-200,000 people, full concessions were sought in the Kalutara to Galle Coastal Strip project. As a result, while O&M contracts may be used in the medium term, concessions outside Colombo are unlikely before 2015-20. Currently, Manila Water Company (Ayala Corporation and United Utilities) is considering developing a suitable form of contract for 500,000 people in the Kalutara to Galle area, which requires some USD218million in investment. In the meantime, NWSDB is considering the potential for outsourcing leakage detection and repair services, bill collection, new water connections and fleet management.

The Water Services Reform Bill was introduced in November 2003. However, The Alliance for the Protection of Natural Resources and Human Rights challenged it in the Supreme Court, which has effectively blocked the Bill, saying that it must be approved by all provincial councils. The main opposition party, the People's Alliance (PA), is in power in six of the seven provincial councils currently functioning.

A lower key approach

The National Water Supply and Drainage Board (NWSDB) is seeking a lower key approach to involving the private sector through developing community-based, demand-driven water supplies, along with introducing cost recovery to operate and maintain the water distribution systems and finally expanding township and urban water supply delivery through public-private partnerships.

In 2004, 3,500 people living in Halgahakumbura, a tenement garden of Colombo had the management responsibility for the operation of their water supplies handed over to Petra Engineering Services Ltd. Instead of using a stand pipe for free, they pay for piped water. The private operator buys the bulk water from the NWSDB. The project has been a success to date, with strong demand to pay for the improved service. The aim is for the NWSDB to replicate what they have called the pro-poor PPP (5P) model in some of the other 1,500 tenement gardens in Colombo, which are currently served by free water.

NWSDB	**1995**	**2005**
Connections	323,000	907,622
Water supplied (million m^3 pa)	275	393
Revenue billing (SLR million)	1,524	5,839
Revenue collection (SLR million)	1,447	5,972
Funding - local (SLR million)	2,042	7,566
Funding - foreign (SLR million)	1,724	5,082

The 2005 capital expenditure was LKR12,648million, with the locally funded component accounting for some 40% of the total spent.

The 2002 Water Supply and Sanitation Policy has never been approved and the Government has since prepared new draft versions of separate national water and sanitation policies. Due to public borrowing constraints, about 50% of the funds needed in the water sector up to 2010 are expected to come from the private sector. Various forms of public-private partnership are being invited by the Government to operate, maintain and extend water sector systems.

Over the last few years, the Government has considered implementing two private sector participatory contracts to operate WSS services in the town of Negombo, north of Colombo, and along the coastal strip from Kalutara to Galle to provide 95% coverage based on private taps and to provide improved sanitation.

Funding requirements for the water sector for 2000-2010 were estimated by NWSDB at LKR85billion. Water sector funds available from the Government over that period were estimated to total only LKR45billion due to constraints imposed by the capacity for public sector borrowing. To fill the funding gap, the private sector has been invited by the Government to invest in water supply in order to mobilize long-term multilateral funds designated for the private sector. More recently, the sectoral public investment program for the 10-year period from 2006 to 2016 has been estimated at LKR135.98billion.

Sources:

ADB – APDF (2007) Asian Water Development Outlook 2007: Country Paper – Sri Lanka, ADB, Manila

Mahinda Chintana: Vision for a New Sri Lanka, A Ten Year Horizon Development Framework 2006 – 2016

MPF (2006) Discussion Paper, p. 87, Department of National Planning, Ministry of Finance and Planning, 2006.

World Bank (2006) Poverty Dimensions of Water, Sanitation and Hygiene in South West Sri Lanka, Water Supply and Sanitation Working Note No. 8, February 2006, World Bank.

TAIWAN

Economics (2006)	
GNI per capita	USD14,059
GNI per capita (PPP)	USD27,600
Agriculture	2%
Industry	23%
Services	69%

After Japan, Singapore and Hong Kong, Taiwan vies with South Korea as the most developed of the Asian economies. It also resembles South Korea in recently unveiling a cautious liberalisation programme that intends to encourage international investment in water and sewerage infrastructure development and services operation in the medium term. The first BOT infrastructure contracts of any kind were awarded in 1997, with the first such contract for bulk water provision being awarded in 2002. There are currently no plans for state sales of water concerns.

Population	
2007 (million)	22.9
2020 (million)	25.0
Urbanisation in 2007	81%
Urbanisation by 2020	N/A
Urbanisation by 2050	N/A

Organisation and regulation

The Ministry of the Interior is responsible for sewers, with the Central Government looking after the financing. The Taiwan Water Supply Corporation is in charge of overall water supply, while the Taipei City Water Supply Department looks after Taipei. The Water Resources Planning Commission reports to the Environmental Protection Administration (EPA), which in turn asks the Government for funding and advises on spending priorities. Construction is approved on a local basis. The two main items of legislation are the Water Pollution Control Act, 1974 (revised in 1991) and the Drinking Water Management Act, 1991 (revised in 1997), along with various Regulations on effluent standards passed between 1988 and 1997. The monitoring of water availability and its use is of a high quality. This reflects the potential constraints that Taiwan's water resources may impose on economic growth and rising consumer expectations.

Actual regulation was marked by a progressive relaxation of effluent limits in the mid 1990s in order to stimulate economic development. Nevertheless, the market for pollution control equipment in the country has been growing at 6-7% pa between 1996 and 1999. The EPA carries out end of pipe audits of industrial discharges. They have resulted in 11,000 fines between July 1994 and June 1998 for violations of effluent discharge limits.

Urban Data (2006)	
With improved drinking water	N/A
With household drinking water	N/A
With improved sewerage	N/A
With household sewerage	20%
With sewage treatment	40%

Water resources

3,156m³ per capita pa of water is available, of which, 28% is currently utilised. Water distribution losses are estimated at 20%. 20% of the population relies on groundwater as the primary water source. 78% of rainfall takes place between May and October. The maximum potential for sustainable water abstraction is estimated at 20billion m³ pa, without further infrastructure development. Investment in water provision and distribution accounted for 0.87% of GNP from 1953-1992.

Groundwater supplies between 21% (wet year) and 41% (dry year) of water needs. Groundwater shortage in Taipei and the city Kaohsiung affect industrial concerns as almost all the domestic water for these cities is obtained from river water. Reservoirs supply 18 – 20% of needs depending on the level of rainfall, having a total capacity of 2.1km^3.

Water demand forecasts

Water resources, supply and demand (million m^3)

	1991	**1995**	**2000**	**2001**	**2002**	**2003**	**2004**
Surface water	N/A	N/A	5,674	5,488	5,437	5,382	5,543
Ground water	N/A	N/A	12,146	12,998	13,264	12,219	12,247
Total	**17,675**	**18,919**	**17,820**	**18,486**	**18,701**	**17,601**	**17,790**
Agriculture	13,554	14,546	12,317	13,012	13,410	12,434	12,604
Domestic	2,493	2,747	3,633	3,734	3,525	3,559	3,532
Industry	1,628	1,626	1,870	1,740	1,766	1,608	1,654

Source: Statistic of Water Resources, Water Resources Agency, MEA, Taiwan, 2005

Total extraction of water was 19.5km^3 pa in 1997, and is forecast to rise to 21.2–23.0km^3 by 2036. Domestic water consumption accounted for 2.4km^3 in 1997, and is forecast to rise to 4.2–5.0km^3 by 2036, while industrial water consumption accounted for 1.7km^3 in 1997, and is forecast to rise to 2.0-3.0km^3. Use of water in agriculture is expected to be constant at 15.4km^3. These forecasts point to an excess in demand over currently sustainable resources of 1.2–.2.0km^3 per annum by 2036. While distribution losses can be reduced from their current level of 20% to perhaps 15-18%, further development of the country's reservoirs and bulk water supply network looks necessary in the longer term.

Internal renewable resources	
Total (1998, km^3)	64.5
Per capita (1998, m^3)	2,972
Withdrawals (1997, km^3)	13.5
For domestic use (1997)	13%

Development of water services

Access to piped water rose from 69.5% in 1981 to 84.2% in 1991. In 1996 water utilities in Taiwan provided 8.45million m^3 of drinking water per day to 15.33million people. Domestic usage rose from 66m^3 per capita per annum in 1977 to 121m^3 per capita per annum in 1995.

Water quality standards

Drinking water quality is assessed under Article 11 of the 1997 Drinking Water Management Statues. 15,000 samples per annum are taken. Until recently, source contamination had caused some deterioration in water quality.

Drinking water quality:

1991	98.17% pass
1995	95.72% pass
2000	98.85% pass
2002	99.67% pass
2004	99.52% pass
2006	99.54% pass
2007	99.58% pass
2008 (ytd)	99.47% pass

Over-abstraction of groundwater has resulted in saltwater ingress, while river quality has declined because of uncontrolled discharges. Under the National Environmental Protection Plan, targets are 97.68% for 2001, 98.34% for 2006 and above 99.00% for 2011.

Effluent treatment

Year	Municipal sewage	Industrial wastewater	Agricultural effluent	Total
1994	9.2%	76.3%	43.4%	**49.0%**
2000	15.9%	73.2%	64.9%	**52.5%**
2005	25.8%	77.2%	71.0%	**58.3%**
2006	30.1%	76.9%	79.6%	**62.0%**
2007	34.5%	77.3%	63.6%	**59.1%**
2001 EP	18.3%	81.0%	49.6%	**60.4%**
2006 EP	29.3%	81.8%	51.8%	**63.6%**
2011 EP	37.7%	81.8%	53.1%	**65.7%**

EP – National EP Plan targets.

Sewerage infrastructure

At a national level, 7% of sewage was treated in 1996, all of this being in Taipei. In 2007, this had increased to 15.6% nationally; 11.3% to the sewerage network and 6,8% to in-house sewage treatment systems. The EPA is aiming for 22.1% connection to sewerage in 2008, with 32% of effluents being fully treated. Taipei's main sewage treatment work offers primary treatment (5% of sewage), with the remaining 2% treated by two 20 year old secondary STWs and two small tertiary STWs. The EPA has drawn up a three-stage plan for treating up to 70% of the country's effluent load. Phase 1, covering Taipei will result in 17% of sewage being treated. The official target for Phase 2 is for 40% of sewage effluents to be treated by 2000. This is currently running some years behind schedule, with the 1998 National Environmental Protection Plan aiming for 26% of sewage to be treated by 2011 and 7% of effluents treated in 2001. The main period of construction is expected to be from 2003 to 2010. The EPA's long-term (Phase 3) aim of reaching 60-70% sewage treatment is now unlikely to be attained until 2015-20. Phase 2 includes covering Kaohsiung and 11 other areas, while Phase 3 plans to extend to Taichung (0.84million people). Phase 3 has not yet been formally approved and requires financing to be organised.

Sewage treatment plan

Phase	Cost (TWD)	Capacity (m^3 / day)
1	40billion	1.3million
2	106billion	2.2million
3	TBA	1.8 – 2.6million

Improving river water quality

Since 1998, the Bureau of Water Resources has overseen the development of five water quality protection zones. The river basins involved provide water for 14million people. The River Basin and Marine Management Plan will cost TWD147.1billion and run from 2001-11. The 1998 National Environmental Protection Plan sets river water quality targets until 2011.

Year	1996	2006	2011
Unpolluted river waters	62%	>68%	>70%
BOD reduction (t/day)	2,336	2,475	2,568

River water quality

Year	Not polluted	Lightly polluted	Moderately polluted	Heavily polluted
1994	63.3%	12.3%	11.1%	13.3%
2000	63.6%	12.0%	12.3%	12.1%
2005	64.2%	9.9%	19.7%	6.2%
2006	65.5%	9.0%	19.5%	6.0%
2007	61.8%	7.9%	23.6%	6.7%
2001 EP	>65.0%			<11.9%
2006 EP	>68.0%			<10.0%
2011 EP	>70.0%			<7.9%

Industrial effluent discharges fell by 20% from their 1987 levels in 1993 and by 85% by 2005. In 2001, 35% of rivers were of bad to fair quality.

Policy implementation

At present there are no fees for wastewater discharge. Industrial effluent has been charged since 2002, while there are no current plans to charge domestic customers.

Groundwater resources	
Total recharge (1998, km^3)	4.0
Per capita (1998, m^3)	184
Withdrawals (1997, km^3)	6.0
For domestic use (1997)	2%

Private sector opportunities

The sale of stakes in water and sewerage entities remains some years away. Sewerage is currently being considered for privatisation, probably during the next 5-10 years. Water supply is unlikely to be privatised for 10-20 years. In the meantime, the first bulk water provision privatisation award was made in 2002 to Suez.

Three BOT projects were under development in 2004:

Kaohsiung Nantzu	75,000m3 per day WWTW & sewerage system
Kaohsiung Feng Shan	58,500m3 per day WWTW & sewerage system
Taipei County Tamshui	700-750,000m3 per day industrial & domestic water treatment

MAJOR CITIES			
Population	**2005**	**2015**	**Status**
Taipei	2,473,000	2,447,000	PSP probable in the medium to long term
Kaoshiung	1,506,000	1,620,000	Suez, water treatment

City study: Taipei

Water supply and sewerage services in the metropolitan area are run by the Taipei City Water Department. All 1,189,095 households were connected to the water supply in 1993. Water use was 675million m^3 pa, with an average daily consumption of 281L per capita. The water tariff operates on a sliding scale with an average tariff of USD0.244 per m^3 with charges increasing above 10m^3 pa, with no surcharge for sewerage services. All properties are metered. Distribution losses are estimated at 24%. Seven water treatment works treat 2.74million m^3 per day, Chitan IV being completed in 2001, with a capacity of 0.5million m^3 per day. A further facility (Chitan V) will be constructed by 2011. Sewage effluents total 0.68million m^3 per day or 247million m^3 pa, 93% of which comes from domestic sewage, via 422,379 septic tanks, with the remaining 30% of the city connected to mains sewerage. By 2002, 59% of households were connected to mains sewerage.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	**Contract**	**Company**
Kaoshing	17 year water treatment BOT	Ondeo
Hsin Chu	WWTW, with 5 year O&M	Darco

In 2002 the Taiwan Water Supply Corporation awarded Suez and Ecotek (China Steel of Taiwan) a contract for the overhaul and operation of a drinking water plant in Kaohsiung. The contract is worth EUR200million, of which Ondeo Degrémont's share is EUR90million, covering equipment overhaul, building new facilities and operating the new plant for a period of 15 years. The new facility will produce 450,000m^3 of drinking water per day from March 2004. While the city has 1.5million people, the facility will also serve a further 1.5million living in outlying towns and suburbs.

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
Ondeo	Suez (France)	3,000,000	0	**3,000,000**
Darco / Leader	Darco Water Technology (Singapore)	0	300,000	**300,000**

Note: The United Nations and the World Bank does not recognise Taiwan's separate existence (while doing so for Hong Kong), so the economic and population data used is not strictly comparable with the rest of this publication. ROC Government and EPA statistics have been used (yearbooks and from their respective web sites).

THAILAND

Economics (2006)	
GNI per capita	USD2,990
GNI per capita (PPP)	USD9,140
Agriculture	10%
Industry	46%
Services	44%

Government departments and law

Thailand's first environmental law, The Enhancement and Conservation of National Environmental Quality Act was passed in 1975, creating the National Environment Board (NEB) and the Office of National Environment Board (ONEB). This act was amended twice in 1978 and 1979, transferring the supervision of the Office to the Ministry of Science, Technology and Energy. These acts had limited effect and in 1992 the 'Enhancement and Conservation of National Environmental Quality Act' (NEQA) of 1992 (B.E. 2535) was passed. This new law created three environmental organisations: the Office of Environmental Policy and Planning (OEPP), the Pollution Control Department (PCD) and the Department of Environmental Quality Promotion (DEQP). These three organisations are mandated to promote the effective implementation of policies, plans and strategies at both national and local levels as well as the enforcement of laws and regulations. In consequence, the Ministry of Science, Technology and Energy changed its name to the Ministry of Science, Technology and Environment (MOSTE). Water policy is enforced by MOSTE, which includes the Wastewater Management Authority and the Department of Environmental Quality Promotion and the Pollution Control Department.

Population	
Total 2007 (million)	63.7
Total 2020 (million)	71.0
Urbanisation in 2007	32.9%
Urbanisation by 2020	38.9%
Urbanisation by 2050	60.0%

Management

Water is managed through the Metropolitan Waterworks Authority (MWA, for Bangkok) and the Provincial Waterworks Authority (PWA, for the rest of Thailand).

Water services

2001	Produced	Sold (million m^3/day)	Connections (million)
MWA	1,415	857	1.45
PWA	704	474	3.0

USD700million is to be spent linking three rivers in eastern Thailand to provide 504million m^3 of water by 2006 and 647million m^3 by 2016, compared with current resources of 300million m^3 a day. In addition, the PWA seeks to upgrade 230 water treatment works for THB35billion (USD945million).

Urban Data 2004	
With improved drinking water	98%
With household drinking water	85%
With improved sewerage	98%
With household sewerage	0%
With 2^0 sewage treatment	12%

Water provision and pollution

The MWA served 4.5million people in Bangkok in 1991, with 79% of the city area covered. In 2001, the MWA served 6million people, or 75% of the population within its coverage area. Poor water treatment facilities mean that water has to be boiled or filtered before use and 20% of the population use bottled water instead. 31% of water is lost due to leakage. The PWA served 3.7million people in 1991, rising to 10million by 2001.

Rural water provision remains a problem, with widespread seasonal scarcity. Water shortages affected 1,369,437 families, or 6,350,356 people, in 364 districts of 44 provinces in early 1999, according to the interior ministry. This compared with shortages affecting 228,664 families or 945,425 people in 300 districts of 42 provinces in 1998.

In 1998, the Pollution Control Department found water quality in 33% of major rivers to be polluted, while 18% were in good condition.

Freshwater	
Total (1998, km^3)	110.0
Per capita (1998, m^3)	1,845
Withdrawals (1990, km^3)	33.1
For domestic use (1987)	5%
For industry (1987)	4%
For agriculture (1987)	91%

PSP plans

In July 1998, the Government announced that the PWA would launch 12 major water privatisation projects for bulk water supply, water treatment and water distribution in 10 provinces in the medium term and that further concessions for Bangkok are to be awarded. This project started in mid 1999, with the corporatisation of the PWA starting in 2000. Water competition for industrial customers was introduced in 2001, with a series of concessions from PWA gained by East Water's Universal Utilities.

Groundwater	
Total recharge (1998, km^3)	43.0
Per capita (1998, m^3)	314
Withdrawals (1980, km^3)	1.0
For domestic use (1980)	60%
For industry (1980)	26%
For agriculture (1980)	14%

Companies noted

East Water (EW) remains the only private sector company entirely devoted to water activities. In addition to its current network expansion plans, the company seeks to be involved in the new privatisation programme and is concentrating on gaining concessions in Bangkok. In 2000, it acquired Electricity Generating Plc's 70% stake in Egcom Tara, a privately held water supply company. EW also has an industrial water JV with VE. Thames Water's water provision contract to northern Bangkok was extended in 1995 to cover additional water management operations.

MAJOR CITIES			
Population	**2005**	**2015**	**Status**
Bangkok	6,5934,000	7,439,000	Partial PSP

PSP moves unsteadily forward

In July 2000, the State Enterprises Policy Committee (SEPC) rejected an application for a direct supplies concession for Thames Water and prohibited the Provincial Waterworks Authority (PWA) from offering any new private deals until the completion of a World Bank-sponsored review. The SEPC ordered the PWA to change its service concessions with Thames into turnkey construction contracts. Factories were not linked up to the privatised systems because they continued to use cheaper water from artesian wells. The PWA had already been forced to pay a private operator THO118million (EUR3.3million) compensation because of the resulting under-utilisation of the available capacity. The PWA has introduced a new method of calculating water bills by the end of the year to better reflect actual costs. PWA hopes the price increases will reduce the losses incurred from subsidising industrial water consumption and pave the way for eventual PSP. The authority also plans a nation-wide overhaul of water systems to reduce unaccounted for water levels from the current 35.6% to 25%.

In 2004, it was announced that the Government was considering an IPO of the MWA which in turn would be linked with one or more strategic partners. The PWA will meanwhile be split into four regional entities. The PWA privatisation is worth an estimated USD1billion. The MWA will be split into West and East Bangkok zones, which generated combined revenues of USD385million in 2002.

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
Egcom Tara	East Water (Thailand)	N/A	0	**N/A**
East Water	East Water (Thailand)	N/A	0	**N/A**
Pathum Thani	CH Karnchang (Thailand)	800,000	0	**800,000**
Bangkok	CH Karnchang (Thailand)	400,000	0	**400,000**
VE	VE (France)	N/A	0	**N/A**

Paying for sewerage

Domestic and business customers were charged for wastewater treatment for the first time in 2003, via a service fee. The rate was set by the Drainage and Sewerage Department: THB2 (EUR0.04) per m^3 of water for household use, THB4 (EUR0.08) for hospitals, markets, department stores and hotels, and THB8 (EUR0.16) for industrial use. Households, state agencies and state enterprises would not pay the fee for the first $10m^3$ of water each month. The cost per household was estimated at THB60 (EUR1.23) a month for treatment. The fee will be phased in over three years to minimise this, starting with THB1 (EUR0.02) per m^3 for households in the first year.

Listed water & sewerage service companies (Please see company section for details)		
Company	**Activities**	**Region**
Eastern Water	Water distribution concession	Eastern seaboard

Corporate malpractice concerns

The USD750million Samut Prakarn wastewater management project has been put on hold due to concerns about the lack of transparency. Concern has been raised about the emphasis on post hoc effluent treatment rather than concentrating on sources of industrial pollution. At the same time, the consultation process failed to meet with the Asian Development Bank's guidelines for good practice, while the operators were unable to demonstrate suitable technical capabilities.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	**Contract**	**Company**
Bangkok	30 year BOT, water distribution	CH Karnchang
East seaboard	Water provision to seven provinces	Eastern Water
Lampang	THB800million water supply project	Eastern Water/VE
North Bangkok	Water management	Thai Tap
Ratcharburi	THB690million water supply project	Eastern Water

Source:

Brown, S. (2002). Asia Water 18 (3) p 9-13.

TRINIDAD and TOBAGO

The Trinidad and Tobago Management Contract

The Water and Sewerage Authority of Trinidad and Tobago (WASA), provides water and sewerage services to the island's 1.27million people. In 1996, piped water was available for less than twelve hours a day, distribution losses were about 50% and 1% of the 240,000 customers were metered. The sewerage system served only 30% of the population. Until the mid-1980s, the government had not raised rates for fifty years and by the end of 1992, it had accumulated losses of USD800million.

Water coverage	1970	1990	1994	2000	2004
Access to improved water	93%	92%	98%	88%	91%

Source: WHO assessments, 1970-2004

In 1994 the Government decided to adopt a phased PSP strategy for the service. Since developing a concession would take too much time in the run up to the 1995 general elections, a two-phase strategy was adopted. In the first phase, WASA would contract a private operator to provide a management team to meet operational, maintenance, and investment targets and follow an agreed business plan over the term of the agreement. A management contract was chosen because of the poor quality of operational information available, undeveloped institutional arrangements and the potential for slow legislative change. Management contracts were seen to be the most flexible way of allowing the authorities to gain hands-on experience of private sector contracts in the sector. During the five years of this contract, a concession contract would be developed.

WASA, service delivery, 2001

24 hours per day	14%
5 – 7 days per week	32%
3 – 5 days per week	13%
2 – 3 days per week	18%
Less than 2 days per week	13%
Pipe but no water	4%
No pipe	6%

Source: UNDP (2005) Sharing Innovative Experiences, Vol 11, Examples of Successful Experiences in Providing Safe Drinking Water

The contract covering water supply, sewerage and sewage treatment and disposal was awarded in 1996 to a JV between Severn Trent, WASA and the Government of Trinidad and Tobago. The contract allowed for Severn Trent to negotiate a follow-on contract within a specified time limit after which it becomes open to all. The process was supported by a USD80million loan from the World Bank, designed to assist the development of conditions suitable for private sector participation.

WASA increased tariffs by 35% for customers receiving water for more than twelve hours a day so as to encourage the private sector operator to expand coverage and ensure a reliable service. The tariff increase was introduced in 1995. This timing was meant to separate the two events, to ensure that the politics of the increase would not sour the arrival of the new operator in the eyes of the public. The contract was politically contentious during its five year life, not least because there was a certain comfort to be found in providing a cheap but substandard service. The contract ended in April 1999.

In 2003, the Inter-American Development Bank supported a proposal for a 25 year concession for water and sewerage services. The contract award process has yet to be started. It is understood that this will involve an operating company with 60% of its equity being locally owned, 30% by an international company and 10% by Government employees.

UNITED STATES OF AMERICA

Economics (2006)	
GNI per capita	USD44,470
GNI per capita (PPP)	USD44,260
Agriculture (1993)	1%
Industry (1993)	22%
Services (1993)	77%

Regulatory background

The Environmental Protection Agency (EPA) implements a series of regulatory programs under the Clean Water Act (CWA) and the Safe Drinking Water Program. The Federal Water Pollution Control Act, or Clean Water Act (1948, last amended 1987) seeks to maintain the "chemical, physical, and biological integrity of the Nation's waters." Under the Clean Water Act all discharges to surface waters of the U.S. must be treated to the level of secondary treatment. The Safe Drinking Water Act (SDWA), amended 1996, requires the EPA to set standards for contaminants in drinking water, monitor drinking water quality, and carry out compliance and enforcement actions. By the mid-1980s the federal government had spent USD400billion on water resource development. From 1972 to 1998 compliance work for the Clean Water Act was supported by USD68billion in federal assistance for the construction of local wastewater treatment systems, while state and local governments contributed a further USD20billion.

US drinking water pipe classification, 1980–2020 (%)

Condition	1980	2000	2020
		(%)	
Excellent	69	43	33
Good	19	17	11
Fair	3	18	12
Poor	3	14	13
Very poor	2	2	23
Life elapsed	5	7	9

Source: US EPA 2002

Since 2001, there have been various moves to downgrade water and wastewater standards and spending priorities, for example, declining to adopt WHO drinking water standards on cost grounds. This has led to some uncertainty about the development of longer term spending plans.

Service provision

740,000 people lacked access to potable water in 1999. A USD210million project was launched in 1999 to rectify this through direct investment in suitable distribution facilities. US Environmental Protection Agency (EPA) standards were being met or exceeded by more than 90% of water utilities in the USA in 1999. These guideline standards are being revised to bring them in line with WHO standards. In Western Europe, similar compliance figures are typically in the 95-99% range. In 1994, 19% of the population (45million people) was served at some point during the year with substandard water in terms of bacterial or chemical pollution. In September 2006, the US EPA proposed that community water systems (serving more than 25 people) should seek to 91% compliance with drinking water standards by 2011 rather than their previous target of 95% by 2008. In 2005, 88% of community based water supplies met the applicable health standards.

Non-compliant water: bacterial contamination

	1993	1994	1995
Number of systems	1,000	750	400
Population (million)	12.1	10.8	9.0

Lead in drinking water has only recently become an area of concern. The proposed Lead-Free Drinking Water Act of 2005 is the first major effort to amend the SDWA in 15 years. It would require the EPA to re-examine and if necessary, revise the national safety standard for lead in drinking water,

requiring all water utilities to test for lead. After the initial test, the nation's utilities would have to test their lead levels every six months, whether they detect a problem or not. According to the EPA, 4% of utilities that serve more than 50,000 people have excessive levels of lead. The proposed law could result in spending USD500billion in 20 years to restructure the 1974 Safe Drinking Water Act and the 1991 amendments. If Congress approves the bill, USD200million will be appropriated every year for four years to help replace lead-contaminated water lines.

Population	
Total 2007 (million)	293.7
Total 2020 (million)	338.4
Urbanisation in 2007	81.4%
Urbanisation by 2020	84.9%
Urbanisation by 2050	90.4%

Water quality

Overall, 50% of the country's 2.4million kilometres of streams and an unknown percentage of the nation's groundwater are polluted to a significant degree. In 1996, 19% of the USA's3.6million miles of rivers were surveyed. 56% of the rivers in terms of river length were regarded as being of good quality and 8% of fair quality. Some form of pollution or habitat degradation impairs the remaining 36% of the surveyed river miles. Excess levels of nitrates and phosphates were noted in 14%, with high bacterial levels in 12%. Agricultural waste was noted in 25% and runoffs from municipal sewage treatment plants in 5%, with urban runoff and storm sewers affecting a further 5%. Urban sewerage and sewage treatment is generally well developed. In contrast, smaller communities have been poorly served to date and many municipally run facilities are understood to be in poor condition.

Sewage treatment development

	1982	**1984**	**1992**	**1996**
Tertiary	22.8%	27.4%	32.0%	33.0%
Secondary	25.0%	23.0%	25.0%	24.0%
Primary	14.0%	13.0%	18.0%	18.0%
Connected	64.0%	63.0%	75.0%	75.0%

According to the American Society of Engineers (ASCE), in 2003 there will be an annual shortfall of USD11billion for replacing or rehabilitating water and wastewater facilities in the United States. The overall condition and performance of the country's drinking water and wastewater systems has worsened since the previous evaluation by ACSE in 2001. Currently, the federal government spends about USD2.5billion annually for drinking water and wastewater treatment facilities. The proposed federal budget for FY 2004 includes a USD360million cut in wastewater funding, while the level for drinking water spending remains unchanged. The EPA anticipates that the percentage of the population receiving sewage treatment will increase from 66% in 1996 to about 88% by 2016.

Urban Data (2004)	
With improved drinking water	100%
With household drinking water	100%
With improved sewerage	100%
With household sewerage	95%
With 2^0 sewage treatment	80%

Market size (from various reports, 2002-04)

There is a market for operating water and sewerage services worth USD47-53billion per annum. The market for water supply to households (110million households at an average of USD300 per annum) in the USA is worth USD33billion pa. This excludes sewerage services.

US billion pa	**High**	**Low**	**Mean**
Water – O&M	32.7	25.7	29.2
Sewerage – O&M	30.8	21.4	26.1
Water – Capex	20.1	11.6	15.9
Sewerage – Capex	20.9	13.0	17.0
Total	**104.5**	**71.7**	**88.2**

Depending upon the source, replacing the USA's aging water and wastewater network and upgrading and extending treatment facilities in the United States is expected to cost USD550–1,000billion over the next 20 years. Government funding is anticipated to cover USD535billion over the next 20 years, according to the US Environmental Protection Agency Water Infrastructure Network. But as shown by the limited funds allocated since 1997, this is open to question, with the proportion of costs being covered by government funding falling from an average of 50% to an extreme of 10% in 2003. Since 2000, Government funding has resulted in a projected USD23billion pa shortfall over the next two decades. This has to be funded by municipalities, debt and innovative ways of delivering performance improvement.

Another insight is provided from the US Conference of Mayors, cited in GWI (2007). This covers water and sewer spending and revenues in 2004-05:

USDbillion	**Water**	**Sewer**
Local government revenue	37.12	31.21
State government revenue	0.19	0.04
Total revenue	**37.32**	**31.25**
Local government expenditure	45.64	35.15
State government expenditure	0.32	1.12
Total expenditure	**45.96**	**36.37**

Non-compliant water supplies

Systems Reporting Violation		**Population Affected**
Coliform bacteria	12,246	24.7m
Inadequate filtration	1,478	20.5m
Faecal bacteria	2,726	11.9m
Lead	3,641	5.0m
Nitrate	588	0.5m
Chemicals/pesticides	325	0.9m

Source: Environmental Working Group based on EPA data. US Water News January 1998.

The treatment of microbiological contaminants in water will require USD20billion, with 35% of surface water systems needing filtration equipment installation, upgrading or replacement. Water use rose from 1950 to a peak in 1980 and has declined since 1985 as various efficiency and cost accounting measures have made an impact.

Billion US gallons per day	**1980**	**2000**
Cooling water for power	210	195
Irrigation	150	137
Municipal	34	43
Other	46	33
Total	**440**	**408**

The costs of compliance

US EPA Needs Assessments and related spending forecasts for drinking water infrastructure

	USDbillion
EPA 1995 Needs Assessment	138 (166*)
EPA 1999 Needs Assessment	151 (167*)
EPA 2003 Needs Assessment	277
Water Infrastructure Network 1999 Estimate	420*
Congressional Budget Office 2002 Estimate	245 – 424*
US EPA 2002 Gap Analysis	170 – 493*

* rebased to 2003 USD value

Spending forecasts

Systems size	USDbillion
Large systems (>50,000 people)	122.9
Medium systems (3,301 – 50,000 people)	103.0
Small systems (<3,300 people)	40.0
Arsenic Rule (effective from January 2006)	0.9
Other new Regulations	9.9

These assessments cover the period 2003 to 2025. USD45.1billion is accounted for by regulatory requirements, the rest by the need to expand and enhance service infrastructure. Regulatory-driven spending currently accounts for USD35.2billion (USD30.2billion of which is accounted for by microbiological standards), plus USD9.9 billion for new regulations. These have been drawn up under the Safe Drinking Water Act (Amended 1996, SDWA), the Surface Water Treatment Rule (SWTR), the Interim Enhanced Surface Water Treatment Rule (IESWTR), and the Total Coliform Rule (TCR).

Sewerage and sewage treatment spending plans

The US need to invest an additional USD181billion for all types of sewage treatment projects eligible for funding under the Clean Water Act, according to the most recent needs survey estimate by the EPA and the individual States, completed in August 2003. The cost needed over the period from 1996 to 2016 to reach a universal level for secondary treatment (and where appropriate, tertiary treatment) has been estimated by the EPA at USD137billion. This includes USD44–63billion for treatment, USD10billion for sewer repairs and rehabilitation, USD21billion for new sewers and USD45billion to correct combined sewer overflows. In addition to the USD137billion in costs documented by the EPA, individual States estimate an additional USD34billion in wastewater treatment needs for projects that do not meet EPA criteria but, nevertheless, represent a potential demand on State resources.

US sewage treatment works upgrade costs, 2003-2025

Customers	USDbillion		Facilities	
50,000 +	58.5	43%	800	2%
3,000 – 50,000	41.4	30%	6,800	13%
Up to 3,000	37.2	27%	46,000	86%
Total	**137.1**	**100%**	**53,600**	**100%**

Source: Source: US EPA (2005) Drinking Water Infrastructure Needs Survey & Assessment, Third Report to Congress

Overall spending needs

Capital spending needs for drinking water and wastewater for 2003 until 2023 were estimated at USD492–820billion, according to the CBO. These figures mirror those recently drawn up by the US EPA at USD499–929billion. Servicing current and future debt accounts for much of this.

Freshwater	
Total (1998,km^3)	2,459.1
Per capita (1998, m^3)	8,983
Withdrawals (1998,km^3)	447.7
For domestic use (1998)	8%
For industry (1998)	65%
For agriculture (1998)	27%

Market structure

There are approximately 200,000 water supplies in the USA. 120,000 of these are point suppliers for institutions such as businesses and schools. There are 60,000 community suppliers, providing water on a regular basis to at least 15 service connections or 25 people. The American Water Works Association (AWWA) has 56,000 member companies. A great majority of these companies are highly localised in nature. Some 80% of the population is served by 24,000 municipally owned and operated water companies. While there are 6,000 private sector water systems, the great majority of these are local enterprises, having been set up to provide water to a specific locality. There are 374 entities

serving 75,000 or more people. Some 95% of private sector contracts have a turnover of less than USD1million pa, equivalent to less than 8,000 people.

Market structure for water provision

Total number of entities	**56,000**
Local systems	26,000
Government owned	24,000
Investor owned	6,000
US Market listed	11
Internationally held	4

A major private sector company may act as the ultimate holding company for a large number of individual water companies. American Water Works (RWE), the largest water company in the USA serves 879 separate communities, at an average of 8,500 people per community. 80% of water supply systems are groundwater based, while less than 10% use surface water alone. The larger companies tend to make more use of surface water. According to the EPA, 84% of the systems serving more than 75,000 people use surface water.

Water provision market structures

Structure	**Size of Operation (Population Served)**	**Number of Service Providers**	**Est. Population Served (million)**
Very Large	>100,000	350	116.3
Large	10,001 - 100,000	3,432	96.5
Medium	3,301 - 10,000	4,498	26.1
Small	501 - 3,300	14,341	20.1
Very Small	<500	31,262	5.1
Total	**100%**	**53,783**	**264.1**

Source: US EPA, 2004.

The percentage of costs recovered for drinking water varies by size of the system. In 1995, while only about 60% of the smallest systems recovered their costs, the number of profitable systems rose in the larger size categories (serving over 50,000 customers per system). Revenues for approximately 84% of publicly owned and 94% of privately owned systems covered their operating costs.

Groundwater	
Total recharge (1998,km^3)	1,514.0
Per capita (1998, m^3)	5,531
Withdrawals (1990,km^3)	110.5
For domestic use (1990)	23%
For industry (1990)	6%
For agriculture (1990)	71%

Opening the market

According to the EPA, in 1995, 34.3million people had their drinking water provided by the private sector. Their total turnover that year was USD14billion. This study has identified 22 private sector companies with a Wall Street market listing providing water and/or sewerage services to a combined total of 33.5million people. In 1998, 95% of sewerage services were in municipal hands, along with 85% of water provision in terms of the population served.

Until 1997, municipal water suppliers had several inbuilt advantages over the private sector. They enjoyed favourable tax differentials, a lower cost of capital, no need to make a profit, no penalty clauses for contract underperformance and no risk management was called for. These advantages were equivalent to a 30% cost advantage when bidding. A municipality can also bury the real costs by shifting administrative staff to other departments. The public sector finds it more challenging to compete for 10-20 year contracts, because of the need to guarantee interest rates for the longer term, while the private sector has tended to avoid seeking five year contracts in recent years.

With an allowable return on investment of 10-12%, the water sector is regarded as offering low political risk, along with slow and steady profits. Pressure to privatise is only really taking place because of

new environmental and public health standards at a time of spending constraints and a dislike of higher bills. The Presidential Executive Order 12803 of 1997 was designed to encourage private-public service partnerships, allowing the use of non-recourse taxable and tax exempt debt financing. In addition, if a STW is privatised, previous grants do not have to be repaid in full. Instead, these can be amortised. This process was first used for Cranston, Rhode Island in 1998. At the same time, the IRS announced that it would allow privatisation related operating contracts to run for up to 20 years.

Breakdown of USA water and wastewater services market, 2001

Million people	**Water**		**Sewerage**	
Regulated utilities	23.5	8.8%	0.8	0.3%
Municipal outsourcing	18.0	6.5%	21.6	7.8%
Municipal	192.8	69.5%	185.0	63.9%
Privately served	42.0	15.2%	77.4	28.0%
Total	**276.2**	**100.0%**	**276.2**	**100.0%**

Source: D A Ll Owen, company database, US EPA.

It is easier to gain a concession for sewerage than for drinking water projects, where contract awards to date have been on an O&M basis. New legislation will be needed to change this. One of the principal constraints is the use of rate of return (ROR) pricing mechanisms. With ROR, excessive investment can be called for to boost overall returns, while contract management costs are boosted by their need to be reviewed every 12-18 months. While the traditional private sector water companies tend to concentrate on water provision contracts, the majority of actual privatisations to take place since 1996 and especially since 1998 have been for sewerage and sewage treatment.

MAJOR CITIES

Population	**2005**	**2015**	**Status**
New York	18,718,000	19,876,000	Some districts with PPP
Los Angeles	12,298,000	13,095,000	Some districts with PPP
Chicago	8,814,000	9,469,000	BOO for sewage treatment underway
Washington, D.C.	4,238,000	4,613,000	PSP under consideration
Philadelphia	5,392,000	5,806,000	Some districts with PPP
San Francisco	3,385,000	3,666,000	Water construction PPP underway
Dallas	4,665,000	5,121,000	N/A
Detroit	4,034,000	4,342,000	PSP water provision
Houston	4,320,000	4,767,000	Partl PPP, United Water Resources
Boston	4,361,000	4,751,000	N/A
San Diego	2,852,000	3,110,000	PSP under consideration
Atlanta	4,304,000	4,864,000	Sewerage management PPP
Phoenix	3,416,000	3,822,000	N/A
Minneapolis	2,556,000	2,795,000	N/A
Miami	5,380,000	6,034,000	Some sewage treatment outsourcing
Seattle	2,989,000	3,289,000	Private water provision contract
Saint Louis	2,159,000	2,346,000	N/A
Tampa	2,252,000	2,481,000	DBO contract for water treatment
Baltimore	2,205,000	2,410,000	N/A
Cleveland	1,855,000	2,019,000	N/A
Pittsburgh	1,806,000	1,962,000	N/A
Riverside – SB	1,690,000	1,882,000	N/A
Denver	2,239,000	2,489,000	N/A
San Jose	1,631,000	1,781,000	N/A
Fort Lauderdale	1,471,000	1,689,000	N/A
Kansas City	1,437,000	1,576,000	N/A
Sacramento	1,550,000	1,731,000	N/A
Portland	1,810,000	2,025,000	N/A
Cincinnati	1,599,000	1,755,000	N/A
San Antonio	1,436,000	1,585,000	N/A
Milwaukee	1,361,000	1,488,000	Private-public partnership for sewage
Norfolk	1,963,000	2,329,000	N/A
Orlando	N/A	N/A	N/A

Population	2005	2015	Status
Virginia Beach	1,460,000	1,598,000	N/A
New Orleans	1,010,000	1,096,000	Sewage treatment PPP
Columbus	1,236,000	1,370,000	N/A
Indianapolis	1,387,000	1,554,000	PSP under consideration
Las Vegas	1,720,000	2,001,000	N/A
Buffalo	999,000	1,091,000	Water management PPP
Providence	1,248,000	1,374,000	N/A
Salt Lake City	943,000	1,042,000	N/A
Oklahoma City	773,000	850,000	Sewage treatment PPP
Memphis	1,053,000	1,167,000	N/A
Jacksonville	961,000	1,069,000	N/A
Louisville	924,000	1,023,000	N/A
Austin	1,107,000	1,271,000	N/A
Charlotte	946,000	1,093,000	N/A
Bridgeport-Stamford	987,000	1,103,000	N/A
Hartford	894,000	984,000	N/A
Nashville	848,000	954,000	N/A
Richmond	888,000	987,000	N/A

As there are two separate markets for PSP in the USA, it is necessary to split corporate activities into those where the assets are owned by the private sector (regulated activities) and those where they remain in municipal hands (O&M). The former has a turnover of USD100-150 per capita against USD35-40 for the latter. The tables below ranks the major players in terms of population served in both classes:

Leading regulated utilities (Y/E 31/12/2003, US million)

Company	Parent company	People served
American Water Works	American Water Works	12,400,000
United Water Resources	Suez Environnement	1,983,000
Aqua America	Aqua America	3,100,000
California Water Service	California Water Service	2,000,000
Southern California Water	American States Water	950,000
San Jose Water	SWJ Corp	1,100,000
Aquarion	McQuarrie	677,000
Utilities Inc	AIG	1,000,000
Middlesex Water	Middlesex Water	385,000
Southwest Water	Southwest Water	510,000
Connecticut Water Service	Connecticut Water Service	278,000
Artesian Water Company	Artesian Resources	250,000
Pennichuck Water	Pennichuck Corporation	130,000
York Water	York Water	171,000
Global Water Resources	Global Water Resources	110,000
Total		**25,044,000**

Numbers are below those for 2002, except where indicated, due to various companies being sold off during 2003-06.

Development of O&M and DBO outsourcing contract awards in the USA, 1997-2007

USD (million)	1997	1999	2001	2003	2005	2007
Municipal O&M	601	802	921	1,050	1,139	1,184
Industrial O&M	22	314	347	161	153	171
Total O&M	623	1,116	1,268	1,211	1,292	1,355
Municipal DBO	16	178	137	173	217	112
Industrial DBO	22	158	44	50	1	5
Total DBO	38	336	181	222	218	117
Total reported revenue	661	1,452	1,449	1,433	1,509	1,472
Other companies	99	218	217	215	226	221
Total market	**670**	**1,670**	**1,666**	**1,648**	**1,735**	**1,693**

Source: Public Works Financing, March 2003 – April 2008

As there are two separate markets for PSP in the USA, it is necessary to split corporate activities into those where the assets are owned by the private sector (regulated activities) and those where they remain in municipal hands (O&M). The former has a turnover of USD100-150 per capita against USD35-40 for the latter. The table below ranks the major players in terms of populations served in both classes:

In 1999 there were 13 companies surveyed by PWF, which had fallen to 5 by 2006 and 2007. In fact, there are 8 major active players (for example AWW could not be surveyed as it was preparing for its IPO). The percentage of such contracts being renewed by the incumbent company rose from 88% to 98% during this period. The fragmented nature of the market is highlighted by an order backlog of USD5,806million for 1,998 reported contracts in 2007. United Water acquired Aquarion Operating Services (2006 revenues USD29million) in 2007, along with Utility Service Co in 2008 (2008 revenues are forecast to be USD120million).

Leading O & M companies (Y/E 12/2007, USDmillion)

Company	Parent	Total	O&M	DBO	People served
US Filter OS	VE	438	373	64	10,500,000
United Water	Suez	216	216	0	5,250,000
OMI	CH2M Hill	193	181	12	5,000,000
AWS	AWW	175	139	36	6,000,000
Severn Trent OS	Severn Trent	99	99	0	2,715,000
Earth Tech	Tyco	135	135	0	2,145,000
Eco Resources	South West Water	120	120	0	1,440,000
Alliance Water	Privately held	20	20	0	230,000
Total		**1,297**	**1,184**	**112**	**35,645,000**

Source: Public Works Financing, March 2003, April 2008, company data.

Sources:

GWI (2007) US mayors press for private funds, GWI, July 2997, Oxford

Public Works Financing, March 2003

Public Works Financing, April 2008

URUGUAY

Economics (2006)	
GNI per capita	USD5,310
GNI per capita (PPP)	USD11,150
GDP in Agriculture	9%
GDP in Industry	30%
GDP in Services	61%

Water and sewerage services

Access to safe water in Uruguay is high by South American standards, at 88%, with 45% of water subject to treatment. Although 92% have sanitation, only 48% are linked to the sewers and the on-site sanitation is normally considered inadequate. The quantity and quality of coverage is better in the capital, Montevideo, than in the provincial towns or rural areas. Many residents have restrictions on supply during the summer months. The state owned national utility, Administración de las Obras Sanitarias del Estado (OSE) provides water and sewer services to urban areas excepting Montevideo, where it provides the water service. OSE serves 330 localities with 2.8million inhabitants with water services and 152 localities with 0.5million inhabitants with sewerage services.

Population	
2007 (million)	3.4
2020 (million)	3.8
Urbanisation in 2007	92.2%
Urbanisation by 2020	93.5%
Urbanisation by 2050	95.6%

Sewerage development

The Government's current priority is for the development of a sewerage network and suitable treatment facilities. Currently, 47million m^3 pa of effluents are treated in the city of Montevideo and a further 22million m^3 in other provincial cities. The World Bank has provided USD42million of the USD73million currently being spent on this work. In May 2003, OSE, Uruguay's state water utility, called for tenders for its USD48million modernisation and systems rehabilitation program project. This includes the construction of a water supply main in the city of Salto and the construction of a new wastewater treatment plant for Durazno. The project is partly financed by a USD27million loan from the World Bank.

Urban data (2004)	
With improved drinking water	98%
With household drinking water	97%
With improved sewerage	100%
With household sewerage	95%
With 2^0 sewage treatment	5%

Freshwater	
Annual availability (1998)	59.0km^3
Per capita	37,971m^3
Annual withdrawal (1990)	4.2km^3
Domestic	6%
Industrial	3%
Agriculture	91%

A cooling climate

In 2005, Uruguay held a referendum on water policy, where a majority was found in favour of water and sewerage services being the responsibility of the state. This vote applies to new contracts.

In 1997 Aguas de Barcelona acquired 60% of Aguas de la Costa which holds a Punta del Este concession, originally granted in 1993, which carries a 10 year optional extension from 2018. While Agbar sold its stake to the government's OSE in July 2006, its local partners (STA Ingenieros, 30%

and Benencio, 10%) are continuing to operate the concession. Aguas de la Costa serves La Barra and San Ignacio.

The Punta del Este area is principally used for upmarket tourism and leisure services. Iberdrola and C de Aguas de Bilbao Bizkaia gained a USD150million concession serving 40,000 connections in the area in 2000. The concession was revoked in 2005 in the wake of the referendum.

Groundwater	
Annual availability (1998)	23.0km^3
Per capita	7,101m^3

OSE invested USD797million on capital projects between 1990 and 2005. Capital spending has declined markedly 2001, typically running at USD5 per capita per annum since then. In 2007, OSE announced plans to increase its annual investment from USD35million pa to USD55-60million pa for the next 4-5 years, via OSE's revenues and through by multilateral banks.

MAJOR CITIES			
City	**2005**	**2015**	**Comments**
Montevideo	1,264,000	1,277,000	N/A

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	**Contract**	**Company**
Punta del Este	25 year water and sewerage concession	Aguas de la Costa

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
Aguas de la Costa	STA / Benencio (Uruguay)	100,000	100,000	**100,000**

VENEZUELA

Economics (2006)	
GNI per capita	USD6,070
GNI per capita (PPP)	USD7,440
GDP in Agriculture	5%
GDP in Industry	52%
GDP in Services	44%

A late entrant

Venezuela was opposed to the privatisation of its water and utility services long after it had become acceptable across much of Latin America. The country's water services were split into 10 regional entities and Hidrocapital in 1989. Problems in raising finance for capital projects in recent years have led the country to reconsider its position on private sector participation. An initial attempt to introduce PSP in Caracas in 1992 failed due to a lack of interested bidders. In 1996, the government announced that it needed USD1billion to upgrade water and sewerage services across the country, including USD500million for Caracas. Venezuela intended to spend USD533million on water and sewerage service upgrades in 1997, but some of this work had to be scaled back due to economic perturbations. The IADB provided USD102million for water and sewerage upgrading work in 1998. Between 1997 and 2001, a total of USD637million was in fact spent on water and sanitation projects.

International funds from oil reserves are bing used to fund USD2billion worth of public projects. The fund will allow the acceleration of some development projects already underway, such as the USD58million El Diluvio dam and the USD100million Metro de Los Teques system in Miranda state.

In 2004, Venezuela announced that it has already met its potable water millennium goal of reducing by half the number of people (based on 1990 figures) who do not have access to potable water, having attained an 88% coverage. According to the government, this goal will be reached for sewerage in 2010. The country aims to have 100% water coverage by 2015, along with 40% of sewage being treated. In total, some USD4.77billion is intended to be invested on various projects between 2003 and 2015.

In 2007, President Hugo Chávez announced that the target for universal water and sewerage coverage was being put forward to 2010. According to Chávez, potable water coverage was 93% in 2007 along with 80% sewerage coverage.

From 2007, the Ley Orgánica para el Servicio de Agua Potable y Saneamiento (the 2001 Organic Law for Services of Fresh Drinking Water and Sanitation) will devolve water and sanitation responsibilities to the municipal level, the services of which will, in theory, be provided by any of a number of agents or partnerships among them: private, public, community or NGO. The process has in fact been delayed, although approximately 20 local cooperatives have come into operation.

Population	
2007 (million)	26.1
2020 (million)	33.5
Urbanisation in 2007	93.1%
Urbanisation by 2020	95.9%
Urbanisation by 2050	97.5%

Caracas and Hidrocapital

Water and sewerage services for Caracas and the state of Miranda are provided by Hidrocapital. Hidrocapital was corporatised in 1981, and operates a 90km aqueduct serving part of the city of Caracas. The company has 340,000 customers, 64,000 of whom pay their bills, while there are some 200,000 illegal or unregistered connections. In all, some 57% of water provided by Hidrocapital is unaccounted for. Hidrocapital has gained finance for a USD50million upgrade that is to be linked to better billing. In Caracas, 76% of the population receive piped water and the sewerage network covers 53% of the population. Officially, 91% of the country's urban population has access to safe water and 97% have adequate sanitation. In 2004, 74% of the urban population had household access to piped water and 78% access to adequate sanitation.

Urban Data (2004)	
With improved drinking water	88%
With household drinking water	75%
With improved sewerage	71%
With household sewerage	61%
With 2^0 sewage treatment	20%

Hidroven

Outside Caracas, water is managed by the state's Hidroven utility. This entity has a number of affiliate companies. Comphania Hidrologicadel Lago (Hidrolago), for example serves the state of Zulia.

Freshwater	
Annual availability (1998)	846km^3
Per capita	35,002 m³
Annual withdrawal (1985)	4km^3
Domestic (1987)	44%
Industrial (1987)	10%
Agriculture (1987)	46%

PSP in Venezuela

Private sector involvement began in 1997, when FCC of Spain was awarded a four year extendable water provision concession to the city of Monagas (620,000 people). This was not renewed when it expired in 2001. Aguas de Valencia gained a 4 year water management contract for Lara state (population 1,100,000 people) worth USD20million pa in 1999. This contract ended in 2002.

Three PSP contracts have at various times since 2000 been under development. The Caracas water system may be rehabilitated under private sector management. The city had a population of 3.01 million in 1995. PSPs are also under consideration for Miranda state's Fajardo water system and Margarita Island's water and sewerage services through the award of a concession contract.

The Chavez administration is distinctly cool towards further private sector involvement, but not necessarily opposed to it.

Groundwater	
Annual availability (2000)	227km^3
Per capita	9,392m^3

Zulia state

In 2001 Tecnicas Valencianas del Agua and Colombia's Triple A gained an O&M contract with Hidrolago for the state of Zulia, including Maracaibo, Venezuela's second largest city. A total of 21 municipalities will be served, covering a population of 3.5million people. The contract is worth USD40million pa.

MAJOR CITIES			
City	**2005**	**2015**	**Comments**
Caracas	2,913,000	3,144,000	PSP under consideration
Maracaibo	2,255,000	2,911,000	O&M contract awarded
Valencia	2,451,000	3,499,000	N/A
Maracay	1,168,000	1,463,000	N/A
Barquisimeto	1,029,000	1,243,000	N/A

Private sector contracts awarded (Please see the relevant company entry for details**)**		
Location	**Contract**	**Company**
Monagas	30 year water provision concession	Proactiva
Zulia State	Water O&M	Tecvasa

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
Proactiva	VE (France)/FCC (Spain)	650,000	0	650,000

Tecvasa	Tecvasa (Spain)	3,500,000	0	3,500,000

VIETNAM

Economics (2006)	
GNI per capita	USD690
GNI per capita (PPP)	USD3,300
GDP in Agriculture	21%
GDP in Industry	41%
GDP in Services	38%

Management

The Ministry of Science, Technology and the Environment was created in 1992, with the framework Law on Environmental Protection passed in 1993 and in effect since 1994. The MOSTE's National Environmental Agency was set up in 1994. This resulted in a Country Programme for Clean Water Supply and Environmental Sanitation in 1995. The Ministry of Planning and Investment (created in 1995) has to approve all environment-related projects above a certain size.

Water losses of 45-70% were identified, in the early to mid 1990s. The recent "open door" policy has increased the pace of change by exposing companies to new markets, improved material standards and quality, and the transfer of technology. In 1994, the Ministry of Urban Construction (MUC) with the assistance of the World Bank issued an order to water companies to reduce water loss by 50% by 2005, and issued guidelines on how this should be achieved. The MUC proposed that water entities review losses, identify the loss components and calculate the cost of control, meanwhile eliminating flat rate tariffs so as to encourage water conservation. The main source of water loss is from illegal connections or illegal use, and from consumer meter under-registration. The MUD has in consequence sought to ensure that all consumers are metered along with introducing organisational changes to improve the accountability of the meter readers.

Population	
2007 (million)	82.2
2020 (million)	99.9
Urbanisation in 2007	27.3%
Urbanisation by 2020	34.7%
Urbanisation by 2050	57%

Policies and priorities

73% of urban households in 2004 had access to piped water. In the major cities, 80% of households have access to piped water or private wells. Average urban water consumption is 50-70L per capita per day. 34% of households are either connected to the sewerage system or have septic tanks. Other households either share facilities or use latrines, with 92% having adequate service in 2004.

Vietnam is seeking to spend some USD1billion on reaching 85% safe water coverage by 2010 and 100% coverage by 2020. In March 1999, a decree was passed seeking to have 60-80% of urban sewage and storm waters connected to a sewerage network by 2020, with 90-100% coverage in Hanoi, Ho Chi Minh City and other major cities and industrial zones. The Government expects this to be self-funded through payments from the public and industry. The intention is to create a series of non-profit urban drainage public service corporations. Between 1999 and 2005, the focus will be on developing storm sewerage systems for Hanoi and Ho Chi Minh City. Currently state and international investment is running at USD0.6 per capita pa against an estimated need of USD15 per capita pa. These plans are based on uniform tariffs introduced in 1999 with the long term aim of cost recovery, devolving water management to the municipal level and a more positive approach to the private sector as agreed at the 10th Party Congress in 2006. In 2004 drinking water distribution was classified as a commercial activity. Particular issues are 21-44% distribution losses in the largest cities, intermittent supplies in some cities and the need to raise investment in water from 0.6% of GDP to 1.2% of GDP for the 2010 plans (ADB, 2007).

Urban Data (2004)	
With improved drinking water	99%
With household drinking water	73%
With improved sewerage	92%
With household sewerage	14%
With sewage treatment	2%

Corporatisation: Tra Vinh

The Tra Vinh Water Supply Company (TWSC) is a state-owned enterprise owned by the Tra Vinh Provincial Government. It received AusAID funding to rehabilitate its network in the 1990s. Following its rehabilitation in 1998, the enterprise was corporatised under the 1995 Government Decree No. 14/CP on State Corporations. Despite having had no water tariff increases since 1998, TWSC has been profitable in every year since it was corporatised in 1998. It reported profits of 20% on total revenues in 2003-2004, 15 % of which was reinvested in system expansion. The company has also not received any subsidies from the government despite it having a program to assist low-income and ethnic minority households with providing loans without interest for new meters and pipes in new connections. Current plans include the introduction of a rising block tariff system which will penalise high volume users and addressing the 42% water losses from those pipes which were not rehabilitated in the 1990s.

Private sector involvement

With the exception of Hanoi and Ho Chi Minh City, current projects are mainly aid related. For example, a 10 year bulk water supply project for Hai Phong (population 570,000) has been underway since 1990, involving USD20million of ODA from Finland, along with USD5million from the Vietnamese Government. This project was extended in 1999 with a USD29million project to expand the city's water provision network between 1999 and 2002. The World Bank is also active in Vietnam, having provided a loan of USD32.5million for a USD48.5million project to expand Hanoi's water supplies (currently 100,000m^3 per day) through two new 30,000m^3 per day water treatment works along with allied water distribution systems.

Freshwater	
Annual availability (1998)	376.0km^3
Per capita	4,827m^3
Annual withdrawal (1992)	54.3km^3
Domestic (1987)	4%
Industrial (1987)	10%
Agriculture (1987)	86%

Local players emerge

In the southern province of Tien Giang, non-state water companies serve about 65% of the 1.6million inhabitants. These include private investors with borrowed capital, cooperatives investing in and managing their own systems, and user groups that have raised capital themselves.

Investment in piped water schemes in Tien Giang Province, Vietnam

State (& state subsidies)	39%
User groups	34%
Cooperatives	10%
Private investors	17%

In one case, an individual raised USD23,000 to connect 600 households with piped water in 2002-03, charging at the government rate of USD0.25 per m^3.

Groundwater	
Annual availability (1998)	84.0km^3
Per capita	1,078m^3

Setbacks for the private sector

In August 2000, the Government announced that no foreign investment would be allowed in Hanoi, while no further foreign BOT contracts would be awarded. Then in 2003, Suez withdrew from its Ho Chi Minh BOT, as part of a corporate retreat from riskier markets. Subsequently, the Asian Development Bank has indicated that it was not happy with Ho Chi Minh City's decision to seek new bids solely from Vietnamese companies for the 300,000m^3 per day Thu Duc water treatment BOT.

Private sector contracts awarded (Please see the relevant company entry for details**)**		
Location	**Contract**	**Company**
Ho Chi Minh City	20 year bulk water provision BOT	BAWT

Private sector company operations (Please see the relevant company entry for details)				
Company	**Parent company (country)**	**Population served**		
		Water	**Sewerage**	**Total**
BAWT	Salcon (Malaysia)	500,000	0	**500,000**

Since 1996, 11% of Ho Chi Minh City's water (100,000m^3 per day) has been provided through a USD38million 20 year BOT project managed by the Binh An Water Treatment Company (BAWT), a Malaysian consortium consisting of Salcon and IJM. The 1998 currency devaluation required an USD25million ADB loan to secure the project.

MAJOR CITIES			
City	**2005**	**2015**	**Status**
Ho Chi Minh City	4,164,000	5,320,000	Bulk water provision part PPP
Hanoi	4,164,000	5,320,000	PSP under consideration
Hai Phong	1,873,000	2,411,000	N/A

City study: Hanoi

The Hanoi Water Supply Company was set up in 1954 by Hanoi's Department of Transport and Public Works. In 1991, 620,000 people were served by 51,705 household connections, with a further 238,000 being served by public taps at an average ratio of one tap per 170 people. 69% of people within the city area were served with water for an average of 12 hours per day. Leakage was estimated at 53% in 1991 and drinking water was typically boiled before use.

In Hanoi, water loss is increasing (currently 160,000m^3/day) while the source is being depleted - the groundwater level is dropping by 1.0m/year. By 1994, 32% of total production was billed. The 68% of water unaccounted for comprised 43% typically referred to as distribution losses, 20% identified leakage, and 5% for the water company's own use. The volume of billed water is currently decreasing, despite the repair of 1000 leaks/year and disconnection of 2000 illegal connections each year. It is therefore assumed that the rate of increase of illegal connections is greater than the rate of leak repair. Consumer studies are seen as an immediate requirement to identify or address consumer waste, illegal connections, tariff charges, and consumer contracts. Currently, 50% of Hanoi's 200,000 customers have contracts for revenue payment. The Hanoi water sector was reorganised in early 1994 into a new company the Hanoi Water Business Company, whose business aims are to have 100% of consumers registered, all with meters and at least 85% of water costs recovered through tariff collection, supported by a 24 hour service level.

Sources:

ADB (2007) Country Paper: Vietnam. Asian Water Development Outlook, ADB, Manila

ADB – APDF (2007) Asian Water Development Outlook 2007: Country Paper – Cambodia, ADB, Manila

AusAid (2005) Water Governance in Context: Lessons for Development Assistance, AusAid, Sydney, Australia

WSP Field Notes (2004): Private Sector Engagement in Rural Water Supply in the Mekong Region: Tapping the Market

PART 3(i): COMPANY ANALYSIS

SAUR / Séché, CDC, & Axa

Société d'Aménagement Urbain et Rural (SAUR) was founded in 1933, making it the last of the major French water companies. Bouygues (see separate entry) acquired SAUR in 1984. SAUR has been associated more with small towns and rural municipalities than either Suez or Veolia Environment (VE). Bouygues sold SAUR (net of its Italian and African activities) to PAI Partners, the French private equity house in January 2005. In March 2007, PAI announced that it was to sell SAUR to Hime, a consortium comprising of Caisse des Dépôts et Consignations (33%), Séché Environnement (33%) and Axa Investment Managers (33%) for EUR1.47billion. In May 2008, CDC granted Séché an 18% option in Hime that if exercised will raise Séché's stake to 51% and paves the way for Séché to take complete ownership of Hime. Séché has a market listing in France and this would in turn allow the company to have a full market presence again.

Saur / Novasaur / Hime

Y/E (EURmillion)	2003 [1]	2004 [1]	2005 [2]	2006 [3]	2007 [3]
Net sales	1,591.6	1,570.3	309.5	1,436.0	1,472.0
EBITDA	N/A	186.6	12.7	152.0	157.0
Operating income	87.8	91.1	2.7	776.0	71.0
Pre-tax income	67.4	83.8	-5.9	N/A	N/A
Net income	-16.7	-2.5	-4.6	N/A	N/A

[1] 2003 & 2004: Y/E 31/12
[2] 2005: 3 months to 31/03
[3] 2006 & 2007: Y/E 31/12

Including long term technical assistance projects (mainly in Saudi Arabia) SAUR serves 12million people internationally with 710million m^3 per annum of water being provided.

SAUR water services revenues

SAUR (EURmillion)	2004	2005 [1]	2006 [1]	2007 [1]
Saur France	832.4	842.3	896.1	935.0
Saur International	80.6	86.3	94.5	95.0
Total	913.0	928.6	990.6	1,030.0

2004 Y/E is to 31/12, 2005, 2006 & 2007 [1] Y/E is to 31/03

The new entity, including Stereau (water engineering in France and internationally) and Coved (waste management services in France) had a consolidated turnover of EUR1.3billion in 2004. Post the divestment of the Italian and African activities, 95% of SAUR's 2007 revenues came from France (65% Saur, 21% Coved & 7% Stereau), with 78% of the groups revenues being from water.

SAUR, population served

Country	Water	Sewerage	Total
France	5,500,000	5,500,000	**5,500,000**
Argentina	1,200,000	950,000	**1,200,000**
China	3,500,000	0	**3,500,000**
Armenia	750,000	750,000	**750,000**
French Overseas Territories	359,000	14,000	**359,000**
Poland	502,000	550,000	**550,000**
Scotland	0	400,000	**400,000**
Spain	720,000	460,000	**720,000**
Total – Outside France	**7,031,000**	**3,124,000**	**7,499,000**
Global total	**12,531,000**	**8,624,000**	**12,999,000**

FRANCE

In France, SAUR provides water and sewerage services to 5.5million people, serving 6,700 communities with water supply and sewerage services through 5,700 water and sewage treatment contracts. Cise was acquired in 1997 and served approximately 3.0million people, mainly for water alone and contributed F3.2billion in 1996. Customer numbers rose by 1.5% and prices by 1.5% in 2000. In September 2000, Cise was renamed SAUR France. SAUR France was renamed Water Services in France in October 2006. Net water distribution and sanitation sales rose by 4.2% in 2006 to EUR514.9million after a 0.6% reduction in metered consumption. More than 90% of contracts up for award during 2006 and 2007 were retained. Septic tank maintenance is provided to some 1million people in 2,000 communities.

UK – Scotia Water

1999	Dalmuir, Glasgow	25 year PFI BOT	600,000, PE sewage treatment

Scotia Water (SAUR UK/Stereau (SAUR), Innisfree, Taylor Woodrow, Barr & Halcrow) constructed the replacement of Glasgow West's sewage treatment works which were built in 1904. The new Dalmuir facility offers increased effluent handling capacity and an appreciably higher degree of treatment. Stereau was paid EUR21million for hardware and SAUR receives EUR2.5million pa for the operational life of the contract.

Spain

In October 2007, SAUR sold its 33% stake in Aguas de Valencia (AgVal) to Suez Environment for EUR135million. SAUR's EMALSA and Gestagua provide water services to 720,000 people and sewerage to 460,000 people. EMALSA and Gestagua had a consolidated turnover of EUR46million and EUR30million in 2003 respectively. EMALSA is a JV run between SAUR, Endesa of Spain and the Las Palmas municipality, which provides water via three desalination plants to a total of 400,000 people and sewerage and sewage treatment for 300,000 people. Gestagua provides water to 320,000 people and sewerage and sewage treatment for 159,400 people. In 2007, the Fuengirola concession was extended for a further ten years, serving 50,000 people rising to a seasonal peak of 120,000 people.

Gdansk, Poland

SAUR Neptune Gdansk, a water and sewerage management JV with the municipality of Gdansk and Sopot, started in late 1992 and runs until 2010. The venture is charging PLN3.95/m³ (USD0.184) for drinking water and PLN3.45 /m³ (USD0.162) for sewerage services to 470,000 people in the city and 505,000 people overall. The increase in fees has been 36% below the rate of inflation. SAUR holds 50.99% of the company. Water quality has moved from 8% EU compliant in 1992 to 87% by 2000, while distribution losses have fallen from approximately 25% in 1992 to 12% in 2007, service compliance rising from 8% in 1992 to 86% in 2002-07. STWs now operate at secondary level and are to be upgraded to tertiary level standard in line with the UWWTD by 2010. The contract generated sales of PLN144million in 2007 and PLN140million in 2006, with a post tax profit of PLN5.1million and PLN4.6million respectively. Between 1999 and 2004, SNG gained ISO 9001, 18001 and 14001 certification, along with overall quality and service certification in 2006.

Armenia

2004	National	Four year O&M	750,000 water & sewerage

This contract for the Armenian Water and Sewerage Company was developed on the lines of the original Yerevan Water contract (see ACEA company entry), the management contract model is now being implemented. In 2004 SAUR was awarded a four-year management contract, supported by a World Bank loan. In 2008 a two year extension may be granted or changed to a lease contract if more appropriate at this time.

Argentina

1998	Mendoza	95 year BOT	1.14million water & sewerage

SAUR (32%), Enron (32%) and Italgas (4.5%) acquired Obras Sanitarias de Mendoza from Mendoza municipality for USD132.7million. Enron sold its stake to South Water SA of Argentina in 2004. Because of the Peso crisis revenues fell from EUR20million in 2002 to EUR18.3million in 2003 and EUR16.6million in 2004. During 1998, the billing collection rate improved from 80% to 90% as the consortium introduced more professional operations management procedures. The province has 1.6million inhabitants with 320,000 water connections serving 1.14million people. The population served by sewerage and sewage treatment has increased from 880,000 in 2001 to 950,000 by 2003. In 2006, the company had 10 water and 10 wastewater treatment works, with a capacity of 5,996L/sec (518,050m^3/day) and 3,550L/sec (302,400m^3/day) respectively. The contract was renegotiated in 2006.

West Indies and Reunion Island

Three contracts for the various French Overseas Territories.

	La Réunion	Martinique	Guadeloupe	Total
Water provision				
Connections	86,726	22,084	10,575	**119,385**
People served	260,000	68,100	31,100	**359,200**
Sewage treatment				
People served	13,500	2,618	2,425	**14,043**
Turnover (EURmillion, 2001)	**27.0**	**8.5**	**6.9**	**42.4**

China – Shanghai Fengxian SAUR Water (SFSW)

2001	Shanghai Fengxian	28 year concession	700,000 water provision

Shanghai Fengxian is a district to the south-west of Shanghai. The plant, operated by SFSW, has a production capacity of 100,000m^3/day and supplies drinking water to 700,000 people. SFSW is equally owned by SAUR International and a local investment company, and is involved in leakage loss detection across the district's distribution network. Under current conditions, the 28-year contract has aggregate sales of approximately EUR84million and generated sales of EUR7million pa. SAUR sold 50% of its stake in Shanghai Fengxian SAUR Water (SFSW) for EUR5.5million in 2006. These had a book value of EUR5.6million at the time.

1996	Harbin	28 year BOT and O&M	2,800,000 water provision

This is a 0.225million m^3/day water treatment plant construction plus management project, which is being operated jointly with the Harbin Water Company. Harbin has a total population of 2.8million. In 1999, Harbin SAUR Water was the first company in the Chinese water sector to be awarded ISO 9000 certification by an international organisation.

Contact Details

Name: SAUR
Address: Atlantis, 1 av Eugene Freyssinet, 78064 St-Quentin-en-Yvelines Cedex, France
Tel: +33 1 30 60 22 60
Web: www.saur.com
www.osm.com.ar
www.gestagua.es
www.sng.com.pl

Joel Seche (Chairman of Hime, President of SAUR)
Oliver Brousse (MD, Hime & SAUR)
Patrick Barthelemy (Deputy CEO, SAUR France)

SUEZ ENVIRONNNEMENT SA

Suez Environnement SA is the second largest water and wastewater company in France, but remains the world's leading international player in terms of the number of people served through its water and wastewater operations. The company has gained many of its contracts via contacts made through the water and sewerage engineering design and build projects carried out by its Degrémont subsidiary. Degrémont is currently operating in 40 countries and has worked in 70 countries over the past 30 years. Suez believes that 1billion people receive drinking water from its treatment plants, including 20% of China's urban population. Since 2003, Suez has reversed its expansion strategy, partly in order to ease its debt burden. Some contracts have been sold and others handed back, especially in developing economies. Suez is continuing to expand in Europe, North America, India and China. After the merger of Suez and Gas de France (GDF Suez) Suez sold 65% of its water and waste management activities in July 2008, 12% to a group of long term holders and 53% to private and institutional investors. This is the third time that the company has in essence been a water and waste management entity – Lyonnaise des Eaux (to 1990, then a merger with Dumez), Lyonnaise des Eaux (1993-97, then a merger with Suez) and Suez Environnement (2008-).

Suez Environnement, profit and loss account

Y/E 31/12 (EURmillion)	2005	2006	2007
Turnover	11,092.0	11,446.6	12,034.1
EBITDA	1,911.8	1,985.4	2,103.6
Operating income	999.8	1,060.4	1,061.4
Net income	659.4	573.8	491.7
Earnings/share (EUR)	1,35	1.17	1.00
Dividends/share (EUR)	N/A	N/A	N/A

Société Lyonnaise des Eaux et de l'Eclairage was founded in 1880, making it the third oldest private sector water company in France. Major contract gains at the outset included Cannes (1880), Barcelona (1881), Dunkirk (1902) and Casablanca (1914). In turnover terms, the company was traditionally one of the smaller French multi-utility service and construction companies. This has been changed by the mergers carried out in 1990 and 1997, the former with Dumez SA of France (construction) and the latter with Compagnie Financiere Suez SA of Belgium (power and waste management). The former was to ensure that La Lyonnaise was too large for Bouygues SA to bid for and the latter to create a multi-utility at least equal to VE, its traditional rival.

Suez-Highlights

1880: Société Lyonnaise des Eaux et de l'Eclairage founded
1914-46: Activities in Morocco, Tunisia, Togo, Congo & New Caledonia
1939: Degrémont founded
1947: Electricity activities in France nationalised
1958: 300,000 subscribers in France
1972: Acquisition of Degrémont
1980-90: Enters Spain, UK & USA for water provision
1990: Merger with Dumez SA
1991: Acquisition of SDI
1996: Acquisition of Northumbrian Water Plc for F7.4billion
1996: Buys out Eau et Force SA
1997: Merger with Compagnie Suez
1997: Buys out Degrémont SA
1998: Acquisition of Browning Ferris International
1999: Acquisition of Nalco and Calgon, buy back of Browning Ferris's stake in SITA
2000: Lyonnaise des Eaux organised into three divisions
2001: S-LDE renamed Suez, LDE renamed Ondeo
2002: Creation of Environmental Division (Ondeo and SITA)
2003: Partial divestment of Northumbrian, other contracts handed back, Calgon sold
2004: Partial divestment of EMOS, Puerto Rico contract handed back, Nalco sold
2005: Rest of Northumbrian sold
2006: Contracts closed in Argentina, Brazilian activities sold
2007: AISA contract ends in Bolivia, expansion in USA, MENA, India & China
2008: Suez Environnment spun off from Suez, acquires Agbar & AgVal stake

From 1914 to 1946, Société Lyonnaise des Eaux provided water services in Morocco, Tunisia, Togo, Congo and New Caledonia. These were nationalised in 1946. In 1972 the company sought to re-enter the international market through the acquisition of Degrémont. Contracts and acquisitions were gained in Spain, the UK and USA between 1980 and 1990, along with the acquisition of SDI in France in 1991. By 1993, the company served 40million people (25.5million outside France). Since then, Suez has increased its international activities fourfold, through major contract gains, the 1996 acquisition of Northumbrian Water Plc, the acquisition of Aquas Andinas in Chile and acquisitions in the USA.

In 2008, Suez Environnement also attained overall ownership of Agbar (see company entry) jointly with Caxia Holding of Spain. This cements a relationship that started in 1991. This has been enhanced by Suez Environnement acquiring SAUR's 33% holding in Aguas de Valencia (see company entry in the 2007 Yearbook).

Prior to the merger with Suez, Lyonnaise des Eaux had some 860 subsidiaries, reflecting the complexity of operating a utility via a large number of local contracts built up through contract awards and acquisitions. Compagnie Financiere Suez SA has been of more strategic importance with regard to power (Tractabel & Electrabel) and waste management (Watco) than the water markets. Some small contracts, supplying water to 300,000 people have been integrated into Suez's portfolio of international contracts. The table below outlines Suez's breakdown of the global population served and its main contract gains since 1984.

Year	Million	Contract gains and acquisitions	
1984	33	0	France & Spain only
1985	34	1	Macao
1986	34	1	Natal (South Africa, O&M)
1987	34	2	Warsaw (USA)
1988	36	1	Essex & Suffolk Water Plc (UK)
1989	36	2	Montecatini Terme (Italy) & Taiping, (Malaysia)
1990	36	0	There were no contract gains this year
1991	36	4	Fiestole (Italy), Gibraltar & Edmonton (Canada)
1992	37	11	South Africa (O&M), USA, Italy, China & Malaysia
1993	47	10	South Africa (O&M), USA, Argentina, Mexico, Germany & Malaysia
1994	53	11	USA, Czech Republic, Mexico & Hungary
1995	55	9	Czech Republic, Hungary, China, Brazil & Colombia
1996	57	16	USA, Colombia, Northumbrian Water Plc (UK), Germany, Australia
1997	82	17	USA, Bolivia, Colombia, Argentina, Morocco, Hungary, Turkey, China, Indonesia & Philippines
1998	89	16	USA, Colombia, Uruguay, Germany, China, Indonesia & Australia
1999	100	16	USA, Mexico, Chile, Germany, Norway, Slovakia & Italy
2000	108	10+	United Water (USA), Chile, China, Cameroon, Brazil, Germany & Korea
2001	110	5+	Korea, China, Chile, Ireland
2002	131	25+	Taiwan, Canada, China, Mexico, Puerto Rico, Jordan, USA
2003	121	3+	Italy
2004	117	5+	Mexico, Russia, China
2005	115	5+	Australia, Morocco, Algeria
2006	110	4+	Saudi Arabia, China, Oman, Spain & USA
2007	112	7+	China, Aguas de Barcelona (Spain), Egypt, India & USA
2008	117	4+	Aguas de Valencia (Spain), Earth Tech (USA)

International water and wastewater services accounted for 30% of consolidated water services turnover in 1994 and 1995, rising to 65% by 2001. International activities contributed at least 75% of the water services' net earnings in recent years, but have fallen back since 2001 due to the Peso crisis and the divestment of various activities. In consequence, international activities accounted for 26% of water revenues in 2004.

The 2005-12 development plan calls for 'highly selective' expansion outside its core markets, which are identified as Europe, the USA and China.

Suez, water and sewage services

Service	Measure	2005	2006	2007
Water provided	Million m^3 pa	4,218	4,406	5,036
Sewage/effluent treatment	Million m^3 pa (2^o / 3^o)	2,153	2,271	2,603
Water coverage	Network Length (km)	175,419	178,678	197,555
Sewerage coverage	Network Length (km)	74,341	76,408	81,745
Water facilities	Number of treatment works	1,128	1,389	1,729
Wastewater facilities	Number of treatment works	1,452	1,4563	1,597

The increase in 2007 reflects the acquisition of Bristol Water (c/o Agbar) and the Perth, Chongqing, Changsu and Algiers contracts entering service.

Suez Environnement, segmental revenues, EBITDA & operating income

Y/E 31/12 (EURmillion)	2005	2006	2007
Revenues			
France	4,230	4,454	5,244
Rest of Europe	4,224	4,556	5,022
International [1]	2,638	2,437	1,738
European Water Services	3,646	3,828	3,917
European Waste Services	4,570	4,945	5,558
International	2,957	2,750	2,645
Other	45	37	36
Intercompany	-127	-113	-122
Total	**11,092**	**11,447**	**12,034**
EBITDA			
European Water Services	772	784	840
European Waste Services	731	844	905
International	434	402	395
Other	-25	-45	-36
Total	**1,912**	**1,985**	**2,104**
Operating income			
European Water Services	534	473	541
European Waste Services	583	399	442
International	198	298	259
Other	-41	-14	-52
Total	**1,274**	**1,155**	**1,189**

Aguas Andinas is consolidated within Agbar and thus is reported in Rest of Europe

In 2004, the water and waste management activities were again regrouped into the current format. Ondeo Industrial Solutions (OIS) was incorporated into European Water Services in 2004. Lyonnaise des Eaux generated revenues of EUR2,630million in France during 2004. Degremont's revenues in 2004 were approximately EUR825million, and water revenues outside Europe accounted for approximately EUR1,500million in 2004.

Suez Environnement, water activity contributions to group turnover

Y/E 31/12 (EURmillion)	2007
Degremont	**954**
- Design & Build	63%
- Operating services	18%
- Equipment	15%
- BOT contracts	4%
France	**1,900**
- Drinking water production	49%
- Wastewater collection & treatment	24%
- Other services	15%
- distribution plant & networks	12%
Agbar	**757**
- Spain	62%
- Rest of the world	38%
Germany	**49**
Central & Eastern Europe	**41**
USA	**422**
- Regulated	62%
- Unregulated	38%
China	**154**
Indonesia	**72**
Morocco	**461**
- Water	19%
- Wastewater	5%
Ondeo Industrial Services	**145**
Safege	**72**

2003 to 2007's years of consolidation: activities ceased

2003	Location	Contract	Population served
Canada	Halifax	Wastewater O&M	380,000
UK	England	Northumbrian Water Plc	6,296,000
USA	Atlanta	Water O&M	2,000,000
Vietnam	Thu Duc	Bulk water BOT	1,000,000
Total			**9,676,000**

2004	Location	Contract	Population served
Colombia	Bogota	Wastewater BOT	1,500,000
Puerto Rico	Puerto Rico	Water & wastewater O&M	3,900,000
Total			**5,400,000**

2005	Location	Contract	Population served
Argentina	Santa Fe	Water & wastewater BOT	1,830,000
Total			**1,830,000**

2006	Location	Contract	Population served
Argentina	Córdoba	Water & wastewater BOT	1,270,000
Argentina	Buenos Aries	Water & wastewater BOT	7,900,000
Brazil	Limeira	Water & w'water concession	1,656,000
Brazil	Manuas	Water & w'water concession	1,656,000
Total			**10,726,000**

2007	Location	Contract	Population served
Bolivia	La Paz	Water & wastewater BOT	1,400,000
Philippines	Manila	Water & wastewater BOT	3,800,000
Total			**5,200,000**

Overall, exit strategies have differed. The Halifax contract was handed back to the municipality and subsequently re-emerged in a different form, while in Puerto Rico and Atlanta the contract was terminated by mutual consent. The Vietnam contract ended after a perceived change in strategy by the Government. Suez sold its holding in Northumbrian Water (Ondeo Services UK) in two stages in order to deconsolidate NWL's EUR3.1billion net debt and sold its activities in Brazil to a local investor. Bogota unilaterally ended the Saltire contract. Suez ended the La Paz/El Alto contract due to local political pressure, with the Buenos Aries and the Aguas de Santa Fe concessions being handed back while the Córdoba concession was sold to a local investor. Despite various problems, the Jakarta and Manila contracts continue to be operated by Suez, although they currently remain under active review.

In Europe, the emphasis is currently on organic growth and gaining contracts in Central and Eastern Europe (where EU subsidies can be mobilised). The three priority markets in Central and Eastern European are the Czech Republic, Hungary and Slovakia.

In September 2003, Suez Ondeo sold Ondeo Nalco to a US based consortium of the Blackstone Group, Apollo Management L.P., and Goldman Sachs Capital Partners for USD4.35billion. Nalco and Calgon were acquired for USD4,157million and USD406million respectively in 1999.

The company's Compass programme aims for organic revenue growth of 5% per annum between 2008 and 2010 and 2% revenue growth through tuck-in acquisitions. EUR4.5billion has been apportioned for acquisitions, maintenance and development, including EUR600million for acquisitions in Water Europe and EUR700million for international acquisitions.

Suez, populations served by country

Country	Water	Sewerage	Total
France	12,300,000	9,000,000	**12,300,000**
Belgium	300,000	0	**300,000**
Great Britain[1]	1,066,000	0	**1,066,000**
Czech Republic	2,165,000	2,165,000	**2,165,000**
Germany	272,000	642,000	**642,000**
Hungary	2,255,000	255,000	**2,255,000**
Ireland	0	220,000	**220,000**
Italy	50,000	50,000	**50,000**
Russian Federation	1,000,000	0	**1,000,000**
Slovakia	150,000	150,000	**150,000**
Slovenia	0	190,000	**190,000**
Spain[1]	12,171,598	13,380,000	**15,000,000**
Chile[1]	6,591,116	6,468,873	**6,591,116**
Mexico	5,130,000	3,600,000	**7,300,000**
United States	7,350,000	4,125,000	**8,400,000**
Australia	3,300,000	75,000	**3,360,000**
New Zealand	0	160,000	**160,000**
China & Macao	14,700,000	1,000,000	**14,700,000**
India	4,000,000	600,000	**4,600,000**
Indonesia	3,500,000	0	**3,500,000**
Malaysia	1,565,000	0	**1,565,000**
South Korea	0	900,000	**900,000**
Taiwan	3,000,000	0	**3,000,000**
Jordan	0	2,200,000	**2,200,000**
Morocco	3,800,000	1,300,000	**3,800,000**
Algeria	6,500,000	3,500,000	**6,500,000**
Qatar	0	700,000	**700,000**
Oman	500,000	0	**500,000**
Saudi Arabia	6,500,000	3,000,000	**6,500,000**

South Africa	330,000	0	**330,000**
Turkey	535,000	535,000	**535,000**
Total outside France	**86,530,714**	**45,215,873**	**99,179,116**
Global total	**99,030,714**	**54,215,873**	**111,479,116**
Country	**Water**	**Sewerage**	**Total**

[1] Activities carried out by Agbar

Alliances and JVs

Ondeo-Lend-Lease Pty: Australian JV (with an unnamed third partner) formed in 1991. It is a marketing vehicle for gaining the bulk water supply contract for Greater Sydney in 1993. The JV has been extended into South East Asia.

Sino French Holdings: A 50/50 JV with Hong Kong's New World Development Corporation, a company that is also actively involved in waste management projects in Hong Kong. SFH is used for all of Suez's contracts in China and Macao.

TESCA: A JV with Bufete International and Bancomer serving Mexico.

Ondeo and poverty reduction

In 2003 Ondeo provided water to 46.5million people in developing economies, including 8.7million people below the poverty line worldwide. This includes 2.5million in South Africa, where they are within 200 meters of a standpipe. 7million people have been connected to piped water supplies through service extensions by Suez.

France

SE's Lyonnaise des Eaux France (LDEF) has been VE's chief competitor in France (and globally) more or less since 1880. By 1958, Suez had 300,000 subscribers in France. The 1972 acquisition of Degrémont SA saw the company move from straightforward service provision to a more broadly based design, build, operate and transfer contract approach. Suez acquired SDI in 1991, gaining 3% of the French water market or some 1.5million people. By 2001, Suez provided 17million people with water (including some 3million in joint contracts with VE) and 9million with sewerage services, where it has since remained. The sewerage market is growing at an appreciably faster rate than the water market. In 1997, Suez acquired all the outstanding shares in Degrémont SA.

Since the ending of Droit d'entrée in 1995, Suez has not made appreciable progress in gaining new contracts in France. At the same time, with two exceptions, no contracts of material significance have been lost.

Recent contract gains include a 20 year wastewater treatment and recovery contract with Grasse (45,000) worth EUR124million signed in January 2008.

SE believes that it currently serves 12.3million people in France (19% of the French population) and sewerage and wastewater treatment for 9million people (18% of the connected population). LDEF's revenues for France were EUR1.9billion in 2007: 49% for drinking water distribution, 24% for wastewater, 15% on other services such as metering and 12% for network management. The company manages a total of 2,600 contracts with an average life of 8 years. Between 2002 and 2007, LDEF 82% of contracts in terms of contracts and 89% in terms of revenues.

Spain

Suez's main involvement in Spain is through Agbar (see separate entry). In 2007, Suez, La Caixa, and HISUSA (51% Suez Environment, 49% Caixa Holding), which jointly owned 49.7% of Agbar, launched a public tender offer for Agbar's outstanding shares. As of July 2008, Suez held 12% of Agbar directly and HISUSA held a further 64%, with Suez Environnement holding 45.9% of Agbar's shares. SE currently uses Agbar to represent all of its water services interests in South America.

Degremont is active in developing desalination contracts in Spain and has built or gained orders for 34 plants to date.

2006	Barcelona	30 year concession	1,300,000, desalination
2007	Muxtamel	5 year DBO	200,000, desalination

The former is a EUR159million contract which will provide 200,000m^3 of water/day at a cost of EUR159million, entering service in 2009 and the latter is a EUR55million contract for two towns in Alicante, with an average production of 50,000 m^3/day, rising to 80,000 m^3/day in the tourist season. Degremont anticipated operating plants desalinating at least 2million m^3/day of water worldwide by 2009.

In addition, SE acquired a 33% interest in Aguas de Valencia (AgVal) in October 2007. Aguas de Valencia provides water management for 3million people of the Valencia region. SE purchased this minority interest from SAUR for EUR135million. The majority shareholder of AVSA remains Inversiones Financieras Agval, a Spanish consortium formed by local shareholders, who hold 60.7% of the company. AgVal serves 1million people in Valencia (a 50 year contract renewed in 2001) and has a further 174 water and sewerage contracts in Spain.

Belgium

Suez's Watco provides water to some 300,000 people in Belgium. Turnover rose from EUR29.6million in 1998 to EUR47.7million in 2000 before falling back to EUR40.5million in 2001.

Italy

Suez increased its stake in ACEA to 8.6% in October 2005, but as of July 2008, this was 5.0%. The Aqua Toscane and Arezzo contracts are held by Suez and the others outlined here by ACEA (see separate entry).

1998	Aqua Toscane	30 year concession	50,000 water and sewerage

Suez holds 100% of Aqua Toscane, which concentrates on water provision for Fiestole (contract started in 1991), Montecatini Terme (1989) and Ponte Buggianes (1992), Florence in Tuscany.

1999	Arezzo	25 year concession	350,000 water and sewerage

In January 1999, a Suez-led consortium gained the first international tender award for a water and sewerage concession following the belated liberalisation of the market in the wake of the 1994 Galli law. Suez's consortium holds 46% of Nuove Acque, with 54% being held by public entities. The contract was formally signed in June 1999. The concession has a JV with the 37 communes involved.

2003	Pisa	ATO privatisation	800,000 water & wastewater

A 45% stake in Acque SpA was acquired by the ACEA led consortium for EUR19.2million. Acque is Tuscany's ATO-2, serving 57 communes. The concession will generate EUR1.2billion in revenues.

2003	Siena/Grosetto	ATO privatisation	350,000 water & wastewater

A 40% equity stake in the Acquedotto de Fiora was acquired by the ACEA led consortium for EUR19.3million, with a concession life of 25 years. The ATO-6 covers 56 communes and required some EUR433million in capital spending.

2003	Florence	ATO privatisation	1,200,000 water & wastewater

The ACEA led consortium has acquired 40% of Publiacqua SpA, the holder of the 20 year concession to operate water and wastewater services for 50 communes in Tuscany's ATO-3. Publiacqua had a turnover of EUR104million in 2002 and net profits of EUR8million. The consortium is contributing EUR60million towards the EUR150million capital increase, with the municipalities paying the remaining EUR90million. In conjunction with the privatisation, EUR300million of Publiacqua's revenues were securitised in order to pay for the capital increase and retire mature debt.

With ACEA and Ondeo controlling services for 2.7million out of the 3.5million people living in Tuscany, a rationalisation of these concessions is planned.

Ireland

2002	Cork	22 year BOT	220,000 wastewater treatment

The EUR70million contract is part of a EUR270million drainage and effluent treatment scheme for the city, which is due to be completed in 2004. The STW will have a 270,000m^3 capacity with a PE of 440,000, half being for industrial clients.

Slovakia

1999	Trencin	20 year lease	150,000 water & wastewater

Suez's TVS was awarded the concession for 50 local authorities in October 1999. The contract requires EUR40million in capex, including construction of a new sewage treatment works, with EUR5million pa in turnover at the outset. This is the first water services privatisation in the country.

Slovenia

1997	Maribor	25 year concession	190,000 wastewater treatment

In February 1997 Suez became the preferred bidder for the Maribor concession. EUR30million investment is needed and the concession project will generate a turnover of EUR8million. There is an EBRD loan attached to the project. The population equivalent for the plant is 200,000 (equivalent to EUR29/capita pa). Maribor is Slovenia's second largest city. Suez is the largest shareholder in the consortium (40% stake, including Degrémont as the constructor). Suez built a water treatment plant in Kopper in 1995. This was the first BOT wastewater treatment contract to be awarded in Central and Eastern Europe.

Hungary

With the gaining of the Budapest water provision contract, Suez's total water services turnover in Hungary is now in excess of EUR85million pa. The contracts serving Pécs and Káposvár have a total turnover of EUR18million pa. Suez has set up a holding company for all its Hungarian water activities.

1997	Budapest	25 year water distribution	2.2million water

Suez and RWE Aqua controls all the shares of the management company and 25% of the equity of the asset management company. The management company formed by Suez (51%) and RWE Aqua (49%) has a 25% stake in Fövarosi Vizmuvek (FV) for USD82million. Suez thus holds 13% of the asset company. FV has a EUR65million turnover and employs 2,200 staff. The population currently served is 2.0million.

2006	Budapest	4 years, DBO	1.5million wastewater

In 2006 Degremont and Veolia, along with Hídépíto and Alterra, two local civil works companies, gained a EUR290million contract to build (EUR249million) and operate for four years (EUR40million) a 350,000 m^3/day wastewater treatment works (wet weather capacity 900,000 m^3) at Csepel to serve 1.5million people in the Budapest area. The facility will enter service in 2010 and will be operated by them until 2014.

1995	Pecs	25 year lease	180,000 water & sewerage

Suez holds 48% of the operating company, with the municipality holding the remaining 52%.

1995	Kaposvar	25 year lease	75,000 water & sewerage

35% of the operating company's equity is held by Suez, with the municipality holding the remaining 65%.

Czech Republic

1993	Brno (BVK)	25 year concession	420,000 water & sewerage
1994	Ostrava	30 year concession	330,000 water & sewerage
1996	South Moravia	25 year concession	350,000 water & sewerage

Suez holds 46% of BVK, the operating company in Brno. The concession was extended for a 25 year period in October 1999 (starting from 2000). The new concession involves upgrading the wastewater treatment plant to meet the EU's UWWTD criteria.

1994	Karlovy Vary	25 year concession	180,925 water & sewerage

Karloy Vary is based in North Moravia. Suez holds 49.8% of VAK, the operating company's equity. Net profits increased from CZK26million in 2005 to CZK28million in 2006, with 15.205million m^3 of water provided in 2006, although water consumption fell from 101.7 to 99.6L/capita/day between 2005 and 2006.

1999	Ostrava area	15 year concession	0.75million water & sewerage

AWG and Suez acquired approximately 76% of the equity of Severomoravske Vodovody a Kanalizace AS (SmVAK) from the municipalities and small shareholders in the region during 1999. Suez currently holds 50.07% of SmVAK. Revenues rose 3.8% to CZK828million in 2006, with a 2% increase in pre-tax profits to CZK62.5million.

2000	Benesov		38,000 water & sewerage
2000	Davle		37,000 water & sewerage
2001	Sumperk	Concession	120,000 water & wastewater

82% of Sumperska Provozni Vodohospoda Ska Spole Nost (SPVS) has been acquired by Ondeo Services. SPVS serves 40 towns and districts in the North East with a total turnover of EUR6million pa. Ondeo serves 2.3million people in the Czech Republic and had a 2000 turnover of EUR138million.

Russian Federation

2004	Moscow	13 year BOOT	1million, water treatment

EVN's WTE awarded the BOOT contract to Degrémont in June 2004. The 275,000m^3/day plant will provide potable water to South West Moscow from 2007 and be operated by Degrémont and WTE until 2017.

Germany

In Germany, Suez operates via Eurawasser. In 2002, Suez bought out Thyssen AG's 51% stake in the JV. Eurawasser had a turnover of EUR75million in 2001 and serves 600,000 people. Revenues in 2007 were EUR49million.

2004	Cottbus	25 year partnership	147,000 water & sewerage

Eurawasser acquired 28.9% of Lausitzer Wasser in February 2004. The town of Cottbus retains 50.1% of the company with the balance being held by local municipalities. Water will be supplied to 102,000 people in Cottbus and 45,000 in surrounding areas, along with sewerage services for 117,000 people. Water revenues are EUR12million for water supply and EUR16million for wastewater pa.

1992	Rostock	25 year concession	302,000 water & sewerage

Rostock was the first major concession awarded to a private sector consortium in Germany. It forms part of the 1991 Baltic Action Plan for reducing effluent discharges into the Baltic Sea. Eurawasser's work on the first phase of the Rostock wastewater treatment facility was completed for EUR130million in 1995. Total capital spending over the life of the contract will be approximately EUR460million. 302,000 served for sewerage and 262,000 for water.

2000	N E Germany	25 year concession	70,000 water & wastewater
2000	Gustrow	25 year BOT	35,000 wastewater

The two contracts signed in April 2000 serve a total of 105,000 people in the Mecklenburg-Pomerania region of North East Germany. The concession contract is with an association of communes with 70,000 inhabitants and involves the provision of 4million m^3 of water and the treatment of 1.3million m^3 of wastewater pa. The Gustrow contract, signed in April 2000, is for the design, construction and management of a wastewater plant to treat 2.4million m^3 pa.

1994	Goslar	25 year concession	55,000, sewerage

Eurawasser has gained a 25 year sewerage contract for Goslar (Lower Saxony) from April 1996. Eurawasser controls a holding of 100% of the management and 49% of assets in terms of equity stakes. The facility will treat 98,000 people equivalents: 55,000 people, 43,000 for industry.

2000	Kriensen,	25 year concession	12,000 water and sewerage

In February 2000, a concession was signed for services to the city of Kriensen.

2001	Schwerin	Participation	100,000 water & sewerage

Suez will participate in up to 49% of the water company following a two year transition period (called a 'silent participation') in the city's multi-utility.

Great Britain

Suez's sold 72.5% of its 100% stake in Ondeo Services UK in May 2002 (see separate entry for Northumbrian Water). The remaining stake was sold to the Ontario Teacher's Pension Plan for EUR377million in April 2005 for a capital gain of EUR260million. Bristol Water is owned via Agbar.

Turkey

1997	Antalya	10 year O&M	535,000 water & wastewater

This is a delegated management contract for the Antalya Water and Sewerage Authority. Suez beat Thames, United Utilities/Bechtel and SAUR for the contract. ANTSU is a 50/50 joint stock company with ENKA. The contract involves customer billing and wastewater treatment. The city's population is forecast to grow to 960,000 by 2005.

Morocco

1997	Casablanca	30 year management	3.8million water & sewerage

Lyonnaise des Eaux de Casablanca (LYDEC) manages the Urban Community of Casablanca contract, covering 4.0million people. This represents 25% of the Moroccan market, with a 1,000km^2 area and 23 urban communities covered. Ondeo Services will be responsible for water and sewerage and Elyo for electricity. 14% of LYDEC's equity was sold on the Casablanca Bourse on 18th July 2005, 80% of the shares being bought by local investors. Suez continues to hold 51% of LYDEC (SE, 30%, GDF Suez, 21%), with the remaining 35% being held by Moroccan institutions.

The water contract is worth MAD5billion (USD 517million) for the expansion and upgrading of water distribution and treatment. Between 1997 and 2007, the number of households connected to the water network rose from 440,000 to 700,000. The wastewater contract is worth MAD16billion (USD1.6billion). By the end of 2006, EUR560million had been invested in the various services. It involves the construction of three WWTWs, including recovery systems and the creation and extension of the sewerage network in development zones of western Casablanca. Currently, 5% of the population is connected to the sewerage network. Leakages of 25million m^3 pa have been dealt with since 1997, equivalent to 5% of water delivered.

2000	Oum Er Rbia	30 year concession	Bulk water provision

The bulk water supply concession for one third of Casablanca was awarded to Elyo and Ondeo Services. EUR30.5million will be spent on the rehabilitation and upgrading of bulk water supplies delivering 55million m^3 of water to the city, generating EUR305million over the concession's life.

2005	Marrakech	5 year DBO	1million, wastewater treatment

The DBO calls for a wastewater treatment facility to enter service by the end of 2006. The facility will be funded by an EIB loan and Degremont will receive EUR9million for its role.

Algeria

2005	Taksebt	5 year DBO	2million, water treatment

This is a 605,000m^3/day water treatment facility, operated on behalf of SNC Lavalin. Construction of the facility started in May 2006 and will last for 37 months, and Degremont will gain EUR38million from the contract.

2005	Athmania	5 year DBO	1million, water treatment

This is a 262,500m^3/day water treatment facility, operated on behalf of Algérienne des Eaux. The facility is due to enter service by 2007 and Degremont will gain EUR24million from the contract.

2005	Algiers	5 year O&M	3.5million, water & wastewater

The contract is initially worth EUR120million and can be extended into a larger project in 2010. The Algerian authorities are responsible for EUR200million pa in investment alongside the project for upgrading and extending the services of Société des Eaux et d'Assainissement d'Algers, with the aim of a 24hrs/day service by mid 2009. The contract formally started in April 2006.

Oman

2006	Oman	Water & power IWPP	500,000, water desalination

Barka 2 is the first private sector water and power facility in Oman. The 120,000m^3 per day facility contract was gained with Oman's National Trading Company and Mubadala.

Saudi Arabia

In June 2002, Suez signed a contract with the Kingdom of Saudi Arabia to oversee a EUR10billion 10 year investment programme for the development of water and wastewater in Mecca Province. Mecca Province has 7.5million inhabitants and three major urban areas: the Holy City, Jeddah and Taif. In Jeddah, the second largest city in the country (2.6million people) there is a chronic shortage of water resources and less than 20% of the city is equipped with a sewer system.

2008	Jeddah	7 year O&M	3.0million, water & wastewater

The 7 year USD61million contract started in September 2008, with the aim of bringing 24 hour water delivery, leakage reduction and to reduce sewage network overflows. The contract covers 5,300km of water distribution mains and 1,000km of sewerage networks.

2007	Jubail	23 year BOOT	3.5million, water desalination

In June 2007, financing was completed for the USD3.44billion required by the independent power and water project. 800,000m^3/day of water will be desalinated. The Suez led consortium (Suez, GE and Hyundai Heavy Industries) holds 60% of the project equity, with 40% being held by Saudi Government institutions.

Jordan

2002	Northern Jordan	25 year BOT	2.2million, wastewater

The contract, announced in July 2002, is designed to bring new water resources into the north of the country. 60% of the USD154million capital spending will come from USAID as a grant. The Khirbet as-Samra treatment facility will replace an existing waste stabilisation pond treatment system, serving about 2.2million residents in Amman and surrounding towns. Construction started in December 2003 with the consortium operating the plant for 22 years after it went into service in August 2008. The facility will handle an average of 267,000m^3/day of wastewater and the contract will generate revenues of USD15million pa. Up to 100million m^3 pa of treated effluent will be made available for agricultural irrigation. Previously, there has been a management contract for water resources serving 2.5million people in the same area which started in 2000 and was handed back to the Government on its completion in 2006.

Egypt

2007	Cairo	DBO	1.8million wastewater

Degremont has worked with the 1.5million m^3 per day Gabal El Asfar wastewater treatment plant serving 9million people in Cairo since 2002. In 2007, it was awarded a EUR34million DBO contract to extend the plant by 300,000m^3 per day to serve a further 1.8million people. Degremont will also continue to serve the original facility from 2008-10 for EUR19.5million. Degremont has been active in Egypt since 1948 and its water treatment works serve 70% of Cairo's 18million residents.

Qatar

2006	Lusail	10 year DBO	200,000 wastewater

Degremont, along with Marubeni Corporation (Japan, pumping stations and conveyor/SCT) and Mushrif Trading and Construction Company (Qatar, civil engineering) will build a 60,000m^3/day WWTW serving 200,000 people in the city of Lusail under a EUR143million contract. It includes 10km of sewage transfer systems and will cost USD123million to construct and generate USD65million in management fees. The contract was awarded in April 2006 and the facility will enter service during 2007.

2005	Doha	10 year DBO	500,000 wastewater

A joint venture between Degremont and Marubeni was awarded a USD180million construction (50/50) and USD80million operation (70/30) contract for the 135,000m^3/day facility in December 2005, which will enter service in 2008.

UAE

In March 2007, Suez signed a strategic partnership with Abu Dhabi's Al Qudra Holdings for bidding for water and waste management projects in the region.

2007	Dubai	10 year DBO	To 900,000 wastewater reuse

A USD800million DBO contract with Palm Utilities to design, build and operate a sewerage system and 220,000m^3 per day wastewater treatment and reuse facility serving the Jumeriah Golf Estates development in Dubai. This city is currently under development and has a planned population of 900,000. Palm Utilities holds a 30 year water services concession for the city from its developer. Degremont will hold 54% of the project.

Cameroon

2000	SNEC	20 year concession	5.3million water provision

A 51% stake in SNEC (Société National d'Eau du Cameroon) was acquired in May 2000 as part of a concession award. The contract includes the upgrading and rehabilitation of water distribution systems in a number of towns and cities, including Douala and Yaounde, which account for 43% of Cameroon's population. Turnover will be EUR24million pa, with total investments of EUR300million.

North America

United Water Resources (UWR) was founded in 1869 and was floated in 1986. In 1994 UWR merged with Suez's General Waterworks Company, giving Suez a 30% holding in UWR. Until it was acquired by Suez, it was the second largest listed water services company in the US. Suez's USA arm, Lyonnaise American Holdings acquired the remaining 67% of UWR's equity that it did not hold in 2000 and its 50% holding in United Water Services (UWS) for EUR1,108million. The company currently serves 7.3million people through its outsourcing activities and 25 regulated utilities in 21 states in the USA, and had a turnover of EUR499million in 2000 and EUR542million in 2001. In 2002, a USD46million water and sewerage contract was awarded by Laredo, Texas, covering 190,000 customers or some 700,000 people.

Acquisition of Earth Tech's US O&M activities

As part of the divestiture of Earth Tech's water operations by AECOM, SE acquired 130 O&M contracts generating revenues of USD50million pa in the North East and Mid West regions of the USA. These contracts cover an estimated 1.0-1.2million people.

1997	Franklin	20 year DBFO	Water

A 5million gallon per day water treatment plant was constructed by Earth Tech in 1997 at a cost of USD15million. The facility supplies water to the entire city.

2001	Newport	20 year DBO	Wastewater

The contract involves constructing a 10.7million gallon per day wastewater facility for Rhode Island City and will generate USD68.9million in revenues. It is anticipated that the DBO will undercut original cost projections by 25% over its life.

2003	New London	5 + 5 year O&M	45,000, water & wastewater

The five year O&M contract for the city of New London, CT is worth USD4.4million and carries a five year renewal option. It covers the city's water system (14,000 customers) and wastewater systems (6,000 customers).

Including Earth Tech's activities, UWR has water and wastewater outsourcing contracts covering 7.5million people and water utilities serving 2.1million people. In total, these cover 8.4 million people.

Current and recently gained activities (USDmillion pa, 2002-03)

Regulated markets	360
O&M outsourcing	175
Consumer products	55
Industrial clients	1,500
Mexico	70

UWR, regional breakdown of people served by regulated activities in 2008

Arkansas	55,000
Connecticut	17,500
Delaware	109,000
Delaware - Bethel	6,000
Idaho	240,000
New Jersey	753,000
New Jersey - Hoboken	33,000
New Jersey – Toms River	122,000
New York	266,000
New York - Westchester	44,000
New York - New Rochelle	143,000
Pennsylvania	175,000
Rhode Island	19,500

Total utility operations	**1,983,000**

In February 2007, United Water acquired the Aquarion Water Company of New York for USD28million, serving some 7,500 people with water services and 20,000 with wastewater treatment in three towns in the State of New York. This is now called United Water Westchester. In addition, approximately 200,000 people are served by smaller owned activities in eight other states. New York South County, a regulated water supply company was acquired for USD3million in May 2004.

UWS, non-regulated activities

UWS was formed in 1997 through the merger of LDE/UWR and JMM-OSI. UWS has 145 contracts and currently serves some 6.5million people via a series of O&M contracts. 2001 turnover was USD174.8million. The Bechtel/United Utilities O&M outsourcing company US Water was acquired for USD40million in 2002. US Water gained its first water and wastewater operating contract in 1982 with the New Jersey Highway Authority. These activities are concentrated in Illinois, North Carolina, Rhode Island and New Jersey. The 1994 wastewater treatment contract with Indianapolis serving 800,000 people was renewed in 2007 with the new contract running from 2008. In June 2007, UW acquired Aquarion Services (AOS), part of Kelda Group's Aquarion. AOS managed Aquarion's water outsourcing activities, covering 650,000 inhabitants in six States (Connecticut, Rhode Island, New Hampshire, Massachusetts, New York and California) through 82 subsidiaries and generating revenues of EUR24million in 2006 compared with USD19million in 2002. AOS's largest contract, a 10 year, USD110million contract to operate the wastewater treatment plant for the Water Pollution Control Authority in Bridgeport, Connecticut was gained in April 2003.

The 1994 Indianapolis contract was renewed for 9 years from 2008 with an option for a further 11 years. The new contract will be worth USD178million. The Jersey City contract was renewed for a further 10 years in 2008 in a contract worth EUR90million. The 227,000m^3 per day Gary sewerage and sewage treatment contract was extended for 5 years in June 2008, generating total revenues of USD54million.

UWS, Main Contracts (net of AOS and Earth Tech)

Location (state)	Contract	Water	Sewerage	Combined
Allamuchy (NJ)	O&M, WTW & WWTW	3,900	3,900	**3,900**
Atlanta (GA)	20 Year O&M, WTW	1,500,000	0	**1,500,000**
Avalon (CA)	5 Year O&M, WWTW	0	4,000	**4,000**
Banning (CA)	5 Year O&M, WWTW	0	25,000	**25,000**
Bedminster (NJ)	5 Year O&M, WW	0	7,100	**7,100**
Big Canoe (GA)	5 Year O&M, WTW & WWTW	4,500	4,500	**4,500**
Boone County (IA)	5 Year O&M, WW collection	0	4,500	**4,500**
Burbank (CA)	5 Year O&M, WWTW	0	100,000	**100,000**
Camden (NJ)	20 Year O&M, WTW & WWTW	87,500	87,500	**87,500**
Cumberland (IA)	5 Year O&M, WWTW	0	6,000	**6,000**
El Segundo (CA)	5 Year O&M, WWTW	0	150	**150**
Freeport (IL)	5 Year O&M, WTW & WWTW	28,000	28,000	**28,000**
Gary (IA)	10 Year O&M, WWTW	0	180,000	**180,000**
Hoboken (NJ)	20 Year O&M, WTW	33,000	0	**33,000**
Indianapolis (IA)	13 + 9 Year O&M, WWTW	0	800,000	**800,000**
Jacksonville (FA)	20 Year O&M, WWTW	N/A	N/A	**N/A**
Jersey City (NJ)	8 Year O&M, WTW	239,000	0	**239,000**
Killingly (CT)	5 Year O&M, WWTW	0	2,600	**2,600**
Laredo (TX)	5 Year O&M, WTW & WWTW	700,000	700,000	**700,000**
Manalapan (NJ)	20 Year O&M, WTW	1,000	0	**1,000**
Manchester (NJ)	O&M, WTW	19,100	0	**19,100**
Milwaukee (WI)	10 Year O&M, WWTW	0	1,200,000	**1,200,000**
North Adams (MA)	10 Year O&M, WTW	15,500	0	**15,500**
Pekin (IL)	20 Year O&M, WWTW	0	34,600	**34,600**
Phillipsburg (NJ)	O&M, WWTW	0	31,450	**31,450**
Pittsburgh (PA)	O&M, W & WW	350,400	350,400	**350,400**
Plainfield (IA)	20 Year O&M, WTW	25,000	0	**25,000**
Rahway (NJ)	20 Year O&M WTW	26,500	26,500	**26,500**

Location (state)	Contract	Water	Sewerage	Combined
Reidsville (NC)	O&M, WTW	14,300	0	**14,300**
San Antonio (TX)	10 Year O&M, WTW	250,000	0	**250,000**
Springfield (MA)	20 Year O&M, WWTW	0	275,000	**275,000**
Stonington (CT)	5 Year O&M, WTW	16,000	0	**16,000**
Total		**3,313,700**	**3,871,200**	**5,968,600**

Canada

1998	Banff, Alberta	5 year O&M	7,600 sewage treatment

One O&M contract, operated by UWS, the Halifax contract, gained in 2002 was rescinded in 2003. In June 2004, an EUR80million construction contract for Halifax was signed, with the municipality operating three wastewater treatment plants with a total capacity of 640,000m^3 per day which will enter service between 2006 and 2008. Degremont has been active in Canada since 1960 and has developed more than 500 water facilities there.

Mexico

Suez operates in Mexico through Bal-Ondeo, a 50:50 JV with Peñoles (BAL Group). In July 2002, Ondeo acquired Azurix's Mexican operations through the JV for USD93million. The five contracts acquired bring Suez's population served in Mexico to 7.3million along with USD70million pa in revenues.

2004	San Luis Potosi	18 year BOT	400,000, sewage treatment

This contract has a total value of EUR263million, with a two year construction and 18 year operational phases. 57% of the 80,000m^3/day of wastewater will be subject to primary treatment and used as agricultural water. The other 43% will be subjected to tertiary treatment and used for cooling a power station. The contract was awarded to Degrémont, Sumitomo (Japan) and Prodin (Mexico) in June 2004.

1994	Mexico City	10 + 5 year O&M	2.6million water systems
1999	Mexico City	5 + 5 year O&M	2.0million water systems

In 1994, IACMEX was awarded a 10 year O&M contract for water metering, billing and collections and water mains maintenance for the central federal district of Mexico City. Azurix acquired a 49% holding in Industrias del Agua de la Cuidad de Mexico (IACMEX) from Severn Trent in 1999. This is for the development of metering and water supply systems, as well as making 330,000 new connections. In October 2004, these contracts were extended for a further five years, and will generate EUR80million in revenues over this period.

1999	Puebla	20 year concession	Sewage treatment
2000	Culiacan	20 year concession	Sewage treatment

Ondeo Degrémont operates six sewage BOTs in Mexico, including the above contracts. The Puebla concession announced in October 1999 is for a sewage treatment works capable of handling 360,000m^3 of effluents each day. The Culiacan facility is situated in Sinaloa state and has a capacity of 150,000m^3/day. There are two other municipal BOTs serving Juarez and Torreon, and two industrial BOTs based in Santa Cruz and Altamira.

1993	Cancun	30 year concession	520,000 water and sewerage

The Cancun resort area has a population of 430,000, which had grown to 520,000 by 2002 and is forecast to grow at 3% pa to 2015. There are currently 78,000 connections. 4.3million tourists visit the resort each year. 65% of the concession's revenues currently come from hotels (with US dollar denominated revenues), with 27% from residential water provision and 8% from wastewater. Azurix acquired its stake in the in Desarollos Hidraulicos de Cancun (DHC) concession in 1999. The concession generates revenues of USD50million pa and is profitable.

There are also 3 BOT contracts previously operated by Azurix:

1999	León	BOT	1.1million sewage treatment
1999	Torreón	BOT	1.0million sewage handling
1999	Matamoros	BOT	Industrial sewage treatment

South America

With the exception of its investments in Chile, Suez completed its exit from water and waste management contracts in South America during 2006-07. Aguas de Barcelona and Degremont continue to be active in these markets.

Argentina

Aguas de Santa Fe was meant to be sold to Fides Group and Grupo Energia BV in 2005, but in May 2005, Suez and Agbar decided to terminate the concession.

The Aguas Cordobesa concession (Ondeo Services (39%), Agbar (17%) and five Argentinean companies) was sold to its local partners in December 2006.

The Aguas Argentinas concession serving Buenos Aires was ended in March 2006.

Bolivia

Aguas de Illimani, serving La Paz & El Alto was handed to the Bolivian Government in January 2007.

Brazil

Suez's interests in Brazil were transferred in 2006.

Chile

1999	Santiago	Privatisation of EMOS	5.1million water & sewerage

Suez and Agbar acquired 51% of Empressa Metropolitana de Obras Sanitarias (EMOS, now called Aguas Andinas), Santiago's water supply company for a total of USD1,135million in 1999 and 2001. All 44 districts of the city are to be covered, along with the long-term development of its wastewater services. Aguas Andinas generated EUR215million in consolidated revenues for 2003. Revenues are expected to double in the next ten years because of wastewater expansion. Currently, 100% of the population is served with piped water and 97% by mains sewerage, while 75% of sewage effluents are treated. In July 2004, Agbar bought 30.1% of Suez's holding in Inversiones Aguas Metropolitanas Limitada (IAM) for EUR139.4million. Suez and Agbar sold 43.4% of IAM shares on the Santiago Stock Exchange in November 2005 and now holds 14.3% of the company, 7.4% directly by Suez.

2000	NE Santiago	Aguas Cordillera	315,000 water & sewerage

Enersis sold Aguas Cordillera to EMOS for USD193million in June 2000. The second highest bidder was Biwater at USD179million. Aguas Cordillera serves 88,000 customers in the Vitacura, Las Condes and Lo Barnechea districts of Santiago.

Colombia

In January 2004, the city of Bogota unilaterally ended the 1997 Saltire WWTW contract, which had served 1,500,000 people.

China

Suez has a total of 16 major contracts for rehabilitating and expanding current water treatment works. Suez now serves approximately 14.4million people in China via Sino-French Holdings (S-FH), which it operates jointly with New World Development Co. Ltd. of Hong Kong. Ondeo manages EUR704million pa of operations in China in 2007, up from EUR300million in 2000. In addition, Degrémont has completed 132 water and sewage treatment construction contracts in China, having been operating in China since 1975, and is responsible for 20% of China's water and wastewater treatment facilities.

In April 2008, SE and New World announced they were contemplating strengthening their relations with their local partner in Chongqing, through the acquisition of a 15% interest in Chongqing Water Group for EUR140million. SE is already active in the city, which has a population of 32million. CWG operates 32 water treatment plants and 35 wastewater treatment plants in Chongqing by the end of 2007, serving approximately 8.4million residents. CWG aims to provide quality services to the entire Chongqing as well as to expand to surrounding provinces in Western China.

SE and New World are also expected to acquire Earth Tech's Chinese contracts. See company entry on AECOM for details.

Agbar also has activities in China which has established in November 2007 a JV with the Chinese company Golden State Water, to supply drinking water and treat wastewater in the province of Jiangsu.

2008	Chongqing	25 year concession, S-FH	1.2million, water

Construction of the first phase of the CNY1.5billion 600,000 m^3 per day project is due to begin in early 2009. The contract was signed in September 2008. This is the first contract to derive from the April 2004 Chongqing Waster Group agreement. At the same time, a concession contract was signed with CWG for water and wastewater services to the city's Changshou Chemical Industry Park.

2006	Changshu	30 year concession, S-FH	1.5million, water

SFH will hold 49% of the equity of Changshu Water Supply Co. This covers the treatment and distribution of drinking water through three treatment plants with a total capacity of 675,000m^3/day, and 2,500km of piping networks. The contract will generate revenues of approximately EUR30million pa through its operational life.

2006	Chongqing	25 year concession, S-FH	1.0million, wastewater treatment

A 50/50 joint venture contract between S-FH and the Water Company of Chongqing was signed in September 2006 for funding, developing and operating a 300,000m^3/day wastewater treatment works serving the Jiang Bei and Yubei sectors of the city in Tangijatuo, building on Suez's water treatment contract signed in 2002 and the agreement drawn up in November 2005 whereby S-FH is investing EUR60million into a joint venture company for the city. EUR60million will be spent on constructing the facility. In 2007 a further contract was signed, raising the capacity of the facility to 900,000m^3/day.

2004	Tianjin	35 year O&M, S-FH	0.85million bulk water supply

The CNY470million (EUR57million) water treatment plant is to serve part of the city of Tianjin. The Tianjin Tanggu Sino-French Water Supply (S-FH) is a 50:50 joint venture between the city and S-FH. The facility will have a treatment capacity of 310,000m^3/day.

2002	Chongqing	50 year concession	1,000,000 water
2002	Qingdao	25 year BOT	2,300,000 water

Two WTWs in Chongqing are to be refurbished and expanded for a total cost of EUR150million. The two plants can handle 275,000m^3/day of water and can be expanded by a further 100,000m^3/day. Likewise, two WTWs in Qingdao are to be refurbished and expanded for a total cost of EUR430million. The two plants treat 540,000m^3/day of water.

2001	Panjin	30 year BOT	267,000 bulk water
2001	Xinchang	30 year BOT	135,000 bulk water
2004	Sanya	30 year O&M	300,000 water

Suez and New World Group, via S-FH, operate three water treatment works in Hainan delivering a total of 230,000m^3/day of water for EUR36million and managing them on behalf of the city. The system will be 50% held by S-FH and 50% by the municipality's Hainan Tianya Water Industry Holding Co. The Sanya contract started in 2004.

2000	Zhengzhou	30 year BMO, S-FH	Bulk water supply
2000	Baoding	20 year BMO, S-FH	Bulk water supply

The contracts for Zhengzhou (Henan) and Baoding (Hebei) were announced in March 2000. They will serve a total of 1.7million people, with USD62million being spent on capital works for facilities delivering 560,000m^3/day of water and generating a turnover of USD500million over the contracts' life.

1999	Changtu	30 year BMO, S-FH	0.3million bulk water supply
1999	Wanzhou	30 year BMO, S-FH	0.5million bulk water supply
1998	Zongshan	22 year BMO, S-FH	1.7million bulk water supply

The contracts for the provinces of Changtu (Chongqing) and Wanzhou (Liaoning) were formally awarded in April 2000, and involve a total of USD35million in capital spending. These contracts will generate USD400million in turnover during their lives. Zongshan is in Guangdong province. The town and surrounding areas has 1.5million people. The contract is to seek to provide water by expanding the current capacity of the two extant plants from 0.7million m^3/day to 0.78million m^3/day. 66% of the Zongshan contract is held by Sino-French Holdings, with the remainder in municipal hands. Revenues are in the region of EUR15million pa. Degrémont carried out the engineering work and the extended facility entered service in 1999.

1997	Lianjiang	30 year O&M, S-FH	0.3million bulk water supply

Lianjiang is in Guangdong Province, with 1.3million inhabitants, 70% of whom are currently served with potable water. The project involves USD15million in capex for the upgraded potable water treatment plant, which is being built by Degrémont.

1995	Chongqing	30 year BMO, S-FH	0.4million bulk water supply

There is a USD25million build and manage contract in Sichuan province, based upon enlarging a water treatment facility that now supplies 20% of the city's 2million population.

1994	Guangzhou	30 year BMO, S-FH	0.9million bulk water supply

The Guangzhou contract will account for 25% of the city's current needs.

1992	Tanzhou	35 year BOT, S-FH	Bulk water supply
1994	Gaozhou	30 year BOT, S-FH	170,000 bulk water supply
1996	Nanchang, Jiangxi	28 year BOT, S-FH	0.9million bulk water supply

1996	Macao	25 year concession	540,000 water supply

This is a renewal of the SAAM contract awarded in 1988 for water provision to 540,000 people, including 140,000 customers. Suez/New World Holdings (NWH) holds 85% of the concession. 255,000m^3/day of water is provided.

Taiwan

2002	Kaohsiung	17 year BOT	3,000,000 water treatment

Taiwan Water Supply Corporation awarded a reconstruction and O&M contract to Ondeo Degrémont and Ecotek, a subsidiary of China Steel, for the overhaul and operation of a drinking water plant in Kaohsiung. The contract is worth EUR200million, of which Ondeo Degrémont's share is EUR90million or EUR6million pa over the 15 year O&M stage. The new facility will produce 450,000m^3/day of drinking water by March 2004.

Korea

2000	Yangju	24 year BOT	100,000 sewage treatment

Suez and Ondeo Degrémont (60%) and Hanwha (Korea, 40%) became the preferred bidder for a contract to design, build and manage three sewage plants for a total daily volume of 75,000m³ and an 85km collecting network in the county of Yangju, in the province of Kyonggi. The population currently stands at 100,000 habitants but is predicted to reach 400,000 inhabitants in 2016 due to urban development. Turnover will be of EUR185million over the duration of the contract.

2001	Pusan	18 year BOT	800,000 sewage treatment

The 135,000gal/day facility and 24km of collecting sewerage pipes will cost USD160million to build, with the contract generating USD490million over its lifetime. Ondeo holds 65% of the consortium, along with Samsung Engineering (20%) and Khumo Industrial (15%). Pusan has a total population of 4million.

India

Degrémont has been present in India since 1954 and has designed, built and operated 130 drinking water and wastewater treatment plants including water works in Mumbai (11million people), Bangalore (1.5million people) and Delhi (3.5million people). In 2007, a strategic partnership with Mahindra Infrastructure Developer Ltd was signed for developing new projects in India. The 1,900,000m^3 per day Mumbai facility will be augmented by a 990,000m^3 per day EUR59million facility serving 4million people to be built under a 4 year DBO contract signed in January 2008.

2007	Chennai	7 year O&M	4million, water treatment

Construction of the 530,000m^3/day of drinking water treatment plant for the Chennai Metro Water Supply and Sewerage Board started in July 2005 a total cost of EUR25.2million, financed with EUR6.6million from a French State protocol and EUR18.7million from the Tamil Nadu Urban Finance and Infrastructure Development Corporation. This is India's largest water treatment works and the first to be fully operated by Suez. The operating contract runs from 2007-14.

2008	Delhi	10 year DBO	600,000, wastewater treatment

A 136,500m^3 per day plant will be will be built in a 30 month period and operated for 10 years by Degremont in a EUR27million contract. The treated effluent will be used for agricultural irrigation.

Philippines

Maynilad Water Services (MWSI)

Maynilad Water Services, Inc. (MWSI) was awarded the western half of the Metro Manila (MWSS) water distribution concession in August 1997. On April 29, 2005, MWSI and its bank creditors, along with the MWSS executed a Debt Capital and Restructuring Agreement. As part of this, MWSS acquired 83.97% of the shares of MWSI, with Ondeo holding the remaining shares. In return, the creditors released it from loan obligations worth a total of USD220million. MWSS took over the operations of MWSI in January and sold to a consortium DM Consunji (see company entry) acquiring the shares in 2007.

Indonesia

1997	West Jakarta	25 year concession	3.5million water

West Jakarta has an estimated 4.5million people in total. Suez owns 95% of the Jakarta concession's equity. The initial investment period was extended from 5 to 10 years in 2000 so as to prevent price rises after a 24% tariff rise in 1999. 50% of residents are currently connected, it is predicted this will rise to 100% by 2022, with 80% paying. Jakarta's population is expected to rise from 9.5million to 12.5million by 2020, with the West Zone population rising to 6.7million.

Rate adjustment negotiations resulted in an addendum to the concession agreement on December 24, 2004, providing for an automatic half-yearly rate revision. PT PAM Lyonnaise Jaya was therefore able to obtain an 8.3% rate revision in January 2005 and another 9.5% revision in July 2005. In addition, PT PAM Lyonnaise Jaya's USD denominated debt was refinanced in July 2005 through an IDR650billion bond issue of approximately USD67million.

In July 2006, Suez sold 49% of its 100% stake in Pal Jaya retaining a 51% majority. PT Astratel Nusantra of Indonesia now owns 30% of PT PAM Lyonnaise Jaya's equity, with the remaining 19% being held by Citigroup Financial Products Inc.

1997	Medan	25 year BOT	2.5million bulk water

This is a USD85million BOT for drinking water supply plant for Medan. It is 85% held by Suez. There are currently 2.5million people in the city. The water supply for Phase 1 will be 170,000m^3/day by 2000, increasing to 260,000m^3/day. Turnover will be USD2billion over the contract's life, or USD80million pa. Medan's population is expected to grow to over 8million by 2015 (currently, the city has a population of 2.5million). Suez has operated a water contract in the industrial zone of Cilegon, Java since 1993.

Malaysia

1993	Johor-Barhu	20 year BOT contract	715,000 water supply

Johor-Barhu involves the lease of a water provision facility generating 0.63million m³/day of potable water. Suez holds 25.5% of the holding company Equiventures Sdn. Bhd., which is expected to seek a market listing in due course.

1995	Kota-Kinabalu	20 year BOT contract	500,000 water supply

In Kota Kinabalu (province of Sabah) a 20 year bulk supply concession for 0.24million m³day of water to 0.5million people was granted to Jetama Sdn. Bhd. 35% of which was held by Suez in 1995.

1989/95	Taiping, Perak	20 year BOT contract	350,000 water supply

In Perak, G.S.L. Water Sdn. Bht. (34.2% Suez) serves 0.35million people via a 20 year BOT contract signed in 1988 and started in 1989. The contract was extended when a 0.11million m³/day water treatment plant was commissioned in 1995.

Australia

1993	Sydney	25 year BOO	3.0million water treatment
1996	Noosa	25 year BOT	45,000 wastewater

Australian Water Services (AWS) is a JV between Suez and Lend Lease Pty formed by Suez in 1991. The Sydney water provision BOT signed in 1993 saw the USD200million facility enter service in October 1996, providing water for 80% of the city. AWS has now entered the 25 year operating concession phase, operating the facility's 3,000ml/day capacity. A BOT concession for Noosa, Queensland was gained in 1996. Water revenues for Suez in Australia in 2004 were EUR30million and water and waste management revenues in 2006 were EUR346million.

2006	Pimpama	25 year DBO	75,000 wastewater

Pimpama is a wastewater treatment plant for the town near Brisbane, with a capacity of 17,000m^3/day.

2005	Perth	25 year DBO	250,000 water

In April 2004, Perth's Western Australia Water Corporation chose Degrémont and Multiplex Engineering to design, build and operate Perth's first reverse osmosis desalination plant. The 25-year contract for a 140,000m^3/day facility represents total revenues of over EUR685million for Degremont, EUR85million in construction work and EUR600million for operating revenues. The facility entered service in April 2007.

New Zealand

Activities in New Zealand are carried out under New Zealand Water Services, an affiliate of Australian Water Services. Other projects include building the Auckland wastewater treatment plant, serving 1.2million people from 2005.

2002	Hutt Valley	20 year DBO	160,000 wastewater

Ondeo Industrial Services – Industrial water outsourcing

Ondeo Industrial Services is part of SEIS (Suez Environment Industrial Solutions) for its industrial services activities. This has been developed along divisional lines: Elyo/Tractabel Industrial Solutions (energy), Ondeo Industrial Solutions (water and wastewater) and Sita One (Waste management). In 2000, Suez had 60,000 water and wastewater customers, mainly for hardware or chemicals, with a 20% share in this global market. Water customers include Yoplait, Pemex Salina Cruz (Mexico), IBM, BSN, Eridania Beghin Say, Coca-Cola (France, 1999) and Scottish Courage (1999).

In 2001, BOC Gases, one of the world's largest producers of industrial natural gas, signed a five-year framework agreement with Ondeo Industrial Solutions. This contract covers water conveyance services and effluent treatment for eight BOC sites in England, Wales, and Scotland.

Ondeo Industrial Solutions had a turnover of EUR157million in 2002, rising to EUR168million in 2003 and EUR178million in 2004. OIS's German activities were sold, in 2006 for EUR21million. Revenues were EUR145million in 2007, all in France, Italy, the United Kingdom, Spain and Benelux. OIS has 200 contracts in Europe and has developed 1,800 process water and 2,000 wastewater treatment plants.

Industrial contracts gained in 2001 (EURmillion pa)

Client	Country	Activities	Revenues		Contract duration
			DB	O&M	
Aticorta	Italy	WWTW	2.5	0.0	N/A
Danone Vitapole	Belgium	WWTW	2.0	3.0	10 years
Infineon	Australia	Process water	3.0	0.0	N/A
ISI Pontelongo	Italy	WWTW	2.1	0.0	N/A
Osram	Germany	Process W & WWTW	2.0	0.0	N/A
SEPR Sant Gobain	France	WWTW	1.0	1.5	5 years
Siemens	Taiwan	Process water	1.5	0.0	N/A
Siemens	Ireland	Process water	1.5	0.0	N/A

In 2002, Danone offered a series of five year integrated industrial services outsourcing contracts for all facilities covering dairy products, bottled water, biscuits and cereals. This covers the management of water, effluent waste and energy. The contract will have a turnover of EUR100-150million pa and seeks a 30% reduction in industrial water consumption from 2000 levels by 2010.

A joint venture with Antwerpse Waterwerken (Brabo Industrial Water Solutions, BIWS) gained a EUR10million 10 year contract with Degussa's Antwerp plant in November 2003. BIWS will manage the facility's condensate treatment and supply it with demineralised water. Other contracts gained by Ondeo IS in 2003 included STMicroelectronics and Ascometal in France, Enichem in Italy, Siemens in Spain and M-Real in Germany.

In February 2004, Ondeo gained a 20 year EUR120million water management contract for the BP Grangemouth complex in Scotland. This includes cooling water, process water and wastewater. Other clients in the UK include Chevron Texaco, Scottish Courage Brewing and Bairds Malt. OIS was awarded a EUR16million five year O&M contract with SEAGATE Technologies at Limavidy in Northern Ireland for the hard drive manufacturing facility's water cycle in June 2006.

In June 2005, Elyo gained a EUR143million 12 year contract to supply steam, compressed air and purified water to Goodyear Dunlop Tyres France. 400,000m^3 of water will be provided via reverse osmosis facilities. Elyo gained a EUR90million 13 year contract with SNPE's Bergerac. This includes the provision of raw, filtered and flocculated water.

Other contract gains (for water only) by OIS in 2005 included Autofina (EUR26million) and Arcelor Group (EUR10million), both in France.

Suez gained a 20 year private-pubic partnership contract in May 2007 for water and wastewater treatment for Tolouse-Blagnac Airport. The contract involves EUR10million in capex and will incorporate a rainwater recovery and recycling facility designed to handle 700,000m^3 of surface run-off annually.

2002	Pudong, Shanghai	50 year water management	Industrial water provision

This contract is a 50:50 JV between Sino French Holdings and Shanghai Pudong Spark Development Zone United, providing 200,000m^3/day of industrial water, serving the Shanghai Spark Industrial Zone (40,000 customers). The contract is worth EUR600million and is the first industrial water contract in China. The contract also caters for the treatment of 45,000m^3/day of effluent via a new EUR50million facility and may be extended to cover the entire water cycle. The Shanghai Chemical Industrial Park includes BP, BASF, Bayer, Huntsman and China's Gao Qiao. In 2002, Ondeo Nalco gained an eight year contract for oil and water treatment service from Suncor Energy, a company specialising in crude oil extraction from oil sands deposits in north-eastern Alberta, Canada. The deal is worth USD10million in revenues.

Contact Details

Name: Suez Environnement SA
Address: 16 Rue de la Ville l'Eveque,
75008 Paris, France
Tel: +331 40 06 64 00
Fax: +331 40 06 66 44
Web: www.suez-environnement.com
Web: www.lyonnaise-des-eaux.fr
Web: www.unitedwater.com

Gerard Mestrallet (Chairman, Suez Environnement & GDF Suez)
Gerard Lamarche (Chief Finance Officer)
Jean-Louis Chaussade (CEO, Suez Environnment)
Bernard Guirkinger (Water Europe)

FRANCE

VEOLIA ENVIRONNEMENT SA

Compagnie Générale des Eaux was renamed Vivendi in May 1998, while retaining its former name for water and wastewater activities. In July 2000, Vivendi Universal sold 28% of its holding in Vivendi Environnement (VE) via a listing on the Paris Bourse and a further 9% in 2001. Vivendi has in turn been renamed Vivendi Universal (VU) and is concentrating upon the telecommunications and media sectors. Following VU's financial problems in 2002, the company sold a further 43% of VE's equity to a series of French institutions and as a result, VE's results (and debt) are no longer consolidated into VU's. VE has been renamed Veolia Environnement (VE) so as to differentiate between the two companies. Water activities were grouped under Veolia Water. After a further sale in December 2004, VU's share of VE fell to 5.3% and was fully divested in 2006. In 2004, after a recapitalisation exercise, the Générale des Eaux name was revived to become the holding company for Veolia Water's French activities.

Veolia Environnement, profit and loss account

Y/E 31/12 (EURmillion)	2003	2004	2005	2006	2007
Turnover	28,063.0	22,500.3	25,570.4	28,620.4	32,628.2
Operating profit	-766.9	1,480.6	1,892.9	2,132.9	2,496.9
Net profit	-2,054.7	391.5	622.2	758.7	927.9
Earnings/share (EUR)	-5.13	0.99	1.59	1.89	2.13
Dividend/share (EUR)	0.55	0.68	0.85	1.05	1.21

Water

Turnover	9,585*	9,805	9,134**	10,088	10,928
Operating profit	743*	800	1,002**	1,161	1,268

* 2003 figures are pro forma
** 2005 include VE's share in Proactiva

Veolia Water has three segments: Veolia Water Operations (municipal and industrial management contracts, 2005 revenues of EUR6.4billion), Veolia Water Solutions & Technologies (design & build contracts and service solutions for municipal and industrial contracts, 2005 revenues of EUR1.6billion, growing to EUR1.8billion in 2006, with EUR2.2billion in orders gained in 2006 against EUR1.6billion in 2005) and Sade (construction, 2005 revenues of EUR1.0billion).

Veolia Water Solutions & Technologies saw its revenues rise by 12.8% to EUR1,881million in 2007.

Globally, Veolia Water (Veolia Eau) has 4,400 contracts and operates in 60 countries.

VWS, 2005 revenue breakdown, 2005

Municipal	55%	Municipal D&B	47%
Industrial waste water	26%	Municipal solutions	8%
Industrial process water	19%	Industrial D&B	12%
		Industrial solutions	33%

Générale des Eaux (GDE) was founded in 1853 and started the privatisation of France's water sector by winning a concession for water supply to Lyon in that year, subsequently to Nantes (1854), Nice (1864) and gaining the first of a series of concessions serving Paris in 1860. In 1884 GDE secured the first wastewater treatment concession, serving the Reims municipality and pioneering the use of ozone to sterilise water at Nice in 1909. VE is also a pioneer in the development of the international water market. Its subsidiary Compagnie des Eaux pour l'Etranger (CEE) was set up in 1879 for international water contracts. CEE took over the water supply concession for Venice in 1880 and further contracts were gained in Verona, Bergamo, La Spezia and Naples. The company set up Compagnie des Eaux de Constantinople for water supply to Istanbul in 1879, and in 1882, CEE gained the water supply concession for Lausanne in Switzerland and Oporto in Portugal. After the
First World War, VE decided to restrict its contracts to France. As a result, contracts were either wound up or nationalised during the inter-war years.

FRANCE

VE developed its presence in water engineering through the acquisition of SADE in 1918 and Tuyaux Bonna in 1924. Since the 1930s, the French water sector has gradually been privatised with VE being the dominant player in the market. From 1967 onwards, VE has diversified, first into waste management, then energy and more recently into construction, property and media and telecommunications.

VE entered the Spanish water market in competition with FCC and Aguas de Barcelona. Professional Services Group of the USA was acquired in 1981 to address the American market and General Utilities Plc was set up in 1986 in anticipation of the privatisation of Britain's water services. Since 1992, the company has been gaining water and sewerage concessions on a global basis. By 1995, VE had 2,300 operating contracts serving 4,000municipalities in France. VE reduced the number of subsidiaries in France from 40 to one. The company's domestic market strength has meant that until recently, it could take a more relaxed attitude towards the international water markets than Suez.

Approximate breakdown of water revenues by region

EURmillion	**2003**	**2004**	**2005**	**2006**	**2007**
France	6,116	4,205	4,459	4,802	4,927
UK	454	413	464	552	573
Germany	708	766	1,205	1,283	1,277
Rest of Europe	900	953	1,111	1,279	1,413
USA	1,893	497	582	641	539
Rest of Americas	315	105	92	122	148
Africa and Middle East	621	629	609	705	1,017
Asia	391	355	434	579	733
Australia and New Zealand	N/A	77	101	124	300
Total	**11,340**	**7,977**	**9,134**	**10,088**	**10,927**

The decrease in revenues between 2002 and 2004 primarily reflects the selling off of the engineering activities associated with USFilter since 2002 and the sale of the stake in FCC during 2004, with the resultant deconsolidation of the Proactiva activities.

VE – Highlights

1853: Compagnie Générale des Eaux (GDE) wins concession for water supply to Lyons
1880-82: Water supply concessions to Venice and other cities
1884: Wastewater treatment concession for Reims
1967: Waste-to-energy projects
1972: Water activities in Spain
1980: Acquires CGEA (waste management and transport)
1981: Acquires Professional Services Group of the USA
1986: General Utilities Plc formed for UK operations
1987: Licence for France's second cellular telecoms system
1987-88: Acquires construction and property companies
1993: Buys out Eau et Ozone
1995: GDE's first loss – due to property & construction
1998: Générale des Eaux renamed Vivendi
1999: Acquires US Filter and Berliner Wasser, formation of Vivendi Water
2000: Partial flotation of Vivendi Environnement (VE) from Veolia Universal
2002: Deconsolidation of VE and VU
2003: VE renamed Veolia Environnement, sale of Everpure
2004: Sale of VE's stake in FCC, sale of US Filter & Culligan, VU's holding falls to 5%
2005: Acquisition of companies in Italy and Germany
2006: VU's last stake sold, Southern Water sold, United Water JV bought
2007: Desalination contracts in Saudi Arabia, Oman and Australia
2008: Strategic acquisitions in Japan

FRANCE

Water activities (excluding Proactiva)

VE: overall water and wastewater activities	2003	2004	2005	2006	2007
Treatment efficiency of wastewater treatment plants	92%	93%	91%	90%	90%
Water provided (million m^3/pa)	6,112	6,270	N/A	N/A	N/A
Industrial provided (million m^3/pa)	217	226	190	369	453
Customers equipped with a water meter	91%	91%	93%	93%	95%
Efficiency of water systems – Worldwide	77%	77%	77%	78%	75%
Efficiency of water systems – Europe (EU 15)	80%	81%	80%	81%	82%

Water efficiency in Europe in 2003 for its ongoing activities was 83% in 2003. The difference is accounted for by newly acquired concessions operating more run down water assets. Likewise, worldwide water efficiency in 2007 was 79% net of a new contract serving 1.5million with an efficiency of 15%.

Population served in each country

Country	Water	Sewerage	Total
Europe			
France	24,500,000	16,200,000	**24,100,000**
Armenia	1,200,000	1,000,000	**1,000,000**
Belgium	0	1,100,000	**1,100,000**
Czech Republic	4,288,000	4,148,000	**4,288,000**
Denmark	83,000	0	**83,000**
Germany	4,950,000	5,030,000	**5,050,000**
Great Britain	3,313,000	585,000	**3,898,000**
Ireland	0	120,000	**120,000**
Hungary	268,000	2,222,000	**2,222,000**
Italy	1,396,000	2,080,000	**2,096,000**
Malta	290,000	290,000	**290,000**
Netherlands	0	1,700,000	**1,700,000**
Poland	80,000	70,000	**80,000**
Portugal	185,000	275,000	**275,000**
Romania	2,050,000	0	**2,050,000**
Slovak Republic	950,000	950,000	**950,000**
Sweden	50,000	50,000	**50,000**
Argentina *	45,000	45,000	**45,000**
Canada	127,000	238,000	**331,000**
Colombia *	2,495,000	287,000	**2,495,000**
Mexico	5,980,000	3,450,000	**5,980,000**
USA	7,000,000	6,000,000	**14,000,000**
Australia	2,829,000	1,226,000	**2,955,000**
China	30,710,000	9,230,000	**35,050,000**
Indonesia	100,000	0	**100,000**
New Zealand	25,000	251,000	**251,000**
Philippines	10,000	0	**10,000**
South Korea	0	410,000	**410,000**
Gabon	607,000	0	**607,000**
Israel	1,400,000	0	**1,400,000**
Morocco	2,900,000	2,200,000	**2,900,000**
Niger	600,000	0	**600,000**
Oman	350,000	700,000	**1,050,000**

UAE	130,000	1,435,000	**1,735,000**
Total outside France	**74,411,000**	**45,092,000**	**95,171,000**
Global total	**98,911,000**	**61,292,000**	**119,271,000**
Country	**Water**	**Sewerage**	**Total**
Europe			
France	24,500,000	16,200,000	**24,100,000**
Global total	**112,710,000**	**66,547,000**	**130,924,000**

* Proactiva activities

People served via Berlinwasser International have not been included. These can be found in the RWE entry.

The number served in France has remained effectively constant in recent years, net of re-statements for cross shareholdings with Suez Environnement. The table also excludes VE's continuing activities in Spain.

Stake divestments

Approximately USD390million has been raised since 2001 through the selling off of non-strategic minority stakes in asset owning water companies in England and the USA. In the former case, this is also related to preparing for VE's blocked bid for Southern Water (First Aqua).

Company	Country	Holding %	Date	Value (million)
Bristol Water	UK	25	March 2002	GBP23
Mid Kent	UK	21	April 2001	GBP22
South Staffordshire Group	UK	32	October 2002	GBP85
Philadelphia Suburban	USA	17	September 2002	USD200
Southern Water	UK	25	April 2006	EUR89

In addition, some USD3,193million has been raised from the sale of peripheral activities in the US Filter group since 2001. Purchasers have been a combination of companies active in water systems engineering and private equity houses.

Division	Vendor	Date	USDmillion
Surface Preparation	International Surface Preparation	July 2003	130
Waterworks distribution	JP Morgan/TH Lee Partners	September 2002	620
Plymouth Products	Pentair	September 2002	125
Filtration and Separation	Pall	February 2002	360
Johnson Screens	Weatherford International	October 2001	140
Culligan	Clayton, Dubilier & Rice	June 2004	610
Everpure	Pentair	December 2003	215
Systems & Services	Siemens	May 2004	993

These sales involved a total write-down of USD4.5million between 2000 and 2004. VE's water revenues in the USA will be USD700million pa post these divestments.

International alliances and JVs

OMSA: A JV in Mexico with ICA, serving 7.8million people in the country.

Proactiva: Proactiva Medio Ambiente is a 50:50 JV between VE and FCC for all water and waste management contracts in Latin America. It is still being used post the FCC stake sale.

RWE/Berliner Wasser Betriebe: A joint bid gained the Budapest sewerage concession in 1997. Since 2000, it has been used on a number of occasions.
China: VE has a number of local partners in China. Major contracts have recently been gained with Citic Pacific and Beijing Capital Group.

FRANCE

EBRD investment: In 2007, the EBRD (European Bank for Reconstruction and Development) invested EUR90million to acquire 10% of Veolia Voda, which while active in Central and Eastern Europe is primarily VE's vehicle for the Russian Federation and the Ukraine.

IFC investment: In 2007, the International Finance Company (IFC) and France's Société de Promotion et de Participation pour la Coopération Economique (PROPARCO) acquired 19.45% in Veolia Water AMI, the holding company for VE's water activities in Africa, the Middle East and the Indian sub-continent.

MENA joint venture: A JV between VE (51%) and Mubadala Development Company (49%) was formed in October 2008 to develop water & wastewatwer contracts in the MENA region. MDC is owned by the Government of the Emirate of Abu Dhabi and has a series of investments designed to diversity the Emirate's economy.

France

Générale des Eaux started operating in France in 1853. By 1953, the company provided water to 8million people and by 1980, it provided water to 19.8million people and sewerage to 6.9million. In 2006, the figure was 24.5million water customers and 16.2million sewerage and sewage treatment customers. The numbers served has fallen from 26million and 17million respectively in 2004 due to joint contracts with Suez being broken up. VE has retained the Générale des Eaux name for its operations in France, which currently has 4,000 contracts with 8,000municipalities in France. The sewerage market is seen as growing at an appreciably faster rate than the water market, because of the low penetration of sewerage networks and sewage treatment in France in the wake of compliance work for the EU's Urban Waste Water Treatment Directive.

In France, the company has to concentrate on consolidating its water contracts in an unprecedented competitive and critical atmosphere. As part of the company's responses to these challenges, customer service charters for 10million people were issued by the end of 1996, with all customers in France being covered by 1999.

Générale des Eaux:	**2001**	**2002**	**2003**	**2004**	**2005**
Contract renewal rate	77%	92%	80%	>90%	>90%

New contracts gained in each year have at least cancelled out contract losses in each of these years. For example, 53 contracts were lost in 2003, but 35 new contracts were gained. The average waited time before the expiration of long term contracts is 12 years. Total revenues for contracts renewed in 2006 are EUR955million, including an 18 year water and wastewater contract for Narbonne (EUR170million), a 12 year water provision contract for Saint Omer (EUR26million) and a wastewater treatment contract gain in Angers Loire (five years, EUR21million). Total revenues for contracts renewed in 2007 were EUR920million, including the community of Nice Côte d'Azur area (12 years, EUR75million), the city of Beauvais (12 years, EUR38million) and the city of Macon (10 years, EUR59million). In the first half of 2008, 77 contracts were renewed (40 for water and 37 for wastewater) including a 18 year EUR242million water contract for the Clergy Pontoise area.

Denmark

Along with one long standing contract for water provision to 60,000 people via VE's I Krüger AS, VE gained the first wastewater management contract in Denmark in February 2006.

2006	Allerød	8 year management	23,000 sewage treatment

The contract covers managing three WWTWs, the sewerage system and overhauling the municipality's sludge recycling system for agricultural application.

The Netherlands

2002	Delftland	30 year DBFO	1,700,000 sewage treatment

FRANCE

The EUR1.5billion contract was won by the Delfluent Consortium, led by VE (40%); two Dutch publicly owned water distribution companies, Delta Water (20%) and Waterbedrijf Europoort (20%), Rabobank (10%), Heijmans Beton-en Waterbouw (5%) and Strukton (5%). The contract started in 2003 and involves operating the working plant at Houtrust (0.4million PE) and developing the new EUR258million 118million m^3 pa plant at Harnaschpolder (1.3million PE) both entering service in March 2007. VE (50%) is leading a JV, along with Delta Water (25%) and Waterbedrijf Europoort (25%) for operating the facilities and 90km of sewerage network. Delftland serves The Hague and surrounding areas.

Spain: FCC

FCC is a Spanish construction and utility company, which dominates the municipal waste collection market. In October 1998, VE acquired 49% of B1998, the holding company for the Koplowitz sisters' interests in FCC, which in turn holds 56.5% of the company. In July 2004, Veolia sold its 49% stake in B1998 to a company controlled by Mrs. Esther Koplowitz. The transaction reduced Veolia Environnement's net indebtedness by EUR1.1billion, with a total cash payment to Veolia Environnement of EUR916million. Veolia Environnement acquired its stake in FCC from Vivendi in 2000 for a total consideration of EUR691million. VE has retained Gruppo General des Aguas (water and sewerage) which in 1997 served 3million people in Spain and had net sales of PTA1billion. The Proactiva joint venture in Latin America is to continue for the time being.

2007	Campo Dailas	17 year BOT	water desalination

In May 2007, VE gained a EUR128million (EUR78million to VE) desalination contract in southern Spain, with an 18 month construction and 15 year operation period.

Portugal

275,000 people (113,000 customers) were served in 2007, generating revenues of EUR29.8million.

1995	Mafra	25 year concession	45,000 water & sewerage

This is VE's first contract in Portugal. The 25 year water provision concession has sales of FRF25million pa (45,000 people, 22,000 subscribers) and will be extended to wastewater. This award has been seen as somewhat contentious, because it has been alleged that this contract has been set up as a loss leader by VE with its water fee tender of EUR0.46/m^3, compared with the current price of EUR0.65/m^3 and Agbar's tender of EUR0.48/m^3. The municipality intends to invest EUR200-250million on improved sewerage systems over the length of the contract.

1995	Ourem	31 year concession	40,000 sewerage

The concession to serve Ourem (110km north of Lisbon, and 80km from Mafra) was gained in April 1995 (40,000 people, via 15,000 connections), with a turnover of EUR1.8million pa.

1996	Frielas	30 year concession	70,000 PE sewerage

In Frielas, a suburb of north Lisbon, VE is involved in the construction of a wastewater treatment plant. Construction started in March 1996 for a EUR43million facility. This was completed at the end of 1998 and serves the equivalent of 70,000 people through a concession contract.

2000	Valongo	30 year concession	80,000 PE water and wastewater

VE was awarded the concession in July 2000 with a turnover of EUR7million pa. Valongo is 20km east of Porto. This contract operates 2 wastewater treatment plants, 200km wastewater collectors and a 480km water network. Aguas de Valongo serves 31,000 subscribers.

2001	Paredes	35 year concession	60,000 PE water & wastewater

VE was awarded the concession in January 2001 with a turnover of EUR4million for 2002, rising to EUR7million pa. Paredes is 40km east of Porto. This contract operates one wastewater treatment plant, 80km wastewater collectors and a 100km water network. SBPAR serves 5,000 subscribers.

FRANCE

The Czech Republic

Veolia Voda (www.veoliavoda.cz) serves 4.3million people in 1,200 municipalities, along with 15 industrial water outsourcing contracts. Revenues in 2005 were CZK11billion. In 2002, VE acquired Bouygues' 50% holding in their CTSE JV.

2006	Prostejov	25 year management	70,000 water & sewerage

VE will manage the Prostejov Water Company's facilities in the Moravian Region and the contract will generate EUR139million.

2006	Slany	15 year management	21,000 water & sewerage

This contract is adjacent to the Kladno-Melnik contract area. Total revenues will be EUR30million.

2005	Hradec Karlove	30 year concession	149,000 water & sewerage

The contract covers 100,000 people in Hradec Kralove, Eastern Bohemia's regional capital and 50,000 in 100 other municipalities in the region. The contract will generate revenues of EUR525million. Kralovehradecka Provozni AS had revenues of CZK534million in 2006.

2004	Kladno-Melnik	20 year concession	331,000 water & sewerage

Revenues for the contract will be worth EUR600million. Stredoceské Vodárny AS generated revenues of CZK614million in 2006.

2004	Eastern Moravia	30 year concession	157,000 water & sewerage

In June 2004 Veolia signed a 30 year contract with Vodovbody a Kanalizace Zlin (VAK Zlin) the water public authority for the eastern part of Moravia in the Czech Republic. The area includes 80 districts. The contract will generate total revenues of around EUR360million. Revenues in 2006 were CZK374million.

1996	Pilsen	12 + 10 year concession	230,000 water & sewerage
1996	Sokolov	10 + 16 year concession	130,000 water & sewerage
1999	Aqua Pibram	10 + 10 year concession	80,600 water & sewerage

Vodarenska and Kanalizanci AS Plzen (VP) serves the city of Pilsen on a lease with O&M work. The contract is currently for water provision (230,000 people) plus wastewater (180,000 people), the latter through a new sewage treatment facility opened in 1997. Industrial and domestic customers pay an equal amount for water and prices are below that seen in most of the Czech Republic. During 1997, the contract was extended to cover a further 72,000 people in the northern part of Pilsen. Allied with the sewerage expansion, this boosted 1998 turnover to CZK700million which was steady at CZK737million in 2006. In 2000, the Pilsen contract was granted a 10 year extension to 2017. In 2004, VP extended its service areas in the two latter districts with the municipalities of Štenovice, Cizcice and Ejpovice.

The Aqua Pibram concession was gained in December 1999. Aqua Pibran was renamed 1.ScV AS after the merger with VAK Ricany u Prahy, s.r.o., which added 4,600 people. 1.ScV had revenues of CZK274million in 2006., while the Sokolov contract gained a 16 year extension. The Aqua Pibram concession contract was extended by 10 years in 2003, with revenues of EUR4million pa.

1998	Northern Bohemia	15 year concession (1995)	1,238,000 water & sewerage

Hyder's stake was sold for CZK795million (USD26.7million) to VE, giving the company 43.17% of Severomoravske Vodovy a Kanalizace Ostrava (ScVK), with Severoceske Vodarensky Svaz (SVS), formed by the client towns, holding a further 34.7%. At the start, 1.07million of the inhabitants were connected to the mains water supply and 0.87million to the sewerage network. ScVK's turnover to March 1999 was CZK1.1billion and rose to CZK5.53billion in 2006.

1999	Ceske Budejovice	10 + 10 year concession	200,000 water & sewerage
1999	V Klatovy	10 year concession	50,000 water & sewerage
1999	3 towns	10 year concession	26,000 water & sewerage

The Ceske contract is operated by 1.JVS, a joint venture originally between VE and SAUR, which VE subsequently took full control of. The original concession was granted a 10 year extension in 2000 to 2018. Revenues in 2006 were CZK691million. The Vodosopol Klatovy concession is incorporated within 1.JVS and was acquired in December 1999, along with the privatisation award for the towns of Susice (12,000), Stary Plznec (6,000) and Stod (6,000).

2000	Olomouc	20 year concession	140,000 water

This concession was awarded to Stredomoravaska Vodarenska AS (SMV) in March 2000. It is the first PSP contract in the region. Total net sales for the contract will be EUR200million. 2006 revenues were CZK395million.

2001	Prague	28 year concession	1,465,000 water & wastewater

VE and AWG paid EUR174million for a 66% stake in PVK, and VE subsequently bought out AWG's stake. In 2002, the remaining 34% of shares were acquired from the municipality. The 13 year concession will generate EUR60million in 2001 and EUR120million in subsequent years. The contract will concentrate on service quality improvement and upgrading water and sewage treatment to EU standards. The concession was extended to 28 years in 2002. Leakage was reduced from 47% in 2001 to 23% by 2006. Revenues in 2006 were CZK4.6billion.

Slovakia

These contracts, awarded in May 2006, are the first international water tenders in the Slovak Republic. Water and wastewater services will be provided to 950,000 people in 750 towns, villages and districts in Central and Northern Slovakia.

2006	Banska Bystrica	30 year concession	660,000 water & wastewater

This is a concession with the Banska Bystrica Water Company (StVS) which will generate revenues of EUR1.4billion over the contract. The town of Banska Bystrica has 85,000 people, with 660,000 in the region.

2006	Poprad	30 year concession	290,000 water & wastewater

Poprad Water Company (PVS) was awarded the concession, with annual revenues of EUR17million and a total contract value of EUR566million. There are 57,000 people in the town of Poprad, which is part of the Presov region in the North East of the country.

Hungary

VE aims to increase its share of the market in Hungary from 20% to 50% in the medium term. In 2007, it served a total of 2.3million people.

2006	Erd Region	25 year concession	100,000 water & sewerage

Érd és Térsége Víziközmû Kft, a joint venture with the Budapest Water Company was set up in May 2006 for providing water and wastewater services to 100,000 people in the seven districts of Erd which lies to the south of Budapest. VE and Budapest Water will hold 26% of the operating company with the municipalities retaining 74%.

2004	Salgótarján	20 year O&M	44,000 sewerage

The Salgótarjáni Csatornamû Kft contract covers the operation of a sewage treatment works and sewerage system serving the towns of Salgótarján, Kazár, Mátraszele and Vizslás.

FRANCE

1994	Szeged	15 year concession	168,000 water & sewerage

The Szeged contract had a FT1.16billion turnover (FT40million) in 1995. The 15 year contract was awarded to VE's 100% held subsidiary Servitec, which holds 49% of Szegedi Vizmü, the holding company for the contract. Currently 60% of the city is connected to the sewerage network. The contract was gained after VE had been awarded a FT200million water treatment plant construction contract in 1992. The company has been profitable since 1996 and water consumption has been reduced by targeting leakage, installing meters and a progressive pricing policy.

2006	Budapest	4 years, DBO	1.5million wastewater

In 2006 Dergremont and Veolia, along with Hídépíto and Alterra, two local civil works companies, gained a EUR290million contract to build (EUR249million) and operate for four years (EUR40million) a 350,000m^3/day wastewater treatment works (wet weather capacity 900,000m^3) at Csepel to serve 1.5million people in the Budapest area. The facility will enter service in 2010 and will be operated by them until 2014.

1997	Budapest	25 year concession	1.9million, sewerage

The management company formed by VE (35%), BWI (35%) and EBRD (30%) took a 25.1% stake in Fövarosi Csatornásási Müvek Rt., Budapest's wastewater company. Secondary treatment capacity has increased from 220,000m^3/day in 2000 to 280,000m^3/day in 2004 (76% being used), with the number of customer connections rising from 137,813 to 162,753.

Poland

2006	Wozniky	10 year management	10,000 water

VE's PWIK Wozniky gained the contract for the town of Wozniky in Upper Silesia in February 2006.

2001	TGMS	25 year concession	70,000 water & sewerage

The contract to operate the Tarnowskie Gory and Miasteczko Slaskie water company was gained in December 2001. The company manages the municipal water and wastewater services for 70,000 people in the two towns. VE's initial 33.85% stake increased to 63.5% in 2003. The contract will generate total revenues of EUR125million.

Romania

2000	Ploiesti	25 year concession	250,000 water

The concession was awarded to Apa Nova Plotesti SRL (73% held by VE, 27% by the municipality) in April 2000. EUR26million will be spent on network upgrading and renewal over 15 years and EUR47million on treatment systems over 25 years, with a turnover of EUR8million pa.

2000	Bucharest	25 year concession	1.8million water and wastewater

The concession to modernise Bucharest's water supply was granted to Apa Nova Bucuresti ANB (84% held by VE, 16% by the municipality) in April 2000. EUR126million was invested in the first five years of the concession out of an expected total of EUR1.05billion, with the proportion of households receiving a continual water supply rising from 39% to 91%. Annual revenues will be EUR80million pa. At the start of the contract, 1.8million people were served with water and 1.67million with wastewater. This is to increase to 2.0million during the contract.

The Russian Federation

In 2007, the EBRD (European Bank for Reconstruction and Development) invested EUR90million to acquire 10% of Veolia Voda, which while active in C&EE is primarily VE's vehicle for the Russian Federation and the Ukraine.

FRANCE

2005	St Petersburg	5 year management	2million water

Veolia Water's SPEP (Société Eau Pure, 51% GDE, 48% Vodokanal & 1% St Petersburg municipality) gained a five year management contract for the city's left bank water treatment works. This facility handles 1.2million m^3/day of water.

A partnership with Evraziysky and Eurasian Water Partnership for the development of water and wastewater projects in Russia was signed in October 2006, including acquiring 50% of EWP's equity. EWP currently has water and wastewater contracts serving Rostov-on-Don (Voda Rostova) and Omsk.

Armenia

2005	Yerevan	10 year management	1.2million water & wastewater

A EUR160million contract supported by World Bank funding. The initial emphasis will be in managing water leakage and service extension.

United Kingdom

Veolia Water UK has controlling holdings in three British Statutory Water Companies (SWCs), asset owning entities that supply water only. VE acquired six SWCs between 1988 and 1990, the most important of which is Three Valleys Water. VE sold its final interest in Southern Water to Southern Water Capital Limited in April 2006 for EUR89.6million.

Y/E 31/03/2008 (GBPmillion)	Population	Equity Holding	Turnover	Operating Profit
Three Valleys Water	3,000,000	100.0%	274.[illegible]	77.[illegible]
Tendring Hundreds	150,000	99.1	17	[illegible]
Folkestone & Dover Water	163,220	78.7	13	[illegible]

Three Valleys Water consists of the Colne Valley, Rickmansworth and Lee Valley Water companies, which were merged in 1994. The company grew again following a merger in October 2000 with VE's North Surrey Water, which was formed in 1973 from four founder companies. The company provides 0.858million m^3/day of water to parts of Bedfordshire, Berkshire, Buckinghamshire, Essex, Hertfordshire, Surrey, and the London Boroughs of Barnet, Brent, Ealing, Harrow, Hillingdon and Enfield. TVW aims to install 200,000meters between 2005 and 2010.

Tendring Hundreds and Folkestone and Dover are characterised by high levels of domestic metering. 66% of the former company's domestic customers had meters in 2007, while the latter company aims to have 90% of customers metered by 2015 compared with 55% in 2007. The Folkestone Waterworks Company was formed in 1848, one of the first to take advantage of the Waterway Clauses Act of 1847, and merged with two other companies in 1953 and 1970.

Thames Water Services was acquired by Veolia Water UK for EUR115million (GBP78million) in August 2007, with an enterprise value of EUR233million. UK revenues of EUR160million (GBP109million) are anticipated for 2008 (with EUR80million revenues gained in the first half of 2008). The company has two principal contracts in Wales and Scotland.

Scotland

1998/99	Eastern Scotland	30 year PFI BOT	585,000 sewage treatment

Sterling Water (TWS (49%), M J Gleeson (41%) and Montgomery Watson (10%)) gained the Eastern Scotland contract. The original Almond Valley and Seafield GBP50million scheme for the upgrading of five sewage treatment works serving Edinburgh and replacing sewage sludge disposal to sea with land based recycling has been extended to include the GBP20million Esk Valley scheme. These contracts are operated by Thames Water Services. The population covered will be 585,000 at the start, rising to 850,000 in an area covering 1million people at the outset and 1.2million at completion.

Wales

2001	Wales	5 + 7 years, Customer Services	1.3million households

The first contract was worth GBP68million to manage customer services for Dwr Cymru Welsh Water until 2005. The contract serves 1.3million connected properties, representing a population of over 3million. In 2005 it was renewed for up to 7 years.

Ireland

2008	Mullingar	22 year BOT	30,000 wastewater

Total revenues for the contract will be EUR46million including a 55,000 PE sewage works which will cost EUR25million and is due to enter service in June 2010.

2006	Limerick	20 year BOT	90,000, wastewater

This is a EUR71million repair, enlargement and operation contract for the city's wastewater treatment plant, which will increase its treatment capacity from 51,000m^3/day to 87,000m^3/day.

Germany

Berliner Wasserbetriebe (BWB)

Y/E 31/12 (EURmillion)	**2003**	**2004**	**2005**	**2006**	**2007**
Domestic revenues	N/A	N/A	N/A	1,123	1,117
International revenues	N/A	N/A	N/A	19	17
Services revenues	N/A	N/A	N/A	5	5
Total turnover	**1,202**	**1,228**	**1,234**	**1,147**	**1,139**
Net profit	116	62	85	89	150
Water sales (million m^3)	214	201	197	202	193
Sewage treated (m m^3)	230	232	227	231	N/A

BWB dates back to 1856, including 45 years with its services being divided by the Berlin Wall. In 1999, after the partial privatisation of BWB, Berlinwasser Holding AG was formed and BWB was vested into this company. The consortium (VE 50.1% and RWE 49.9%) acquired 49.9% of BWB for EUR1.69billion, with the majority 50.1% stake being held by the City of Berlin.

1999	Berlin	30 year concession	3.9million water and sewerage

BWB serves 3.4million people in Berlin, operating nine water treatment works and six sewage treatment works. In addition water is provided to 90,000 people and wastewater treatment to 0.5million in Brandenburg via 10 water and 24 wastewater contracts with a total of 113 local authorities.

The sale by VE and RWE of 80% of Berlinwasser International to Marubeni in 2005 was rescinded in 2006 and in 2007 BWB decided to continue developing these activities. Please see the RWE company entry for BWB International's activities.

Other contracts in Germany directly held by VE

1995	Döbeln/Oschatz	20 year management	135,000 water and sewerage

Oewa (46% held by VE, a JV with Veba Kraftwerk Ruhr AG until 1998) gained a contract for Döbeln/Oschatz in Saxony with a turnover of (DM17million), serving 135,000 people.

1999	Grimma	25 year concession	85,000 water and sewerage

The concession covers 19 communes in Saxony, 85,000 being served with piped water and 45,000 with sewerage. The contract is worth EUR153million over its life. Oewa Wasser und Abwasser GmbH mainly operates in Saxony-Anhalt, holding 25 contracts, including 6 gained via the 1994 acquisition of Awatech.

1999	Midewa	Acquisition	400,000 water & sewerage

FRANCE

In December 1999, activities in Saxony Anhalt were boosted by the acquisition of Midewa, which has a turnover of EUR56million pa. 400,000 are included for water services and 200,000 for sewerage. VE also has a 25 year O&M contract for sewerage services in the Hanover area, with a turnover of EUR15million pa.

2001	Görlitz	Acquisition (74.9%)	80,000municipal services

Saxony's Stadwerke Görlitz had a DM120million (EUR61million) turnover in 2000. It provides waste management, water, sewerage, energy and public transport services to the town.

2003	Gera	10 year BOT	165,000 water & wastewater

The contract is with the municipality of Gera in Thuringia. Total revenues for the contract will be EUR130million.

2004	Braunschweig	16 year BOT	250,000 water

Veolia Water acquired 74.9% of Braunschweiger Versorgungs AG (BVAG) in December 2004 for EUR372.5million. The company manages water and wastewater services for the city in Lower Saxony. The company will generate revenues of EUR270-300million pa from 2005.

2005	Braunschweig	30 year O&M	250,000 wastewater

A subsequent contract, awarded in December 2005 covers the city's wastewater treatment plants run by Stadtentwässerung Braunschweig Gmbh and is worth EUR390million.

Belgium

2001	Brussels	20 year DBFO	1.1million sewage treatment

Construction of the Brussels North STW started in 2003, and the facility entered service in the first half of 2008. The contract is worth a total of EUR1billion over its life, including EUR290million in Capex and a fee of EUR49.6million pa for the Aquiris consortium. Treatment capacity will be 119million m^3 pa.

Sweden

2001	Norrtalje	10 year 'concession'	50,000 water & wastewater

The turnover over the life of the contract will be EUR25million. This is the first water PPP in Sweden. Veolia Vatten also operates the water and wastewater networks for the municipalities of Danderyd and Jarfalla, as well as pumping stations for Stockholms Lokaltrafik (SL).

Norway

2003	Oslo	Construction/operation option	Water treatment

This is to be the largest water treatment plant in Norway, serving some 250,000 people and costing EUR73million in total, with completion planned for 2008. There is an option for a 15 + 5 year operations contract worth EUR102million.

Italy

Until 2005, VE was effectively engaged in managing a portfolio of operating contracts and strategic stakes. The 2005 acquisition of Enel Hydro has more than compensated for the decision to sell its stakes in the two Genovan water companies to Amga. It is understood that VE continues to hold 72% of Siemec, a company providing sewerage and sewage treatment to 700,000 people.

FRANCE

Acquisition of Enel Hydro

75% of Siciliacque, the entity running Sicily's water distribution system was sold to a VE and Enel joint venture in 2004 for EUR299million. The 40 year concession starts in 2004 and calls for investments of EUR1billion, including EUR300million in the first decade and reducing leakage from 30% to 12%.

Enel's water activities were sold to Veolia for EUR36million in May 2005. Enel Hydro SpA provides water to 6.1million people, mainly through Idrosicilia SpA which provides water management services in Sicily. VE acquired 100% of Enel Hydro in the deal, along with 20% of Idrosicilia and an option for Enel's remaining 40% stake in the latter company.

2001	Latina	30 year concession	600,000 water and wastewater

ATO de Latina covers southern Lazio's ATO-4, serving 38 communes. A consortium of VE (21.8%), Enel (23%) and Acquedotto Pugliese (23%) gained the concession in July 2001, after the tendering process had been held up by a dispute over the scoring system. The concession will be worth EUR2billion over its operating life. UFW needs to be decreased from 70% to 25-30% and major sewage treatment upgrades are also required. A further 500,000 tourists use the area.

2001	Calabria	30 year concession	752,000 water and wastewater

VE and Acquedotto Pugliese hold 49% of Societa Risorce Idriche Calabresi (So Ri Cal), serving the region of Calabria. The concession became operational in 2002 and involves Lira800billion of capital spending over its life, mainly during the first 8-10 years.

Gruppo Camuzzi

Gruppo Camuzzi was founded in Milan in 1929. In October 2001, Mill Hill NV, the Dutch holding company of the Garilli family, sold 40% of its 100% holding in Gruppo Camuzzi to Enel for EUR434million. In March 2002, Enel bought the rest of Camuzzi for USD870million from Mill Hill NV. The company is principally engaged in gas services. In 1997, Camuzzi gained a 20 year concession contract for water and wastewater services for the town of Massa, serving 44,051 and 30,379 people respectively. Camuzzi's subsidiary Gazometri in total manages 5 concessions in Lombardy, Tuscany and Abruzzo and supplies 40,195 customers. 6% of the group turnover in 1999 was in environmental services.

Argentina

1994/1996	Balacarse & Laprida	20 year concessions	45,000 water and wastewater

The concessions cover two towns in the Buenos Aries region. Camuzzi holds 100% of Aguas de Laprida and 70% of Aguas de Balacarse. The concessions serve a total of 17,835 customers. USD3.54million has been spent on infrastructure development since 1994, with a 2001 turnover of USD1.74million.

China

VE's consolidated revenues in China were EUR350million in 2003. It is by some way the fastest growing market VE is involved in and is set to become VE's largest international water services market in the medium term. VE currently has 20 municipal and 5 industrial contracts, serving some 30million people in China, including 21million via full service concessions.

2007	Haikou	30 year management	800,000 water & wastewater

The Haikou (Hainan) contract was awarded in June 2007, following the acquisition of 49% of the operating company. The contract will generate revenues of EUR776million.

2007	Tianjin	30 year management	3million water

Veolia Water acquired 49% of the Tianjin Shibei Water Company Ltd from the Tianjin Water Works (Group) Company Ltd. The contract will generate revenues of EUR2.5billion. The project will cover the district of Shibei, the Northern part of Tianjin, and the Binhai district on the Eastern coast. It includes

managing the Xinkaihe water production plant (1million m^3/day) and a 1,988km of mains and the 500,000m^3/day Jinbin water treatment works, currently under construction. In addition, the company will develop the water conveyance network to all the industrial areas in the Binhai area, situated along the coast of Bohai Bay.

2007	Lanzhou	30 year management	3.2million, water

This EUR1.6billion contract for the capital of Gansu Province was gained in January 2007. VE will hold 45% of the Lanzhou Water Supply Company. VE will manage four water treatment plants with a total capacity of 2,190,000m^3/day and 640km of water mains.

2006	Liuzhou	30 year management	1.0million, water

The August 2006 contract sees VE taking 49% of Liuzhou Water Services and responsibility for managing all water distribution services, including 4 water treatment plants with a combined capacity of 540,000m^3/day. Revenues over the contract will be some EUR330million.

2005	Kunming	30 year BOT	3.5million, water

Signed in November 2005, this contract will generate EUR1,100million in revenues. VE and Citic Pacific will hold 49% of Kunming Water Supply and manage its 1.615million m^3/day water treatment and distribution service. This contract generated EUR20million in revenues during the final seven months of 2006.

2005	Changzhou	30 year BOT	1,200,000 water management

Veolia Water and Citic Pacific acquired a 49% stake in the municipal company Changzhou Tap Water Group following an international tender. The contract is worth EUR800million and involves managing the company, including 5 water treatment plants (capacity 790,000m^3/day), a 1,750km distribution network and customer services.

2005	Handan	25 year BOT	800,000 wastewater

This contract involves the construction of a new wastewater treatment plant with a capacity of 100,000m^3/day and its operation for 25 years. The Veolia Water Systems contract will have total revenues of EUR62million.

2005	Urumqi	23 year BOT	1,200,000 wastewater

The contract serves the capital of the Xinjiang Uyghur Autonomous Region and involves upgrading and operating for a 23-year period of the city's wastewater treatment plant, in partnership with Beijing Capital Group (BCG). The plant's current capacity of 200,000m^3/day will increase to 400,000m^3/day by 2008. Total revenue for Veolia Water for the contract will be EUR260million.

2003	Shenzhen	50 year BOT	7,600,000 water & wastewater

This contract is being jointly operated with Beijing Capital Corporation (see company entry) and will generate revenues totalling EUR8.5billion. 45% of the contract company is held by VE and BCG and 55% by the Shenzhen municipalities. VE is investing EUR390million into the project. At the start of the project, 2.6million people were served.

2004	Weinan	22 year BOT	300,000, water

This is a EUR190million rehabilitation and operation contract for bulk water services, providing 160,000m^3/day.

2004	Hohhot	30 year BOT	2.5million, water

The rehabilitation and operation of the Inner Mongolian capital's water production and treatment system (10 plants) has a capacity of 515,000m^3/day will generate revenues of EUR600million.

2004	Beijing	20 year BOT	wastewater

The Bei Yuan wastewater treatment plant is adjacent to the Olympic Village and the contract will generate total revenues of EUR20million.

2004	Zunyi	35 year concession	600,000 water

Zunyi is in Guizhou Province. This rehabilitation and operation contract is being carried out jointly with Citic Pacific (see company entry) and will generate total revenues of EUR210million.

2003	Qingdao	25 year BOT	1million wastewater

The contract (with China Everbright) covers the operation of two wastewater treatment works for the 2008 Beijing Olympiad. Revenues will total EUR110million. The capacity of the Maidao plant was increased from 80,000m^3/day to 140,000m^3/day in 2006.

2003	Beijing	20 year BOT	250,000 wastewater

Veolia Water and Kerry Utilities (part of PPB of Malaysia), signed a 20 year contract to operate the Lugouqiao wastewater treatment plant, located in the east of Beijing. Total revenues will be EUR50million. This is the first private sector WWTW contract for Beijing and will be financed through a World Bank loan to the Beijing municipality with VE and Kerry providing an additional EUR5million. The plant will cost EUR40million.

2002	Baoji	BOT, 23 year	500,000 bulk water supply

VE is to refurbish the city's two WTWs and to expand their capacity. Revenues over the life of the contract will be approximately EUR300million.

2002	Zhuhai	BOT, 30 year	1,200,000 bulk water supply

VE is to refurbish one WTW and to construct a second facility. Revenues over the life of the contract will be approximately EUR400million.

2002	Shanghai	50 years, O&M	2.2million water services

In May 2002, VE gained the water O&M contract for the Pudong business district in Shanghai. This is the first outsourcing contract to give a foreign company the responsibility for providing a full service offering: embracing drinking water production, network distribution and customer services. Veolia Water has bought a 50% share in a new JV company, Shanghai Pudong Veolia Water Corporation, for an amount of EUR266million. At the start of operations, the contract will supply potable water to 535,000 domestic connections and 18,000 commercial and industrial customers with an average daily consumption of 1.2million m^3. An immediate priority has been reducing distribution losses from their 30% level. The entire Pudong area currently has 2.4million residents. The 50-year contract is expected to generate a turnover of over EUR10billion during the term due to the expected substantial growth of Pudong in the coming years. The business district is forecast in the long-term to be home to 5million people.

1998	Chengdu	BOT, 18 year	850,000 bulk water supply

The BOT contract was awarded to Chengdu Générale des Eaux-Marubeni Waterworks (CGDEM), a JV with Marubeni (60% VE, 40% Marubeni). This is the first wholly foreign owned BOT water supply project in China. The project for Sichuan's capital cost USD100million, USD90million going on the treatment plant. It supplies 460,000m^3/day of water. Construction took 30 months and includes 27km of pipelines. Chengdu has a total population of 10million, of whom 3.2million live in the central area. The Chengdu Municipal Waterworks General Company currently only serves 1.8million people. Revenues of on average EUR24million pa are forecast from 2002.

1997	Tianjin	'Concession-type', 20 year	3.5million water treatment

This was awarded for upgrading the Lingzhuang water treatment works, which has a 500,000m^3/day capacity and is one of the Tianjin's largest facilities, providing water to one third of the 11million served by the municipality. The facility is to have its capacity increased by 250,000m^3/day in the medium term. The contract generates bulk water sales of USD15million pa, with an agreed capex of USD30million for plant rehabilitation and the building of a new 13km piping network. CGE Tianjin Waterworks holds the concession, which is 55% held by a JV which is in turn 70% owned by VE and 45% held by the municipality's Tianjin Waterworks Co.

Kazakhstan

VE was awarded two contracts in March 2000: (1) A 30 year water management contract for the old capital Almaty (1,250,000 people) and (2) A USD40million contract for pipeline and pumping station renovations for the new capital Astana (300,000, to grow to 500,000). The Almaty contract never started due to delays by the Government causing VE to pull out. VE retains an industrial water services presence in the region.

Republic of Korea

2004	Kumdan	23 year BOT	150,000, wastewater treatment

The Kumdan WWTW is located near Incheon. The facility will have a capacity of 40,000m^3/day and will generate consolidated revenues of EUR80million. The contract is jointly run by Hanwha Engineering & Construction Corporation & Doosan Construction & Engineering.

2001	Incheon	23 year BOT	260,000 sewage treatment

The Incheon contract (Samsung Veolia Incheon Wastewater Co., Ltd., VE 80%, and Samsung Engineering 20%) involves USD300million being spent on two sewage treatment works (Mansu, 70,000m^3/day and Songdo, 30,000m^3/day) with a total capacity of 100,000m^3/day. The two facilities entered service in April 2005.

Japan

VE has had a low key presence in Japan, being involved in short term wastewater maintenance contracts for some years. Major contracts have been gained since 2006, including two three year O&M wastewater treatment works in 2006 (Saitama, a district near Tokyo and for Hiroshima) and in April 2007, VE gained a three year O&M contract for a 283,000m^3/day wastewater treatment plant serving 500,000 people in Chiba, which will generate total revenues of EUR17.8million.

In July 2007, Veolia Water Japan and J-Power (Japan's Electric Power Development Co) acquired Fresh Water Miike, a water management unit of Mitsui Mining Co. This company, now named Fresh Water Service Co provides water services for half of the households in Omuta, Fukuoka Prefecture and the neighbouring Arao in Kumamoto Prefecture. VE made four further acquisitions of water technology companies in Japan during the first half of 2008:

Company	Revenues	Revenue year
Nishihara Environment Technology	EUR38million	2007
Dai Nippon Eco Engineering	EUR8million	2008
Yamagata Kangyo Engineering	EUR4million	2007
Nichijo	EUR7million	2006

India

VW India gained a four year performance contract to provide continual water supplies at various pilot locations in the state of Karnataka, serving 200,000 people through 33,000 connections including 10,000 social connections.

2007	Nagpur	5 year O&M	100,000, water
2008	Nagpur	15 year DBO	650,000, water

Revenues for the 30 month construction and 15 year operations contract will be EUR24million, including construction. The 240,000m^3 per day water treatment plant contract was awarded in June

2008 and builds upon an earlier rehabilitation contract and a pilot services upgrading project designed to provide a continual water supply for 10,000 customers (100,000 people) in the city.

Indonesia

1997	Sidoarjo	25 year BOT	100,000 bulk water supply

This concession is for bulk water provision to PDAM Delta Tirta Sidoarjo, the local water entity. The concession holds 95% of the equity, along with Indonesia's PT Agumar Nusa and PT Hansa Letsari. The build and management concession will entail a capital investment of IDR130billion, or a EUR4million investment by Veolia Water. The facility will have a 20,000m^3 day capacity, for 100,000 people.

Philippines

The 1998 Fort Bonifacio concession was sold to a third party in 2007.

2000	Manila	25 year concession	Water supply and sewerage

The concession for the Clark Economic Zone is similar to the Fort Bonifacio contract. In this case, it is for a 4,400ha site earmarked for future development, where EUR25million will be spent developing the basic water and wastewater infrastructure in the first three years of the contract.

Malaysia

The company gained its first concession in 1995 and has made further progress by working with local companies so as to take over the operation of their concession contracts.

1995	Selangor	25 year O&M contract	1.4million water provision

The Selangor contract involves bulk water provision for the entire state. This involves the management and rehabilitation of the state's 26 water treatment plants with VE as a subcontractor to Puncak Niaga.

Gabon

1997	SEEG	20 year concession	910,000 utility services

VE won the tendering process to acquire a 51% stake in the Gabonese public utility Société d'Electricité et d'Eau du Gabon (SEEG), with 49% of SEEG held by local investors. This is a XAF700million concession for water production and electricity distribution to the three principal cities; Libreville (422,000 people served with water), Port-Gentil and Franceville, including XAF200million for water. Average tariffs fell by 17% at the start of the contract and have been held to less than the rate of inflation since then.

Water coverage	1993 coverage	2000 target	2000 actual
Libreville	49.3%	53.0%	61.3%
Franceville	38.6%	43.0%	58.0%
Port Gentil	37.7%	43.0%	49.5%

There were 100,385 customer connections in 2005, including 17,978 which have subsidised connections using less than 15m^3/month. By 2006, the connection rate had risen from 40% to 70%, with 192,000 people in worse off areas being connected to water and sewerage since 2002. 920,000 are currently provided with electricity services and 607,000 with water services out of the country's population of 1.3million.

Niger

2000	SEEN	10 years, management	Up to 2.1million, water

Supported by USD65million in funding by the World Bank's IDA, the French Development Agency and the West African Development Bank, this 10 year affermarge contract for Société d'Exploitation des

FRANCE

Eaux du Niger (SEEN, 55% VE, 45% local investors) covers 52 urban centres and charges on average XOF208/m^3 (EUR0.3) for drinking water. Between 2001 and 2005, the number of connections rose from 58,000 to 79,433, including 11,688 new low cost connections. Niamey (600,000 people) is the initial target area, with other addressable markets to be covered later. The contract will be worth a total of EUR150million and aims to serve 1million people when fully operational. Bill collection rates were 97% in 2004, reflecting a programme to optimise affordability for all clients, with 84% network efficiency and 97% water quality compliance in 2005.

Burkina Faso

2001	Ouagadougou	5 year support services	900,000 water

VE, along with local companies Cabinet Mazars and Guerard was awarded a five year support services contract supported by the World Bank to expand services for the city aiming to cover 0.9million people.

Chad

2000	STEE	Phased PPP	Up to 7million water

Société Tchadienne d'Electricité de l'Eau (STEE), Chad's water and electricity utility, may undertake a series of PPP exercises, involving greater degrees of private involvement over a series of phases. An O&M contract started in 2000, but little evidence of this contract developing has since been noted.

Morocco

The two concessions currently serve 3.6million people in 38 local authorities through 738,500 electricity and 588,500 water customer connections including 48,500 low cost water and sewerage connections. 3.2million people are served with water and sewerage. A particular emphasis has been placed on water network efficiency:

% efficiency	2002	2004
Tangier	60.9%	73.4%
Tétouan	52.7%	66.0%
Rabat	68.0%	81.7%

2001	Tangier & Tétouan	25 year concession	Up to 1.4million water & electricity

The concession serves a total of 23 districts within the two cities. VE (51%) is the lead company in Amendis a consortium comprising ONA of Morocco, SOMED (Morocco and UAE) and Canada's Hydro Quebec. The two concessions cover water & wastewater and electricity services for 23 districts within the two cities, serving a total of 1.4million people; 780,000 in Tangiers and 630,000 in Tetouan. The Tangiers contract were designed to generate revenues of EUR66million pa from 2001 and the Tétouan contract will generate revenues of EUR39million, with combined revenues of EUR130million pa by the fifth year. The concessions involve network and service maintenance, with an emphasis on extending and rehabilitating sewerage services. The concessions will also be designed to take into account the population growth anticipated over the duration. 28,500 low cost water and wastewater connections have been made to date, along with the aim of 90% sewerage coverage by 2008.

1999	Rabat	30 year concession	Up to 2.2million, water & sewage

The EUR4.6billion utility privatisation for Rabat and Sale was awarded to Redal, Dragados' consortium with Electricidade de Portugal, Pleiade (Portugal) and Alborada (Morocco). Rabat's utilities serve 1.7million people, with a EUR138million (USD130million) turnover for water, sewerage and electricity services in 1998. 84million m^3 of water was delivered in 2000. Dragados sold its stake to VE in November 2002. MAD700million (EUR64million) was invested in the area in 2003, including MAD350million in wastewater treatment facilities, concentrating on a new WWTW in Skhirat. 15,000 low cost water connections and 20,000 low cost sewerage connections have been made since 2002.

FRANCE

Oman

2006	Muscat	5 + 3 year management	700,000 wastewater treatment

A five-year management contract with a three-year extension option was awarded by the Oman Wastewater Services Company in June 2006 to assist in the management of wastewater services in Muscat. OWSC is responsible for all wastewater services in Muscat under a 30 year concession agreement at the beginning of 2006 with the Government of Oman for the acquisition, development and operation of Muscat's wastewater collection and treatment system.

2007	Sûr	22 year BOO	350,000 water provision

In January 2007, VE gained a EUR434million 22 year contract to build, finance and operate a 80,200m^3/day RO desalination plant for the city of Sûr and the surrounding region of Sharqiyah. The facility will cost EUR111million to construct in partnership with Bahwan Engineering Co (VE 60%, Bahwan 40%).

Saudi Arabia

In April 2008, Veolia Water AMI was awarded a six year EUR40million incentive-based management contract for improving aspects of the management of the 10,000km Riyadh water supply system and the 4,500km sewerage system. The former will involve reducing leakage from its current 50% level and the latter in improving the connection rate of the city, where currently 2.0million of the 4.5million inhabitants are connected to the system.

United Arab Emirates

2007	Fujairah	12 year O&M	130,000, desalination

Veolia Water was awarded a contract to operate and manage the reverse osmosis desalination plant at the F2 IWPP project in Qidfa, Fujairah in December 2007. There is a three year pre-operational phase prior to the facility entering service in 2010.

2007	Abu Dhabi & Al Ain	25 year BOT	1.2million, wastewater

A EUR364million contract (including construction), which was announced in July 2008. The Abu Dhabi (850,000 people in 2008) plant will have a 300,000m^3 per day capacity and the plant serving the emirate's second city, Al Ain (348,000 people in 2003) will treat 130,000m^3 per day. Construction will take 3 years, with a 22.5 year operating contract on completion. The shareholding is similar to the Ajman concession. In addition, VE has a DBO contract (the 3 year operating phase generating revenues of EUR10million) to treat the water in the artificial lake by the Burj Dubai Tower which was also gained in 2008.

2006	Ajman	27 year Concession	235,000 wastewater treatment

The concession was awarded in February 2006 to Moalajah. This company is managing the concession and is 67% owned by VE and 33% by Besix of Belgium. The concession company is in turn 50% held by Besix, 20% by VE, 10% by Black & Veatch and 20% by the Ajman Government. A 90,000m^3/day facility will be constructed from 2007-09, along with 230km of sewerage and the contract will generate EUR151million in revenues. This supersedes the Thames Water/Black & Veatch BOT, whereby a USD100million refinancing, using the first monoline credit facility in the Middle East formed part of Thames Water selling its 60% stake in the original 2003 concession to the new holders.

Israel

2001	Ashkelon	25 year BOT	1.4million water desalination

VID Investment Consortium, comprising VE, IDE and Dankner of Israel gained the BOT contract. VE holds 50% of OTID, the construction company's equity, and 49.5% of ADOM, the operating company. The contract covers the construction and operation of two 54million m^3 pa facilities, the largest membrane sea water desalination plant in Israel. Total revenues will be EUR900million, with the plant costing USD110million to build. The provision price of USD0.527/m^3 was well below expectations due

to new technologies purchased by VE and a relatively low cost of capital. The facility entered service in 2003 with full capacity in 2005.

Australia and New Zealand

United Water was set up in 1995 to bid for the Adelaide contract, as a vehicle for securing business for the state in other parts of Australasia. VE bought out Thames Water, its United Water joint venture partner in 2005.

Australia

VE serves 2.1million people in Australia. In December 2006, VE was appointed as a consultant to the State of Queensland for the development of all installations and infrastructure, and will then operate these installations. This project, whose completion is anticipated for the end of 2008, represents a global investment of EUR1.2billion for the State of Queensland.

2006	Queensland – I	DBO	Wastewater recovery

The first contract involves the recycling of wastewater from sites at Oxley, Wacol, Goodoa and Bundamba, Luggage Point and Gibson Island. The volume of water treated by microfiltration or ultrafiltration, reverse osmosis and UV, will be 232,000m^3/day. The water will be used by industrial customers. The facilities entered service in 2008.

2006	Queensland – II	10 + 5 year DBO	450,000 water

A 125,000m^3/day desalination plant will supply residents of the Gold Coast and the South Eastern Region of Queensland. The 10 year O&M phase can be extended by a further five years. The initial O&M phase will generate revenues of EUR210million.

1995	Adelaide	15.5 year BOT	1.1million water & sewerage

This was the first contract gain by the TWI/VE UW alliance. It is now 95% owned by Veolia Water. The project involves AUD650million of construction work and the concession will be worth AUD1.5billion over its life. The contract involves the construction and operation of six water treatment plants and four sewage treatment plants and allied distribution infrastructure. The first phase entered service in 1996 and the construction project was completed in 1998.

2006	Ballarat	15 year BOOT	115,000 wastewater

A EUR43million construction and operation contract for a wastewater treatment plant to serve the city.

1999	Ballarat	25 year BOOT	115,000 water supply

UW is responsible for the O&M element of the contract originally awarded to Thames Water. An additional 20 year contract covering four local water works was gained in 2003 serving 5,000 people in the neighbouring towns of Beaufort, Blackwood, Clunes and Forest Hill.

Other contracts are operated through General Water Australia.

1996	Sydney	25 years, BOO	500,000 water treatment

The AUD180million treatment Wyuna Water project currently handles 370Ml/day and can be further upgraded to 534Ml/day. The Woronora plant (160Ml/day) entered service in April 1997 and the Illawarra Plant (210Ml/day) in December 1996.

2007	Sydney	23 years, DBO	500,000 water treatment

This is a reverse osmosis desalination plant with an initial capacity of 250,000m^3/day which can be expanded at a later date to 500,000m^3/day. The EUR540million contract includes a three year construction phase followed by a 20 year operating phase.

FRANCE

1998	Noosa	15 years DBO	54,000 water treatment

This involves a holiday resort in Queensland with an off-season population of 44,000. The 45L/day facility entered service in December 1999.

2000	Coliban	25 years BOOT	110,000 water treatment

The Aquia 2000 project for Victoria's Coliban Water Authority consists of three WTWs serving Bendigo (126Ml/day), Castlemaine (18Ml/day) and Kyneton (8Ml/day).

2001	NSW	20 years DBO	11,000, wastewater

A sewage treatment works for the townships of Gerringong and Gerroa, 120km south of Sydney. The facility entered service in August 2001 and the recovered water is used for farm irrigation.

2000	Maffra	10 year BOT	Water treatment

The USD10.6million contract is for an industrial water treatment facility in the state of Victoria.

New Zealand

1997	Papakura	30 year BOT	41,000 water & sewerage

Papakura is an urban district of Auckland. The AUD12million contract was awarded to UW in 1997.

2002	Ruapehu	10 year O&M	15,000 water & sewerage

In November 2002, UW started a 10 year O&M contract with the Ruapehu District Council, a rural region of approximately 15,000 residents located 320km south of Auckland. The contract covers rural water and wastewater treatment facilities, 117km of water pipes, 97km of wastewater pipes, 3,670 wastewater connections, 4,570 water connections and 38km of stormwater pipes.

2004	Thames-Coromandel	10 year O&M	25,000 water & sewerage

Thames-Coromandel District is in the North Island. It has a residential population of 25,000 rising to 150,000 during the summer. There are 14,650 water and 18,100 wastewater connections.

1995	Wellington	25 year DBO	170,000 sewerage

Two sewage treatment works have been constructed at a total cost of NZD149million (GBP50million), along with a sludge de-watering plant and a 1.8km long sea outfall at Moa Point. The construction phase ended in 1998, and. the facility is now in service, with a 21 year operating contract. United Water acquired Anglian Water International (NZ) in June 2004.

Latin America

Turnover for Proactiva Medio Ambiente was EUR443million in 2000, with net profits of EUR7.3million. Revenues have been impacted by currency weakness and fell to EUR145million in 2002. This has been further reduced to EUR34million in 2003 due to the non-renewal of a number of contracts, most notably for Puerto Rico.

Argentina

Proactiva Medio Ambiente was awarded the Catamarca contract in April 2000 for water supply management for the departments (parts of the town) of Capital, Vallejo Viejo and Fray Mamerto Esquiú in the province of Catamarca, in the northwest part of the country. It was rescinded in 2006.

Venezuela

1997	Monagas	30 year concession	552,000 water

FRANCE

Proactiva Medio Ambiente Venezuela gained the Hidrocapital concession for the water supply and sewerage for the north east sector of Caracas in July 2002. The service area has 650,000 inhabitants. Forecast revenue is USD2million pa.

Colombia

1998	Bogotá	20 year BOT	2million water

This is the contract for upgrading and expanding the TIBITOC water treatment works in consortium with 2 local partners, with Proactiva holding 33% of the equity. The contract involves USD78million in investment, USD22million in the first 3 years. Total contract revenues will be USD300million. The plant has a capacity of 900,000m^3/day serving some 2million people.

1996	Tunja	20 year concession	151,000 water & wastewater
2000	Monteria	20 year concession	329,000 water & wastewater

The Monteria concession was gained by Proactiva Medio Ambiente in December 1999 and will generate COP29billion in revenues, with COP10.5billion in investments over the contract life. It serves 329,000 people with water and 124,000 with sewerage. The Tunja concession serves 151,000 with water and 148,000 with sewerage.

Brazil

1998	Parana	Strategic stake acquisition	8.1million water & sewerage

The operating consortium paid BRL249.8million (USD217million) for 40% of Sanepar, the water and sewerage company serving the state of Parana, with Proactiva holding a 35% stake in the consortium. Since 2003, VE's role in the concession has been eased.

Mexico

VE's JV company, Omsa, operates four contracts serving a total of 6million people. Since 1993, VE's stake in Omsa has increased from 33% to 38% in 1996, to 45% in 1997 and to 50% in 1998. ICA, VE's partner, is a Mexican civil engineering and construction company. Caasa serves 506,000 people in the city and more than 300,000 in the surrounding areas; 851,000 with water and 843,000 with sewerage. The 30 year concession was granted in October 1993 and is 90% held by Proactiva.

Sapsa (Mexico City)	2.43million	Water management services (1993-2009)
Caasa (Aguascalientes)	0.85million	Water and waste water concession
Puebla	1.20million	Water and waste water concession
Acapulco	1.50million	Water and waste water concession

USA

US Filter's (USF) involvement in public-private partnerships (PPPs) go back to the first partnership for water services in the USA awarded in 1972. The management contract for Burlingame's (CA) wastewater treatment facilities remains in USF's hands. The Bethlehem Steel contract signed in 1950 was the first industrial outsourcing contract in the USA. Upon the purchase of US Filter by Veolia Environnement in 1999, US Filter and the former Professional Services Group of Aqua Alliance were merged to create North America's largest water and wastewater outsourcing company, in 2003 serving 14million people in 600 communities and thousands of companies across all industrial and commercial markets through 91 water and 185 wastewater treatment plants. According to Public Works Financing, US Filter has been the North American market leader in PPPs in recent years. Following the sale of the non-core activities, USFilter Operating Services has been renamed Veolia Water North America (VWNA).

2008	Oklahoma	4 year O&M	water

This is an extension of a contract that has been sunning since 1985 and the latest phase will generate total revenues of EUR29million.

FRANCE

2008	New London	10 year O&M	50,000, water & wastewater

New London is in Connecticut. The contract will manage the sewerage services for 14,000 customers and water services for 6,000 customers with total revenues of EUR37million.

2007	Milwaukee	10 year O&M	1.1million, wastewater

Awarded in December 2007, the EUR272million contract covers the management of the regional liquid waste management network of Milwaukee, Wisconsin and management of the production of Milorganite, fertiliser granules produced by the drying of residual mud from the waste water purification plant.

2007	Tampa Bay	16 year DBO	Water treatment

A USD158million contract to expand the regional water treatment plant in Florida from 272,500m^3 per day to 454,200m^3 per day, which will enter service in 2010. VE will operate the facility for 13 years from then.

2006	NY State	7 year DBO	Wastewater treatment

A USD45million contract for the 1.5million gal/day (7,000m^3/day) facility serving Rockland County.

2005	Gresham, Oregon	7 year O&M	106,000 wastewater treatment

The contract is worth USD21million and involves handling 20million gal/day of effluent.

2004	Richmond, CA	18 year O&M	wastewater treatment

The contract is worth EUR50million.

2004	Virgin Islands	20 year BOT	75,000 wastewater treatment

Two 18,000m^3/day wastewater treatment facilities are to be constructed at St. Croix and St Thomas. Both facilities are expected to enter service at the end of 2006, generating revenues of USD126million throughout their contracts. There is also a five year renewal option.

2002	Indianapolis, IA	20 year O&M	800,000 water treatment

At USD1.5billion, it is the largest PPP in the United States' history. The system produces an average of 138million gal/day for residents in the city and within a 25 mile radius around the city.

2002	Atlanta, GA	10 year O&M	Manage city-wide biosolids system

USD200million agreement to produce and market 100 dry tonnes/day of biosolids. VWNA is the leading biosolids services supplier in the U.S, serving 130 different communities. The contract was terminated by Atlanta in 2006.

Canada

Veolia Water Canada (VW Canada) is a subsidiary of VWNA. Its activities draw from the USF operations and, since 1976, VW Canada has gained 22 municipal O&M contracts. With the exception of Moncton (New Brunswick) all identified contracts are in Ontario.

2006	Brockton	Five years, O&M	10,000, water & wastewater

The contract announced in July 2006 involves the management of three water treatment plants with a capacity of 2.29mg/day and one wastewater treatment plant with a capacity of 1.98mg/day. Revenues will be USD0.47million pa.

1997	Haldimand/Norfolk	O&M	200,000, wastewater

FRANCE

The original contract in 1997 was for both counties. In 2004, separate contracts were drawn up for each county. The Norfolk contract covers three WWTWs with a capacity of 24mg/day and the Haldimand contract is for four WWTWs with a capacity of 16mg/day.

1999	Toronto	15 years, DBO	1,000,000, wastewater biosolids

The contract covers the biosolids drier and pelletiser facility serving the city's 216mg/day Ashbridges Bay WWTW.

1998	Moncton	20 years, DBFO	100,000, water

This was the first major PPP contract gained in Canada. It was agreed in April 1998 and covers a 94,635m^3/day (25mg/day) water treatment facility. The CAD85million contract will save the city some CAD12million on anticipated capital costs.

Six other contracts have been identified:

Location	Date	Population	Service
Bayfield	N/A	2,000	Water
Georgian Downs	2001	1,000	Wastewater
Goderich	2000	15,000	Water & wastewater
Huron-Kinloss	2003	N/A	Water
Port Stanley	1997	2,500	Wastewater
Varna	2001	500	Water

VE in industrial outsourcing

21% of VE's water turnover in 2000 was with industrial clients, which rose to 33% by 2006. VE's industrial outsourcing contracts have a typical duration of between 3 and 10 years, although an increasing number of contracts now run for 15 or 20 years. Overall multiservice revenues were EUR400million in 2003, rising to EUR440million in 2006, with EUR370million in large industrial client contracts gained that year. During 2003-04, Veolia Environnement signed several multiservice contracts (water, waste and energy) with industrial customers for cumulative revenues of around EUR1.25billion. VE's multiservice customers include Arcelor, Aventis, BP, Novartis, PSA, Renault, Solvay and Total. Veolia's 15 year contract with Renault was expanded in 2006 to include a five year management contract covering all service facilities in the Paris region with the aim of cutting expenditure by 20% during this period. The Novartis contract was renewed for 7 years in December 2007 and will generate EUR980million in revenues.

Industrial outsourcing in the Americas

In the US, USF enjoyed a 53% market share for identified industrial water and wastewater outsourcing services in 2002, according to Public Works Financing. Major recent developments include a 20 year, USD66million contract with Alon, USA, to manage the water, wastewater, sludge and groundwater facilities at its Big Spring refinery in Texas and the acquisition of MCS Technologies LLC, a leader in the refinery waste separation and treatment services market, based in Corpus Christi, Texas. The 15 year IPSCO Steel contract was gained in 1999 while the USD100million Sunoco contract was gained in 1998. Contracts gained in 2000 include Westlake (15 year, USD75million), Conoco (USD30million), GM (USD30million) and BP (USD1.3million). In 2001, VE gained a EUR300million 15 year industrial services contract for Usinor's Vega do Sul facility in Brazil. The 10 year effluent management contract for Millennium Chemicals, signed in 2001, is worth EUR165million.

In 2003, USF gained contracts with the Dupont and Kerr-McGee chemical and energy groups for terms of between 15 and 20 years with an aggregate estimated total revenue of more than USD100million.

Industrial outsourcing in Europe

Veolia Water Industrial Outsourcing provides water and wastewater management services to industrial customers in the UK and Ireland. Contracts include a 10 year contract with Shell to supply all of their chemical and oil refineries on site with up to 3,500m^3/day of softened water on a DBO basis, and a 10 year O&M contract with Mettis Aerospace (the aerospace component manufacturer) regarding its

effluent treatment plant as well as to supply its manufacturing operations with recycled process water. During 2002, a EUR27million 15 year contract with Arcelor Packaging and a EUR11million 12 year contract with Smurfit Cellulose du Pin were gained in France, both for effluent treatment.

In October 2001 VE acquired Depurazioni Industriali (DI) from Italy's Montedison. DI specialises in the treatment of industrial waste water, and generated EUR8million in revenues in 2001. The company owns three plants where it treats effluent from three industrial sites operated by Montedison's Cereol and Novaol under 20-year management contracts, along with effluents from third parties. VE also reached a partnership agreement with the Montedison group for a three year exclusive right between Veolia Water and the four companies (Cereol, Cerestar, Provimi and Beghin Say) resulting from the 2001 Eridania Beghin Say contract, covering the outsourcing of water management at over 50 industrial sites throughout Europe. VE believes that the industrial water outsourcing service market in Italy is worth EUR300million.

In the Czech Republic, a EUR20million 10 year contract with Spolchemi involving the design, construction and operation of an effluent treatment plant was signed in 2001. In 2002, a EUR5million, 10 year water and wastewater services contract was signed with Cutisin's Jilemnica, a subsidiary. In September 2003, Veolia Water gained an industrial services contract with Synthesia, a member of the Unipetrol Group covering the operation of Synthesia's wastewater treatment facility. The 200,000 PE plant also treats wastewater from the city of Pardubice (population of 100,000 in eastern Bohemia), where the company is located. The 10 year contract will generate revenues of EUR90million.

Other contracts in the Czech Republic include: Glaverbel Czech (producer of flat glass-process water supply); Termo Decin (operation of water management facilities); Cutisin (producer of food packaging-wastewater and process and drinking water); ICN Czech Republic (pharmaceutical-operation of an industrial and municipal WWTP complex); Eastman Sokolov (producer of commodity products-wastewater and drinking water); Keramika Horni Briza (ceramic tiles-wastewater treatment plant); Intersnack (Ceske Budejovice); Airport Line; Hennlich (Usti nad Labem); Marius Pedersen (Plzen); Rudolf Jelinek (Zlin) and Setuza (Olomouc).

Veolia Water signed a contract in Hungary with Hajdú-Bét, a major poultry slaughterhouse located in Debrecen, in the east of the country. The 3 year contract covers the operation of a wastewater pre-treatment plant and will generate revenues of EUR1million.

Other contracts gained in 2003 included Johnson Matthey (United Kingdom) MD Papier GmbH & Co. (Germany), and Grande Paroisse S.A. (France, a subsidiary of the Atofina Group). Total revenues for these contracts will be EUR57million.

A EUR60million 10 year contract was gained in March 2004 by VE's Globalis GmbH for environmental services at Visteon's German site in Duren. This was the first multi service contract awarded in Germany. A EUR78million 10 year contract signed with Corus Packaging Plus in Trostre (Wales, UK) in 2004 concentrates on effluent treatment services.

In April 2005, PSA Peugeot Citroën outsourced the environmental management activities of its new factory in Trnava, Slovakia to VE. The eight year contract will generate revenues of EUR60million.

A EUR42.7million upgrade for the Bayswater treatment plants, which serve the Bayswater and Liddell power stations in New South Wales, Australia was awarded in June 2006. This includes a five year operations and maintenance for facilities.

Outsourcing in Asia & Oceania

Australia

In September 2008 Veolia Water and AquaNet Sydney Pty Ltd (part of the Jemena Ltd group) signed a contract with the Sydney Water Corporation for the first private scheme provide recycled water to industrial users in New South Wales. This will ease demand on Rosehill and Camellia's drinking water supplies, in western Sydney by providing 4.3billion litres pa of water for major industrial customers, with a future capacity for a further 3billion litres of water per year if needed. The BOOT contract will generate revenues of EUR122million over 20 years with a EUR30million 20,000m³ per day water recycling facility being developed in 2009.

FRANCE

Malaysia

In September 2002, VE signed a contract with Petronas for outsourcing services in water treatment and supply at the Kertih petrochemical complex in Malaysia. The 20 year contract does not involve any investment on the part of Veolia Water. The company will operate a potable water production plant with a capacity of 250,000m^3/day and a distribution network serving customers such as BP Chemicals, Mitsui and Union Carbide, which work with Petronas in the petrochemical complex. The contract will generate revenues of EUR200million over its lifetime.

Singapore

VE signed a six year contract worth EUR53million for the construction and operation with Showa Denko, a subsidiary of the Japanese group Showa, for an ultra pure industrial water treatment unit in 2006.

Korea

The USD1billion Hyundai Petrochemical's Daesan contract (January 2000) runs for 20 years. The Hynix Semiconductors Corporation 12 year EUR900million contract for Hyundai of Korea is the largest industrial water outsourcing contract in the world to date. The contract calls for four ultra-pure water plants and two WWTWs. VE is acquiring the company's water and wastewater facilities for EUR196million and will generate EUR830million in revenues over the next 12 years. It was extended to 17 years in 2006 and in 2008, a new treatment plant entered service. A contract was gained in 2004 with the Kumho group for the maintenance and operation of water and wastewater facilities at Kumho Rubber Ulsan, and Kumho Petrochemical and Kumho Polychem (15 years, O&M) at the Yeosu National Industrial Complex.

Thailand

Global Utilities Services Co. Ltd (Thailand) is a JV between Veolia S.Napa (49%), Industrial Estate Authority of Thailand (49%), and the IEAT Provident Fund (2%). GUSCO currently has 8 industrial water management contracts in Thailand, including Sony, Egco, GM and Ford, with a THB900million (USD21.2million) turnover or USD2.65million pa per contract.

In May 2007, a 15 year DBO contract was signed with PTTPE, worth EUR75million for the construction and operation of a water treatment plant.

China

In January 2006, a 25 year industrial wastewater management contract was agreed with Sinopec at Beijing Yansan PetroChemical's Yanshan facility, 50km south west of Beijing. The EUR249million contract involves running four wastewater treatment plants with a total capacity of 129,000$m^{3/}$day including the recovery of 40,000m^3/day of process water.

Two water contracts were gained in 2007; Tianjin Soda (construction and operation, 27 years, worth EUR492million) and Qingdao Soda (operation of a water demineralisation facility for 25 years, generating EUR33million).

Contact Details

Name: Veolia Environment SA
Address: 42 Avenue de Friedland, 75008 Paris, France
Tel: +33 1 71 71 10 00
Fax: +33 1 71 71 11 79
Web: www.veoliaenvironnement.com
www.veoliawater.com
www.generale-des-eaux.com

Henri Proglio (Chairman and CEO)
Jerome Contamine (CFO)
Antoine Frerot (CEO, Veolia Water)
Paul-Louis Girardot (Director, Generale des Eaux)

RWE AG

RWE is the largest of the German multi-utilities. In the late 1980s, the company began to develop RWE Umwelt AG into one of Europe's largest waste management companies. In the mid 1990s, the company set up RWE Aqua as a subsidiary of Umwelt, to exploit the opening up of the water and wastewater markets in Germany and in central and Eastern Europe.

RWE – Water acquisitions 2000-03

Company	Year	Revenues EURmillion	Stake (%)	Equity value EURmillion
Thames Water plc, UK	2000	2,247.00	100.00	7,100.00
ESSBIO, Chile	2000	46.00	51.00	340.00
E'town Corporation Inc., USA	2000	190.00	100.00	670.00
ANSM, Chile	2001	22.00	N/A	N/A
ESSEL, Chile	2002	20.00	25.50	150.00
Ondagua & Pridesa, Spain	2002	148.00	75.00	95.00
China Water Company, China	2002	[1] 9.70	48.80	N/A
RWW, Germany	2002	97.00	14.30 to 74.90	194.00
RWW, Germany	2002	97.00	74.90 to 79.80	N/A
American Water Inc., USA	2003	1,700.00	100.00	4,500.00

[1] Six months to 31-10-2001

RWE sought to become the third largest European water company by 2005 and achieved this by 2000 through its agreed bid for Thames Water. As a result of the September 2001 bid for American Water Works, RWE is now the third largest water utility company globally and the market leader in Germany, the UK and the USA. In 2005, RWE completed the divestment of RWE Umwelt and decided to sell its activities outside Germany and Central & Eastern Europe.

A move away from water…

In 2004, RWE decided to concentrate on its European and American activities and is considering the fate of its other contracts on the basis of a "managed exit from all non-core markets". After a series of differing announcements on its Chilean and Spanish operations during 2005, the company formally announced in 2005 that it would divest its Thames Water and American Water Works holdings, along with its water activities outside continental Europe. In December 2006, Thames Water was sold to Kemble Water, a special purpose vehicle organised by the Macquarie European Infrastructure Fund for GBP4.8billion plus GBP3.2billion in assumed debt. The total value of the divestment of EUR11.9billion resulted in a book gain of EUR0.7billion for RWE.

…save for a safe European home

For the time being, RWE is retaining BWB and its other German activities, along with those directly held by the company in Central & Eastern Europe. This covers approximately 15million people, often within multi-utility contracts.

Divestment progress and plans (up to October 2008):

Pridessa / Ondagua	Spain	Sold to Acciona (EUR150million)
Thai Tap Water	Thailand	Sold to CH Karnchang, its JV partner
Ajman	UAE	Sold to Veolia
Berlinwasser International	Global	Sold to Marubeni, but bid was rescinded in 2006
China Water Company	China	48% stake sold to Biwater in 2007
United Water	Australia	47.5% stake sold to Veolia, its JV partner
ESSAM/ESSBIO/ESSEL	Chile	Sold to Southern Cross (USD300million)
Thames Water	England	Sold to Macquarie in 2006
American Water Works	USA	39.5% stake sale & IPO, May 2008

RWE AG, profit and loss account

Y/E 30/06 (EURmillion)	2003	2004	2005	2006	2007
Turnover	43,875	42,137	39,487	42,554	42,504
Pre-tax profit	2,123	3,935	3,15(	3,537	5,233
Net profit	93	2,137	2,23	3,847	2,659
Earnings/share (EUR)	1.69	3.80	3.97	6.84	4.73

FY 31/12 (EURmillion)	2003	2004	2005	2006	2007
Turnover – Thames	1,603	1,680	N/A	N/A	N/A
Turnover – Europe & ROW [1]	2,335	2,264	N/A	N/A	N/A
Turnover – Americas	1,914	1,801	1,878	1,702	1,601
Total turnover	4,249	4,065	N/A	1,702	1,601
Operating profit – Thames	1,218	612	687	N/A	N/A
Operating profit – Europe & ROW	169	311	238	N/A	N/A
Operating profit – USA	600	466	586	425	409
Total operating profit	**1,374**	**1,389**	**1,416**	**425**	**409**
Capital spending	6,129	1,465	1,405	1,588	696

[1] Non BWI C&EE water activities were transferred to RWE energy. These generated revenues of some EUR100million in 2003.

2006 and 2007 are net of Thames Water.

In 2007, all water activities were classified as discontinued operations. No separate information is provided about RWE's water activities.

RWE, breakdown of populations served

Country	Water	Sewerage	Total
Germany	11,500,000	6,200,000	13,200,000
Hungary	1,500,000	50,000	1,550,000
Croatia	0	750,000	750,000
Poland	135,000	135,000	135,000
Albania	450,000	350,000	450,000
Azerbaijan	50,000	0	50,000
Mauritius	0	200,000	200,000
Namibia	0	80,000	80,000
China	0	2,300,000	2,300,000
Puerto Rico	1,600,000	0	1,600,000
USA	16,400,000	2,820,000	17,500,000
Canada	420,000	0	420,000
Total - home markets	**11,500,000**	**6,200,000**	**13,200,000**
Total – international	**20,555,000**	**6,685,000**	**25,035,000**
Grand total	**32,055,000**	**12,885,000**	**38,235,000**

Germany

RWE Aqua is responsible for the water business of RWE in Germany, Hungary and Poland and the international activities managed by Berlinwasser. In 2000, it was split from RWE Umwelt and merged with Thames Water, then in 2003 it was merged with the rest of RWE Energy. RWE Aqua gained the Budapest water concession in 1997 and acquired 22.5% of Berlin Water in 1999. Budapest was held jointly with Suez and the latter jointly with VE. RWE Aqua had a total turnover of EUR808million in 2000 due to the Berlin Water acquisition.

Stakes held by RWE Aqua account for 13.2million people in ten German states. Berlin and Essen have stakes in the following entities: Hastrabau (Langenhagen), SEG (Schwerte), Ruhrwasser (Essen), WVN (Essen), MKW (Frankfurt), WRH (Ludwigschafen), envia aqua (Chemnitz) and W&A Holzland (Hermsdorf), DAR (Aachen, Trier, Weisbaden, Mannheim and Berlin) and ARGE (KRW (Neuweid), KAWAG (Ludiwigsburg) and LEW (Augsburg).

RWE Aqua acquired the majority stake in RWW (Rheinisch-Westfälische Wasserwerks-gesellschaft GmbH) in Mülheim an der Ruhr in April 2002. RWE was one of the founding members of RWW in 1912 with a 14.3% stake, which was increased to 74.9% in 2002. It was agreed with the municipal shareholders to keep the current water tariff stable until 2005. RWW has responsibility within RWE Aqua for North Rhine Westfalia, Rhineland Palatinate, Belgium, the Netherlands and Luxembourg. In September 2002 RWE Aqua acquired an additional 4.8% in RWW. RWW serves 1million people and had a turnover of EUR77million in 2001. The stakes cost a combined EUR233million.

Berliner Wasserbetriebe

Y/E 31/12 (EURmillion)	**2003**	**2004**	**2005**	**2006**	**2007**
Domestic revenues	N/A	N/A	N/A	1,123	1,117
International revenues	N/A	N/A	N/A	19	17
Services revenues	N/A	N/A	N/A	5	5
Total turnover	**1,202**	**1,228**	**1,234**	**1,147**	**1,139**
Net profit	116	62	85	89	150
Water sales (million m^3)	214	201	197	202	193
Sewage treated (m m^3)	230	232	227	231	N/A

BWB dates back to 1856, including 45 years with its services being divided by the Berlin Wall. In 1999, after the partial privatisation of BWB, Berlinwasser Holding AG was formed and BWB was vested into this company. The consortium (VE 50.1% and RWE 49.9%) acquired 49.9% of BWB for EUR1.69billion, with the majority 50.1% stake being held by the City of Berlin.

1999	Berlin	30 year concession	3.9million water and sewerage

BWB serves 3.4million people in Berlin, operating nine water treatment works and six sewage treatment works. In addition water is provided to 90,000 people and wastewater treatment to 0.5million in Brandenburg via 10 water and 24 wastewater contracts with a total of 113 local authorities.

The sale by VE and RWE of 80% of Berlinwasser International to Marubeni in 2005 was rescinded in 2006 and in 2007 BWB decided to continue developing these activities.

International contracts directly held by RWE

Croatia

2000	Zagreb	26 year BOT	0.75million sewage treatment

This is the largest sewage treatment concession award in central and Eastern Europe to date, involving EUR270million in capital spending. The project scope includes design, construction and operation of the wastewater treatment plant (1million PE) and the administration facilities, construction of the main collecting pipeline (9.8km) and coverage of main drainage canal (5.5km). The concession company, Zagrebacke otpadne vode d.o.o (ZOV), is formed by RWE Aqua (48.5%), WTE Wassertechnik GmbH (48.5%, see EVN, Austria) and the City of Zagreb (3%). Construction began in July 2002 and was completed between 2004 (mechanical treatment) and 2006 (biological treatment).

Poland

2002	Gornicza	25 year concession	135,000 water & sewerage

RWE acquired a 34% stake in PwiK, the municipal supplier for Dabrowa Gornicza in Silesia. The contract runs for 25 years. The partnership between RWE Aqua and the city of Dabrowa Gornicza is the first project for RWE Aqua in Central & Eastern Europe and at the time also only the third privatisation project in the Polish water market. Sewage treatment coverage will be extended from 30% to 100%.

Berlinwasser International

The sale by VE and RWE of Berlinwasser International to Marubeni in 2005 was rescinded in 2006. Berlinwasser International AG (BWB) was set up by Berlinwasser in 1994 and therefore predates the concession award to RWE and Veolia in 1999. BWB gained its first contracts in 1997-98 and currently has nine projects in five countries with a total order backlog worth EUR495million in 2003.

Hungary

1997	Budapest	25 year O&M	1.5million water distribution

Suez and RWE Aqua control all the shares of the management company and 25% of the equity of the asset management company. The management company formed by Suez (51%) and RWE Aqua (49%) took a 25% stake in Fövarosi Vizmuvek for USD82million. RWE holds 13% of the asset company. FV has a USD80million turnover and employs 1,500 staff. RWE subsequently transferred its shareholding into BWI.

1997	Hodmézövásarhely	25 year concession	50,000, sewerage

Zsigmondy Bela Rt. Manages the concession agreement with the city of Hodmézövásarhely. A wastewater treatment plant with a capacity of 30,000m³ per day has been upgraded to comply with the UWWTD.

Azerbaijan

2002	Imishli	10 year O&M	50,000, water

BWI is responsible for the management of the city's water services and owns 75% of the operating contract. The well network was rehabilitated in 2001 prior to the contract's commencement. Water provision improved from 2 hours per day to 15 hours per day by 2003. In 2003, 57% of tariffs were collected, rising to 75% by 2005.

China

The 1997 20 year BOT for a waterworks serving Xian was sold in 2003 after legislatory change prevented the fixed rate of returns in contracts run by international companies. BWI's 35% stake in Waterworks Xian South Co., Ltd, to the majority shareholder, the water enterprise of Xian, China for USD11.2million.

2004	Hefei	23 year TOT	1.1million, sewerage

The WangXiaoYing 310,000m^3 per day facility was built by the municipality between 1998 and 2002 and BWI took over its operation in December 2004. Hefei Wang Xiao Ying Sewage Treatment Co., Ltd. is 80% held by BWI and 20% by East China Engineering Science & Technology Co. Ltd in a CNY480million contract.

2003	Nanchang	20 year BOT	1.2million, sewerage

The 330,000m^3 per day facility entered service in October 2004, built at a cost of EUR30million and handles a third of the city's sewage. Nanchang QingShanHu Project Co. Ltd. is 80% held by BWI and 20% by Third Construction & Engineering Co. Ltd.

Namibia

2002	Windhoek	20 year O&M	80,000 sewerage

The contract (34% BWI, 34% Veolia & 33% VA Tech) covers a water reclamation facility at the city's sewage treatment plant and provides 21,000m^3 of water per day, a third of the domestic water supplies for the city of 250,000. The turnover of Wingoc is approximately EUR2million pa. In addition, BWI has a five year O&M contract for the city of Swakopmund's sewage treatment works, which have a capacity of 10,000m^3 per day.

Mauritius

2008	St Martin	7 year O&M	200,000 sewerage

The contract is 100% held by BWI and covers the management of a 70,000m^3 per day wastewater facility.

Albania

2003	Four Albanian towns	5 year O&M	450,000 water & wastewater

BWI gained a five year EUR4million contract to take over management of water supply and wastewater disposal in the Albanian towns of Durres, Fier, Lezhe and Saranda. The project is supported by EUR20million in funding from the World Bank and will be implemented by a JV between BWI (60%) and Aquamundo (40%). Sewage treatment will be upgraded to secondary (biological) standards and water supplies will be improved from two to four hours daily to a 24 hour supply.

BWI sold its 97.5% shareholding in the Elsaban concession, serving 80,000 people in 2006.

American Water

39.5% of American Water's shares were sold by RWE in May 2008 for USD1.35billion.

See company entry

Contact Details

Name: RWE AG
Address: Opernplatz 1, D-45128 Essen, Germany
Tel: +49 201 12 00
Web: www.rwe.com
www.berlinwasser.de
www.berlinwasser.com

Dr. Jürgen Großmann (President and CEO)
Dr. Klaus Sturany (Vice President, financial control)

ACEA (AZIENDA COMNUALE ENERGIA e AMBIENTE SPA)

Azienda Comunale Energia e Ambiente (ACEA), the municipality serving electricity and water services to the city of Rome, was partially floated in February 1999. 51% of the equity is held by the municipality of Rome, 8.9% by Suez Environnement and the rest by a variety of private and institutional investors. A further share sale by the municipality may be considered. The company was founded in 1909 for electricity distribution, started water provision services as AGEA in 1937 and was renamed ACEA in 1945. ACEA is Italy's largest water and electricity utility. The company believes that it provides the best quality drinking water in Italy at one of the lowest prices for a major city in Europe. In August 2007, merger talks began between ACEA and Iride, the utility which merged with AMGA in 2006.

ACEA, profit and loss account

Y/E 31/12 (EURmillion)	2003	2004	2005	2006	2007
Rome-Water billed (million m^3)	408	432	438	442	447
Other ATOs-Water billed (million m^3)	N/A	N/A	N/A	226	276
Wastewater billed (million m^3)	455	459	473	485	476
Turnover	1,481.1	1,413.0	1,624.4	2,187.3	2,583.3
Water EBITDA	N/A	152.9	170.6	206.7	212.8
Operating profit	147.8	210.5	232.6	290.5	323.4
Net profit	49.0	112.3	127.9	147.4	173.4
Earnings/share (EUR)	0.23	0.53	0.60	0.69	0.79

Water related capital spending rose from EUR83.9million in 2005 to EUR119.1million in 2006. Water billed for other regions in 2006 was for 213million m^3.

Country	Water	Sewerage	Total
Italy	7,910,000	9,110,000	9,110,000
Peru	800,000	0	800,000
Honduras	495,000	495,000	495,000
Columbia	3,900,000	0	3,900,000
Total - home markets	**7,910,000**	**9,110,000**	**9,110,000**
Total – international	**5,195,000**	**495,000**	**5,195,000**
Grand total	**13,105,000**	**9,605,000**	**14,305,000**
Country	**Water**	**Sewerage**	**Total**

Italy

Through a series of contract gains for ATOs, ACEA is now the leading water and wastewater company in Italy. Current year targets for building upon ACEA's presence in western Italy are ATO1 (Lucca), ATO2 (Perugia) and ATO3 (Rieti).

ACEA is seeking to merge the Florence, Pisa and Siena-Grosseto ATOs into a single entity serving 3.3million people in Tuscany.

ACEA: Activities in Italy, 2008

Contract	Stake	City	Million people served	Water billed (million m^3)
ATO 1	29%	Lazio-Centrale	3.37	447
ATO 5	94%	Frostione	0.43	26
ATO 6	80%	Siena-Grosetto	0.37	26
ATO 2	45%	Pisa	0.72	57
ATO 3	85%	Firenze	1.20	90
ATO 3	90%	Sarnese Vesuviano	0.70	N/A
SIGESA	100%	National	2.40	N/A

In the medium term, ACEA aims to gain contracts for a further 2.2million people via the ATO process and to gain some 17% of the Italian water and sewerage market (9.8million people) by 2012, with total water delivered rising from 655million m^3 in 2006 to 979million m^3 in 2012. The corporate business plan is based on gaining additional ATOs in western Italy and becoming the dominant regional player.

The Tuscan ATOs are currently being merged.

Regulated activities		**2005**	**2008**
ATO2 – Lazio	Million m^3	438	527
Other ATOs	Million m^3	159	304
EBITDA	EURmillion	165	229

Rome

In 1999, 2.8million people were served with water services and 2.2million with sewerage services. This currently stands at 3.37million people through ACEA ATO 2, a 30 year concession between ACEA (96%) and 111 councils (4%) in the ATO2 Lazio region that started in January 2003 and a series of additional contracts.

Y/E 31/12 (EURmillion)	**2004**	**2005**
Water provision	22.85	23.52
Sewerage	33.77	33.41
Water maintenance services	1.29	1.23
Monumental fountains service	1.59	1.59
Urban water services	7.24	6.21
Concession fee	17.20	17.87

Expansion has been achieved through taking on services for neighbouring municipalities:

2003: Starting with the municipalities of Rome, Monterotondo, Tivoli, Guidonia-Montecelio, Grottaferrata, Ciampino and Fiumicino, the Simbrivio Consortium, was taken over, a system that supplies water on a wholesale basis to 45 municipalities and 2 consortia.

2004: The municipalities of Castel Madama, Mentana, Fonte Nuova, Marcellina, San Gregorio da Sassola, Ciciliano, Pisoniano, Rocca Santo Stefano, Montelanico and Albano Laziale, along with a wholesale water system from a consortium set up by the former Southern Italy Development Fund and previously managed by Lazio Regional Authority, which services Pomezia, Ardea and Lanuvio.

2005: The municipalities of Casape, Carpineto Romano, Sambuci, Affile, Arcinazzo Romano (excluding the CO.RE.CALT. Consortium) Gavignano, Gorga, Cervara di Roma, Subiaco, Castel Gandolfo, Vicovaro, Artena, Trevignano Romano and Santa Marinella.

2006: Doganella Consortium's aqueduct system serving the municipalities of Palestrina, Zagarolo, Colonna and San Cesareo and the system serving the municipalities of Bellegra, Roiate, San Vito Romano, Castel San Pietro Romano and Gallicano. Waste water and sewerage services in the municipalities of Capranica Prenestina and Olevano Romano, where drinking water services are managed by another operator. Water services in the municipalities of Poli, Genazzano and Rocca di Cave from March 2007. Services in the municipalities of Fiano Romano, Jenne, Nemi (drinking water services only), Vejano, Segni, Saracinesco, Lariano, Lanuvio, Sacrofano, Tolfa, Allumiere, Pomezia (provisional management of sewerage and water treatment services), Sant'Oreste, Nazzano and Castelnuovo di Porto.

2007: Rocca di Cave, Poli and Genazzano (water, having already held their wastewater contracts) and Torrita Tiberina, Riano, Marino, Oriolo Romano and Ponzano Romano (water and wastewater). A water and wastewater contract for Cerveteri became operational in February 2008.

To date, 74 municipalities have opted for ACEA's services in the region, accounting for 94% of the addressable population, or 3.37million people.

Subsequent ATO awards

2003	Frosinone	ATO privatisation	430,000 water & wastewater

In April 2002, a consortium led by ACEA gained a 30 year concession for the Frosinone ATO 5. ACEA holds 65% of the consortium, with CREA being one of the secondary investors. The concession covers 430,000 people (182,000 customers). EUR361.5million will need to be invested during the concession's life. The concession entered into service in October 2003 and covers 86 municipalities.

Three ATOs were gained in Tuscany by a consortium lead by ACEA and also featuring Ondeo. With ACEA and Ondeo controlling services for 2.7million out of the 3.5million people living in Tuscany, a rationalisation of these concessions is planned.

2002	Pisa	ATO privatisation	720,000 water & wastewater

A 45% stake in Acque SpA (AI) was acquired for EUR19.2million. AI is Tuscany's ATO-2 Basso Valdarno, serving 57 communes. The 20 year concession will generate EUR1.2billion in revenues.

2003	Siena/Grosetto	ATO privatisation	373,000 water & wastewater

A 40% equity stake in the Acquedotto de Fiora was acquired by the ACEA led consortium for EUR19.3million, with a concession life of 25 years. ATO-6 Ombrone covers 56 communes and required some EUR433million in capital spending.

2003	Florence	ATO privatisation	1,200,000 water & wastewater

The ACEA led consortium has acquired 40% of Publiacqua SpA, the holder of the 20 year concession to operate water and wastewater services for 50 communes in Tuscany's ATO-3 Medio Valdarno. Publiacqua had a turnover of EUR104million in 2002 and net profits of EUR8million. The consortium is contributing EUR60million towards the EUR150million capital increase, with the municipalities paying the remaining EUR90million. In conjunction with the privatisation, EUR300million of Publiacqua's revenues were securitised in order to pay for the capital increase and to retire mature debt. ACEA is currently in talks to acquire 40% of ASA SpA, Tuscany's ATO-5 Toscana Costa-Livorno. ASA provides water to 359,000 in the Livorno municipality.

2005	Sarnese Vesuviano	ATO privatisation	700,000 water & wastewater

A 30 year concession awarded to Campania-Gori SpA, serving part of Naples.

Acquisition of SIGESA

ACEA acquired SIGESA (Società Italiana Gestione Servizio Ambientale) for EUR21.4million in June 2005 and the acquisition was consolidated on 1st January 2006. SIGESA was founded by Bouygues/SAUR in 1986 and acquired the water services activities of Fiat SpA in 1998 along with 71% of Crea in February 2000 (the remaining 29% being held by Italmobiliare SpA). The acquisition valued Crea at EUR67million. Crea supplies water to 13 regions. In 2003, SAUR acquired 26.5% of Umbria Acque the ATO serving 460,000 people in the city of Perugia. Other activities are in Lucca, Rieti and Benevento.

Population served (million)	Sigesa	Crea	Combined
Water	0.35	0.85	1.20
Wastewater	0.45	1.85	2.40

Turnover increased from EUR21million in 1999 to EUR48million in 2000 and EUR58million in 2001. Consolidated revenues were EUR30.7million in 2004 after the divestment of the gas activities. ACEA acquired SIGESA for EUR19million in July 2005, a purchase price of EUR2million and the assumption of EUR17million in liabilities.

Sale of Acqua Italia to Amga

In November 1999, ACEA set up Aqua Italia SpA (AI), a 67:33 venture with Impreligio SpA. In 2000, AI acquired majority stakes in Acquedotto de Ferrari Galliera (ADF, 67%) and Acquedotto Nicolay (AN, 53%), two of the three listed water companies in Italy prior to the emergence of the municipal multi-utilities. Both companies serve the city of Genoa (see their respective company entries). ACEA has also acquired 3.7% of Amga's (see relevant company entry) equity. All three companies provide water services to the city of Genoa. In July 2005, ACEA sold its stake in Acqua Italia to Amga SpA for EUR61million and the assumption of EUR10million in debt. Acqua Italia has revenues of EUR20million in 2004, and a net income of EUR3million.

International activities

In July 2004, ACEA announced that while it would retain its existing water activities, it would not be seeking new international contracts. ACEA's Yerevan contract was completed in 2005 and VE gained a subsequent contract serving that city. ACEA's international activities had revenues of EUR15.8million in 2005 (2004; EUR12.9million) and an operating profit of EUR3.1million (2004; EUR2.2million).

Albania

2001	Tirana Acque	4 year management	650,000 water

ACEA holds 40% of Tirana Acque, an Italian consortium developed to take advantage of bilateral agreements between Italy and Albania. The contract is worth EUR10.5million. The longer-term aim is to be involved in the privatisation of Greater Tirana Water Supply and Sewerage.

Honduras

2000	San Pedro	30 year concession	495,000 water & sewerage

The concession was awarded to Aguas de San Pedro in August 2000 and entered service in February 2001, with ACEA holding 31% of the consortium's equity. Service targets are for 100% water coverage in three years and 100% sewerage coverage within five. USD135million of investment is planned during the life of the concession.

Peru

2000	Cono Norte	27 year concession	800,000 water

ACEA (Consorcio Agua Azul SA, 45%) teamed with Impregilo SpA (40%), Fisia Utalimianti SpA (5%) and Castalia & Cosapi SA (10%) of Peru for the Cono Norte concession that was awarded to Agua Azul SA in January 2000. After two years constructing a new water treatment works for USD50million, the operating contract runs for 25 years. Cono Norte is part of the city of Rio Chillon. Its population is currently 750,000 but is expected to rise to 2,000,000 by the end of the concession. The concession involves the supply of 44million m^3 of water pa at PEN2.8million/month (USD0.8million) and involves USD80million in capital spending.

Colombia

Operations are carried out through ACEA's 51% held Aguazul Bogota.

2003	Bogota	5 year O&M	2,500,000 water

The contract is with the municipality's Empresa de Acueducto y Alcantarillado de Bogotà (EAAB) and covers 45% of the city's population, based in zones 2 and 5. The contract has an annual turnover of USD10million.

2003	Santo Dominigo	4 year O&M	1,400,000 water

The contract is with the municipality's CAASD. It will run for a minimum of four years and is renewable.

Contact Details

Name: ACEA SpA
Address: Piazzale Ostiense 2, 00154 Rome, Italy.
Tel: +390 6 57 991
Fax: +390 6 57 994 146
Web: www.aceaspa.it

Fabiano Fabiani (Chairman)
Andrea Manzoni (CEO)
Isadora Lucciola (CFO)

AGUAS DE BARCELONA SA

Sociedad General de Aguas de Barcelona SA (Agbar) is under the indirect control of Suez. In 2007, Suez, La Caixa, and HISUSA (51% Suez Environment, 49% Caixa Holding), which jointly owned 49.7% of Agbar, launched a public tender offer for Agbar's outstanding shares. As of July 2008, Suez held 12% of Agbar directly and HISUSA held a further 64%, with Suez Environnement holding 45.9% of Agbar's shares. Suez plans to increase Agbar's free float from 10% to 30-33% in the medium term.

Agbar dates back to the Compagnie des Eaux de Barcelone founded in 1867 and incorporated in Paris as La Societé Générale des Eaux de Barcelone, in 1881, before being acquired by Catalan investors and incorporated in its current form in Barcelona in 1919 for the provision of water and sewerage services in Barcelona. Until 1985, Agbar along with FCC enjoyed an effective duopoly of Spanish private sector water and sewerage contracts across Spain. Since then, several Spanish construction companies and electricity utilities have entered the market, and in several cases have subsequently sold these activities.

In June 2006, Agbar acquired Bristol Water, the largest independent Statutory Water Company in England and Wales for EUR256.8million.

Agbar, profit and loss account

Y/E 31/12 (EURmillion)	2003	2004	2005	2006	2007
Water turnover	892.7	1,057	1,204	1,427	1,563
Group turnover	2,676.5	2,589	2,749	2,579	2,861
Water operating profits	N/A	131	184	250	265
Group operating profits	183.0	238	303	330	371
Water net profit	N/A	173	185	N/A	N/A
Net profit	243.0	266	338	308	483
Minority interests	-48.7	-50	-86	141	131
Group net profit	194.3	216	252	167	353
Earnings/share (EUR)	1.33	1.47	1.70	1.12	2.36

2006 & 2007 results reflect the disposal of Applus

Agbar, services in 2006

Water	Spain	International
Municipalities served	1,131	75
Population served	12,347,431	9,050,179
Customers served	5,741,611	1,924,171
Water treatment plants	211	34
Water delivered (million m^3 pa)	1,274	795
Treatment capacity (m^3/day)	2,430,775	2,996,434
Sewerage		
Municipalities served	355	49
Population served	6,214,277	5,818,873
Sewer systems (km)	17,811	9,980
Sewage treatment		
Municipalities served	478	49
Population served	11,049,432	3,830,748
Capacity (m^3/day)	1,845,495	1,008,143

Agbar, services in 2007

Water	Spain	International
Municipalities served	1,205	68
Population served	12,171,598	9,009,367
Customers served	6,089,018	3,218,328
Water treatment plants	223	38
Water delivered (million m^3 pa)	1,319	1,332
Treatment capacity (m^3/day)	2,496,143	3,285,216
Sewerage		
Municipalities served	381	64
Population served	8,377,872	8,887,124
Sewer systems (km)	20,645	13,960
Sewage treatment		
Municipalities served	498	62
Population served	10,168,063	3,403,932
Capacity (m^3/day)	2,495,853	1,215,094

Operating margins have consistently been higher than for the company's other activities, with an internal rate of return of 15% for most recent contracts. Agbar expects to devote 65% of its capital expenditure on water and sewerage services in the medium term.

Spain

Excepting Barcelona, Agbar's water and sewerage contracts in Spain have an operating life ranging from 5 to 30 years. The company provides sewerage services for 8million people and 10million have their sewage treated. Agbar holds 52% of the private sector's share of the water provision market in Spain. Currently municipalities hold 48% of the market, which is being steadily eroded by privatisations. Agbar serves 1,368,911 customers in the Barcelona metropolitan area, a total of 2.815million people. In 2006, the Alicante concession, serving 725,000 people, was extended from 2016 to 2036.

Agbar has some 2,100 water, sewerage and sewage treatment contracts in Spain, ranging from serving 1,000 to 2.8million people. In 2007, 21 new water concessions were gained (44,000 people, including Santa Cruz de la Palma, in the Canary Islands for 17,640 inhabitants) and 59 contracts renewed (213,000 people, including Benidorm, in Alicante (67,500) and Ripollet, in Barcelona (34,700 inhabitants)). 23 sewerage contracts were renewed or gained, serving 159,000 people, including a new contract for Ciudad Real (71,005). 41 wastewater treatment plant management contracts were awarded, with a PE of 285,000, including a new contract for Xátiva, in Valencia (28,000 inhabitants) and the renewal of the contract for Mahón, in the Balearic Islands (27,000 inhabitants); and ten wastewater treatment plants currently managed by the Gran Canaria Island Council for 30,000 equivalent inhabitants.

Acquisition of Ferrovial's water and wastewater activities

In July 2004, Ferrovial sold its water activities to Agbar for EUR43.3million. These consist of 14 concessions for water and wastewater services to 217,480 people in 32 municipalities, rising to 450,000 during the summer. Contracts for some 50,000 people were gained during 1998 and 1999 and for a further 150,000 during 2000. This business was mainly built up between 1998 and 2000 and consists of 130,000 customer accounts generating revenues of EUR16.3million in 2003. The main towns served with water or wastewater by Ferroser are: Ponferrada and San Andrés del Rabanedo (Castilla-León), Estepona, Ubeda and Vélez Blanco (Andalucía), Poio and O Barco de Valdeorras (Galicia), Plá de Mallorca (Balearic Islands), Guadalemar (Extremadura), and Castañeda and Cartes (Cantabria).

Partial sale of Aguagest Sur

50% of Aquagest Sur was sold to Unicaja and Caja Granada in July 2005 for EUR73.5million. Agbar will retain the rest of the company's equity. Aguagest Sur was founded in 1991 and is responsible for water and sewerage services for 43 municipalities in Andalusia, serving 1,194,535 people.

International activities

Until recently Agbar sought major contracts in Latin America in partnership with Suez but now Agbar operates on its own. Likewise, as demonstrated by the Bristol Water acquisition, the group is seeking opportunities in markets outside Latin America. Two small stakes in the USA (10% of Western Water) and Morocco (5% of Lydec) have been sold.

Agbar, number of people supplied in Spain and internationally

Country	Water	Sewerage	Total
Spain	12,171,598	13,380,000	**15,000,000**
United Kingdom	1,092,000	0	**1,092,000**
Chile	6,591,116	6,468,873	**6,591,116**
Colombia	895,000	895,000	**895,000**
Cuba	1,272,414	1,272,414	**1,272,414**
Mexico	711,188	711,188	**711,188**
Algeria	1,500,000	0	**1,500,000**
China	1,250,000	1,200,000	**2,450,000**
Total outside Spain	**13,311,718**	**10,547,475**	**14,511,718**
Global Total	**25,483,316**	**23,927,475**	**29,511,718**

Since 2005, the company has reviewed its activities in Latin America and has withdrawn from Argentina, Uruguay and Brazil. The company remains committed to Chile and Cuba, but all other activities remain subject to review.

United Kingdom – Bristol Water

The Bristol Waterworks Company (Bristol Water) was founded in 1846. Bristol Water supplies water to 1,066,000 people in the city of Bristol in western England and certain surrounding areas. Sewerage services are carried out by Wessex Water (YTL). Veolia Environnement's 24.7% holding was sold to the Ecofin Water & Power Opportunities Fund Plc in 2002 for GBP38million. In April 2001, Bristol Water and Wessex Water set up a JV to combine their customer services and billing operations. Bristol Water Plc is 100% held by Bristol Water Group Plc, the successor company to Bristol Water Holdings Plc set up in September 2003 which operates the company's non-regulated activities. By May 2005, all non regulated activities with the exception of some joint ventures had been divested.

Bristol Water Group, profit and loss account

Y/E 31/03 (GBPmillion)	2004	2005	2006	2007	2008
Bristol Water Plc	70.7	70.6	81.9	86.3	91.0
Other activities	42.8	27.9	0.0	0.0	0.0
Group turnover	113.5	98.5	81.9	86.3	91.0
Operating profit	20.0	15.1	24.9	25.2	26.3
Pre-tax profit	14.5	1.6	18.4	18.9	17.9

In December 2003 Bristol Water announced a refinancing to increase in the level of borrowings in the regulated water business and a return of GBP51million to shareholders. A second round of refinancing was completed in June 2005, returning a further GBP30million. Agbar made a GBP175million agreed bid for Bristol Water in April 2006, which was declared unconditional in May 2006.

Argentina

Agbar's has exited from its activities in Argentina.

Aguas de Santa Fe was meant to be sold to Fides Group and Grupo Energia BV in 2005, but in May 2005 Suez and Agbar decided to terminate the concession. The Aguas Argentinas concession serving Buenos Aires was ended in March 2006. The Aguas Cordobesa concession (Ondeo Services 39%, Agbar 17% and five Argentinean companies) was partly sold in December 2006; Agbar selling 12% to Roggio and retaining 5%.

Chile

Agbar holds 50.1% of the equity of Aguas Andinas via Inversiones Aguas Metropolitanas Limitada (IAM). In 1999 Agbar and Suez acquired 51.2% of Empressa Metropolitana de Obras Sanitarias (EMOS, now Aguas Andinas), Santiago's water supply company, for a total of USD1,135million. In 2002, Agbar's stake was increased from 16.0% to 25.6% through the exercise of a call option at a cost of EUR180million. In 2004, Agbar bought 30.1% of Suez's holding in IAM for EUR139.4million. As a result, Agbar owns 80.2% of IAM, with Suez holding the remaining 19.9%. IAM was listed on the Santiago Stock Exchange in January 2007, with IAM holding 50.1% of the company, CORFO (Chilean Government) 35.0% and a free float of 14.9%.

1999	Santiago	Privatisation of EMOS	5.8million water & sewerage

All 44 districts of the city are to be covered, along with the long-term development of its wastewater services. Revenue growth is being driven by wastewater services expansion. Currently, 100% of the population is served with piped water and 97% by mains sewerage, while 75% of sewage effluents are treated.

Enersis sold Aguas Cordillera to EMOS for USD193million in June 2000.The second highest bidder was Biwater at USD179million. Aguas Cordillera provides water and sewerage services to 116,591 clients (315,000 people) in the Vitacura, Las Condes and Lo Barnechea districts of Santiago. Aguas Cordillera has been integrated within Aguas Andinas.

Aguas Andinas, profit and loss account

Y/E 31/12 (CLPmillion)	**2003**	**2004**	**2005**	**2006**	**2007**
Water revenues	111,015	109,112	111,955	115,386	115,886
Sewerage revenues	66,079	83,287	97,991	105,546	106,032
Other – regulated	9,754	8,131	9,939	10,059	8,007
Other – non regulated	9,285	13,821	15,992	18,331	23,831
Turnover	168,398	195,433	219,623	249,322	253,756
Operating profits	87,242	94,999	111,301	112,221	121,314
Net income	69,456	71,022	83,278	90,884	97,059
EPS (CLP)	9.75	10.21	12.41	13.55	14.47

	2003	**2004**	**2005**	**2006**	**2007**
Water clients ('000)	1,436	1,467	1,503	1,550	1,598
Sewerage clients ('000)	1,405	1,438	1,474	1,521	1,569
Water coverage	100%	100%	100%	100%	100%
Sewerage coverage	98%	98%	98%	98%	N/A
Sewage treatment coverage	63%	67%	69%	72%	N/A

1995	Valdiva	Concession	120,000 water & sewerage

The concession was awarded to Aguas Décima SA. 120,000 people are served via 26,000 client contracts for water and 21,500 for sewerage. The first objective for the concession is to connect the outstanding 4,500 customers to the sewerage service.

2008	ESSAL	Acquisition	650,000 water and sewerage

Iberdrola's Iberener acquired 51% of Empresa de Servicios Sanitarios de Los Lagos SA (ESSAL) from the Chilean Government for USD94million in 1999. 35% of ESSAL is now held by the Government and 10% by its staff. ESSAL is one of Chile's smaller water companies and is based in Region X in the south of the country ESSAL serves 166,000 customers (650,000 people, against 500,000 in 1999) in the Region, which includes the cities of Osorno and Puerto Montt, with a population growth of 6% pa. USD240million in investments is called for, to increase the number of water connections within its operating area and to develop sewerage services and sewage treatment facilities, with the aim for universal sewerage and sewage treatment by 2005. Aguas Andinas acquired ESSAL's holding for CLP72.5billion in March 2008.

Uruguay

Agbar acquired 60% of Aguas de la Costa at the end of 1997. The company sold this stake back to the Government's OSE in 2006 for USD3.4million, part of which was in turn acquired by two local companies STA Ingenieros (30%) and Benencio SA (10%).

Brazil

Agbar gained the concession to operate water and wastewater services for Campo Grande in 2001. In 2005, Agbar sold its 50% stake in Aguas Guariroba to a consortium formed by Bertin and Equipav (See company entry for Grupo Equipav SA), who also acquired 31% from Copel. Aguas sold its stake for BRL57million.

Colombia

1995	Cartagena	25 year concession	895,000 water & sewerage

Aguas de Cartanega SA ESP has been profitable since its onset. 44.8% of its shares are held by Agbar, 50% by Distrito Turistico y Cultura de Cartagena and 5.1% by local shareholders. Agbar's stake cost COP280million. In 2007 water coverage was 100% against 73% in 1995, with sewerage coverage at 82% against 61%. The aim is for 95% water coverage by the end of 2008. Water services have been provided to 350,000 people since the concession started (93% urban poor) and sewerage services to 240,000 (90% urban poor). Aguas de Cartagena has 132,000 water customers and 102,000 sewerage customers. In 2006, Agbar agreed to continue running the concession after consultations with the city. During 2005, net profits eased by 8.9% to COP7.77billion, with a 6.0% increase in revenues to COP96.3billion.

Cuba

Interagua formed Aguas de La Habana, a JV with the Cuban Government in 1999, for two water management contracts currently serving 1,200,000 people, with an eventual coverage of 1,400,000 people. The contract serves La Havana and Varadero. Water supply systems were renovated for 298,000 people in 2001-02. In February 2000, Interagua was awarded a 25 year water management contract for Havana.

Service development in Varadero and Havana

Varadero	**1994**	**2006**
Population covered	95%	100%
Hours service/day	18	24
Number of connections	5,000	11,000
Havana	**2000**	**2006**
Population covered	95%	100%
Hours service/day	8	10
Number of connections	327,000	365,000

Source: Presentation by José María Tura, General Manager of Aguas de La Habana to Agbar conference "Five international examples of environmental management in the service of the citizens" on 19th June 2007.

Mexico

2001	Saltillo	25 year concession	711,188 water & sewerage

Agbar has gained 49% of Empresa Paramunicipal, the company responsible for the management of the drinking water supply and sewerage services in the city of Saltillo, in the state of Coahuila situated in northern Mexico. The remaining 51% is to be held by Sistema Municipal de Aguas de Saltillo (SIMAS). The city of Saltillo was founded in 1577. In 2004, water was supplied to the entire population (146,245 customers), with 92% served by sewerage. During 2005, the sewerage network will be completed. Turnover was EUR21million in 2001. EUR81.9million is to be invested during the contract. 7,000 customers were gained during 2007.

Algeria

In November 2007 Agbar gained a concession for water supply and treatment in the province of Orán for a term of five and a half years. Orán, located in the north east of Algeria on the Mediterranean coast, has a population of 1.5million inhabitants and after the capital, Algiers, is the second largest city in the country. Société des Eaux Oran, SPA, is 50% held by Agbar and 50% by the Government's Algérienne des Eaux y el Offi ce National de l'Assainissement.

China

The Agbar Group is operating a series of water supply and wastewater treatment projects in the province of Jiangsu, through a joint venture with the Golden State Water Group Corporation Group, including Chinese capital in which the Merrill Lynch Group also has a stake. November 2007 entailed a EUR30million investment by Agbar, including EUR14.45million for Agbar's 49% stake in the joint venture company.

The joint venture will be responsible for three 30-year concessions: the management of a waste water treatment plant (with capacity of 300,000m^3/day) in Nanjing; the construction and management of a potable water treatment plant (350,000m^3/day) in Taizhou, and the management of another potable water treatment plant (50,000m^3/day) and the related distribution network in Xuyi.

See company entry for the Golden State Water Group.

Contact Details

Name: Grupo Agbar
Address: Torre Agbar, Avenida Diagonal, 211 08018 Barcelona, Spain
Tel: +(34) 93 342 20 00
Fax: +(34) 93 342 26 70
Web: www.agbar.es

Jorge Mercader Miro (Chairman)
Angel Simón (General Director)
Juan Antonio Guijarro (Water, except Catalonia and Balearics)
Leonard Carcolé (Water, Catalonia and Balearics)

UNITED KINGDOM

CASCAL NV

Cascal specialises in investing in and operating water and wastewater systems. The company was formed in April 2000, and at the time brought together all of Biwater's operational contracts in a single company (see company entry on Biwater). Cascal was originally a wholly owned subsidiary of the Biwater Group but in January 2008 some of its shares were floated on the New York Stock Exchange (NYSE).

Cascal NV, profit and loss account

YE 31/03 (USDmillion)	2004	2005	2006	2007	2008
Water supply turnover	89.2	94.7	101.4	107.2	133.2
Water contracting turnover	7.6	16.2	9.3	14.5	27.5
Group turnover	96.8	110.9	110.6	121.7	160.6
Operating profit	22.6	30.1	31.5	36.2	40.2
Pre-tax profit	17.7	35.9	27.2	15.7	22.3

Cascal NV, regional breakdown of revenues

Year ended March 31 (USDmillion)	2006	2007	2008
United Kingdom	67.9	75.1	94.8
South Africa	13.4	13.8	21.7
Indonesia	9.5	11.1	11.4
China	0.0	2.9	10.0
Chile	6.8	6.4	7.6
Panama	0.0	6.2	8.8
The Philippines	2.1	2.4	2.9
Holding Companies	1.2	0.2	0.7
Revenue from continuing operations	100.8	118.6	157.8
Discontinued operations (Mexico & Belize)	9.8	3.1	2.9
Total reported revenue	110.6	121.7	160.6

Cascal, number of people served internationally

UK	430,000	0	430,000
Philippines	220,000	220,000	220,000
Indonesia	730,000	0	730,000
Chile	440,500	352,500	440,500
Panama	300,000	0	300,000
South Africa	404,000	404,000	404,000
China	1,510,000	0	1,510,000
Grand Total	**4,034,500**	**976,500**	**4,034,500**

UK

Bournemouth Water (founded in 1863) and West Hampshire Water (founded in 1893) were both acquired by Biwater in 1989 and merged in 1994. Bournemouth & West Hampshire Water (BWHW) was later transferred to Cascal when it formed in 2000. BWHW now has 197,000 connections, serving a resident population of 430,000 which rises to 500,000 in the summer. BWHW is 100% held by Cascal and has an operating licence in perpetuity, subject to 25 years notice of termination. The UK water sector is heavily regulated and controlled; in 2007 BWHW was ranked second for levels of service by the regulator.

UNITED KINGDOM

Bournemouth and West Hampshire Water Plc financial highlights

YE 31/03 (GBPmillion)	2004	2005	2006	2007	2008
Water supply turnover	28.41	29.98	34.52	34.85	36.93
Non-regulated turnover	2.31	2.81	3.06	4.67	9.73
Group turnover	30.70	32.78	37.58	39.52	46.66
Operating profit	9.43	11.13	14.17	14.34	15.40
Pre-tax profit	8.65	9.94	-3.69*	10.95	10.91

* GBP10.5million before exceptional items

Meter penetration in 2007 reached 50% and is expected to reach 55% by 2009-10 following the installation of 26,860 meters. In 2005, the company refinanced its debt by issuing GBP65million of index linked wrapped bonds under the Royal Bank of Scotland's Artesian programme. These bonds are repayable by 2033 and carry a coupon of 3.084%, with an inflation-related indexation charge on their principal value.

Philippines

1996	Subic Bay	30 year concession	220,000 water & sewerage

The Subic Water and Sewerage Company Inc. (Subicwater) is a JV with local partners, serving Subic Bay Freeport and Olongapo City. Subicwater was established together with the Subic Bay Metropolitan Authority (SBMA) and the Olongapo City Government to undertake the project by means of a twenty five year concession contract (extended to 30 years in 2003), which is due to expire in 2027 and has a 25 year extension option.

Subicwater took over the operation and maintenance of the existing assets and is undertaking extensive refurbishment work, upgrading treatment works, pipework and rehabilitation and the extension of water distribution and sewerage networks. There are 32,000 water connections and 70km of water mains and 50km of sewerage networks.

Indonesia

1995	Batam Island	25 year concession	700,000 water provision

The Batam Industrial Development Authority (BIDA) awarded Cascal and its local joint venture partners, Bangun Cipta Kontraktor (BCK) and Syabata Cemerlang a 25 year concession contract in 1995 to operate, manage and develop the water facilities on the island of Batam. The partners set up a local company, Adhya Tirta Batam (ATB) to fulfil their concession obligations. Cascal and BCK acquired the Syabata Cemberlang shareholding in November 2002 and now have equal shares in ATB.

Batam Island has enjoyed exceptionally high investment and growth ever since it was designated a special development zone by the Indonesian Government. Non-revenue water has been reduced from 49% in 1995 to 27% in 2007. Further investment is being implemented to reduce non-revenue water to 25%, and even lower over the remainder of the concession period. Due to the high growth, water demand grew by 10% in 2002-03, with 69,000 customer connections. In 2003-04, connections rose by a further 18% to 81,000 and to 132,000 by 2008. Adhya Tirta Batam currently serves 700,000 people. In May 2008, PT Adhya Tirta Batam undertook to construct a new water treatment plant in Duriangkang, along with approval for a 20% tariff increase. The new construction is the third stage in the development of an integrated potable water system and follows the completion of earlier modules built in 2001 and 2004. The new treatment plant will have a capacity of 11.5million gallons per day, equivalent to a population of almost 200,000, and is expected to commence operations in April 2009.

2008	Telang Kelapa	25 year concession	30,000 water provision

Cascal holds 40% of PT Adhya Tirta Sriwijaya, which has a concession for water provision to Sukarame, an area near to Palembang, with a total population of 160,000.

China

The China Water Company (CWC)

The China Water Company (CWC) was originally founded by AIDC, a company majority held by the Australian Federal Government. Thames Water Aqua International GmbH acquired 48.8% of CWC for USD20million, plus a USD50million capital injection in 2001. In November 2006, Cascal acquired 87% of the China Water Company Limited from Thames Water, Sime Darby (Hong Kong) and two minority shareholders.

China Water has offices in Hong Kong and Shanghai and it owns majority stakes in six water service companies in China which are based in Xinmin and Qitaihe (in the North), Yanjiao (near Beijing), Yancheng and Zhumadian in the middle of the country and Fuzhou (in the South East). The water service companies are all joint ventures with local water companies or development zones.

2008	Yancheng	30 year concession	600,000 water provision

In April 2008 Cascal acquired a 49% stake in Yancheng China Water Company. The new joint venture company, Yancheng China Water Company, a joint venture between China Water (49%) and the Municipality of Yancheng (51%), formally commenced operations in May 2008. Yancheng CWC operates three water treatment plants with a combined capacity of 235Mld supplying a network consisting of 925km of transmission and distribution mains, serving the entire population of the city. The company employs 592 staff. Due to increased demand from both residential and commercial customers the company is currently planning a further 100Mld expansion.

2004	Fuzhou	35 year concession	150,000 water provision

The Fuzhou CWC Water Company Limited contract is a 30 year concession which started in December 2004. Fuzhou CWC operates the water supply assets for the Fuzhou Economic & Technological Development Zone. Construction of the 125,000m^3/day WTW ran from 2004 -2006. The facilities consist of two plants with a combined capacity of 125Mld and 93km of distribution network, which is mainly gravity fed.

2000	Yanjiao	25 year BOOT	150,000 water provision

The CWC Yanjiao (Hebei Province) contract covers a water treatment works which were built between 2000-2003. In October 2001, CJV (Yanjiao CWC) was established between The China Water Company and Sanhe Yanjiao Water Company to develop and manage water supply in Yanjiao ETDZ. The water treatment and supply facilities have been constructed in two phases and currently have a maximum output of 60Mld.

2000	Xinmin	25 year BOOT	80,000 water provision

The CWC Xinmin (Liaoning Province) Water infrastructure project covers one 30,000m^3/day water treatment works, built in 2000-2001. The project involved the digging of 10 new deep wells (80 metres in depth) along the Liu River bank; construction of a 4.5km raw water transmission pipeline and construction of a new 30Mld water treatment plant incorporating iron and manganese removal to ensure that the treated water from the plant is in compliance with the National Drinking Water Standards (NDWS).

UNITED KINGDOM

2001	Qitaihe	25 year BOOT	130,000 water provision

On commencing the twenty five year operational contract in 2001, the joint venture, established between the China Water Company and Qitaihe Water Company, took over an existing 20Mld water treatment plant. It has since constructed and now operates a new 100Mld plant, pumping stations and raw water pipelines.

The service population has increased from 100,000 to 130,000 in the past four years. Since 2006, Qitaihe CWC has introduced a 24-hour water supply service so that the customers are able to enjoy a high quality and continuous water supply service.

2008	Zhumadian	25 year BOOT	400,000 water provision

In June 2008 China Water acquired 51% of Zhumadian China Water Company, a joint venture in Zhumadian City, Henan Province (Zhumadian Bangye Water Group holding the remaining 49%). On 23rd July 2008 Zhumadian CWC commenced operations. Zhumadian CWC currently has a water supply capacity of 120Mld, supplying a transmission and distribution network of 422km. A 100Mld expansion is currently being constructed and is due to be operational by the end of 2009. This increased capacity is designed to supply seven major industrial customers engaged in a variety of industries, including power generation, chemical and steel production.

Chile

1994	Santiago	Perpetual	12,500 water & wastewater

Cascal has been active in Chile since 1995 principally through two subsidiary companies AGUAS SANTIAGO S.A. and AGUAS CHACABUCO S.A. Aguas Santiago operates concessions in the centrally regulated urban areas, mainly to the east of the city. All concessions in Chile are perpetual and are granted under Chilean law DFL 382/89, supervised and regulated by the Superintendence of Sanitary Services (SISS) and financial regulator.

Aguas Chacabuco provides services to contract regulated new population centres in rural areas to the north of the city, which are all potential future urban areas. In both cases, the two companies provide initial construction of water and wastewater infrastructure followed by the ongoing provision of sanitary services to the inhabitants of those areas.

1994	Antofagasta	30 year concession	340,000 water & wastewater

This is the first WWTW PSP project in Chile. Situated in the northern desert regions of Chile, the Antofagasta facility serves one of the driest parts of the world which has only 3.3mm of rainfall pa. The facility treats waste from a population of almost 342,000 and recycles the water, selling it on to industry and farms. Since the start-up of this operation in 1994, Cascal has completed a number of further projects in the region. These include the design, construction and operation of a sewage treatment plant for the Chilean Air force at the air base of Cerro Moreno. The sewage treatment plant re-uses its treated water to provide for the region's only local golf complex and country club, creating the dramatic contrast of a fertile golf course against the barrenness of the surrounding mountains.

2002	Noranda	22 years	Industry

This USD6million project was signed in November 2001 and provides 6Mld of treated wastewater to a copper smelter. It is owned by an important Canadian company located in the sector of La Negra, some 45km from Antofagasta. This project encompasses the installation of both a pumped and a gravity pipeline system that totals 40km in length and has a capacity of 10.3Mld. This gives a surplus of 4Mld that can be sold to other industries which are also located in the sector of La Negra.

UNITED KINGDOM

2008	Santiago	Perpetual	71,500 water provision

In June 2008 Cascal acquired 100% of ServiComunal. ServiComunal is a water and wastewater concession that serves the town of Colina, in the province of Chacabuco approximately 22km north of Santiago. It is located close to some of the other Cascal operations near Santiago. ServiComunal serves a population of 71,500 through 19,000 connections.

2008	Santiago	Perpetual	16,500 water provision

In June 2008 Cascal acquired 100% of ServiLampa. ServiLampa serves the town of Lampa, approximately 20km north-west of Santiago as well as the housing of Sol de Septiembre about 2km to the south-east of Lampa. It is also 20km from Cascal's other project at Colina (ServiComunal). ServiLampa serves a population of 16,500 through almost 5,000 connections.

Mexico

1993	Puerto Vallarta	15 year O&M	250,000 sewerage

The first sewage treatment BOOT in Mexico, with a WWTW to secondary standard that entered service in 1995. This plant has enabled Puerto Vallarta to develop into a major international holiday resort. It has a production capacity of 216Mld. In 2004, the BOOT contract was sold to SEAPAL for a profit of USD12.9million and Cascal's interest continued under an O&M contract until 2008 and was formally sold back to SEAPAL January 2008.

Panama

2004	Laguna Alta	30 years, BOOT	300,000 water

This is Panama's first BOOT water project involving the construction of a 76Mld potable water treatment plant for Aguas de Panama. The contract serves people in the La Chorrera, Arraijan and Capira areas, west of the Panama Canal. The project was first signed in 2000, and construction started in 2003 with a syndicate lead by the IFC providing USD15million of the project's USD25million funding. The facility entered service in 2004. Cascal acquired the contract in 2006. The government announced in 2008 that it is seeking an early termination of the contract and in August 2008 Cascal sought leave to the Supreme Court to protect its interests.

South Africa

1999	Nelspruit	30 year concession	404,000, water & sewage

The ZAR300million Silulumanzi concession covers the Maputo Development Corridor in Mpumalanga Province and is the fastest growing municipality in South Africa and has the World Cup football tournament due to be held there in 2010. This is the first full privatisation in South Africa. Cascal has taken over billing and revenue collection while modernising the facilities and has focused the concession on improving and expanding service delivery to the townships.

In the first 2 years of operation 91km of new water mains were laid as well as 18km of sewers. At the same time thousands of unregistered connections were found and many household and mains leaks repaired. This has substantially reduced NRW and over 6Mld have been saved to date; over 8,000 broken meters have been replaced and a further 15,000 new meters have been installed. In September 2008 Cascal completed the purchase of the remaining 10% of Silulumanzi.

1999	Dolphin Coast	30 year concession	50,000 water & sewerage

In May 2007, Cascal acquired 73.4% of Siza Water from Bouygues for USD2.9million. Siza Water provides water and wastewater services to approximately 50,000 people in the Dolphin Coast region of South Africa. The Borough of Dolphin Coast in Ballito is one of the main tourist resorts in South Africa and is experiencing rapid growth of both its resident population and its tourist industry. The

concession is operated through Siza Water which will make USD172million of investments during the life of the concession. The population served varies between 30,000 (low season) and 100,000 (high season). Siza Water generated revenues of USD5.5million in 2006.

Contact Details

Name: Cascal NV
Address: Biwater House, Station Approach,
Dorking, Surrey RH4 1TZ
Tel: 01306 746080
Fax: 01306 746031
Web: www.cascal.co.uk

Stephane Richer (Chief Executive Officer)
Steve Hollinshead (Chief Financial Officer)
Jonathan Lamb (General Counsel & Company Secretary)
Brian Winfield (Chief Growth Officer)
Andrew Young (Projects Director)

UNITED KINGDOM

Biwater plc

Biwater was founded in 1968, providing water purification hardware to swimming pools. During the 1970s, Biwater moved into sewage treatment hardware and developed a number of export markets. In 1986, Biwater won a USD1billion construction contract called the Malaysian Rural Water Supply Scheme which was followed by a 5 year maintenance contract. In 1989 it acquired the Bournemouth & West Hampshire Water Companies which is now part of the Cascal NV Group. Biwater is a privately owned company, specialising in water treatment and sewerage engineering. Biwater also currently has the largest installed capacity of membranes in the United States as well as the largest installed capacity of membrane bio-reactors (MBR's) in the UK.

Biwater Plc, profit and loss account

YE 31/03 (GBPmillion)	2004	2005	2006	2007	2008
Turnover	185.3	191.9	203.0	250.6	325.3
Share of joint ventures	(24.2)	(26.6)	(28.4)	(18.5)	(12.6)
Group turnover	161.1	165.3	174.6	232.1	312.7
Operating profit	2.8	7.0	10.1	13.2	20.2
Pre-tax profit	0.1	6.0	(0.7)	5.2	8.4

Biwater, number of people served internationally

Cascal projects	4,034,000	976,000	4,034,000
Abu Dhabi	0	1,900,000	1,900,000
Algeria	400,000	0	400,000
Sudan	2,500,000	0	2,500,000
Grand Total	**6,934,000**	**2,876,000**	**8,834,000**

Major PSP contracts:

Abu Dhabi

2008	Abu Dhabi	BOT, 22.5 years	1.9million, wastewater treatment

The project involves the construction and 22½ year operation (until October 2033) of the 300,000m^3 /day Wathba Sewage Treatment Plant (STP) in Abu Dhabi and the 80,000m^3 /day Saad STP in Al Ain.

Algeria

2008	Oued Sebt	BOO, 25 years	400,000, desalination

A Biwater Construction Ltd led consortium has been awarded a Build, Own, Operate contract expiring in April 2036 for a new seawater reverse osmosis desalination plant to be constructed at Oued Sebt in the region of Tipaza, Algeria. The new plant will deliver 100,000m^3 per day of drinking water when completed.

Sudan

2005	Khartoum	12 year management	2.5million, water provision

Biwater was awarded a USD108million water treatment works on the banks of the River Nile for Khartoum State Water Corporation. This is one of Sudan's first private sector financed water projects. This contract involves the Operation and Maintenance of the Biwater turnkey constructed Omdurman Water Treatment plant. Funding for the facility has been provided by the Dutch Ministry of Foreign Affairs (USD58million) and the Industrial Development Cooperation (IDC), a South African development bank.

UNITED KINGDOM

Tanzania

City Water, a joint venture of Biwater International (UK), Gauff Ingenieure (Germany) and Superdoll Trailer Manufacturers Ltd. (Tanzania), began operations on 1st August 2003, implementing a USD143.5million donor funded project. On 13th May 2005, the contract was cancelled by the government. City Water obtained a UK High Court injunction against the contract's termination in May 2005, pending arbitration, but this was ignored by the Tanzanian Government. An application to the International Centre for the Settlement of Investment Disputes (ICSID) was made and the ICSID court upheld Biwater's claim that the Government of Tanzania broke the terms of the Bilateral Investment Treaty between the UK and Tanzania on four separate counts.

Some recent major construction awards

Libya: A EUR10million contract for a municipal wastewater treatment scheme in Tripoli gained in August 2007 and running to 2012. The scheme which comprises a wastewater treatment plant, pumping stations and a 14 kilometre forcemain will be commissioned in 2010 and will cater for half the City's population.

Singapore: In May 2008, Biwater was awarded a supply contract for the largest water reuse project in South East Asia. At a capacity of 228,000 m^3 per day this will provide 15% of Singapore's water demand by 2010. Design and supply will take place from February 2009, with site testing and startup from May 2010.

Contact Details

Name: Biwater plc
Address: Biwater House, Station Approach,
Dorking, Surrey RH4 1TZ
Tel: 01306 740740
Fax: 01306 855233
Web: www.biwater.com

Adrian White (Executive Chairman)
David White (Deputy Chairman)
Larry Magor (Director)
Martin Duffy (Company Secretary)

UNITED KINGDOM

UNITED UTILITIES PLC

United Utilities Plc (UU) is a company specialising in managing water, wastewater, electricity and gas networks. Its main UK base is in the north west of England, where it provides water supply, sewerage, and electricity supplies to 7million people. After the divestment of Vertex and Your Communications, UU was reorganised as a single business with two particular sets of activities under the Utility Solutions banner:

- UU North West – (Licensed multi-utility operations) manages and maintains the water and wastewater assets within its statutory areas of operation.
- Infrastructure Management manages and operates assets outside its statutory areas of operations and brings together its other non-regulated asset-based activities as one business. United Utilities International sits within this part of the organisation. Formerly called UU Contract Solutions, these are now called non-regulated.

United Utilities' GBP1billion rights issue (GBP500million in September 2003 and GBP500million in June 2005) is the first UK rights issue to explicitly earmark funds for water and wastewater infrastructure spending since the 1989 privatisation. While the rights issue will require additional dividend payments of GBP40million pa, this is less than the coupon additional debt would have commanded, while lowering the coupon for future debt issues. By avoiding underwriting, the total cost of the issue is GBP10million. UU is returning GBP1.5billion to its shareholders in the wake of the GBP1,050million sale of UU Electricity (along with GBP686million in debt).

United Utilities, profit and loss account

Y/E 31/03 (GBPmillion)	2004	2005	2006	2007	2008
Turnover					
UU North West	1,300.7	1,384.7	1,502.9	1,314.3	1,414.2
Non-regulated	N/A	N/A	654.5	742.2	916.0
Operating Profits					
Multi Utilities	516.9	541.7	637.5	581.0	611.6
Non-regulated	N/A	N/A	68.5	62.6	50.6
Group turnover	2,060.0	2,103.7	2,086.0	1,986.7	2,362.9
Operating profit	597.1	651.4	729.5	642.1	663.2
Net interest	-248.1	-283.8	-284.4	-139.2	-184.9
Pre-tax profit	349.0	367.6	445.1	502.3	478.3
Earnings/Share (p)	54.2	30.1	24.3	40.9	47.3

Regulated water and wastewater revenues in 2005 were GBP1,126million, rising to GBP1,221million in 2006 and GBP1,321million in 2007. During the 2000-05 period, GBP195million was spent on upgrading wastewater treatment works and GBP106million on storm water overflow systems. Capital spending rose from a total of GBP441million in 2005-06 to GBP570million in 2006-07, 54.5% for water and wastewater network maintenance and 45.5% for service and quality enhancement. UU is implementing a carbon emission plan that will cut emissions by 18% by 2010 through using renewable energy supplies for its water and wastewater operations and a further 8% through harvesting methane from sewage treatment processes by 2012 at a total cost of GBP37million.

In September 1999, the Mersey Basin gained the River Prize for the best river clean up operation in the world. This reflects the gains made since the Mersey Basin campaign started in 1981, when Europe's most polluted river was described as an 'affront to civilised society'. 2,000km of waterways have been restored since then, with UU spending GBP1.6billion on capital works to divert domestic and industrial effluents into an integrated sewerage diversion and sewage treatment scheme between 1989 and 2002. In 2001, the first salmon were caught in the Mersey since 1921.

After GBP1.1billion in spending between 1990 and 2002, the problem of the region's bathing water is being tackled. Compliance has moved from 18% in 1988 to 97% in 2002. In 1997, after the main scheme had been completed, compliance was at 50% and a GBP150million follow-up scheme concentrated on upgrading specific STWs and to reduce further a number of storm water discharges. In 1999, 11 out of 34 designated beaches failed the mandatory criteria and this fell to 1 in 2003 and all complied in 2006. The three failures in 2007 may be attributable to exceptional rainfall.

UNITED KINGDOM

Bathing water compliance	2001	2003	2004	2005	2006	2007
Guideline	4	4	7	7	8	10
Mandatory	26	32	29	25	22	19
Fail	4	1	1	2	0	3

Sale of UU Industrial

UU acquired Hyder Industrial Solutions (HIS) from Hyder after the latter company's take-over in 2000. The company provides water and wastewater provision and treatment services through the development of dedicated facilities. HIS was subsequently rebranded UU Industrial. These activities were sold to Tradebe Group, a Spanish industrial services company in October 2007.

Scotland

1998	Fort William	28 year PFI BOT	14,000 sewage treatment
1998	Inverness	28 year PFI BOT	66,000 sewage treatment
1999	Tay	28 year PFI BOT	270,000 sewage treatment
2001	Moray Coast	28 year PFI BOT	55,000 sewage treatment

These contracts were awarded by the North of Scotland Water Authority to Catchment Ltd, with UU responsible for the operation of the sewage treatment works through Caledonian Water. The GBP45million Highland scheme has two facilities, at Fort William (PE of 20,000 for GBP10million) and Inverness (PE of 125,000 for GBP35million), which are both fully operational. The Tay scheme (33% held by UU) is for a single site serving Dundee and Angus and entered service in March 2002 at a total cost of GBP120million. The GBP76million scheme for the Moray Firth involves three sewage treatment works and 25km of sewerage for the Moray Firth.

England, Wales and Scotland – Outsourcing contracts

During 2004-05, UU Contract Solutions (UUCS) gained GBP3.3billion in utility related contracts across the UK and revenues of at least GBP650million pa in the medium term. No contracts were subsequently gained, which fits in with a pattern of these contract awards in relation to the AMP cycles.

The four year operations contract with Glas Cymru for Dwr Cymru Welsh Water's (DCWW) operations started in April 2001. This contract was originally worth GBP450million and was expanded to GBP600million, covering both water and sewerage activities. To date, variable costs have been reduced by 20%. This was replaced with a 15 year, GBP1.5billion contract starting from April 2005, with five yearly reviews. In 2002, UUCS also gained a GBP15million water meter installation and replacement contract.

United Utilities water outsourcing contracts

ear	Client	Contract	Total value	Duration
2001	Welsh Water	Operations	**GBP450million**	4 years
2003	Scottish Water	Capex management (JV)	**GBP1,100million**	5 years
2004	Welsh Water	Operations	**GBP1,500million**	15 years
2005	Southern Water	Capex management (JV)	**GBP750million**	5 years
2006	Scottish Water	Capex management (JV)	**GBP760million**	4 years

The Southern Water contract is worth GBP300million to UU and covers 250 water and wastewater projects, while UU will be involved in managing water provision across Wales and sewage treatment in north Wales. UU is now involved in managing contracts covering 35% of the UK water sector's asset base and is involved in 60% of the 9% of the utilities market in the UK that has been outsourced to date. Scottish Water Solutions gained a contract starting in 2004 to manage GBP1.1billion of Scottish Water's GBP1.8billion 2001-06 capital spending programme.

International activities

United Utilities International Ltd. (UUI) is the 100% held international water contracts arm of UU. After a number of major contract gains by UUI (as North West Water International) in 1993 and one in 1994,

it entered into a JV with Bechtel (USA) and Edison (Italy). In 2003-04, International Water sold its stakes in the Bulgarian, Philippine, Polish and Estonian operations back to UU and other parties. UU in turn sold its activities in Ecuador to Italy's Edison in 2005 (see company entry in the 2007 Yearbook).

UU remains one of the leading UK water companies for international contracts. The company has gained a reputation for aggressively cutting back at Capex demands while meeting compliance targets. The company ought to be regarded as one of the five leading global competitors in water and sewerage privatisation projects. UU's current target markets are the UK, central and eastern Europe and Australia.

United Utilities Plc, number of people served in the UK and internationally

Country	Water	Sewerage	Total
England	6,840,000	6,880,000	6,880,000
Scotland – PFI	0	405,000	405,000
Poland	300,000	300,000	300,000
Estonia	405,000	405,000	405,000
Bulgaria	1,500,000	1,200,000	1,500,000
Kuwait	0	1,900,000	1,900,000
Philippines	5,200,000	500,000	5,200,000
Australia	814,000	135,000	819,000
India	1,600,000	0	1,600,000
Total-home market	**9,828,000**	**10,328,000**	**10,328,000**
Total-international	**12,119,000**	**6,170,000**	**13,705,000**
Grand total	**21,923,000**	**16,358,000**	**24,028,000**

Poland

1999	Biesko Biala	12 year concession	300,000 water and wastewater

In November 1999, UUI and International Water entered into a strategic partnership with the municipality of Biesko Biala and acquired 33.2% of Aqua SA, the utility providing water and wastewater services to the city (200,000) and 12 municipalities in the surrounding area. The concession is being supported by the World Bank.

Estonia

2000	Tallinn	15 year concession	405,000 water and wastewater

The total contract is worth USD700million. UU and IW bid EEK338million (USD75.6million) for a 50.4% stake in AS Tallinna Vesi. The city of Tallinn also holds a single Golden Share. The IPO of Tallinna Vesi saw UU's stake fall from 38% to 26.5%. There were 15% price increases in 2004 and 2005. The emphasis is on developing a municipal and stormwater sewerage and effluent treatment system. Tallinna Vesi has 19,300 customer connections including apartment blocks where all people are served through a common metered connection. 68% of customers are domestic customers, 20% apartment associations and 12% are commercial customers.

Wastewater plant efficiency rose from 57.1% to 78.9% between 2002 and 2006, distribution losses fell from 31.6% in 2002 to 19.7% in 2006 and water quality compliance (all samples) rose from 95.1% in 2002 to 99.6% in 2006. A rate rise of 6.5% above inflation in January 2008 has been agreed, with 2% above RPI increases for 2009 and 2010 proposed.

Tallinna Vesi AS, profit & loss account

FY 31/12 (EEKmillion)	2003	2004	2005	2006	2007
Water sales	200.9	220.7	262.7	289.3	311.9
Wastewater sales	180.7	204.5	232.9	259.7	287.3
Other sales	122.4	123.3	94.4	144.2	221.6

UNITED KINGDOM

Total revenues	504.0	548.5	592.0	693.2	820.8
Net Income	104.5	173.0	174.4	277.8	227.8

For further details, please see the separate company entry for Tallinna Vesi in the 2007-08 Yearbook.

Bulgaria

1999	Sofia	25 year concession	1,500,000 water and wastewater

UUI and International Water were awarded the concession in December 1999. The winning bid was based on fees of USD152million against USD239-273million tendered by Suez and Berlin Water and USD66million in Capex in the first three years, against USD59-64million by the same companies. USD200million will be invested in the city's infrastructure over the life of the concession. The contract is worth [USD]700million over its life. UU holds 57.8% of Sofiyska Voda. Customer satisfaction has increased from 23% in 2000 to 70% by 2005.

Australia

UU serves a total of 819,000 people via 12 water treatment facilities and two industrial wastewater treatment projects. These have been carried out in both cases as a JV with Australia's Transfield Group, with 50% of the equity held by UU Australia. UU has indicated that it is keen to acquire one or more of the Australian water and sewerage entities that are currently being mooted for PSP.

2008	SE Queensland	5 years, O&M	Bulk water

LinkWater, the authority responsible for the bulk transfer of potable water in SE Queensland signed a AUD50million five year O&M agreement with UU Australia and Transfield in April 2008. United Utilities and Transfield Services will assist LinkWater to operate and maintain new water grid pipeline assets currently under construction, along with more than 200km of existing mains and associated works such as pumping stations and potable water reserves.

2004	Fleurieu Peninsula	20 year BOT	5,000 wastewater

A AUD32million wastewater treatment plant for Victor Harbour in South Australia, designed to handle an average flow of 5/day. The facility entered service in mid 2005. Victor Harbour is a tourist resort on the Fleurieu Peninsula, with a resident population of 5,000 and an average population of 20,000.

2003	Coliban	10 + 5 year O&M	130,000 water & wastewater

Campaspe Asset Management is responsible for O&M for a number of municipalities in northern and central Victoria. This includes 22 water and 10 wastewater treatment plants.

1993	Melbourne	25 year BOOT	100,000 water

This was the first BOOT project in the Australian Water industry, involving the renovation of Yan Yean reservoir, the oldest in Victoria, particularly during summer months when demand is high. A new direct filtration plant has replaced existing basic treatment facilities and now has a capacity of 155,000/day. It can reach a population of over 300,000 and supply 100,000 of these people at any one time. After AUD25million in spending, the refurbished facility entered service in 1994.

1995	Sydney	25 year BOOT	230,000 water

The Build, Own, Operate, and Transfer (BOOT) contract was awarded in 1992 and the facility entered service in 1995. It involved the construction of a new water treatment works costing AUD124million. The plant provides a population of 230,000 people with up to 265Ml/day of water. After 25 years, Sydney water can either buy the facility or renegotiate another operations contract.

1996	Adelaide	25 year BOOT	154,000 water

UU won the Adelaide BOOT contract for water treatment in South Australia's Riverland region in 1996. The AUD115million BOOT for 10 water treatment plants serves over 150,000 people in 90

communities. The consortium is made up of UU (50%) and AMP (Australia, 50%). Construction was from 1997-99, and the facility entered into service in September 1999.

In May 2000, UU Australia signed a GBP40million 20 year DBO contract with Queensland Nickel for a wastewater treatment plant designed to recover nickel from process water. In September 2000, UU announced that it is seeking to develop an underground lake discovered by Anaconda Nickel Ltd of Perth in the Western Desert. The lake is estimated to hold 2,000billionL of water. It is located in the Officer Basin, 400km from the mining area of Kalgoorie. The water is suitable as industrial water or could be treated for human consumption.

India

2003	Tirupur	30 year BOT	1.6million water treatment

This is the first large scale private sector water provision project in India. It was awarded to Mahindra Water Utilities Limited (UU Australia and Bombay's (Mumbai's) Mahindra and Mahindra Ltd), serving the capital of Tamil Nadu. This involves the construction of a 185Ml/day water treatment plant, pipeline, service reservoirs and a wastewater treatment plant and pumping stations at a total cost of USD220million. The WTP entered service in 2005 and will provide water for the textile manufacturers and over 1.6million residents in the Tiripur municipal area and surrounding villages.

Philippines

1997	Eastern Manila	25 year concession	5.2million, water & sewerage

After the World Bank's IFC bought a 9% stake in Manila Water for USD15million in 2004 and the 2005 IPO (35.2% sold to the public and 2.7% to employees) United Utilities holds 11.7% of Metro Manila. See company entry for more details.

Water services	**1997**	**2007**	**2008**
Cost of water (Ps/m^3)	10.70	5.55	5.88
Compliance with drinking water standards	91%	100%	100%
Non-revenue water	63%	25%	24%
Households served	325,000	892,000	986,000
Water delivery (million L/day)	440	948	1,040
Delivery 24 hours/day	26%	98%	99%

Some 1.3million people in low income areas have been connected to piped water supplies since 1997 through the company's 'Tubig Para Sa Barangay' programme, which has connected 223,000 households since 1998. The company is currently developing new contracts outside its original territory and aims to gain similar contracts in South & South East Asia.

Manila Water, profit and loss account

FY 31/12 (PHPmillion)	**2003**	**2004**	**2005**	**2006**	**2007**
Water sales	3,062.3	3,357.2	4,538.4	5,250.2	6,421.1
Environmental charges	305.9	339.9	464.9	532.1	637.3
Sewer charges	198.6	213.6	279.8	308.1	348.7
Total revenues	**3,777.9**	**4,291.2**	**5,763.1**	**6,784.7**	**7,825.4**
Net Income	1,150.5	1,329.7	1,939.7	2,226.0	2,419.0

Water supply in 1Q 2006 was running at a peak of PHP887million L/day and rose to 1,077million L/day in 1H 2008. The company has rehabilitated the Magallanes wastewater treatment plant which processes up to 40million L/day of wastewater. It has built 26 sewage treatment plants across the area and two more are to be constructed as sewerage connections rise from 12% in 2007 to 30% by 2012.

UNITED KINGDOM

Kuwait

2001	Sulaibiya	30 year BOT	1.9million sewage treatment

Utilities Development Co, (Ionics (GE) & United Utilities) are responsible for the build-operate-transfer deal. The project is now run by the Utilities Development Company (Kuwait) please see company entry in the 2007-08 Yearbook for more details.

Contact Details

Name: United Utilities Plc
Address: Dawson House, Great Sankey,
Warrington WA5 3LW, UK
Tel: +44 1925 237 000
Fax: +44 1925 237 073
Web: www.unitedutilities.com
Web: www.unitedutilities.com.au

Sir Richard Evans (Chairman)
Philip Green (Group Chief Executive)
Tim Weller (Group Finance Director)
Charlie Cornish (MD Utility Solutions)

PART 3(ii):COMPANY ANALYSIS: LOCAL/REGIONAL PLAYERS

ARGENTINA

LATIN AGUAS / CHAMAS GROUP

Latin Aguas was founded in 1990 and in 1991 it became the first company to gain a water concession in Argentina. The company is the largest privately held Latin American owned water company. Projects have also been carried out in Brazil, Peru, Nicaragua, Dominican Republic and Ecuador. Latin Aguas is owned by the Chamas family, who specialise in construction work in north east Argentina. Three concessions serving 1.8million people have been gained to date. In Peru, GTZ Peru / Proagua carried out technical assistance projects in nine regions during 2006.

Aguas de Corrientes

This concession, gained in 1991 was the first water and wastewater concession awarded in Argentina. Aguas de Corrientes SA covers 145,500 customers in 10 cities (Saladas, Goya, Mercedes, Esquina, Paso de los Libres, Curuzú Cuatiá, Santo Tomé, Monte Caseros and Bella Vista) of the province of Corrientes. The company was the first water operator to gain the ISO9002 certification for customer service. Three districts Empedrado, Santa Lucía and Yapeyú were incorporated in 2006. This contract is now reported separately from the rest of Latin Aguas, but it remains under the control of the Chamas Group.

Aguas de Salta

The 30 year concession for water and wastewater services to Salta province was awarded to Aguas de Salta in 1998. Aguas de Salta is a joint venture between Latin Aguas and JCR. It covers 100 municipalities, with 36% of the population originally having inadequate water and wastewater service coverage. Restrictions on water supply to 160,000 people have been removed to date along with a capital investment of USD32.7million. Customer numbers have been increased by 40%, through enlarging service coverage and improved tariff collection. Revenues have been increased by 109% without a rate rise, through service enhancement and improved billing, with 56% more billing and the collection rate increasing from 68% to 92%. In 2004, a USD44million five year investment plan was agreed with the regulator in return for a ARS48 (USD15.6) per annum increase in water bills for all but the poorest 20% of its customers.

Aguas de La Rioja

The contract for the Province of La Rioja (population 280,198) was awarded to Aguas de La Rioja SA in 1999. From 1999-2003 customer connections increased by 37% from 34,952 to 47,838. From 1999-2003, monthly collection of bills from billing revenues rose 27% to 89% resulting in revenues improving by 608% without tariff increases, while operational costs were reduced by 40%.

Aguas de Tumbes

The Tumbes concession was awarded to Latin Aguas in October 2005. It covers 14 locations in the Tumbes area and has two water treatment works and 11 wastewater treatment works.

Financial numbers are for 2003, service data is for 31/12/2007, except for Aguas de Corrientes. 2007 revenues were in excess of USD45million.

ARSmillion (2003)	Aguas de La Rioja	Aguas de Salta	Aguas de Corrientes	Aguas de Tumbes	Total
Water coverage					
Customers	56,004	250,112	145,500	37,463	**489,079**
People served	235,217	1,050,470	634,233	157,387	**2,077,307**
Sewerage coverage	70%	70%	N/A	46%	**N/A**
Customers	41,477	183,094	110,076	22,950	**357,957**
People served	174,200	769,000	473,329	95,400	**1,511,929**
Revenues					

LATIN AGUAS / CHAMAS GROUP

Contact Details

Name: Latin Aguas SA
Address: Buenos Aries 766 (W3400BMH)
Corrientes, Argentina
Tel: +54 3783 430017
Fax: +56 3783 23989
Web: www.latinaguas.com
Web: www.aguasdelarioja.com.ar
www.aguasdesalta.com.ar

Dr. Jorge Chamas (President)

AUSTRALIA

UNITED GROUP LIMITED

United Group specialises in industrial maintenance, facilities management, commercial property management services, manufacturing, fabrication and construction for the power supply and distribution, water and waste management, mining and mineral processing, oil, gas and LNG and telecommunications sectors. Its United KG subsidiary is involved in integrated facilities management, industrial maintenance and engineering construction. The company is active in Australia, New Zealand, the United Kingdom and Southeast Asia.

In June 2004, United Group paid AUD15million for Thames Water Projects, a company covering Thames' process engineering activities in Australia, Malaysia and Singapore. Thames Water Projects has a turnover of AUD50million and employs 110 staff; 60 in Melbourne, 20 in Kuala Lumpur and 30 in Singapore. The business was part of Thames Water's international operations and is now called United KG Water Projects, part of the UGL Infrastructure division. The company dates back to a water treatment chemicals company operating in Australia in the 1920s which was acquired by Thames when it bought PW Worldwide in 1989.

While most of Thames Water Project's activities are for third parties, the acquisition includes TW's industrial water outsourcing project in Victoria. United Water anticipates winning further contracts in water reclamation.

2000	Maffra	10 year BOT	Water treatment

The USD10.6million contract is for an industrial water treatment facility in the state of Victoria.

1999	Sydney	25 year BOT	Water and wastewater treatment

The 8Ml/day water recycling facility entered service in 2000 for the Sydney Olympiad. It consists of a 2.2Ml/day wastewater recovery plant and a 7Ml/day microfiltration and reverse osmosis water treatment plant. The company operates the facility for the Olympic Co-ordination authority.

United Group aims to develop the division to concentrate on the direct management of water and wastewater treatment assets. The Group's total water and wastewater order book is over AUD250million. In July 2008, UGL Infrastructure was awarded a five year alliance contract with Melbourne Water for as programme of 50 separate projects. This follows a AUD100million five year alliance agreement with Melbourne Water for upgrading the city's Eastern & Western sewage treatment works awarded in May 2008.

Y/E 31/06 (AUDmillion)	2004	2005	2006	2007	2008
Turnover	1,078.5	1,258.1	2,232.4	2,549.5	3,478.2
Operating profits	41.8	58.3	115.6	154.2	211.6
Net income	29.1	43.0	78.7	92.7	136.1
Earnings per share (AUD cents)	29.1	45.8	63.7	67.8	84.9

Contact Details

Name: United Group Limited
Address: 40 Miller Street,
North Sydney, NSW 2060, Australia
Tel: (61 2) 9492 8888
Fax: (61 2) 9492 8844
Web: www.unitedgroup.com.au
Web: www.ukgwaterprojects.com.au

Trevor Rowe (Chairman)
Richard Leupen (Managing Director and Chief Executive Officer)
David Irvine (Chief Financial Officer)

BRAZIL

ANDRADE GUTIERREZ CONCESSOES

AGC is part of Andrade Gutierrez (AG) one of Brazil's three largest construction companies active in construction projects and concessions throughout Latin America. AG has three divisions: 1) Construção Pesada 2) AG Concessões 3) AG Telecomunicações. AG holds 77.22% of AG Concessões (AGC), with the World Bank's IFC owning 13.48% and Fundo de Investimentos em Ações (Fundação Sistel) with 9.29%. AGC holds 27.5% of Domino Holdings and Domino (other holders: Proactiva VE / FCC 30.0%, Daleth Partners 27.5% and Copel 15.0%) in turn holds 34.75% of Sanepar. 52.5% of Sanepar is held by the government of Parana, with the rest being in the market.

FY 31/12 (BRLmillion)	2003	2004	2005	2006	2007
Sanepar – Revenue	960	1,032	1,118	1,154	1,218
Sanepar – EBITDA	487	497	519	486	541
Sanepar – Investments	251	297	361	500	338
AG Concessões – Revenues	286	364	462	1,096	1,829
AG Concessões – EBITDA	130	165	183	270	420
AG Concessões – Net profit	45	81	93	112	232
Group revenues	3,850	4,371	4,729	6,277	7,891
Group EBITDA	902	1,259	1,336	1,398	1,863
Net profit	342	58	147	174	427

In 1998, Domino Holdings was awarded the concession for Sanepar, the water and sewerage company serving the state of Parana. This is Brazil's fourth largest water utility. Parana borders Argentina and is seen as a growth region in Brazil. Sanepar provides waterworks services to a total of 8.1million inhabitants.

BRL221million (USD04million) has been spent expanding services in the north of the State between 2003 and 2005, including BRL123million on sewerage services in Londrina. Where 71% of wastewater is treated, along with BRL711million budgeted for water services extension in 2006. During 2005, Sanepar renewed nine municipal contracts and gained one additional 30-year concession for water supply and sanitation services in the municipality of Bom Jesus do Sul, with operations in 344 of the state's 399 cities. In its operating area, 99% of households have access to treated water and 51.1% are connected to the sewerage network, with 95.7% of sewage collected, the highest level in Brazil.

Sanepar, FY 31/12	2003	2004	2005	2006	2007
Water – people served (million)	7.913	7.989	8.136	8.313	8.543
Water connections ('000)	2,067	2,131	2,188	2,256	2,325
Water billed (m^3)	419,053	425,496	438,141	447,163	460,269
Sewerage – people served (million)	3.585	3.664	3.892	4.106	4.438
Sewerage connections ('000)	824	857	926	1,004	1,098
Sewerage billed (m^3)	202,140	206,344	217,331	229,694	246,448

The acquisition of 85% of Water Port SA by AGC Participações Ltda In 2003 involves the development of a water and sewerage network serving the right bank of the port of Santos. Construction work started in 2005 and the facility entered service (with a five year operating contract) in late 2007, generating BRL20million pa.

Contact Details
Name: Andrade Gutierrez
Address: Av. do Contorno, nº 8123, Belo Horizonte - Minas Gerais 30110-910
Tel: (31) 3290-6699
Web: www.agsa.com.br
Web: www.sanepar.pr.gov.br / www.sanepar.com.br

Edwardo Borges do Andrade (Chairman)
Ricardo Coutinho de Sena (President & Chief Executive, AG Concessões)

COMPANHIA DE SANEAMENTO DE MINAS GERAIS (COPASA)

Companhia de Saneamento de Minas Gerais (COPASA) operates in the State of Minas Gerais, Brazil and is the third largest water and sewerage company in Brazil in terms of its net revenue. In 2005 the State of Minas Gerais had a total population of 19.2million (with an urban population of approximately 16.1million). COPASA provides water supply services to 611 municipalities and 248 towns and villages (813 locations in all), serving 12.2million people via 3.23million connections, along with 1.56million sewage connections serving 6.4million people. The number of people being served by water and sewerage contracts is growing at 3% and 6% per annum respectively. In February 2006, COPASA floated 30% of its shares on the Sao Paulo Stock Exchange (Bovespa).

Evolution of activities

	2002	2004	2005	2006	2007
Water connections (million)	2.718	2.855	2.927	3.035	3.173
Sewerage connections (million)	1.132	1.285	1.330	1.370	1.494
Water (million m^3)	613.9	608.4	617.6	575.7	589.7
Sewage (million m^3)	290.5	305.6	318.9	303.9	317.7
People served with water (million)	10.4	10.8	11.2	11.5	12.0
People served with sewerage (million)	4.8	5.4	5.5	5.8	6.2
People in served urban areas (million)	10.6	11.2	11.4	N/A	N/A

Concession agreements are negotiated with each municipality, with a typical term of 30 years. The most important contract is for the City of Belo Horizonte, a co-operation agreement being signed in November 2002. This contract accounted for 37.6% of COPASA's net revenue for the nine-month period ended September 2005. 80% of COPASA's revenue is derived from concession agreements that have at least 14 years to run.

Principal contracts

Municipality	Concession	Date Signed	Term
Belo Horizonte	Water/Sewage	04-2004	30 years
Contagem	Water/Sewage	02-1974	99 years
Betim	Water/Sewage	12-2004	38 years
Monte Claros	Water/Sewage	04-1998	30 years
Ipatinga	Water/Sewage	12-1997	25 years

Y/E 31/12 (BRLmillion)	2003	2004	2005	2006	2007
Water supply	603.2	852.9	1,060.5	1,245.4	1,497.4
Sewerage	270.4	400.9	505.6	546.5	529.9
Group turnover	1,109.3	1,194.4	1,476.6	1,681.9	1,836.0
Operating Profits	N/A	259.4	356.2	433.0	422.9
Net Profits	94.1	253.0	288.6	356.4	329.3
Earnings per share (BRL)	N/A	N/A	N/A	3.11	2.87

COPASA has 1,086 water treatment plants, with a treatment capacity that has grown from 37m^3 per second in 1999 to 40m^3 per second in the in 2005. A further 13 water treatment plants are under construction, which will see a 3.8% increase in treatment capacity. Distribution fosses have fallen from 26.3% in 2001 to 23.4% in 2005. 30% of sewage collected was treated at 36 wastewater treatment plants with a capacity of 6.2m^3 per second in 2005. A further 30 wastewater treatment plants with a capacity of 3.1m^3 per second are under construction.

COPASA is continuing to expand its networks, through new concessions and internal growth. At the end of 2007, COPASA held water and sewage concessions in 184 municipalities, water only concessions in 427 municipalities and had no activities in 242 municipalities. COPASA is concentrating on the 2.51million people in municipalities where it provides water but not sewerage, where the company believes 1.575million can be addressed by the end of 2010. Water and sewerage contracts for a further 0.478million people have also been targeted during this period.

COMPANHIA DE SANEAMENTO DE MINAS GERAIS (COPASA)

Capex in 2007 was BRL838million against a budgeted BRL1,000million.

Projected Investments (BRLmillion)

Y/E 31/12 (BRLmillion)		2008	2009	2010
Current Concessions	Water supply	177	124	105
	Sewerage	335	211	228
	Other	30	32	32
	Total	542	367	365
New Concessions	Water supply	149	149	151
	Sewerage	309	334	329
	Other	0	0	0
	Total	458	483	480
Total		**1,000**	**850**	**845**

Contact Details

Name: COPASA MG
Address: Rua Mar de Espanha, 525
Belo Horizonte - MG, 30330-270, Brazil
Tel: +55(31)3250-2015
Fax: +55(31)3250-1409
Web: www.copasa.com.br

Marcio Augusto Vasconcelos Nunes (Vice Chairman, President & CEO)
Antonio A Junho Anastasia (Chairman)
Ricardo Augusto Simoes Campos (Chief Financial Officer)

GRUPO EQUIPAV SA

Equipav is a construction company that was founded in August 1960, in Campinas, in the State of São Paulo. The company has been involved in water construction projects since the outset, starting with the waste water system for the city of Flórida Paulista. The company has diversified into other areas including waste collection (Colepav, founded in 1993) and managing road concessions.

In October 2005, CIBE Saneamento (Equipav and Heber Participaçoes / Bertin) acquired Agbar's holding in Aguas Guariroba and 31% of Copel's holding. Copel continues to hold 10% and local investors 9%. CIBE's 81% holding Aguas Guariroba was acquired for BRL80million.

1998	Dos Lagos	25 year concession	360,000 water & sewerage

Prolagos serves five cities in the "Região dos Lagos" (Region of the Lakes) in the state of Rio de Janeiro: Cabo Frio, Búzios, São Pedro da Aldeia, Iguaba Grande e Arraial do Cabo. The concession was originally awarded to IPE Aguas de Portugal in 1998 and AG acquired Prolagos from IPE Aguas de Portugal in December 2007. BRL56million was spent between 2002 and 2004 on the construction of four wastewater treatment works. Water coverage has increased from 30% in 1998 to 91% by 2007, with 46% served by sewerage and sewage treatment.

2007	Belford Roxo	concession	400,000 water & sewerage

Águas de Belford Roxo serves the city of Belford Roxo, city in the state of Rio de Janeiro. The concession was awarded directly to GE. The city had a population of 480,000 in 2007.

2000	Campo Grande	30 year concession	730,000 water & sewerage

Agbar's Interagua was awarded a water and sewerage contract for Campo Grande in July 2000, which started operations in October 2000 as Aguas Guariroba, a venture 50% held by Agbar, 41% by Cobel and 9% by Sanesul. Total investment will be EUR155.3million. Turnover was EUR27.7million in 1999. The concession currently serves 730,479 people for water and 123,536 for sewerage (17% of the population). Water meters were installed for 20,000 customers in 2001. Sewerage coverage will increase from 30% to 70% in the next five years.

Contact Details

Name: Grupo Equipav
Address: R. Selma Parada, 201, Bl-2 Térreo,
Galleria Office Park, CEP 13091-605
Vila Madalena, Campinas/SP, Brazil
Tel: +55 (19) 3707-4800
Web: www.grupoequipav.com.br

SABESP

In 1877, the Province of Sao Paulo granted a concession for the provision of water and sewage services to Companhia Cantareira de Agua e Esgotos. In 1893, the Province assumed responsibility for the provision of water and sewage services and formed the Reparticao de Agua e Esgotos (Office of Water and Sewers), a Governmental agency. Companhia de Saneamento Basico do Estado de Sao Paulo (SABESP) was founded in 1973. The state water and sewerage company for Sao Paulo was partly floated on the Soma in November 1996 and promoted to the Bovespa exchange in June 1997. The Sao Paulo Government sold a further 19% of SABESP's equity for BRL507million (USD204million) in May 2002 and after further sales in 2003 and 2004 now holds 50.3% of SABESP's equity. The sale took place both on the Sao Paulo Bourse and the NYSE.

SABESP – Breakdown of 2007 revenues and volumes

	Water Volume	Water Revenues	Sewage Volume	Sewage Revenues
Residential	72%	56%	82%	60%
Commercial	8%	21%	11%	24%
Industrial	2%	6%	2%	7%
Public	3%	9%	3%	10%
Wholesale	15%	8%	2%	<1%

SABESP, new water connections

000 connnections	2007	2007	2008	2009	2010	2007-10
	Forecast	Actual				
Sao Paulo	86.7	108.4	96.9	89.3	87.6	360.5
Regional	62.1	65.3	70.0	75.0	84.4	291.6
Total	148.8	173.7	166.9	164.3	172.0	652.1

SABESP, new sewerage connections

000 connnections	2007	2007	2008	2009	2010	2007-10
	Forecast	Actual				
Sao Paulo	81.2	86.5	100.5	87.2	84.2	353.0
Regional	58.9	65.0	63.9	82.4	233.4	438.6
Total	**140.1**	**151.5**	**164.4**	**169.6**	**317.6**	**791.6**

SABESP serves water to 23.0million people in 365 of the 645 cities in the area (59% of the state's population), along with six bulk water supply contracts serving a further 3.2million people. 100% of the urban population is connected to the water network, 79% to sewerage and 66% of the sewage collected is treated. The company operates 461 sewage treatment facilities and seven ocean outfalls. Distribution losses have fallen from 33.0% in 2003 to 29.5% in 2007. SABESP plans to reduce losses to 24% by 2010.

Water provision, billed by region

Y/E 31/12 (million m^3)	2003	2004	2005	2006	2007
Sao Paulo Metropolitan Region	932	955	998	1,031	1,047
Regional Systems	487	487	502	513	526
Wholesale	346	251	259	263	274
Total	**1,765**	**1,692**	**1,759**	**1,807**	**1,847**

Since 2004, a bonus scheme was implemented to encourage domestic and commercial customers to minimise water consumption. This has made a material impact on water usage.

SABESP – Capex plans

Y/E 31/12 (BRLmillion)	2007	2008	2009	2010	2007-10
Water	336	563	622	755	1,976
Sewage	487	907	824	814	3,025
Others	137	104	145	176	662
Total	**960**	**1,574**	**1,591**	**1,745**	**5,663**

SABESP aims to increase sewerage coverage to 84% by 2010, along with adding 652,100 new water connections in response to the region's population growth. There are 15.9million people in the state where SABESP either has no services or supplies water on a wholesale basis only.

National and International possibilities

Law No. 12,292 which was passed in March 2006, allows SABESP to expand its activities into other states in Brazil and internationally. From 2008, SABESP has been allowed to acquire stakes in these companies. SABESP Environmental Solutions has been established to concentrate on large users.

SABESP - profit and loss account

Y/E 31/12 (BRLmillion)	2003	2004	2005	2006	2007
Turnover	4,110	4,642	5,356	5,527	5,971
Operating profits	1,477	1,293	1,655	1,898	2,076
Net income	833	513	866	873	1,049
Earnings per share (BRL)	**2.93**	**2.52**	**3.79**	**3.83**	**4.60**

Contact Details:

Name: Companhia de Saneamento Basico do Estado de Sao Paulo
Address: Rua Costa Carvalho, 300, Pinheiros,
Sao Paulo SP 05488-900, Brazil
Tel: +55 11 3388 8000
Fax: +55 11 3813 0254
Web: www.sabesp.com.br

Dilma Seli Pena (Chairman)
Rui De Britto Alvares Affonso (CFO)
Gesner Jose de Oliveira Filho (President / CEO)

CANADA

AQUATECH WATER MANAGEMENT SERVICES INC

Aquatech Water Management Services (AWMS, a separate entity from Aquatech International Corp of Pennsylvania, USA) was founded as SAUR's Canadian subsidiary in 1981. SAUR sold the company to its management and private investors in 2002.

In 2000, Aquatech had water and wastewater revenues of CAD7million. The company served 768,000 people for wastewater and 88,500 for water provision. Some 65% of the private water sector in Canada is controlled by the company. At the time, Aquatech operated 25 wastewater treatment works, with a capacity of 680,000m^3 per day, or a PE of 2,266,666, along with 13 drinking water plants with a total capacity of 74,200m^3 per day.

The company has two principal operating subsidiaries:

- Aquacers (jointly operated with Simo Management and Gest Eau of Canada) has operated the sewerage and wastewater treatment services for Longueuil since 1993.

- Gestion Eaux-Richlieu (jointly operated with P. Bailargeon Ltd of Canada) has operated the sewerage and wastewater treatment services of Saint-Jean-Sur-Richelieu since 1998.

Contracts gained and retained since 2002 include:
Régie d'Assainissement de Boischatel (sewerage pumping and wastewater treatment)
City of Lévis (sewerage pumping and wastewater treatment for the city of Saint-Nicolas)
City of Longueuil (sewerage pumping and wastewater treatment)
Creg Quay Corporation (sewerage pumping and wastewater treatment)
Municipality of Compton (water, sewerage pumping and wastewater treatment)

Contact Details
Name: Aquatech Water Management Services
Address: 101, Roland-Therrien blvd, Suite 110 Longueuil,
Québec, J4H 4B9, Canada
Tel: +1 48 (450) 646-5270
Fax: +1 48 (450) 646-7977
Web: www.aquatech-inc.com

Jean-Guy Cadorette (General Manager)
Jean Pierre Azzopardi (President)
Yves HF Bélanger (Director, Administration and Finance)

CAYMAN ISLANDS

CONSOLIDATED WATER

Consolidated Water Co., Ltd. (CWC) was incorporated as the Cayman Water Co in August 1973, to provide water services in areas where the supply of potable water is scarce. The company provides potable water from two reverse osmosis desalination plants in Grand Cayman Island to the most populated areas of Grand Cayman and a public water utility in parts of the Cayman Islands under a 20 year exclusive license from the Government of the Cayman Islands awarded in 1979 and renewed in 1990. The Lower Valley facility has its contract renewed for seven years in 2006 and is to be upgraded from 0.79 mg/day to 1.06 mg/day. There were approximately 4,600 residential and commercial customers (hotels, condominiums etc.) served in the Cayman Islands at the end of 2007 compared with 3,300 in 2003. In 2005, there were 44,000 residents in the islands.

SeaTec Belize Limited was acquired in 2000. SeaTec has operated a desalination plant on Ambergris Caye in Belize, since 1996. This company has been renamed Belize Water Ltd. (BW). BW serves some 4,500 people in Belize. In 2005, the Government of Belize acquired the facility, which CWC continues to operate. In addition, CWC has developed two desalination plants in the Bahamas that are providing water to leisure developments on those islands. The company is concentrating on projects on the two Bimini Islands, serving 1,600 people.

In February 2003, the CWC acquired a series of operations in the British Virgin Islands, Barbados the Bahamas and the Cayman Islands. The USD25million package involves managing water treatment plants capable of desalinating 8million gallons of water per day. This also involved increasing the company's stake in the Waterfields Co Ltd desalination plant in Nassau, Bahamas from 26.2% to 38.9%. In 2003, the capacity of the British Virgin Island facility was expanded from 1.2 to 1.7million gallons per day.

CWC Operations (million gallons per day)

Location	Plants	Capacity
Cayman Islands	6	7.60
Bahamas	3	10.00
Belize	1	0.51
British Virgin Islands	1	1.70
Total	**12**	**19.80**

Further bids to develop and operate facilities in Bermuda and Barbados are currently under appraisal.

In the Cayman Islands, the West Bay plant was expanded from 720,000 g/day to 920,000 g/day in January 2008. The major development in 2006-07 has been the development of activities in the Bahamas, where 9.8million g/day is now produced via two new plants.

CONSOLIDATED WATER

CWC principal facilities (gallons per day)

Location	Plant	Operation	Capacity
Cayman Islands	Governor's Harbour	Retail	2,200,000
Cayman Islands	West Bay	Retail	920,000
Cayman Islands	Britannia	Retail	710,000
Cayman Islands	Red Gate Road	Bulk	1,300,000
Cayman Islands	Lower Valley	Bulk	1,100,000
Cayman Islands	North Sound	Bulk	1,600,000
Cayman Islands [1]	Frank Sound	Bulk	2,380,000
Bahamas	South Bimini	Retail	115,000
Bahamas [1]	Windsor	Bulk	2,600,000
Bahamas [1]	Blue Hills	Bulk	7,200,000
Belize	Ambergris Caye	Bulk	465,000
Barbados [1]	Sandy Lane Resort	Bulk	1,300,000
British Virgin Islands	Jost Van Dyke	Bulk	1,700,000
British Virgin Islands [1]	Tortola	Bulk	700,000
Bermuda [1]	Tynes Bay	Bulk	600,000

[1] In development as of 31/12/2007

Retail Water covers the desalination and water distribution operations in the Cayman Islands and Bahamas, Bulk Water covers those operations in Belize, the Cayman Islands, Bahamas and British Virgin Islands and Services, the company's engineering and management services.

Consolidated Water Co. Ltd., profit and loss account

Y/E 31/12 (USDmillion)	**2003**	**2004**	**2005**	**2006**	**2007**
Retail water sales	10.92	12.09	13.37	18.00	19.52
Bulk water sales	7.05	10.30	11.72	18.30	22.10
Services revenues	1.09	0.89	1.09	1.92	7.53
Turnover	19.05	23.28	26.19	32.23	49.15
Operating profits	4.04	5.06	4.21	7.18	9.21
Net profits	4.18	6.20	5.51	7.52	11.39
Earnings per Share (USD)	0.41	0.53	0.45	0.59	0.79

Operations in Grand Cayman were affected during 2005 by Hurricane Ivan, which struck in September 2004.

Contact Details

Name: Consolidated Water Co.
Address: Trafalgar Place, West Bay Road,
Grand Cayman, Cayman Islands
Tel: (345) 945-4277
Fax: (345) 949-2957
Web: www.cwco.com

Jeffrey M Parker (Chairman)
Frederick W McTaggart (President and CEO)
David Sasnett (CFO)

CHILE

AGUAS ANDINAS

Aguas Andinas (AA), formerly EMOS, is Santiago's water supply and sewerage company. AA serves 5million people via 1.5million customer connections. Water services to Santiago were formally organised in 1861 with the first capital works starting in 1865. AA was founded in 1977 and turned into a limited company in 1989. In June 2000, Santiago had an estimated population of 6.102million.

Aguas Andinas, Number of Connections

	1999	2001	2003	2005	2007
Water	1,152,000	1,376,184	1,435,723	1,502,634	1,597,737
Sewerage	1,120,600	1,346,064	1,404,739	1,474,391	1,569,392

42.0% of the equity of AA was sold to Inversiones Aguas Metropolitana Ldta (IAM, Suez-Lyonnaise and Aguas de Barcelona) for USD957million and a further 9.2% for USD178million, valuing the company at USD2,180million. Suez sold 30.1% of IAM to Agbar in July 2004 for EUR139million. After a poorly received flotation in 1999, a second share sale in 2002 has resulted in 13% of the equity now being held by outside investors. 35.0% of the equity currently remains in government hands (CORFO), which in 2004-05 planned to sell to institutional investors for USD400million.

Aguas Andinas, service development

Revenues are expected to double in the next ten years because of service expansion. At present its charges are amongst the lowest fees in Latin America. Tariffs vary by company, for Aguas Andinas in 2007 it was CLP248 per m^3 and for sewerage CLP222 per m^3 compared with CLP230 per m^3 for water and for sewerage CLP187 per m^3 in 2005 which from 2004 includes sewage treatment.

Currently, 100% of the population is served with piped water and 99% by mains sewerage and 72% of sewage effluents are treated, compared with 3% in 2000. Service expansion in recent years has concentrated on adding new connections as Santiago's population has risen. 7,800 connections were added in 2003 through the award of six new concessions, along with two concessions serving 135 customers in 2004 and four serving 1,080 customers in 2005. 2,116 customers were gained through 6 new concessions in 2007 and other applications for concessions are pending covering 14,996 customers. Water has also been provided to 41,485 customers (248,910 people) living in rural areas which previously did not have a service.

Year (km)		Aguas Andinas		Aguas Cordillera
	Water	Sewerage	Water	Sewerage
2003	10,683	8,664	1,237	1,056
2004	10,820	8,759	1,264	1,060
2005	10,979	8,879	1,313	1,072
2006	11,111	8,994	1,322	1,084
2007	11,256	9,087	1,340	1,093

During 2003, 71% of capital spending was for sewage treatment and 11% for sewerage. Water distribution accounted for 8% and bulk water treatment 4% with 6% going on information technology and monitoring. The lower spending in 2004-05 reflects the completion of the main elements of sewage treatment programme, sewage treatment accounting for 21% of spending in 2005. CLP325billion on capital spending in 2000-2004, compares with CLP85billion in 1995-1999.

AGUAS ANDINAS

Capital spending

Year (CLP billion)	Aguas Andinas	Aguas Cordillera
2002	92.33	5.45
2003	75.51	6.44
2004	28.31	5.06
2005	22.18	7.74
2006	25.88	10.97
2007	29.75	9.34

23% of 2007 capex was on sewerage, 23% on sewage treatment, 14% on water treatment and 30% on water distribution.

Sewage treatment works

Facility	Completion date	Cost (US4Dmillion)	Capacity (m^3/s)	Treatment coverage
El Trebal	2001	150	4.4	23.2%
La Farfana	2003	315	8.8	71.8%
Los Nogales	2009	210	6.6	100.0%

The Farfana sewage treatment works handles sewage from 3.3million people, placing it amongst the five largest WWTWs in the world. The USD700million sewage treatment programme involves the construction of 13 smaller WWTWs for 610,000 people in outlying areas. The water recovered from these facilities will be used to irrigate 130,000 Ha of farmland.

Aguas Andinas, profit and loss account

Y/E 31/12 (CLP million)	2003	2004	2005	2006	2007
Water revenues	111,015	109,112	111,955	115,386	115,886
Sewerage revenues	66,079	83,287	97,991	105,546	106,032
Other – regulated	9,754	8,131	9,939	10,059	8,007
Other – non regulated	9,285	13,821	15,992	18,331	23,831
Turnover	168,398	195,433	219,623	249,322	253,756
Operating profits	87,242	94,999	111,301	112,221	121,314
Net income	69,456	71,022	83,278	90,884	97,059
EPS (CLP)	9.75	10.21	12.41	13.55	14.47

	2003	2004	2005	2006	2007
Water clients (‘000)	1,436	1,467	1,503	1,550	1,598
Sewerage clients (‘000)	1,405	1,438	1,474	1,521	1,569
Water coverage	100%	100%	100%	100%	100%
Sewerage coverage	98%	98%	98%	98%	N/A
Sewage treatment coverage	63%	67%	69%	72%	N/A

2008	ESSAL	Acquisition	650,000 water and sewerage

Iberdrola’s Iberener acquired 51% of Empresa de Servicios Sanitarios de Los Lagos SA (ESSAL) from the Chilean Government for USD94million in 1999. 35% of ESSAL is now held by the Government and 10% by its staff. ESSAL is one of Chile’s smaller water companies and is based in Region X in the south of the country. ESSAL serves 166,000 customers (650,000 people, against 500,000 in 1999) in the Region, which includes the cities of Osorno and Puerto Montt, with a population growth of 6% pa. USD240million in investments is called for, to increase the number of water connections within its operating area and to develop sewerage services and sewage treatment facilities, with the aim for universal sewerage and sewage treatment by 2005. Aguas Andinas acquired ESSAL’s holding for CLP72.5billion in March 2008.

AGUAS ANDINAS

2000	Santiago	Aguas Cordeillera	280,000, water & sewerage

Enersis sold Aguas Cordeillera to AA for USD193million in June 2000. The second highest bidder was Biwater at USD179million. In 2000 Aguas Cordeillera served 110,636 customers (280,000 people) for water and 108,919 for sewerage in the Vitacura, Las Condes and Lo Barnechea districts of Santiago. By 2007, the number of customers had increased to 125,789.

2000	Santiago	Aguas Manquehue	13,000, water & sewerage

50% of Aguas Manquehue was acquired in 2000 and the remaining 50% in 2003. The company has 4,982 water and 4,837 sewerage customers. The company, along with Aguas Los Dominions has been integrated into Aguas Cordeillera.

Contact Details

Name: Aguas Andinas SA
Address: Av. Presidente Balmaceda 1398,
Casilla No. 1537, Santiago 420, Chile
Tel: +56 2 496 2001
Fax: +56 2 496 2641
Web: www.aguasandinas.cl

Alfredo Noman Serrano (Chairman and President)
Joaquin Villarino Herrera (Vice Chairman)
Felipe Larrain Aspillaga (CEO)

AGUAS NUEVAS

In June 2004, Aguas Nuevas gained ESSAT (Tarapaca region, Aguas del Altiplano), ESSAR (Araucania region, Aguas Araucania) and ESMAG (Magallanes region, Aguas Megallanes), the final three 30 year concessions for Chile's 12 water and wastewater regions. Regions I, IX and XII were the smallest and most rural of the concession areas. The Solari interests bid USD172million for the three concessions, compared with USD160million by JP Morgan (USA) the only other final bidder.

YE 31/12 (CLP million)	2005	2006	2007
Connections – water	318,103	329,823	334,810
Connections – sanitation	337,298	349,212	353,448
Water sales (million m^3)	66.63	68.32	68.84
Turnover	48.76	52.52	57.43
Operating profit	20.41	21.09	23.36
Net profit	14.23	15.82	16.23

Aguas Nuevas is owned by various investors associated with the Solari Family. Their chief interests lie in SACI Falabella, a leading chain of department stores in Chile that has diversified into areas such as financial services. Aguas Nuevas is currently 9% held by Inversione Megeve (held by Reynaldo Solari and three of his children), 21% by Invesriones Lucca, 20% Inversiones y Rentas Liguria (Juan Cueno) and 11% each by Sergio Cardone Solari, Carlos Heller, Juan Carlos Cortes and Ceccilia Karlezi and smaller investors. Nuevas Aguas was registered on the Santoiago stock exchange in June 2007.

Development of sewage treatment

YE 31/12	2000	2004	2005	2006	2007
Aguas de Altiplano (ESSAT)	87.9%	98.1%	97.7%	98.7%	99.1%
Aguas Araucania (ESSAR)	4.7%	11.5%	11.0%	90.0%	99.3%
Aguas Magallanes (ESMAG)	11.7%	91.6%	89.1%	100.0%	100.0%

ESSAT, ESSAR and ESMAG: Company characteristics

Company	ESSAT	ESSAR	ESMAG
Region			
Purchase price (USDmillion)	74.2	61.3	35.2
Population	482,594	869,535	150,826
Water customers (2007)	129,093	178,430	44,652
Sewerage customers (2007)	124,536	164,402	43,611
Sewage customers (2007)	123,624	150,659	43,062
Water sold (m^3 per second)	2.06	3.60	0.64
Water treatment works	2	26	4
Sewage treatment works	3	27	3

Contact Details

Name: Aguas Nuevas
Address: Isidora Goyenechea 3600, Piso 4,
Las Condes, Santiago de Chile
Tel: (56-2) 583 4600
Web: www.aguasnuevas.cl
www.agausaraucania.cl
www.aguasaltiplano.cl
www.aguasmagallanes.cl

Sr. Piero Solari Donaggio (President)
Sr. Vicente Domínguez Vial (Vice Chairman)

ANTOFAGASTA PLC

Antofagasta PLC/Antofagasta Minerals SA is a Chilean company, listed on the London Stock Exchange that specialises in mineral extraction (especially copper and molybdenum) and road and rail logistics. In November 2003, Antofagasta gained a 30 year concession to operate the water rights and facilities in the Antofagasta Region of Chile previously controlled by Empresa de Servicios Sanitarios de Antofagasta SA (ESSAN). The concession is intended to complement Antofagasta's existing transport and mining activities in the region, including the water distribution business already operated by the Railway.

Antofagasta Plc, profit and loss account

YE 31/12 (USDmillion)	2003	2004	2005	2006	2007
Turnover	1,076.2	1,942.1	2,445.3	3,870.0	3,826.7
Operating Profit	357.2	1,203.4	1,506.4	2,804.1	2,653.4
Net profit	180.7	579.5	725.8	1,354.3	1,382.1
EPS (US cents)	18.3	58.8	73.6	137.4	140.2

The concession contract was signed and control of the assets was transferred on 29 December 2003 by Aguas de Antofagasta SA, the company's newly created water management subsidiary. The cost of the concession was CLP116.6billion (USD193.8million). Under the concession contract, certain assets and liabilities were transferred to Aguas de Antofagasta by way of a USD27million sale. Other assets (mainly water rights and infrastructure) were transferred by way of concession and will devolve to ESSAN at the end of the 30 year period. There were 115,000 customers in 2003.

Aguas de Antofagasta consists of two businesses, an unregulated business supplying mines and other industrial users and a regulated business supplying domestic customers. Distribution losses fell from 29% in 2003 to 26.5% in 2007 with plans to take this down to 25% in 2009. For Antofagasta, the company will focus both on the future development of mining operations in the region and the expected increased demand in domestic consumption. Sales to domestic customers were 27.1million m^3 in 2005 and 29.0million m3 in 2007, with industrial sales of 5.0million m^3 and 10.9million m^3 respectively. The latter will grow from 2008 boosted by sales of re-treated water in Calama to mines and industrial clients.

Aguas de Antofagasta, profit and loss account

YE 31/12 (USDmillion)	2003	2004	2005	2006	2007
Customers	115,000	121,000	127,768	125,790	134,993
Water sales (million m^3)	-	32.6	33.1	37.8	39.9
Turnover	41.4	44.9	53.7	63.7	67.1
EBITDA	25.0	30.1	33.9	41.4	40.7
Pre-tax profit	19.8	21.8	25.1	N/A	N/A

Non-regulated services are being expanded with a 15 year supply contract for mining water to BHP's Spence project near El Tesoro running from July 2006 (2.3million m^3 in 2006 and from 2007, 4.7million m^3 per annum).

Contact Details

Name: Antofagasta PLC
Address: 5 Princes Gate, London SW7 1QJ,
United Kingdom
Tel: + 44 20 7808 0988
+ 562 377 5145
Web: www.antofagasta.co.uk

J-P Luksic (Chairman & CEO)
P J Adeane (Non-Executive Director)
Marco Kuti (CEO Aguas de Antofagasta)

ESSBIO

Southern Cross is a private equity group focussing on South America. The Southern Cross Latin America Private Equity Fund, LP was created in 1998 and the Southern Cross Latin America Private Equity Fund II LP which was closed in 2003. In February 2006 it acquired Thames Water's interests in Chile for approximately USD300million. In 2007, ESSBIO and SEEEL were acquired by the Ontario Teachers Pension Fund which now holds 50.8% of the Series C equity and 30.0% of the Series A & B equity, along with its associate, Westwater Investment, which holds 20.8% of the Series A equity.

ESSBIO, profit and loss account

Y/E 31/12 (CLPbillion)	2006	2007
Turnover	78.03	80.55
Operating profits	30.66	31.96
Net profits	18.79	20.41
Earnings per Share (CLP)	7.10	7.70

Between 2000 and 2007, CLP326.0billion has been invested on various projects, CLP35.1billion on water production, CLP65.0billion on water distribution, CLP50.5billion on sewerage and CLP147.5billion on sewage treatment.

Region	Connections	Water	Sewerage	Sewage treatment
O'Higgins	183,660	99%	81%	80%
Bio Bio	447,290	99%	90%	90%
Total	630,950	99%	87%	87%

ESSBIO has 67 wastewater treatment works, 22 in the O'Higgins region and 45 in Bio Bio. Wastewater treatment coverage rose from 42% to 72% in 2003 as the capital works programme brought a series of new plants into operation.

Million m^3	2005	2006	2007
Wastewater treated			
O'Higgins	75.5	81.4	78.4
Cordillera	58.3	72.2	79.3
Costa	121.4	153.4	148.1
Total	255.2	307.0	305.8

ESSEL and ESSBIO have been merged as ESSBIO. ESSEL is now referred to as the O'Higgins region.

2000	ESSEL	Asset ownership	600,000 water & sewerage

Inversiones Andes Sur, the TWI/EDP JV acquired Empresa de Servicios Sanitarios de El Libertador (ESSEL) of Chile for USD136million. The company serves 600,000 people in the city of Rancagua in Chile's 6th Region. ESSEL had a 2001 turnover of USD19million. TW acquired 25.5% of ESSEL for USD67.6million in March 2000, and bought out EDP's share of the company for USD70.5million in December 2001.

2000	ESSBIO	Asset ownership	1,500,000 water & sewerage

TW acquired 50.96% of Empresa de Servicios Sanitarios del Bio-Bio SA (ESSBIO) for USD336million between September and October 2000. Located in Concepción, 350 miles south of the capital, Santiago, ESSBIO serves 1.5million people in Chile's 8th region, and had a 2001 turnover of USD46.9million. Capital investment of approximately USD180million between 2002 and 2006 is planned, primarily targeted at wastewater treatment in Concepcion (entered service in 2003, serving 500,000 people) and Los Angeles (140,000 people).

ESSBIO

Contact Details
Name: ESSBIO
Address: Casa Matriz, Diagonal Pedro Aguirre Cerda N° 1.129, Piso 2, Concepción, Chile
Tel: +56 (41) 263700
Web: www.essbio.cl

Kevin David Kerr (President)
Stephen Donald Dowd (Vice President)
Pedro Pablo Errazuriz Dominguez (General Manager)

ESVAL

ESVAL was the first Chilean water company to be privatised when AWG and Chile's Enersis acquired 45% of the company in 1998. In July 2001 AWG bought out Enersis's 72% stake in the Aguas Puerto joint venture for USD131million, bringing its total investment in ESVAL's equity to GBP142million. In October 2003, AWG's 44.7% stake in Esval was acquired by Consorcio Financiero for USD82million. In May 2004, Aguas Puerto transferred its final 5.04% stake in Esval to investment fund administrator Moneda Asset Management. A residue of ESVAL is traded on the Santiago Stock Exchange. The company serves the city of Valparaiso and the adjacent coastal region. In November 2003, Esval's Aguas del Valle gained a 30 year concession to operate Essco through a USD89.7million bid and Essco is wholly owned by Esval. In December 2007 the Ontario Teacher's Pension Fund acquired 69.4% of Esval from the holders, with Corporacion de Formento de la Produccion holding 29.4% and small investors holding the remaining shares.

	ESSCO	**ESVAL**	**Total**
Region	IV	V	
People served	510,126	1,392,165	**1,902,291**
Coverage – water	100%	100%	**99%**
Coverage – Sewerage	96%	96%	**93%**
Coverage – Sewage treatment	98%	96%	**97%**

ESVAL, consolidated profit and loss account

31/12 (CLPmillion)	**2006**	**2007**
Revenues	92.00	94.99
Operating profit	40.17	38.73
Net profit	23.40	22.46

Essco generated revenues of CLP21.9billion in 2007 and net profits of CLP6.0billion. Esval generated revenues of CLP71.0billion and a net of CLP17.4billion. Capital spending in 2006 and 2007 reflects the development of sewage treatment and sewerage services, especially at Essco.

		ESSCO		**ESVAL**
	2006	**2007**	**2006**	**2007**
Water	9%	31%	73%	73%
Sewerage	28%	45%	10%	10%
Sewage treatment	58%	13%	9%	9%

Capital spending at Aguas de Valle was CLP19.49billion in 2006, 58% on wastewater treatment, 28% on sewerage and 9% on water treatment and distribution. In 2007, total investments were USD24.86million, 73% on water distribution and treatment, 10% on sewerage and 6% on sewage treatment.

Contact Details

Name: Esval
Address: Cochrane N° 751, Valparaíso, Chile
Tel: + 32 2290 000
Fax: + 32 2290 502
Web: www.esval.cl
Web: www.aguasdelvalle.cl

Kevin David Kerr (President)
Jorge Lesser Garcia Huidobro (Vice President)

NUEVOSUR

Southern Cross Group is a private equity group focussing on South America. The Southern Cross Latin America Private Equity Fund, LP was created in 1998 and the Southern Cross Latin America Private Equity Fund II LP which was closed in 2003. In February 2006 it acquired Thames Water's interests in Chile for approximately USD300million. In 2007, Southern Cross sold its interests in Nuevosur to the Ontario Teachers Pension Fund, with now holds 90.1% of the company's equity.

The ANSM concession contract was purchased by Thames Water for USD171million in November 2001. Aguas Nuevo Sur, Maule (ANSM) is located in the 7th region, serving a population of over 600,000 and in 2000 generated revenues of USD21.4million. ESSAM is positioned between ESSEL in Rancagua and ESSBIO in Concepcion.

Nuevosur, profit and loss account

Y/E 31/12 (CLPbillion)	2006	2007
Turnover	21.81	25.86
Operating profits	6.22	9.29
Net profits	2.63	7.58
Earnings per Share (CPL)	18.71	39.50

Million m^3	2005	2006	2007
Wastewater treated	54.6	117.3	147.7

The Curico WWTW increased treatment from 6% to 24% in 2002 and eight small facilities opened during 2003 increased the treatment rate to 35%. Sewage treatment in the region rose from 35% to 72% in 2004 with the Molina-Lontue wastewater treatment plant entering service. Eight more small WWTWs entered service during 2006.

In 2007, there were 205,460 clients, with a 99% water coverage in the region, along with 94% sewerage and 90% sewage treatment.

Between 2000 and 2007, CLP100.81billion has been spent on capital spending, CLP8.33billion on water production, CLP14.85billion on water distribution, CLP4.27billion on sewerage and CLP64.09billion on sewage treatment.

Name: AGUAS NUEVO SUR, MAULE, S.A.
Address: Casa Matriz, Planta de Agua Potable San Luis, Sector Monte Baeza s/n Talca, Chile
Tel: (56-71) 204101
Web: www.aguasnuevosur.cl

Kevin David Kerr (President)
José Luis Arrano (General Manager)

CHINA

ANHUI WATER RESOURCES DEVELOPMENT CO

YE 31/12 (CNYmillion)	2003	2004	2005	2006	2007
Water Turnover	N/A	N/A	707.2	731.9	1,003.2
Group Turnover	807.0	947.3	1,255.9	1,511.4	1,578.6
Operating profits	40.1	70.1	81.8	89.6	96.7
Net profits	25.0	30.2	30.8	42.4	24.0
Earnings Per Share (CNY)	0.21	0.13	0.14	0.19	0.11

Anhui Water Resources Development Co., Ltd was listed on the Shanghai Stock Exchange in April 2003. The company is involved in six business lines: Construction, Water, Real Estate, Development of Building Materials, Construction & Operation of Five Star Hotels and Technology consultancy. Water accounted for 43% of 2007 revenues and real estate 22%.

Water activities include operating water and sewerage services and water and wastewater engineering work.

Contact Details
Name: **Anhui Water Resources Development Co Ltd**
Address: Zhanggongshan Nance,
Donghai Road, Bengbu, Anhui 233000
Tel: 086 552 408 1028
Web: www.cahsl.com

Wang Jimgmin (Chairman)
Yang Guangliang (President)
Niu Xiaofeng (Chief Financial Officer)

BEIJING CAPITAL CO

The Beijing Capital Group was founded in 1995 through the amalgamation of 17 state owned enterprises in Beijing. In 1999, the company entered the water sector when it acquired the Gao Bei Dian Water Treatment Plant from the Beijing Municipal Water Treatment Company. Since 1989, the Group has invested over CNY6billion in urban infrastructure development and has average returns of 9-12% on its water activities. BCC was partly floated on the Shanghai Stock Exchange in 2000. Its' 72.6% held subsidiary Beijing Capital Co. (BCC) was listed on the Shanghai Stock Exchange in 2000. BCC has invested in a series of water joint ventures and has started to operate its own water contracts, generating revenues of CNY14.8million in 2003. In 2004, Capital Group's income from water services was up 398% over the previous year; this was 23% of the primary business' income and an increase of 17% from the previous year.

Water revenues accounted for 73% of BCC's revenues in 2007. BCC's water treatment capacity in 2005 was 6million m^3 per day, supplying 10million people in total. The capacity rose to 7.4million m^3 per day, serving 14million people in 2006 and by the end of 2007, total capacity was 8.3million m^3 per day. BCC aims to have a total treatment capacity of 15million m^3 per day by 2010.

Beijing Capital Co

YE 31/12 (CNYmillion)	2003	2004	2005	2006	2007
Turnover – Water	N/A	N/A	202.0	429.9	444.3
Turnover – Sewerage	N/A	N/A	18.4	397.0	573.4
Turnover	234.2	299.1	482.4	1,190.0	1,400.6
Operating profits	45.9	74.3	84.6	266.5	284.8
Net profits	403.5	490.5	485.4	451.9	510.3
Earnings Per Share (CNY)	0.19	0.23	0.22	0.21	0.23

Three joint ventures have been signed to date:

Beijing Water Co., Ltd. A joint venture established in 2002 by Beijing Urban Drainage Group (51%) and Beijing Capital Co., Ltd (49%). Beijing Water Co., Ltd is focused on city sewage treatment. Its registered capital is CNY4.02billion, ranking first in China. Its two subsidiary factories, Gaobeidian Sewage Treatment Factory and Jiuxianqiao Sewage Treatment Factory, have a total capacity of 2.1million m^3 per day, accounting for 81% of sewage handling capacity in Beijing. 1.2million m^3 per day of capacity was operational in 2006 with 0.9million m^3 per day (serving 2.88million people) under construction.

Ma'anshan Capital Water Co., Ltd. Established by Beijing Capital Co. Ltd, in 2002, with a 30 year concession, BCC has invested CNY90million and holds 60% of the equity. The total capacity of the joint venture is 0.455million m^3 per day, supplying 550,000 people. The company is developing water treatment works in eastern China: Shandong, Jiangsu, Zhejiang and Anhui.

Beijing Capital VW Investment Co., Ltd. This company was founded in 2003 following a strategic agreement signed in 2001 and has a registered capital of USD30million; Beijing Capital Co., Ltd (51%) and Veolia Water Investment (49%). This was the first Sino-Foreign investment company in this sector. Three contracts have been gained to date, in Shenzhen, Baoji and Weinan.

In December 2003, the JV announced that it was paying CNY2.94billion for a 40% stake in the Shenzhen Water Group (SWG). Shenzhen Water Holdings Co., Ltd (SWH) was formed out of the merger of the former SWG with the former Shenzhen Sewage Administration on 28, December 2001. This water wastewater service company operates 5 water treatment plants, 4 wastewater treatment plants, 4 sewerage systems and 15 fully owned or holding companies. BCC has 55% of the contract's equity, Veolia Environnement 40% and CGE-BC Water Investments 5%. As a water supply and sewage company SWH's total asset amounts to CNY6.6billion and net assets to CNY5.9billion, of which about CNY2billion is from the former SWG and about CNY4billion from sewage assets. SWH has the water concession of the Shenzhen Special Economic Zone, covering 93% of the SEZ's water supply and 95% of its wastewater treatment.

Shenzhen Water Holdings Co., Ltd (SWH) was formed out of the merger of the former SWG with the former Shenzhen Sewage Administration on 28 December 2001. This is the first water group that has transformed from a water company to a company with both water service and wastewater service. With total assets of over CNY6billion which include 5 water plants, 4 wastewater processing plants,

BEIJING CAPITAL CO

5 branches, 4 sewage systems and 15 fully owned or holding companies, the state-owned SWH treats 1.672million m^3 per day, 93% of Shenzhen City's drinking water, along with a sewage treatment capacity of 1.082million m per day, accounting for 95% of the City's total. It supplies 500million m^3 of water and treats 300million m^3 of wastewater and its annual turnover is over CNY1billion.

2003	Baoji	25 year BOT	550,000, water provision

The Baoji VW-BC Operation Co., Ltd is 44% held by BCC, along with Veolia Environnement and the Baoji Tap Water Company. The facility has a design capacity of 175,000m^3 per day, covering 550,000 people.

2005	Weinan	29 year BOT	260,000, water provision

In 2005, Beijing Capital Co., Ltd, Veolia Water, and Weinan Water Supply Co., Ltd founded the Weinan VW-BC Operation Co., Ltd. The operation period is 25 years, with BCC holding 44% of the equity, VE 26% and the municipality 30%. Its design capacity is 70,000m^3 per day, covering water provision for 250,000 people.

Other contract gains noted

2006	Linyi	25 year BOT	600,000, wastewater treatment

The Linyi Capital Water Co., Ltd. is 40% held by Beijing Capital Co., Ltd, along with 30% by Beijing Capital (HK) Ltd and Linyi Wastewater Treatment Plant holding 30%. The treatment capacity of the company is 150,000m^3 per day, including 100,000m^3 per day in the first phase and 50,000m^3 per day in the second phase, covering a population of 600,000.

2004	Qingdao	BOT	250,000, water provision

Qingdao Capital Ruihai Water Co., Ltd. is 40% held by BCC, with the rest being held by Qingdao Municipal Drainage Management Section and Qingdao City Development & Investment Co., Ltd. This joint venture company provides 80,000m^3 of water each day and serves 250,000 people.

2004	Yuyao	25 year BOT	680,000, water provision

The Yuyao Capital Water Co., Ltd is 95% held by BCC and was formed in January 2004. It has a 25 year contract to supply 680,000 people with drinking water, with a capacity of 220,000m^3 per day.

2004	Xuzhou	30 year BOT	1,200,000, water provision

The Xuzhou Capital Water Co., Ltd is 80% held by BCC and 2% by the Xuzhou Tap Water Company. The company supplies 550,000m^3 of water per day, covering a population of 1.2million.

2005	Qinhuangdao	25 year BOT	720,000, water treatment

Qinhuangdao Capital Water Co., Ltd is 51% held by BCC and 49% by the Qinhuangdao Public Utilities Department. It has a water supply capacity of 390,000m^3 per day, covering a population of 720,000.

2004	Huainan	30 year BOT	550,000, water & wastewater

Huainan Capital Water Co., Ltd. is 88% held by BCC and 12% by Huainan Water Service Co., Ltd. The company has a water treatment capacity of 270,000m^3 per day and a sewage treatment capacity of 100,000 m^3 per day, serving a population of 550,000.

2007	Hewenhu	30 year BOT	500,000, water & wastewater

In September 2007, BCC acquired 65% of the Jiujiang Hewenhu Environmental Protection Co., Ltd. from Shenzhen Jin Da Lai Environmental Protection Co., Ltd. and Jiangxi Jin Da Lai Environmental Protection R&D Center Co., Ltd. The company gained the Hewenhu Sewage Plant and Tail Water Discharge Project BOT in Hewenhu, Jiangxi in 2006. Hewenhu Sewage Plant is expected to process

BEIJING CAPITAL CO

polluted water of 100,000m^3 per day after the first-stage construction, rising to 300,000m^3 per day in the future.

2007	Dongying	30 year BOT	650,000, water & wastewater

In December 2007, Beijing Capital Co., Ltd. and Guozhong Water Investment Co., Ltd. agreed a 30 year BOO contract serving the Shandong Dongying Economic Development Zone Sewage Treatment Plant with a 130,000m^3 per day capacity. BCC also reached a Strategic Cooperation Agreement with Hunan Provincial People's Government in Changsha for the franchise rights to construct and operate new sewage treatment installations in Hunan Province.

Contact details

Name:	Beijing Capital Co
Address:	7th Floor, Jinguan Centre No 8, Sanhuan Road East, Chaoyang District, Beijing, 100028 China
Tel:	86-010-6468-9035
Fax:	86-010-6468-9030
Web:	www.capitalgroup.com.cn
	www.capitalwater.cn

Lin Bao (Chairman)
Liu Xiaoguang (Deputy Chairman & CEO)
Cao Gui Jie (Deputy General Manager)
Pan Wentang (President)
Yu Li (Chief Financial Officer)

BIO TREAT TECHNOLOGIES

Bio-Treat Technologies specialises in developing and implementing wastewater systems using its BMS Biological Process Technology. This process was developed by the company in 1993 and has been used in 500 waste and wastewater treatment projects in China. In 2002, Bio-Treat provided the technology for Global Green Tech Group's (Hong Kong, see company entry) contracts in China. The company was floated in January 2004 and gained its first BOT contract in China (Kunshan) in February 2004. Since then, the company has gained a total of 15 BOT and TOT water and wastewater treatment contracts serving more than 6.25million people along with 13 turnkey projects.

2008	Xuancheng	30 year BOT	250,000, wastewater treatment

Xuanchedng is in Anhui Province. The CNY66million plant will have a capacity of 50,000m^3 per day. It will enter service at the start of 2010.

2008	Foshan	23 year BOT	250,000, wastewater treatment

The CNY66million plant will serve Shishan Town, in the Nanhai District of Foshan City in Guangdong. It will have a capacity of 50,000m^3 per day. It will enter service at the start of 2010.

2007	Binzhou	25 year BOT	200,000, wastewater treatment

The CNY70million plant will serve Binzhou City's Economic Development Zone in Shandong Province. It will have a capacity of 40,000 m^3 per day and will enter service during 2008.

2007	Nanjing	30 year BOT	200,000, wastewater treatment

Two wastewater treatment works with a capacity of 20,000m^3 per day will be built at a total cost of CNY67million. They will serve Nanjing City's Luhe Economic Development Zone. Further development of treatment capacity is anticipated and these plants will enter service by the end of 2008.

2006	Wuhan	29 year TOT	Wastewater treatment

2006	Kunshan	29 year TOT	500,000 wastewater treatment

The CNY376million Wuhan and Kunshan contracts were awarded in July 2006. The Kunshan contract for the plant was developed by the company in 2004-05, while the Wuhan contract involves the rehabilitation of an existing municipally built facility. The Wuhan facility expected to re-enter service in 1Q 2007.

2005	Beijing	29 year TOT	200,000 wastewater treatment

The CNY110million contract was awarded in July 2006. The underground facility will have a 40,000m^3 per day capacity. Construction was to be started at the end of 2006 and to be completed within 24 months.

2006	Suzhou	25 year BOT	2million wastewater treatment

The CNY500million contract was awarded in January 2006. Suzhou is in Jiangsu Province. It involves the construction of a 150,000m^3 per day facility which will eventually become a 450,000m^3 per day complex. Construction took place between mid 2006 and 2008.

2005	Nanjing	25 year BOT	200,000 wastewater treatment

This USD10million 40,000m^3 per day project in Jiangsu Province was planned to be constructed during 2006-07. The operational phase started by the end of 2007. A similar plant may in future be built next to this one.

2005	Jiangdu	230 year BOT	250,000 water treatment

In April 2005, Bio-Treat gained a CNY179million 100,000m^3 per day water treatment BOT contract for the city in Jiangsu Province. The contract will be operated by New Efficient Limited, which is 34% held by Bio-Treat and 65% held by World Eagle. The plant was expected to enter service in mid 2007.

BIO TREAT TECHNOLOGIES

2004	Xianjiang	25 year BOT	1million wastewater treatment

The Xianjiang (Shaanxi Province) contract incurred a CNY36million cost over-run in 2006. The contract's construction phase was originally meant to run from October 2004 to December 2006 at a cost of CNY288million. It entered service in May 2006 and has a capacity of 200,000m^3 per day.

2005	Lianyuangang	25 year TOT	500,000 wastewater treatment

Bio-Treat's Perfect Grace Investments Limited owns 95% of the CNY140million project in a joint venture with Oriental Fortune, covering the rehabilitation and upgrading of the city's 100,000m^3 per day wastewater treatment plant. Lianyuangang is in Jiangsu Province.

2005	Lianyuangang	25 year BOT	400,000 wastewater treatment

Bio-Treat's Perfect Grace Investments Limited owns 95% of a CNY105million project in a joint venture with Oriental Fortune, covering the construction of a new 80,000m^3 per day wastewater treatment plant. Lianyuangang is in Jiangsu Province.

2005	Suqian	30 year BOT	300,000 wastewater treatment

This covers two contracts gained in March 2005 worth a total of CNY178million for the construction of two plants with a capacity of 80,000m^3 per day and 60,000m^3 per day. Construction started in May 2005 and was completed in September 2006. Suqian is in Jiangsu Province.

2004	Kunshan	29 year TOT	500,000 wastewater treatment

The contract for the Kunshan plant was awarded in February 2004 and construction was completed in July 2005 and has a treatment capacity of 100,000m^3 per day.

Y/E 31/06 (CNYmillion)	**2004**	**2005**	**2006**	**2007**	**2008**
Wastewater treatment services	537.7	1,023.9	1,287.2	1,356.7	1,098.0
Sales of goods	129.6	230.0	259.9	122.6	183.9
BOT / TOT discharge fee	N/A	N/A	12.6	109.4	122.4
Group turnover	667.3	1,254.0	1,559.7	1,588.7	1,405.3
Operating profit	225.6	379.8	350.4	461.4	316.5
Net profits	280.9	327.6	189.0	330.3	125.4
Earnings per share (CNYcents)	0.31	0.39	0.22	0.37	0.14

Contact Details

Name: Bio-Treat Technology Limited
Address: Tu Tang Industry Area
Tu Tang, Changping,
Dongguan City, Guangdong, China
Tel; +86 769 399 2606
Fax: +86 769 382 5638
Web: www.bio-treattechnology.com

Chan Kong (Chairman & CEO)
Lau Cheuk Lun (CFO)

CATHAY INTERNATIONAL GROUP

Cathay International Holdings (CIH) is a Hong Kong and UK based company founded in 1991. It specialises in hotels, toll roads, power plants and through its minority held subsidiary Cathay International Water (CIW) it has diversified into a number of water treatment plant operation contracts.

In 1996, STIC (now part of Sembcorp of Singapore) acquired an 18% stake in Cathay International's water activities for USD45million. This stake was sold back to CIW and Cathay International (Overseas) Holdings for USD44.8million in June 2003. Cathay International Water's shareholders include the Santander Group (since 1991), Nomura/Jafco (since April 1996), UBS (Switzerland, since May 1997) and JP Morgan Securities Asia (since May 1998).

Following a series of contract awards in 1997, seven facilities with a total capacity of 1.89million m^3 per day were rehabilitated or built for USD196.5million.

Jinan

1997	Dayang	25 year	Water treatment

Dayang has a capacity of 0.4million m^3 per day and is being constructed for USD30million. CIW holds 60% of the joint venture.

1997	Three facilities	25 year BOT	Water treatment

Three facilities (Dongjiao, Nanjiao and Xijiao) with a combined capacity of 0.9million m^3 per day are being rehabilitated for USD90million. CIW holds 80% of the joint venture.

Binzhou

1997	Dongaio	20 year ROT	Water treatment

Dongiao has a capacity of 40,000m^3 per day and is being rehabilitated for USD9.9million. CIW holds 60% of the joint venture.

1997	Cathay Water Plant	20 year ROT	Water treatment

The Binzhou Cathay Water Plant Limited has a capacity of 50,000m^3 per day and is being rehabilitated for USD6.6million. CIW holds 60% of the joint venture.

Jiangmen

1997	Jiangmen	ROT	Water treatment

The water plant has a capacity of 0.5million m^3 per day and is being rehabilitated for USD60million. CIW holds 80% of the joint venture.

YE 31/12 (USDmillion)	2004	2005	2006	2007
Turnover	6.9	6.3	17.7	34.2
Operating profits	-5.0	-4.1	-2.4	-3.0
Net profits	-6.8	-6.4	-5.3	-8.0
Earnings Per Share (USD)	-0.04	-0.03	-0.02	-0.03

Contact Details

Name: Cathay International Holdings Limited
Address: 25/F Chartered Bank Building
4-4A Des Voeux Road, Central
Hong Kong
Tel: +852 2828 9289

James Buchanan (Chairman)
Wu Zhen Tao (CEO)
Patrick Sung (FD)

CHEUNG KONG INFRASTRUCTURE HOLDINGS LTD

Cheung Kong Infrastructure (CKI) is 85% held by Hutchinson Whampooa Limited and was partly floated on the Hong Kong Stock Exchange in 1996. CKI invested HKD69million in the HKD140million Yueyang water treatment works project serving Yueyang City (Hunan Province) in 1998. This stake was sold for a HKD11million profit in 2003. In addition, CKI's CK Life Sciences has developed a series of bioremediation product applications; WonderTreat™, for treatment of municipal wastewater, contaminated surface water and industrial wastewater. CKI acquired AquaTower of Australia in March 2004. In April 2004, CKI acquired Cambridge Water Plc of the UK from Spain's Union Fenosa for GBP51.4million. Union Fenosa had in turn acquired Cambridge Water for GBP57million in 1999. CKI also holds 4.75% of Southern Water Plc.

Cheung Kong Infrastructure, profit and loss account

YE 31/12 (HKDmillion)	2003	2004	2005	2006	2007
Turnover	1,613	2,507	2,247	1,822	1,865
Operating profits	1,043	957	835	392	412
Other profits	3,579	3,210	5,637	3,637	4,779
Net profits	3,349	3,523	6,007	3,670	4,772
Earnings Per Share (HKD)	1.49	1.56	2.66	1.63	2.12

Australia: AquaTower
AquaTower was formed in 2002 to provide potable water to 25,000 people in four regional towns in Victoria. CKI was one of the two original investors in the 25 year BOT project and in 2004 acquired the outstanding 50% held by Abigroup of Australia, CKI holding 49% and CK Life Sciences holding 51%.

United Kingdom: Cambridge Water
The Cambridge University and Town Waterworks was founded in 1853 and was floated as Cambridge Water Plc in 1996. Cambridge Water supplies water to 297,000 people (119,700 customers) in the city of Cambridge and certain surrounding districts, with sewerage services being provided by Anglian Water Plc. The population in the service area has increased by 17,000 since 1995. The water and gas and electricity activities were spun off into separate companies and the latter activities were sold to Scottish and Southern Electricity in 2003 for GBP4million. 60% of customers have water meters, compared with 51% in 2002 and demand for metering is rising by 4% pa.

Cambridge Water, profit and loss account

Y/E 31/03 (GBPmillion)	2004	2005	2006	2007	2008
Turnover	15.76	15.68	17.51	18.64	20.69
Operating profit	0.89	4.40	3.89	5.12	5.17
Pre-tax profit	10.76	4.58	3.74	4.83	3.59

Contact Details
Name: Cambridge Water Plc
Address: 41 Rustat Road, Cambridge CB1 3QS, United Kingdom
Tel: +44 1223 706050
Fax: +44 1223 214052
Web: www.cambridge-water.co.uk

Michael Halstead (Chairman)
Stephen Kay (Managing Director)

Contact Details
Name: Cheung Kong Infrastructure
Address: Cheung Kong Centre, 2 Queen's Road, Central, Hong Kong
Tel: 852 2122 3986
Fax: 852 2501 4550
Web: www.cki.com.hk

Victor Li Tzar Kuoi (Chairman)
Kam Hing Lam (MD)
Chan Loi Shun (CFO)

CHINA EVERBRIGHT INTERNATIONAL

China Everbright International (CEI) is a Hong Kong based company active in Guangzhou Province, providing water and wastewater for Shenzhen (population 1.3million) through a local joint venture and wastewater for Zibo (population 2.6million), along with further projects under development.

YE 31/12 (HKDmillion)	2003	2004	2005	2006	2007
Wastewater turnover	N/A	N/A	N/A	298.2	550.5
Turnover	83.6	65.2	132.9	884.0	1,347.0
Operating profits	N/A	15.3	38.7	185.9	360.5
Other profits	N/A	101.7	104.1	381.6	65.4
Net profits	N/A	86.8	106.8	460.5	337.9
Earnings Per Share (HKDc)	N/A	0.34	0.42	0.16	0.11

The Everbright-Veolia Water joint venture was signed in 2003. In August 2004, CEI, Veolia Water and the Qingdao Municipal Government started a project covering the city's Qingdao Haibohe and Qingdao Maidao Waste Water Treatment Plants. The total investment cost of the project is USD42.8million, with CEI holding 60% of the project's equity. CEI is the lead player in the asset owning contract (Qingdao EB-VW Waste Water Treatment Co. Ltd.) and Veolia is the lead player in the operating contract (Qingdao Veolia Water Operating Company Limited). Commercial operation of the plants started in January 2005, with a treatment capacity of 150,000m^3 per day. During 2005, 54.4million m^3 of sewage was treated. In March 2005, a consortium led by Veolia Water Systems was appointed by the operating company to extend the Qingdao Maidao Waste Water Treatment Plant, boosting overall treatment capacity to 220,000m^3 per day with an investment of CNY244million. This facility entered service in July 2007.

2005	Zibo	25 years, TOT	450,000, wastewater treatment

CEI gained a concession for Zibo's wastewater treatment with the Zibo Municipal Government, Zibo Finance Bureau and Zibo City Environmental Protection Bureau and Zibo City Fisheries Bureau in September 2005. This is a 25 year contract on a TOT basis, with an investment cost of CNY224million. Operations started in December 2005, with the rehabilitated facilities entering service in May 2006, with a daily treatment capacity in excess of 220,000m^3 per day.

In February 2005, CEI entered into a framework agreement with Shenzhen Municipal Government for long-term strategic cooperation for developing BOT or TOT waste-to-energy projects and urban waste water treatment projects in Shenzhen, along with seeking opportunities in reusable water generation.

2008	Boxing County	30 years, TOT	300,000, wastewater treatment

In February 2008, CEI signed a two phased wastewater treatment contract with the Boxing County Government, Shandong Province. This covers a 30,000 m^3 per day TOT contract (Phase I, a works upgrade) and Phase II, a 30,000 m^3 per day BOT contract. The project will cost CNYB70-80million. And will be financed by raising the waste water treatment service fee will be increased from CNY0.75 per tonne to CNY0.9 per tonne. Boxing neighbours Zibo City and has a population of about 478,000.

2008	Jinan	26 years, BOT	1million, wastewater treatment

In March 2008 CEI signed a concession with the Jinan Municipal and Public Utility Bureau for a 26 year BOT, 100,000m^3 per day Jinan Number 3 wastewater treatment works. The CNY138million facility will be opened by October 2009.

2006	Jinan	30 years, TOT	2million, wastewater treatment

The first phase of the Jinan Waste Water Treatment Upgrade Work Project, covering the waste water treatment plants No. 1 and 2 will be completed by the end of 2008 for approximately CNY280million. CEI acquired the two waste water treatment plants in Jinan City by way of TOT in 2006 and secured operation rights of the plants for 30 years. After the completion of the refurbishment work in 2007, their waste water treatment capacity is approximately 400,000m^3 per day.

2007	Jiangyin	Acquisition	1million, wastewater treatment

In November 2007, Everbright Water (Jiangyin) Limited a JV between CEI and Jianguin's Xin Guo Lian took over four waste water treatment plants in Jiangyin City for CNY624million. CEI holds 70% of the joint venture. The facilities have a total capacity of 190,000m^3 per day and will cost CNY201million to build.

Contact Details

Name: China Everbright International Limited
Address: 27th Floor, Far East Finance Centre, 16 Harcourt Road, Hong Kong
Tel: (852) 2804 1886
Fax: (852) 2528 4228
Web: www.ebchinaintl.com

Tang Shuanging (Chairman)
Chen Xiaoping (CEO)
Raymond Wong Kam Chung (CFO)

CHINA WATER GROUP

Previously called the China Evergreen Environmental Group, CWG is based in Guangzhou and is held by Evergreen Asset Group Ltd, which is domiciled in the British Virgin Islands. The holding company has four majority-owned subsidiaries, Guangdong Xinxinmei Environmental Protection Co. Ltd., Beijing Haotai Shiyuan Water Purification Co. Ltd., Shangdong Haiyang Shenshi Environmental Protection Co. Ltd. and Xianyang Beicheng Water Purification Co. Ltd.

YE 31/12 (USDmillion)	2003	2004	2005	2006	2007
Turnover	0.00	9.37	6.98	4.80	N/A
Operating profits	-0.08	1.95	2.41	-6.58	N/A
Pre-tax profits	-0.08	3.62	-0.48	-1.68	N/A
Net profits	1.77	3.70	-0.76	-1.50	N/A
Earnings Per Share (USD)	0.10	0.00	-0.01	-0.01	N/A

To date, four BOT contracts have either been completed or are in progress. Revenues from BOT contracts were USD250,571 in 2004, USD302,011 in 2005 and USD989,970 in 2006.

The Company has completed the design and construction of over 14 waste water facilities across China with total daily capacity of 120,000m^3, with three BOT waste water treatment facilities with a total daily capacity of 70,000m^3. The company currently has a pipeline of 10 BOT and turnkey projects principally in Guangdong Province through Guangdong Xinxinmei Environmental Protection Company and has entered into two arrangements to acquire existing BOT projects in Henan Province with a total processing capacity of 130,000m^3 per day.

BOT contracts	Cost (USDmillion)	Capacity (m^3 per day)	Contract (years)	Operational since
Tianjin Shi Shen	1.09	10,000	20	11-2003
Xinle Shen Mei	4.11	40,000	22	10-2003
Haiyang City Shen Shi	3.62	20,000	22	06-2005
Handan Cheng Sheng	3.53	33,000	22	2Q-2007

The municipal wastewater treatment facility serving Haiyang City in Shandong Province will generate an average revenue of USD600,000-650,000 per annum over the total project life of 22 years.

A BOT contract in Beijing (Beijing Hao Tai) was sold to a third party in 2006, generating a net profit of USD 44,872. No material announcements regarding projects are available about the company's activities post 2006 other than in January 2007, the company decreased its investment in the Handan project from HKD 17.86million to HKD 7.2million, retaining a 34.32% holding in the project.

Contact Details

Name: China Water Group
Address: 7A01, Baicheng Building, 584 Yingbin Road, Dashi, Panyu District, Guangzhou, Guangdong, China
Tel: 86 20 3479 9768
Web: www.china-eec.com

Pu Chong Liang (President, Chief Executive Officer)
Li Jia He (Chief Operating Officer)

CHINA WATER AFFAIRS GROUP

The China Water Affairs Group started operating water and sewage BOT contracts in 2002-03. The company provided 0.5million m^3 per day of water in 2006, serving 1.2million people. The CWAG now operates 20 operating units in China providing a total of 440,000m^3 per day of raw water and 3.5million m^3 per day of potable water, serving approximately 6.0million people. Sewage treatment activities include an 80,000m^3 per day 25 year TOT contract in Huizhou, which started in July 2007.

China Water Affairs Group, profit and loss account

FY 31/03 (HKDmillion)	2004	2005	2006	2007	2008
Water provision	0.6	6.7	15.0	55.8	240.3
Water installation	0.0	0.2	9.3	41.7	128.7
Sewage treatment projects	0.0	6.0	9.1	0.0	26.8
Turnover	33.2	48.5	52.9	140.3	772.5
Pre-tax profit	-99.3	-29.8	-20.3	151.7	655.1
Net profit	-99.3	-31.0	-25.0	102.9	520.0

Water provision contracts

Company	City / Province	Year	Stake
Jiangxi Wannian Silver Dragon Water Affairs	Wannian, Jiangxi	2005	100%
Xinyu Water Affairs Group	Xinyu, Jiangxi	2005	60%
Yanshan Silver Dragon Water Affairs	Qianshan, Jiangxi	N/A	100%
Fenyi Silver Dragon Water Affairs	Fenyi, Jiangxi	N/A	60%
Gaoan Water Affairs	Gaoan, Jiangxi	2007	60%
Jingzhou Water Supply	Jingzhou, Hubei	2007	51%
Jiangling Silver Dragon Water Affairs	Jingling, Hubei	N/A	100%
Chongqing Yong Chuan Global Credit Water	Yongchuan, Chongqing	N/A	100%
Henan Yinlong (Fugou) Water Supply	Fugou, Henan	N/A	100%
Henan Yinlong (Xihua) Water Supply	Xihua, Henan	N/A	55%
Zhoukou Silver Dragon Water Affairs	Zhoukou, Henan	2006	70%
Henan Luyi Silver Dragon Water Supply	Luyi, Henan	2004	100%
Guangdong Renhua Silver Dragon Water	Renhua, Guangdong	2003	73%
Huizhou Daya Bay Yiyuan Purified Water	Daya Bay, Huizhou, Guangdong	2007	49%
Guangdong Xinhui Water Affairs	Xinhui, Guangdong	2006	50%
Foundation Gang-Wu (Changzhou) Water	Wujin, Jiangxu	N/A	40%
Hainan Xing Cheng Xiang Water Supply	Haikou, Hainan	N/A	56%

Sewage treatment contracts

Company	City / Province	Year	Stake
Fenyi China Water Environmental Prtn	Fenyi, Jiangxi	N/A	60%
Jingzhou China Water Environmental Prtn	Jingzhou, Hubei	2006	100%
Huizhou Daya Bay Qingyuan Env Prtn	Daya Bay, Huizhou, Guangdong	2007	49%

Jiangxi operations contract

In May 2008, the CWAG entered into a preliminary agreement with Jiangxi Province Administrative Assets Group Company who has granted the Group first right of refusal to operate any of some 80 sewage plants which to be completed in Jiangxi Province before September 2010 with a total daily processing capacity of 1.9million m^3. This is equivalent to 8-9million people. Phase one will include 45 sewage treatment plants to be completed before September 2009. The estimated total investment for the construction of the sewage treatment plants, piping networks and related facilities is approximately CNY6billion, including CNY3billion for the sewage treatment works.

Contact Details

Name: China Water Affairs Group
Address: Suite 6408, 64/F Central Plaza, 18 Harbour Road, Wan Chai, Hong Kong
Web: www.chinawatergroup.com

Duan Chuan Liang (Chairman)
Du Lin Dong (CEO)
Li Ji Sheng (Director)

CHINA WATER INDUSTRY GROUP

The Sky Hawk Computer Group was listed on the Hong Kong Stock Exchange in 2002. Its computer and watch activities were consistently loss making. In 2006 the company moved into the water sector and was renamed the China Water Industry Group. The computer peripherals and TechnoMarine watch activities were either sold or wound up during 2007 in order to concentrate on its water activities. The water activities generated an operating profit of HKD7.9million in 2007.

100% of the Anhui Dang Shan Water Industry Company (serving Danzhou City of Hainan Province) was acquired in 2006 along with 70% of Jining City Haiyuan Water Treatment Company Limited (Hendong District in Shandong Province). In December 2006, CWIG acquired Anhui Dang Shan Water Industry Co Ltd in Anhui Province.

In March 2007, 51% of Yichun Water Industry Company Limited was acquired for CNY30million. The company provides water and sewerage services in Yichun County, Jiangxi Province. In April 2007, Linyi Fenghuang Water Industry Company Limited, a joint venture between CWIG and Linyi City Hedong District Water Supply Company Limited was established. CWIG acquired 60% of the JV for CNY18million. The JV provides water to Linyi City, Hedong District, Shandong Province. In July 2007, CWIG acquired 51% of the Shangqiu Zhengyuan Water Industry Co. Limited and Linyi Ganghua Water Industry Company Limited for CNY67.5million. That month, CWIG also subscribed CNY21million into the share capital of Jinan Hong Quan Water Company Limited's Jining City Haiyuan Water Treatment Company Limited.

By the end of 2007, the China Water Industry Group (CWIG) had acquired 7 urban water supply enterprises and 4 sewage treatment enterprises in China, with an aggregate water supply capacity of 2.3million m^3 per day and an aggregate sewage treatment capacity of 100,000m^3 per day, providing water supply and sewage treatment services to a population of 4.8million in Shandong, Jiangxi, Henan, Anhui and Hainan provinces.

Letters of intent for joint ventures announced in 2007

2007	Company / project	Water (m^3/day)	Sewage (m^3/day)
April	Shang Qiu City, Henan Province	1,000,000	0
August	Du Yun City, Guizhou Province	100,000	0
August	Suzhou EDZ, Anhui Province	100,000	120,000
October	Linyi City, Shandong Province	1,500,000	600,000

The October letter of intent concerns a 51% - 49% joint venture for water supply and sewage treatment plants in Lan Shan District, Luo Zhuang District and the subordinated regions including Tan Cheng County, Cang Shan County, Ju Nan County, Yi Shui County, Meng Yin County, Ping Yi County, Fei County, Yi Nan County and Lin Shu County in Linyi City in Shandong Province.

During 2008, a series of more substantial acquisitions and JVs were made. The June and July JVs are at the letter of intent stage, while the August acquisition is a formal undertaking. In June a joint venture was announced with Shenyang Water Development Limited, covering six water supply projects in Shenyand City. Also in June a 80% - 20% JV with the Stated-owned Assets Supervisory Committee of Geermu Municipal Government (also known as Golmud, Qinghai Province) was established. In July, a joint venture was agreed with the Yunfu City Deyu Environmental Protection Company regarding three entities in Guangdong Province. In August, eight projects held by Shenzhen South China were acquired for HKD700million. These have a total water treatment capacity of 180,000m^3 per day and 480,000m^3 per day of wastewater treatment and generated revenues of HKD41million and post-tax profits of 30million in 2007.

The company aims to have a water supply volume of 5-10million m^3 per day and a sewage treatment capacity of 2million m^3 per day by 2010-11. Letters of intent covering 3.02million m^3 per day of water supply and 820,000m^3 per day of sewage treatment capacity have been signed, along with the acquisition already announced in 2008.

CHINA WATER INDUSTRY GROUP

Letters of intent and acquisitions announced in 2008

2008	Company / project	Water (m^3/day)	Sewage (m^3/day)
June	Geermu, Qinghai Province	100,000	0
June	Shenyang City	120,000	0
July	Yunan County, Duyuan, Guangdong	0	20,000
July	Yunan County, Yiyuan, Guangdong	0	20,000
July	Yunfu City, Guangdong	100,000	60,000
August	Sihui South China, Shenzhen, 20 year BOT	0	50,000
August	Baoji, Shenzhen, 25 year BOT	0	100,000
August	Sihui Urban, Shenzhen, 30 year BOT	0	30,000
August	Boluo, Shenzhen, 20 year BOT	0	30,000
August	Huidong, Shenzhen, 22 year BOT	0	40,000
August	Huizhou No 4, Shenzhen, 25 year BOT	0	30,000
August	Huizhou No 6, Shenzhen, 22 year BOT	0	30,000
August	Tangshan, Shenzhen	180,000	0

China Water Affairs Group, profit and loss account

FY 31/12 (HKDmillion)	**2003**	**2004**	**2005**	**2006**	**2007**
Water provision	0.0	0.0	0.0	0.0	24.4
Water construction & installation	0.0	0.0	0.0	0.0	28.4
Sewage treatment	0.0	0.0	0.0	0.0	6.8
Turnover	109.4	82.8	61.2	70.1	94.9
Pre-tax profit	-8.3	-18.8	-42.5	-95.4	-15.6
Net profit	-9.5	-18.4	-44.3	-95.4	-24.3

Contact Details

Name: China Water Industry Group
Address: Room 1207, 12th Floor, West Tower, Shun Tak Centre
168-200 Connaught Road Central, Sheung Wan, Hong Kong
Tel (852) 2547 6382
Fax (852) 2547 6629
Web: www.chinawaterind.com

Li Yu Gui (Chairman)
Zhong Wen Sheng (MD)
Liu Bai Yue (COO)

CITIC PACFIC LTD

CITIC Pacific is the Hong Kong arm of CITIC, China's leading investment company. It was floated on the Hong Kong Stock Exchange in 1996. 50.5% of the equity is held by private and institutional investors, 29% by CITIC's CITIC Hong Kong and 20.5% by the management.

CITIC Pacific, Profit and loss account

YE 31/12 (HKDmillion)	2003	2004	2005	2006	2007
Turnover	26,180	22,912	26,564	47,049	44,933
Operating profits	1,132	1,539	1,897	6,558	8,603
Other profits	1,190	3,111	3,341	3,386	4,008
Net profits	1,305	3,534	3,989	8,272	10,843
Earnings Per Share (HKD)	0.60	1.61	1.82	3.77	4.91

Citic sought five water and waste management projects in Shanghai, Hangzhou, Guangzhou and Jiangsu in 2004-05.

Zunyi

2004	Zunyi	35 year concession	Water treatment

Citic Pacific holds 75% of the asset and 25% of the operational companies (CGE (Zunyi) Water Treatment Co., Ltd), with CGDE (Veolia) holding the remaining 25% and 75% respectively. Zunyi is in Guizhou Province. The contract involves acquiring the extant facilities for CNY152million and has a total cost of CNY200million. These consist of the Nanjiao and Beijiao water treatment works, each having a capacity of 100,000m^3 per day. The asset company is to pay the operational company a set of fees up to an annual cap of CNY51million. Citic anticipates a 15% return on its investment in the project.

Changzhou

2005	Changzhou	30 year concession	Water treatment

CITIC holds 24% of Changzhou CGE Water Co., Ltd, which is responsible for treating and distributing water to Changzhou in Jiangsu Province. The four WTWs have a combined capacity of 710,000m^3 per day. It is anticipated that the Jiangsu project will involve a total investment of HKD1billion.

Kunming

2006	Kunming	30 year concession	Water treatment

CITIC holds 12.5% of Kunming CGE Water Supply Co., Ltd, which is responsible for treating and distributing water to Kunming, Yunnan Province. The seven WTWs have a combined capacity of 1,115,000m^3 per day.

Contact Details

Name: Citic Pacific Limited
Address: Citic Tower, 1 Tim Mei Avenue,
Central, Hong Kong
Tel: 852 2820 2111
Fax: 852 2877 2771
Web: www.citicpacific.com

Larry Yung Ghi Kin (Chairman)
Henry Fan Hung Ling (Managing Director)
Peter Lee Chung Hing (Deputy Managing Director)

EGUARD RESOURCES DEVELOPMENT CO LTD

Eguard Resources Development Co., Ltd. was established in as the Beijing Sound Group 1993 and is chiefly involved in developing and operating solid waste management projects, along with some urban water supply and wastewater treatment services in Hubei. It was partly listed on the Shenzhen It stock exchange and remains majority held by Sound Group. The majority of projects are operated under Epure, the company's Singapore listed subsidiary (see company entry for details).

YE 31/12 (CNYmillion)	2004	2005	2006	2007
Turnover – Water	N/A	5.8	4.1	N/A
Turnover – Sewerage	N/A	12.7	11.2	N/A
Turnover	81.9	125.7	226.0	344.4
Operating profits	34.1	35.5	59.6	116.4
Net profits	25.9	28.1	47.4	86.6
Earnings Per Share (CNY)	0.13	0.14	0.24	0.43

Five of Beijing Sound's projects are included under Eguard:

Jiangsu Shuyang Shuyuan Tap-Water Supply Plant
100,000m^3 per day as designed, 50,000m^3 per day in the first phase

Jiangxi Nanchang Xianghu Wastewater Treatment Plant
300,000m^3 per day in the first phase

Zhejiang Tonglu Hengcun Tap-Water Supply Plant
20,000m^3 per day in the first phase

Hubei Jingmen Xiajiawan Wastewater Treatment Plant
100,000m^3 per day as designed, 50,000m^3 per day in the first phase

Inner Mongolia Baotou Nanjiao Wastewater Treatment Plant
200,000 m^3 per day as designed, 100,000m^3 per day in the first phase and providing 55,000m^3 per day of re-usable water

Contact Details

Name: Eguard Resources Development Co., Ltd.
Address: 95 Dongshang Road Qingjiang Building 20F
Yichang, Hubei 443000
Tel: +86-0717-6319012
Web: www.eguard-rd.com

Wen Yibo (Chairman)
Wu Xiaodong (Chief Financial Officer)
Zhang Jingzhi (President)

GLOBAL GREEN TECH GROUP

Global Green Tech Group (GGTG) is a Hong Kong listed company specialising in a range of cosmetic and surfactant products for domestic and industrial use. Golden Idea is a private biotechnology company in China engaged in the research and development of wastewater treatment systems as well as the design, development, sales and installation of environmental protection equipments other than wastewater treatment. Global Success Properties Ltd, a unit of GGTG, currently owns 8.0 % of Golden Idea.

In September 2002, GGTG signed a letter of intent with Golden Idea Bio-technology Engineering Group Ltd and Guangxi Liuzhou City Investment and Construction Development Co., Ltd for a joint investment in two sewage treatment plants. GGTG and Golden Idea are to acquire from Guangxi Liuzhou City Investment the rights for the development and operation of two sewage treatment plants at Liuzhou in China. The development and operation rights will last not less than 25 years, with a proposed investment of USD61.35million. HKD100million was earmarked for expanding the plant in 2002. The total project will cost HKD480million.

The two plants will serve over 800,000 commercial and residential users in the city of Liuzhou. The technology development and construction of these two plants are expected to take two years and the plants are scheduled for the commencement of operations by the end of 2004, although no subsequent announcements have been identified.

Global Green Tech Group, profit and loss account

FY 31/12 (HKDmillion)	2003	2004	2005	2006	2007
Turnover	633.59	624.89	769.87	846.9	1,071.8
Net profit	92.24	112.21	249.35	271.1	385.5
Earnings per share (HKDc)	18.4	11.7	24.1	19.7	27.9
Dividend per share (HKDc)	4.00	2.00	2.00	N/A	N/A

Contact Details

Name: Global Green Tech Group
Address: Rm 3402-08, 34/F Office Tower Convention Plaza,
1 Harbour Road, Wan Chai, Hong Kong
Tel: +852 2522-2811
Fax: +852 2973-0033
Web: www.globalgreentech.com

Jim Lau Jin Wei (Chairman)
Paul Ng Yuk Yeung (CFO)
Wong Ying Yin (Director)
Bang Young Bae (Director)

GUANGDONG INVESTMENT LTD

Guangdong Investment Ltd (GDI) is a property and investment company controlled by the municipality of Guangdong's GDH Limited (58%) and Guangdong Trust (11%). Following heavy losses in 1998 and 1999, the company has been restructured to concentrate on utilities, infrastructure and property. The traditional utility activities were in power generation. In December 2000, GDI acquired 81% of GH Water Supply (Holdings) for HKD3.96billion as part of a refinancing exercise. GH Holdings owns 99% of WaterCo, a company that operates the assets for the transfer of treated bulk water to Hong Kong. WaterCo was corporatised in April 2000 and supplies water to parts of Shenzen and Donnguan in Guangdong Province along with supplying 75% of Hong Kong's drinking water under a 30 year non-exclusive contract (from August 2000.) This is equivalent to serving 5million people. The latter contract accounts for 90% of WaterCo's revenues. A water piping project (Phase IV renovation project) increased the system's capacity from 1,743million m^3 pa to 2,423million m^3 in 2003 at a cost of CNY4.7billion. Two refinancings of the water operations in 2003 and 2005 have reduced financing costs by approximately HKD880million pa. GDI's stake in GH was increased to 86.5% in 2005 and to 87.4% in 2006.

Guangdong Investment Ltd, profit and loss account

Y/E 31/12 (HKDmillion)	2003	2004	2005	2006	2007
Turnover from water supply	2,958	3,119	3,193	3,226	3,193
Group turnover	5,164	5,109	5,249	6,056	6,689
Group operating profits	2,170	1,957	2,376	2,873	3,074
Pre-tax profit	1,673	1,238	1,728	2,048	2,404
Pre-tax profits from water supply	829	648	719	1,061	1,296
Net income	1,107	896	1,304	1,507	1,697
Earnings per share (HKD)	0.194	0.160	0.227	0.250	0.278

Under the original agreement, the agreed supply for 1995 was 690million m^3, increasing by 30million m^3 per annum to the designed maximum capacity of 1,100million m^3 pa by 2008. In return for an interest free loan granted by Hong Kong to Guangdong Province in 1998, the agreed increase in water supply was cut from 30million m^3 per annum to 10million m^3 per annum from 1998, reducing the overall volume provided between 1998 and 2004 by 560million m^3.

Year,million m^3 pa	2003	2004	2005	2006	2007
Water to Guangdong	940	1,170	1,225	1,243	1,374
Water to Hong Kong	810	820	830	517	715
Total Water Sales	**1,740**	**1,990**	**2,045**	**1,860**	**2,089**

The volume of water sold to Dongguan rose by 79.8% in 2003 and has subsequently continued to rise, with revenues in 2007 rising by 19% to HKD870million. In Hong Kong, despite the lowered rate of growth in water deliveries since 1998, demand has continued to be significantly lower than the agreed volume. In 2001, water used was 61million m^3 below the agreed volume, falling to 56million m^3 below the agreed volume in 2002. This meant that the Water Supplies Department had to pay HKD188.19million in 2001 and HKD172.76million in 2002 for water that it did not use. The Hong Kong Water Supply Agreement for 2006 to 2008 was concluded between the Government of Hong Kong Special Administrative Region and the Guangdong Provincial Government in 2005. The total annual fixed amount for the water sales to Hong Kong is HKD2,494.8million, a decrease of HKD34.9million for the 2006 to 2008 sales.

Contact Details

Name: Guangdong Investment Ltd
Address: 28-29/F Guangdong Investment Tower,
148 Connaught Road, Central District, Hong Kong SAR, China
Tel: +852 2860 4368
Fax: +852 2528 4386
Web: www.gdi.com.hk

Wenyue Li (Chairman)
Hui Zhang (MD)
Wai Keung Li (CFO)

GUOZHEN ENVIRONMENTAL PROTECTION

Guo Zhen Environmental Protection (GZEP, formerly called the Anhui Guozhen Environmental Protection Energy-Saving Technology Company) is owned by the Anhui Guozhen Group Ltd. Co. This is a privately held company based in Anhui Province that has net assets of CNY400million. GZEP has been the lead builder for some 30 wastewater treatment plants and has been involved in the construction of over 200 other wastewater treatment plants.

A total of 10 BOT and TOT contract awards have been identified, the first five of which were generating revenues of approximately USD13million pa in 2005. These contracts serve approximately 6.0million people.

2000: BOT for the Bozhou City Wastewater Treatment Plant with a capacity of 80,000 tonnes/day.

2001: 15 year operating contract for two wastewater treatment plants in Shenzhen City (total city population of 1.285million in 2005).

2001: BOT project in Guangdong Province, the Xinhui East Wastewater Treatment Plant. The wastewater treatment plant serving the Xinhui District of Jiangmen (Guangdong Province) opened in October 2003. The district invested CNY36million (EUR4million) for the land and a supporting network of sewage pipelines. Guozhen is responsible for the WWTW's CNY42million investment and operation. The city has to pay CNY0.67 (EUR0.07) for each tonne of sewage treated, compared with CNY1.2 (EUR0.13) it would have spent if it had conducted its own investing and management. The municipality had estimated that the 80,000m³ per day WWTW would have cost CNY280million to develop and finance. Xinhui had a population of 735,500 in 2005.

2003: First BOT project in Anhui Province, the Zhuzhuanjing Wastewater Treatment Plant.

2003: 30 year TOT for Xu Zhou wastewater treatment plant with capacity 165,000 tonnes/day (city population of 1.662million in 2005).

2004: 20 year TOT for the Changsha Second Wastewater Treatment Plant with a capacity of 140,000 tonnes/day (city population of 2.051million in 2005).

2005: The management of the Shenzhen Caopu Sewage Treatment Plant was taken over in April. The treatment capacity of Shenzhen Buji Caopu Sewage Treatment Plant is 150,000 m^3 per day.

2007: BOT for Lankao County (25,000m^3 per day), Suqian City Yanghe (10,000 m^3 per day) and Wuhu City Tranmenshan (Phase 1, 60,000m^3 per day).

Contact Details

Name: GuoZhen Environmental Protection
Address: 699 Changjing West Road
Hefei, Anhui, China
Tel: 0551-531 9529
Fax: 0551-532 2901
Web: www.gzep.com.cn

Jian Xingchao (Chief Engineer)
Wu Hao (Vice President)
Ms Duan Zhuan Jian (Chairman)

HONG KONG & CHINA GAS AND LIGHT

Hong Kong & China Gas and Light (Towngas) is a Hong Kong based power utility which has recently embarked on an investment programme in China resulting in 25 joint venture projects to date. Towngas' Han Yan Water gained its first water contract in China in 2005 and currently has three such contracts covering 1.8million people in total. These are for Tianjin, Wujiang (Jiangsu province) and in Wuhu (Anhui province) along with managing an integrated water supply and wastewater joint venture in Suzhou Industrial Park, Suzhou, Jiangsu province. Water revenues were HKD209.6million in 2006 and HKD260.9million in 2007.

In May 2006, Towngas announced that it is planning to take a 50% stake in a CNY3.0billion water project in Tianjin. This project will have an initial handling capacity of 100million m^3 pa and could be expanded to 400million m^3 pa a year in the future.

In July 2005, Towngas agreed to pay CNY776million for an 80% stake in Wujiang Water Investment Company in Jiangsu province. This involves a total investment of CNY970million for a 30 year concession for supplying water to the Wujiang administrative zone. The first phase of the project with Towngas, expected to be completed this year, will involve CNY600million, with a treatment capacity of 330,000m^3 pa, with the capacity rising to 530,000m^3 pa which started in 2007-08. Water is currently supplied to 180,000 households in Wujiang, a city with a population of 780,000. Water consumption in 2005 was forecast at 115million m^3, while demand for water in Wujiang has grown at 20% per annum since 2001.

In June 2005 Towngas gained a 75% stake in a water supplier in Anhui province for CNY225million. The 30 year CNY700million concession is for part of the city of Wuhu, which has a total population of 2.25million, with the utility supplying 85million m^3 of water in 2005.

Towngas, profit & loss account

Y/E 31/12 (HKDmillion)	2003	2004	2005	2006	2007
Group turnover	7,289	8,154	9,351	13,465	14,225
Pre-tax profits	3,800	3,923	5,922	5,890	9,334
Net profits	3,051	3,287	5,281	5,862	9,269
Earnings per share (HKD)	0.54	0.58	0.95	0.879	1.391

Contact Details

Name: Hong Kong & China Gas Company Ltd
Address: 23rd Floor, 363 Java Road, North Point, Hong Kong
Tel: (852) 2963 3483
Fax: (852) 2516 7368
Web: www.towngas.com

Lee Shau Kee (Chairman)
Alfred Chan Wing Kin (CEO)
John Hon-Ming Ho (CFO)
James Kwan Yuk Choi (COO)

JIANGXI HONGCHENG WATERWORKS CO

The Jiangxi Hongcheng Waterworks Co was partly floated on the Shanghai Stock Exchange in June 2004. The IPO raised CNY264million, CNY256million of which is to be used in expanding the water supply network through three projects designed to expand supply capacity from 900,000 m^3 per day to 1.2million m^3 per day by 2007. Electricity accounted for 38% of its production costs in 2003. Water is charged at CNY0.553 per m^3 and has been fixed at this level for two years, with limited scope for further increases. The company is responsible for 85% of Nanchang's water supplies.

During 2005, the company supplied approximately 279.56million m^3 of water from its Qingshan, Changyang, Xiazheng Street, Niuhang and Changling water plants. In 2007, 304.3million m^3 of water was supplied and 21.0million m^3 of sewage was treated.

In 2005, the Company acquired a 51% stake in an environmental protection company that has an exclusive right to operate a Jiujiang-based company engaged in the treatment of waste water.

Jiangxi Hongcheng Waterworks Co, profit and loss account

Y/E 31/12/(CNYmillion)	2003	2004	2005	2006	2007
Turnover – water	127.2	133.1	152.6	168.0	170.5
Turnover - sewage	0.0	0.0	0.0	2.5	12.1
Turnover	127.2	133.1	151.6	169.5	181.7
Operating Profit	44.0	39.1	43.7	47.1	48.0
Net Profit	25.5	25.5	27.3	28.8	29.4
EPS (CNY)	0.283	0.214	0.195	0.206	0.210

Contact Details

Name: Jiangxi Hongcheng Waterworks Co
Address: 98 Guanyin Road
Nanchang, Jiangxi, 330001 China
Tel: 86 791 521 0336
Fax: 86 791 522 6672
Web: www.jxhcsy.com

Mao Mujin (Chairman)
Liu Zhong (President)
Li Xuelang (Deputy General Manager, Director)

NANHAI DEVELOPMENT COMPANY LIMITED

Nanhai Development Company Limited (NDC) was founded in 1992 and supplies drinking water and designs and installs water supply systems in Nanhai and surrounding areas in Guangdong Province. NDC also has a 60% interest in a water provision company based in Jiujiang, Jiangxi Province. The company was listed on the Shanghai Stock Exchange in December 2000. 36.5% of its equity is held by the Nanhai Water Supply Group. The municipality of Nanhai has 1.10million people. The company seeks to raise water supply to 1.32million m^3 per day. In 2005, the Company supplied a total of 274.13million m^3 of water against 304.7million m^3 in 2004.

Nanhai Development Company Limited, profit and loss account

Y/E 31/12 (CNYmillion)	2003	2004	2005	2006	2007
Turnover – Water supply	253.7	272.4	308.6	327.0	356.8
Turnover – Sewerage	0.0	0.0	N/A	N/A	27.8
Total turnover	253.7	272.4	317.1	365.2	409.4
Operating profit	115.0	126.4	137.1	148.8	168.5
Net profit	64.1	71.5	77.5	86.3	92.9
EPS (CNY)	0.31	0.262	0.285	0.318	0.343
DPS (CNY)	0.20	0.25	0.25	0.20	0.18

In 2007, the company invested CNY59million in upgrading the Pinzhou Sewage Treatment Project, which it will operate for 24 years. Capacity will rise from 42,500 m^3 per day at the outset to 50,000 m^3 per day from 2010.

Contact Details

Name: Nanhai Development Company Limited
Address: 21st Floor Jianhang Building,
Guicheng Nanhai Avenue,
Nanhai District, Foshan, Guangdong, 52820 China
Tel: +86-757-8628-0996
Fax: +86-757-8623-8565
Web: www.nhd.net.cn

He Xiangming (Chairman)
Feng Chenggui (President)
Chen Huixia (Finance Director)

NINGBO FUDA COMPANY LIMITED

Ningbo Fuda Company Limited (Fuda) is a consumer electronics company, which is also involved in water distribution. In 2005, Fuda supplied 155million m^3 of drinking water, which rose to 164million m^3 in 2007.

Y/E 31/12/(CNYmillion)	2003	2004	2005	2006	2007
Turnover - Water	-	-	119.3	122.7	123.8
Turnover	1,114.1	1,279.9	1,068.8	1,420.5	1,394.8
Operating Profit	160.2	137.6	58.0	124.4	116.0
Net Profit	70.8	77.7	22.7	40.7	42.4
EPS (CNY)	N/A	0.21	0.6	0.11	0.10

Contact Details

Name: Ningbo Fuda Company Limited
Address: No.355 Yangming West Road
Yuyao, Zhejiang 315400 China
Tel: +86-574-628-14275
Web: www.fuda.com

Bai Xiaoyi (Chairman)
Xu Liagen (President / Party Secretary)
Zhou Guohua (Finance Director)

NWS HOLDINGS LTD

NWS is the Hong Kong Stock Exchange listed services arm of the New World Development Company. The company was listed on the Hong Kon Stock Exchange in 1997. NWS has been involved in the water sector in China since 1993 through Sino French Holdings (Hong Kong), its 50-50 joint venture with Suez Ondeo. Total water treatment capacity at the start of 2004 was 3.95million m^3 per day, rising to 4.38million m^3 per day by the end of 2005, with 21 water projects with a total capacity of 5.72million m^3 per day in 2007. Operating profit of NWS's water activities were HKD80.6million for 2005, rising to HKD87.4million in 2006 and HKD102.2million in 2007. In April 2008, NWS & Suez Environnement paid EUR140million for 15% of Chongqing Water Group. CWG owns and operates 32 water treatment works and 35 sewage treatment works in Chongqing and aims to expand its services into neighbouring areas.

NWS Holdings Ltd, profit and loss account

YE 31/06 (HKDmillion)	2003	2004	2005	2006	2007
Turnover	5,770	12,553	10,286	12,544	15,047
Operating profits	257	953	-83	342	845
Other profits	1,316	1,172	3,201	1,667	1,690
Net profits	1,213	1,538	2,886	1,657	2,005
Earnings Per Share (HKD)	1.39	0.86	1.60	0.89	1.01

Holdings' attributable interest (%)

Project	Capacity (m^3 per day)	NW stake	Contract expiry	Region
Macau Water Plant	330,000	42.5	2010	Macau
Zhongshan Tanzhou Water Plant	60,000 (Phase I)			
	90,000 (Phase II)	29	2027	Guangdong
Zhongshan Dafeng Water Plant	200,000 (Phase I)			
	200,000 (Phase II)	33.06	2020	Guangdong
Zhongshan Quanlu Water Plant	500,000	33.06	2020	Guangdong
Dongguan Microfiltration Equipment Plant	N/A	25	2014	Guangdong
Nanchang Water Plant	50,000 (Phase I)			
	50,000 (Phase II)	25	2023	Jiangxi
Baoding Water Plant	260,000	27.5	2020	Hebei
Siping Water Plant	118,000	25	2030	Jilin
Zhengzhou Water Plant	360,000	25	2031	Henan
Xinchang Water Plant	100,000	25	2032	Zhejiang
Changtu Water Plant	50,000	35	2029	Liaoning
Panjin Water Plant	110,000	30	2032	Liaoning
Shanghai Spark Water Plant	100,000	25	2031	Shanghai
Shanghai SCIP Water Treatment Plants	Wastewater - 50,000			
	Industrial Water - 200,000			
	Demineralized Water - 4,800	25	2052	Shanghai
Qingdao Water Plant	543,000 (Phase I)			
	183,000 (Phase II)	25	2027	Shandong
Chongqing Water Plant	380,000 (Phase I)			
	160,000 (Phase II)	30	2052	Chongqing
Sanya Water Plant	235,000	25	2033	Hainan
Tanggu Water Plant	310,000	25	2039	Tianjin
Changshu Water Plant	675,000	24.5	2036	Jiangsu
Chongqing Tangjiatuo Waste Water Plant	300,000	50	2036	Chongqing

NWS HOLDINGS LTD

Contact Details

Name: NWS Holdings Ltd
Address: New World Tower 2, 18 Queen's Road, Central, Hong Kong
Tel: 852 2131 0600
Fax: 852 2131 0611
Web: www.nwsh.com.hk

Henry Cheng Kar Shun (Chairman)
William Doo Wai-Hoi (Deputy Chairman)
Norman Chan Kam Ling (Chief Executive Officer)

QIANJIANG WATER RESOURCES

Qianjiang Water Resources Development Co is a municipally based company providing water supply to Qianjiang City in Zhejiang Province (1999 population 313,000). QWR had its IPO on the Shanghai Stock Exchange in October 2000. Water sales in 2005 were 96.09million m^3.

Y/E 31/12/(CNYmillion)	2003	2004	2005	2006	2007
	N/A	N/A	110.3	134.5	179.1
Turnover	216.2	155.5	240.3	375.9	377.0
Operating Profit	N/A	18.7	36.1	51.3	23.9
Net Profit	28.9	16.5	22.0	17.7	33.6
EPS (CNY)	0.11	0.06	0.08	0.06	0.12

In July 2008, the company acquired 70% of Lishui Water Supply and Drainage Company, from the Assets Supervision and Administration Commission of the city for CNY94.421million. Lishui City has a population of 2.5 million at the prefecture level.

Contact Details

Name: Qianjiang Water Resources
Address: 3 Santai Shan Road, Hangzhou, Zhejiang, China
Tel: +86-571-8797-4386
Web: www.qjwater.com

Hi Zhonghui (Chairman)
Zhang Disheng (Vice Chairman, President)
Wang Zhaohui (CFO)

SHANGHAI INDUSTRIAL HOLDINGS

Shanghai Industrial Holdings Limited (SIHL) is a broadly based infrastructure, logistics and technology company, which is 58% held by the Shanghai municipal government. The company was partly floated on the Hong Kong Stock Exchange in 1996. In 2003, the company decided to enter the Chinese water and sewage treatment BOT market. The company originally planned to invest a total of CNY10billion by 2006 in operating water supply, sewage treatment and sewerage networks, with the objective of becoming one of the top three water services companies in the Chinese market. By the end of 2007, the company had HK5.2 billion in water and wastewater assets.

Shanghai Industrial Holdings, profit and loss account

YE 31/12 (HKDmillion)	2003	2004	2005	2006	2007
Total turnover	2,826	3,429	6,025	6,851	7,954
Operating profits	1,647	1,685	1,550	1,639	2,122
Net income	1,259	1,378	1,028	1,258	2,007
Earnings per share (HKD)					

In August 2003, SIHL formed a CNY500million 50:50 joint venture with the state-held China Energy Conservation Investment Corporation (CECIC), now called General Water of China Co. The joint venture's China Water and Sewage Treatment Company and Zhong Huan Water Treatment Construction Limited Corporation started operations in November 2003. China Water and Sewage Treatment subsequently signed heads of agreements with Xiamen Water Services Group and Zhenjiang New Area Administrative Commission in Jiangsu province for water services investment projects. Total investment in the two projects will exceed CNY1 billion.

As at the end of 2007, General Water of China had 14 project companies in nine provinces with a total daily capacity of 4,543,000 m^3 per day. These entities had total assets of HKD5,200million in 2007, with revenues of HKD466 million, an increase of 33.9% over 2006.

The Xiamen GWC Sewage and Wenzhou GWC Zhengyuan have been completed and are in operation, while the projects held by General Water of China (Chongqing) Co. Ltd. and General Water of China (Huzhou) Co. Ltd. were put into trial operation in the second half of 2007. Revenues of Xiamen GWC Sewage and Wenzhou GWC Zhengyuan were HKD233 million and HKD41.78 million respectively in 2007. The projects held by General Water of China (Wenzhou) Co. Ltd. and General Water of China (Shenzhen) Co. Ltd. are entering service in 2008. 2008. Preliminary works for the City Water supply project in Suifenhe, commenced in the first half of 2007 and completion and commencement of production are expected in 2010.

SHANGHAI INDUSTRIAL HOLDINGS

Projects	Stake	Investment (CNYmillion)	Capacity (m^3 / day)	Operation period
Xiamen GWC Water Supply Ltd, Fujian	45%	CNY 105	1,200,000	30 years, 2006
Xiamen GWC Sewage Treatment Ltd	55%	356	559,000	30 years, 2006
Bengbu Water Supply Company, Anhui province	60%	155	430,000	30 years
Xiangtan Water Supply Company, Hunan province: Water Sewage treatment	70%	140	 425,000 100,000	30 years
Eastern Huzhou Water Sewage Treatment, Zhejiang province (BOT)	100%	90	10,000	22 years
Changshou Chemical Industrial Zone, Chongqing (BOO), Water Sewage treatment	100%	589	240,000 40,000	50 years
Xianyang Water Supply Company, Shaanxi province	50%	85	180,000	30 years, 2007
Xianyang Water Supply Project (re-routing of water distribution, BOT)	100%	568	300,000	30 years
Longhua Sewage Treatment, Shenzhen province (BOT) Phase 2	100% 100%	160 N/A	150,000 400,000	22 years, 2006 N/A
Huzhou Water Supply Project (BOT), Zheijiang province	100%	824	200,000	34 years, 2009
Eastern Wenzhou Sewage Treatment, Zheijiang province	100%	203	100,000	27 years, 2007
Central Wenzhou Sewage Treatment, Zheijiang province	70%	N/A-	200,000	N/A
Suifenhe, water supply, Heilongjiang province	100%	N/A	110,000	N/A
Xiangtan, sewage treatment, Hunan	100%	N/A	100,000	N/A

China Water and Sewage Treatment have in turn set up a joint venture with the Xiamen Water Services Group to operate the principal water supply and sewage treatment facilities in Xiamen. The city is one of China's five Special Economic Zones and contract covers a water supply capacity of 1.0million m^3 per day and a sewage treatment capacity of 514,000m^3 per day. Capacity for these two projects were increased to 1,200,000 m^3 per day and 559,000 m^3 per day respectively during 2007.

A second joint venture has been formed with the Zhangjiang New Area Administrative Commission in Jiangsu Province for the exclusive right to operate water supply and sewage treatment facilities in Zhenjiang New Area. China Water and Sewage Treatment is expected to invest by 2006 a total of CNY250 million in a 100,000m^3 per day waterworks BOT project, a 60,000m^3 per day sewage treatment plant TOT (Transfer-Operate-Transfer) and BOT project, and a sewerage network project for water supply and sewage collection in the Zhanjiang New Area.

Contact Details

Name: Shanghai Industrial Holdings Ltd.
Address: Harcourt House, 39 Gloucester Road,
Hong Kong, HK
Tel: 00852 2529 5652
Fax: 00852 2529 5067
Web: www.sihl.com.hk
Web: www.cecic.com.cn

Cai Lai Xing (Chairman)
Cai Yu Tian CEO)
Qu Ding (Deputy CEO)
Cherie Chan Yat Ying (CO)

SHANGHAI CHENGTOU HOLDING CO LTD

Shanghai Chengtou, formerly the Shanghai Municipal Raw Water Co., Ltd. (SMRW) was founded in 1992 and abstracts water from the Yangtze and Huangpu rivers for treatment at the Shanghai municipality's water treatment stations. The company builds and operates the pumping stations, canals and reservoirs necessary for the bulk water provision to the city. 52% of SMRW's shares are held by the Shanghai State Assets Management Bureau. The Company had six subsidiaries and major associates.

During 2005, SMRW supplied approximately 1.7billion m^3 of water and treated a further 0.6billion m^3 of wastewater. In addition, SMRW supplies bulk water to Veolia Water's 2002 Shanghai Pudong contract. During 2007, the company supplied 1.258 billion m^3 of raw water and 0.177billion m^3 of treated water and treated approximately 0.621 billion m^3 of wastewater. Sales of water and wastewater accounted for 44% and 23% of total 2007 revenues respectively.

Shanghai Municipal Raw Water Co., profit and loss account

YE 31/12 (CNYmillion)	2003	2004	2005	2006	2007
Water supply turnover	713.0	N/A	N/A	N/A	N/A
Water treatment turnover	240.1	N/A	N/A	N/A	N/A
Total turnover	969.7	971.2	1,010.6	1,202	1,210
Operating profits	450.4	504.4	618.4	626	618
Net income	429.4	433.4	391.1	602	525
Earnings per share (CNY)	0.228	0.226	0.200	0.317	0.277

Contact Details

Name: Shanghai Municipal Raw Water Co. Ltd.
Address: 5/F, 818 Sichuan Road North,
Shanghai, 200085, China.
Tel: +86 21 6356 4432
Fax: +86 21 6356 4880
Web: www.rawwater.com.cn

Liu Qiang (Chairman)
Shoupei Wu (President)
Bai Lei (Financial Controller)
Gu Yuliang (Chief Engineer)

SHANGHAI URBAN CONSTRUCTION GROUP

China's largest wastewater treatment BOT project, Shanghai Zhuyuan No.1 WWTP, with a capacity of 1.7 million m^3 per day was originally awarded to Shanghai Youlian Development Company (45%), Huajin Information Investment (40%) and Shanghai Urban Construction Group (15%) in 2002. This group in turn gained the tender for Zhuyuan No.2 WWTP project in 2004. Shanghai Youlian subsequently withdrew from the two WWTP projects due to the changed financing policies in China. In 2005 Shanghai Urban Construction Group won the Zhuyuan No.2 tender and was awarded a twenty-five year concession. At the end of the concession, the facility will be handed over to the Shanghai Chengtou Corporation.

The Zhuyuan No.2 Sewage Treatment Plant will cost CNY600 million and has a design capacity of 500,000m^3 per day and will mainly deal with sewage from the northern part of the city, such as Yangpu District. Construction started in late 2005 and was continuing in 4Q 2007. Treated sewage from the facility will reach Level 2 of the state sewage discharge standard, above that of most local facilities. The project is to be supported in part through a World Bank loan of USD200 million for various urban environmental projects in the city. The original bid by Shanghai Youlian Group was the lowest with a price of CNY0.299 per tonne.

Contact Details

Name: Shanghai Urban Construction Group
Address: 654 Mengzi Road,
Shanghai, 200085, China.
Tel: +86 21 630 17388 0086
Fax: +86 21 630 18245
Web: www.sucgcn.com

Zhu Jiaxiang (Chairman)
Zhu Renwei Jiang Xianfu (Vice Chairman)
Chen Jinzhang (Chief Financial Supervisor)

SHANGHAI YOUNG SUN INVESTMENT CO LTD

Shanghai Young Sun Investment Co., Ltd. was founded in 1995. It owns and operates three sewage treatment plants in Shanghai, with an aggregated daily treatment capacity of 145,000 m^3 per day. It also has two subsidiaries and one affiliate, of which one is in Shanghai, providing consulting services of urban infrastructure investment, operation and management, and two based in Shanghai and Chengdu, Sichuan Province, engaged in water treatment business.

Y/E 31/12 (CNYmillion)	2003	2004	2005	2006	2007
Turnover	42.0	49.8	50.8	109.2	185.9
Operating Profit	23.8	13.5	23.6	40.8	18.9
Net Profit	22.6	31.1	32.7	36.9	13.1
EPS (CNY)	0.09	0.13	0.13	0.15	0.05

Contact Details

Name: Shanghai Young Sun Investment Co., Ltd.
Address: Block D, Building 10 555 Xu Jiahui Road,
Shanghai, 200023, China.
Tel: +86 21 639 01001
Fax: +86 21 639 01001

Zhu Shiyin (Chairman)
Qu Xia (CFO, General Manager)

SHENZHEN KONDARL (GROUP) CO LTD

Shenzhen Kondarl (Group) Co., Ltd. was established in 1979. Its chief activity is in food production. In 2005 and 2007, 17% of itsmillion revenues came from water distribution, compared with 19% in 2006.

Y/E 31/12 (CNYmillion)	2003	2004	2005	2006	2007
Turnover - water	N/A	N/A	136.4	142.3	N/A
Turnover	846.7	964.2	862.3	737.9	847.8
Operating Profit	56.9	75.5	0.8	-47.2	11.3
Net Profit	5.4	7.3	-112.6	-126.7	24.3
EPS (CNY)	N/A	0.02	-0.29	-0.32	0.06

Contact Details

Name: Shenzhen Kondarl (Group) Co., Ltd.
Address: Level 2, Ji Hao Building No. 1086 Shen Nan East Road
Luo Hu District, Shenzhen, SHZ 518003
Tel: +86-0755-254-25020
Fax: +86-0755-254-20155
Web: www.kondarl.com

Luo Aihua (Chairman & President)
Zhu Wenxue (Chief Financial Officer)

SICHUAN GUANGAN AAA PUBLIC CO LTD.

Sichuan Guangan AAA Public Co., Ltd. (AAA Public) was established in 1999. The company operates hydroelectric generation and distribution services and distributes water in part of Sichuan Province, including Guangan, Yuechi County and Huaying. In 2005, the company sold 10.7 million m^3 of water.

Y/E 31/12/(CNYmillion)	2004	2005	2006	2007
Turnover - Water	N/A	N/A	N/A	33.6
Turnover	220.7	260.2	389.4	456.9
Operating Profit	50.7	72.5	71.5	56.6
Net Profit	24.3	30.4	29.5	15.5
EPS (CNY)	0.17	0.15	0.15	0.08

In November 2007, the company announced that it was acquiring Sichuan Linshui Aizhong Water Co Ltd, a water utility company, from Chinese state-owned Sichuan AAA Investment Holding Group Co Ltd (SA). Previous to this, SG AAA held 10% of SLAW's equity. Along with acquiring Sichuan Wusheng Aizhong Water Co Ltd and two gas companies, the transactions are worth CNY89 million.

Contact Details

Name: Sichuan Guangan AAA Public Co., Ltd
Address: 86 North Qujiang Road
Guangan District, Guangan, Sichuan 638001
Tel: +86-826-298-3049
Fax: +86-826-298-3358
Web: www.sc-aaa.com

Luo Qinghong (Chairman)
He Tulin (Chief Financial Officer)
Chen Yunhai (President)
Li Mingping (Party Secretary)

SUZHOU NEW DISTRICT HI-TECH INDUSTRIAL CO LTD

Suzhou New District Hi-Tech Industrial Co., Ltd. (SNDHT) is responsible for the development and operation of water, road, gas and power services for Suzhou's Hi-Tech Industrial Development Zone. 24.5% of its shares were floated in August 1996, and the company is currently 48.6% held by Suzhou New District Economic Development Group.

There are 400 industrial facilities and 100,000 residents in the area. Demand for water is currently in excess of 300,000m^3 per day, provided by the city. The dedicated Suzhou Xinning Water Works was opened in 2000, providing 150,000m^3 per day, which can be doubled at a later date.

Suzhou New District Hi-Tech Industrial Co. Ltd., profit and loss account

Y/E 31/12 (CNYmillion)	2003	2004	2005	2006	2007
Turnover – Public Service	N/A	N/A	29.2	29.5	66.7
Turnover	813.2	1,524.1	1,518.6	1,953.4	2,467.8
Operating profits	189.1	299.5	276.8	227.5	332.3
Net income	108.7	129.8	143.0	155.4	222.3
Earnings per share (CNY)	N/A	0.158	0.174	0.189	0.266

In December 2002, Suzhou New District Hi-Tech acquired a 25% stake in Suzhou New District Xinning Running Water Development Co Ltd, a water utility company, from Suzhou New District Economic Development Group Corp, a unit of Chinese state-owned Suzhou government, for CNY17.2 million.

Contact Details

Name: Suzhou New District Hi-Tech Industrial Co., Ltd.
Address: 25/F Jinhe Building, 35 Sishan Road,
New District, Suzhou, Jiangsu Province 215011, China
Tel: +86 512 680 72581
Fax: +86 512 809 9281
Web: www.sndht.com

Ji Xiangqun (Chairman)
Gao Jianping (Vice Chairman)
Xu Ming (President)
Zhuang Liangbao (Finance Director)

TIANJIN CAPITAL ENVIRONMENTAL PROTECTION

Tianjin Capital Environmental Protection Company Limited (TCEP) is involved in sewage treatment and other municipal services and operates in Tianjin and Guizhou Province. During 2005 it operated nine subsidiaries and had a total sewage treatment capacity in the Tianjin region of 1.49 million m^3 per day and processed 131 million m^3 of sewage. At the start of 2006, TCEP's services covered the South-western regions, Yangtze River, and Jiangsu and Zhejiang provinces. TCEP's sewage treatment plants capacity outside Tianjin also increased to 1.02 million m^3 per day. In 2007, the company's sewage treatment plants had a capacity of 2.485 million m^3 per day, compared with 2.365 million m^3 per day in 2006. Potable water sale volumes rose from 31.6 million m^3 in 2006 to 34.0 million m^3 in 2007 and recovered waster sales rose from 1.8 million m^3 to 3.3 million m^3 during the same period.

Y/E 31/12 (CNYmillion)	2003	2004	2005	2006	2007
Turnover – Sewage	N/A	N/A	504.5	651.7	N/A
Turnover – Potable water	N/A	N/A	N/A	30.9	N/A
Turnover – Water recycling	N/A	N/A	12.5	23.1	N/A
Turnover	629.7	713.7	580.5	770.3	938.6
Operating profits	N/A	514.7	338.5	357.2	408.4
Net income	278.0	311.9	177.5	153.3	176.0
Earnings per share (CNY)	0.21	0.23	0.13	0.12	0.13

The company is currently expounding its activities into other provinces. 63% of the company's equity is indirectly held by the Tianjin Urban Construction Bureau.

2001	Tianjin	26 year BOT	7,500,000 sewage treatment

TCEP's main contract is with the Tianjin Sewage Company. TCEP acquired a series of sewage treatment works serving the city that was either in development or not complying with the appropriate standards. The Company processed 131 million m^3 of sewage during 2005 against 227 million m^3 in 2004, with revenues of CNY253 million. This reflects the works being carried out during 2005. The Dongjiao sewage water treatment plant treated 123 million m^3 of sewage during the year, against 132 m^3 in 2004. The original Jizhuangzi sewage treatment plant (260,000m^3 per day) was rehabilitated during 2005 and is undergoing trials with a second plant (280,000m^3 per day). The other treatment plants, at Jizhuangzi (540,000m^3 per day), Xianyanglu and Beicang are being replaced or upgraded to meet contemporary standards. TCEP's sewage treatment plant capacity in the Tianjin region has reached 1,490,000m^3 per day.

2005	Baoying	26 year BOT	250,000 sewage treatment

TCEP set up a joint venture in June 2005, for the Baoying Sewage Water Treatment Project. Baoying Capital Water Co., Ltd. has a registered capital of CNY38 million, 70% held by TCEP. Baoying Capital Water Co., Ltd. will build and operate a sewage water treatment plant with a capacity of 25,000m^3 per day, which can be expanded to 50,000m^3 per day. The total investment for the first phase of the joint venture was CNY93.4 million.

2005	Hangzhou	26 year TOT	2,000,000 sewage treatment

The Hangzhou Qige Sewage Treatment Plant joint venture was signed in June 2005 for a 26 year Transfer-Operation-Transfer (TOT) Project. The Hangzhou Tianjin Capital Water Company Limited has a registered capital of CNY257.5 million, 70% held by TCEP. Phase I of Hangzhou Qige Sewage Water Treatment Plant has commenced operation, with a capacity of 400,000m^3 per day, with phase II (200,000 m^3 per day) still under construction. The total investment is estimated at CNY881 million.

2005	Fuyang	30 year licence	500,000 sewage treatment

In August 2005, TCEP's 98% held Fuyang Capital Water Co., Ltd. gained the contract for the Anhui Fuyang Sewage Water Treatment Project. The sewage plant's treatment capacity is 100,000m^3 per day, and has commenced operation. The project is under licensed operation, the transfer price was approximately CNY102 million, with a term of 30 years.

2005	Honghu	TOT	350,000 water & sewage treatment

TIANJIN CAPITAL ENVIRONMENTAL PROTECTION

The Hubei Honghu Sewage and Water Supply Project started in December 2005, with TCEP holding 98% of Hubei Honghu Capital Water Co., Ltd., which has acquired three facilities under a TOT contract; the sewage water treatment plant of Honghu city (70,000m^3 per day) and two water treatment plants with designed capacity of 80,000m^3 and 30,000m^3 per day. The total investment amount of the sewage treatment portion was CNY50 million.

2005	Qujing	26 year BOT	750,000 water & sewage treatment

A cooperation agreement was signed in June 2005, for recycled water supply and sewage treatment in the central urban area of Qujing in Yunan. A joint venture is being established with the Qujing City Recycled Water Supply and Sewage Water Treatment Corporation, to acquire the sewage treatment plant and the water supply plant through a 30 year TOT project. The Qujing Sewage Treatment Plant has a daily treatment capacity of 80,000m^3 (to be expanded to 160,000m^3 per day) and the No. 1, No. 2 and No. 3 Water Supply Plants have daily production capacities of 80,000m^3, 60,000m^3 and 60,000m^3 respectively. The acquisition price of the assets will be approximately CNY290 million. Qujing Capital Water Co., Ltd. is 90% held by TCEP.

2008	Xian	25 year TOT	1,000,000 sewage treatment

In March 2008, TCEP acquired sewage treatment works of the Xian Capital Water Company Limited along with a 25 year operations contract after a tender process for CNY643 million. The plants were held by the Xian Sewage Water Treatment Plants and Xian Infrastructure Investment and Construction Company (XICC). Sewage processing volumes are contracted to be 102,000 m^3 per day for the first year of the contract and 114,000 m^3 per day for the rest of the contract at the Xian Sewage Water Treatment Plant and 127,500 m^3 per day for the first year and 142,500 m^3 per day for the rest of the contract at the XICC Purification Centre. The two plants have a total maximum capacity of 310,000 m^3 per day.

TCEP also has three industrial effluent treatment contracts serving: [1] the Tianjin Port Bonded Area, one of the functional areas of the Tianjin Binhai New District; [2] the Tianjin Binhai Mass Transit Development Co. Ltd.; and [3] the Huaxi sewage treatment plant and the Erqiao sewage treatment plant with a design capacity of 40,000m^3 per day in Guiyang City.

Contact Details

Name: Tianjin Capital Environmental Protection Company
Address: Chuangye Huanbao Building 76 Weijin South Road
Nankai District, Tianjin, 300381
Tel: +86-22-2393-0000
Web: www.tjcep.com

Ma Baiyu (Chairman)
Gu Qifeng (President)
An Pindong (Finance Director)

WUHAN SANZHEN INDUSTRY HOLDING CO LTD

Wuhan Sanzhen Industry Holding Co., Ltd. (WSI) was founded in 1998 and is responsible for the abstraction, treatment and distribution of drinking water to the city of Wuhan and the surrounding area. 25% of the company's shares were floated in April 1998, 71% being held by the Wuhan Water Business Group Co. Ltd.

Wuhan Sanzhen Industry Holding Co., Ltd., profit and loss account

Y/E 31/12 (CNYmillion)	2003	2004	2005	2006	2007
Water supply	159.4	N/A	158.8	153.1	153.2
Drainage	0.0	N/A	11.0	10.7	11.9
Turnover	159.4	169.1	169.9	290.1	238.7
Operating profits	52.2	46.6	18.1	79.4	36.6
Net income	30.1	35.6	45.5	50.9	58.6
Earnings per share (CNY)	0.07	0.08	0.10	0.12	0.13

WSI's Zongguan and Baihezui waterworks supply water to 97% of the Hankou area. WSI is also involved in sewage treatment through the Wuhan Water Purification Plant, a 2-class sewage treatment plant.

Contact Details

Name: Wuhan Sanzhen Industry Holding Co., Ltd.
Address: 68 Tian Men Dun Road Jiang Han District
Wuhan 430023, Hubei, China
Tel: +86 27 8572 5739
Fax: +86 27 8587 5730
Web: www.600168.com.ch

Chen Lqian (Chairman)
Tu Lijun (President)
Xu Hong (Finance Director)

CHINA WATER INDUSTRY INVESTMENT GROUP

Xinjiang Changyuan Water Resources Industry Group Co Ltd (XCWR), a 60% owned subsidiary of China Water Industry Investment Corp (CWIIG), acquired a 60% interest in Kuerle Huitong Yinquan Water Co Ltd, a water utility company, from Xinjiang Huitong Co Ltd, for CNY78million in 2007. Kuerle Huitong Yinquan Water is engaged in the urban water supply for Korla, Xinjiang Uygur Autonomous Region. Korla has a population of 380,000, up from 40,000 in 1982. Xinjiang Huitong's water revenues were CNY23.1million in 2005 and CNY27.6million in 2006, with part year revenues of CNY12.3million in 2007.

China Water Industry Investment Corp. was founded in October 2004 as a national investment company focusing on investment, construction and operation of projects for urban water supply, sewage treatment and desalination. CWIIG is active across China, particularly including Shandong, Xinjiang, Zhejiang, Inner Mongolia, Jiangsu, Qingdao and Sichuan. In 2007, CWIIG's daily water supply capacity was approximately 2.8million m^3 per day.

In October 2007, China Water Affairs acquired 19.4% of China Water Industry Investment Corporation from Shanxi Wanjiazhai Yellow River Diversion Project General Company for CNY175million.

Contact Details
Name: China Water Industry Investment Corp.
Address: No 10 Nan Niange, Xuanwu District, Beijing
Web: www.chinahho.com

Liu Zhenghong (Vice General Manager)
Ni Shiqiang (Manager, Investment Department)

XINJIANG CHANGYUAN WATER RESOURCES INDUSTRY GROUP CO LTD

Xinjiang Changyuan Water Resources Industry Group Co Ltd (XCWR), a 60% owned subsidiary China Water Industry Investment Corp (CWIIG), acquired a 60% interest in Kuerle Huitong Yinquan Water Co Ltd, a water utility company, from Xinjiang Huitong Co Ltd, for CNY78 million in 2007. Kuerle Huitong Yinquan Water is engaged in the urban water supply for Korla, Xinjiang Uygur Autonomous Region. Korla has a population of 380,000, up from 40,000 in 1982. Xinjiang Huitong's water revenues were CNY23.1 million in 2005 and CNY27.6 million in 2006, with part year revenues of CNY12.3 million in 2007.

China Water Industry Investment Corp. was founded in October 2004 as a national investment company focusing on investment, construction and operation of projects for urban water supply, sewage treatment and desalination. CWIIG is active across China, particularly including Shandong, Xinjiang, Zhejiang, Inner Mongolia, Jiangsu, Qingdao and Sichuan. In 2007, CWIIG's daily water supply capacity was approximately 2.8 million m^3 per day.

In October 2007, China Water Affairs acquired 19.4% of China Water Industry Investment Corporation from Shanxi Wanjiazhai Yellow River Diversion Project General Company for CNY 175million.

Contact Details
Name: China Water Industry Investment Corp.
Address: No 10 Nan Niange, Xuanwu District, Beijing
Web: www.chinahho.com

Liu Zhenghong (Vice General Manager)
Ni Shiqiang (Manager, Investment Department)

XINJIANG URBAN CONSTRUCTION CO LTD

Xinjiang Urban Construction (Group) Co., Ltd. is principally engaged in real estate operation, municipal infrastructure construction, the supply of source water and new construction materials. During 2007, the Company obtained approximately 51% and 35% of its total revenue from its real estate operation and municipal construction, respectively.

Y/E 31/12 (CNYmillion)	2003	2004	2005	2006	2007
Turnover - Water	N/A	N/A	61.3	59.6	53.5
Turnover	405.9	385.9	453.3	558.1	792.4
Operating Profit	48.4	37.8	47.3	50.2	92.5
Net Profit	27.5	23.3	24.6	31.0	51.6
EPS (CNY)	0.17	0.08	0.08	0.11	0.16

In 2004 Xinjiang Urban Construction acquired the operational assets of water supply works in Shidunzishan from Urumqi Municipal Water Supply Company. These had an asset value of CNY216 million at the time.

Contact Details

Name: Xinjiang Urban Construction Co. Ltd.
Address: Chengjian Building, No. 133 Nanhu South Road
Urumqi, XNJ 830063, China
Tel: +86 991 488 9813
Fax: +86 991 488 9813
Web: www.xjcj.com

Liu Jun (Chairman)
Ji Wei (President)
Li Li (CAO)

INDIA

BHEL

BHEL (Bharat Heavy Electricals Limited) is the largest related energy and infrastructure sector-engineering and manufacturing enterprise in India. It is 67% held by the Indian Government. Activities include manufacturing water testing systems and desalination plants. BHEL's Industrial Systems Group (ISG) has been seeking to develop private sector operations in water and wastewater treatment projects, which has been identified by the company as one of the principal areas for growth between 2002 and 2007. As part of this, the company has developed its ability to provide systems and services for water management systems including potable water pumping stations, desalination plants, water treatment plants and sewage and effluent treatment plants.

In 2003, BHEL commissioned three potable water pumping stations in the vicinity of Bangalore, providing 0.27million m^3 of water per day. The fully automated project has been set up by ISG for the Bangalore Water Supply and Sewerage Board, under the Cauvery Water Supply Scheme Stage IV. This project has entered a three year O&M period.

In September 2003, BHEL gained a wastewater treatment construction and operations contract in Chennai. The INR364million (USD7.9million) contract was awarded by the Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB). The order envisages design, engineering, supply, installation and commissioning of mechanical and electrical equipment, besides automation and complete civil works of a 40,000m^3 per day sewage treatment plant at Nalsapakkam, Chennai. The facility entered service in 2005, when BHEL will take over the plant's Operation and Maintenance for ten years. The sewage treatment plant will have its own power plant which will be run by biogas, generated within the facility, making it self-sufficient and lowering operating costs.

BHEL, profit and loss account

Y/E 31/03 (INRmillion)	2003	2004	2005	2006	2007
Revenues	79,546	86,625	103,364	145,873	188,385
Operating profits	8,572	10,749	16,630	25,057	36,928
Pre-tax profit	8,024	10,148	15,816	26,544	37,361
Net profit	4,445	6,582	9,534	16,792	24,147
EPS (R)					

Contact Details

Name: BHEL
Address: BHEL House, Siri Fort,
New Delhi - 110049, India.
Tel: +91 11 26001010
Fax: +91 11 26493021
Web: www.bhel.com

Shri K Ravi Kumar (Chairman & Managing Director)
Shri C S Verma (Finance Director)

IVRCL CONSTRUCTION AND PROJECTS LTD

IVRCL Constructions & Projects Ltd (IVRCL) has developed a policy of moving its construction activities from civil engineering to lump sum turnkey projects, to design and execution projects and in three cases BO/BOT concessions: The Alandur WWTW; the Tirupur MSW facility and the athletes' village for the December 2002 National Games in Hyderabad.

IVRCL Constructions & Projects Ltd, profit and loss account

FY 31/03 (INRmillion)	2004	2005	2006	2007	2008
Net sales	7,735	10,450	15,014	23,465	36,981
Operating profit	559	809	1,290	2,392	3,660
Interest	-121	-214	-253	-325	-478
Profit before tax	340	595	1,037	1,851	2,853
Extraordinary items	88	0	0	0	0
Tax paid	35	26	108	436	748
Net profit	392	567	930	1,415	2,015
ESP (Rs)	N/A	N/A	8.8	12.4	16.1

The company's regional structure was changed into a divisional structure in 2001. Currently water systems and pipelines account for 61% of orders as of May 2008 against 30% in 1998. The total order backlog at the time was INR122billion, of which INR76billion related to water and waste management projects. 53% of revenues in 2005-08 were from water and waste management projects.

The company gained the first BO for wastewater in India: First STP Private Ltd (95%): JV with VA Tech Wabag Ltd (Balcke Duo & Wabag Technologies Ltd), a subsidiary of Austria's VA Tech AG. Then developing a 12 Ml/day (4.4million m^3 pa) WWTW at Perungudi for Alandur Municipality, where IVRCL has installed the underground sewerage system. 25,162 households have been connected to the system.

In 2005, the company's Chennai Water Desalination Ltd was awarded India's first desalination contract, a DBOOT worth INR4.9billion for a 100,000m^3 per day facility at Minjure, Chennai in Tamil Nadu. This is a joint venture with Spain's Befesa: 75% IVRCL, 25% Befesa. In June 2008, the project was 67% complete and is expected to enter service in January 2009.

IVRCL also has a 114km bulk water provision construction project for supplying water from the Ongur river to Chennai, which contains a five year O&M component.

Contact Details

Name: IVRCL Constructions & Projects Ltd
Address: M-22/3RT, Vijayanagar Colony ,
Hyderabad, Andhra Pradesh 500 057 India
Tel: 040 334 3678
Fax: 040 334 5004
Web: www.ivrcl.com

E. Sudhir Reddy (Chairman and MD)
R. Balarami Reddy (Finance Director)

JUSCO

Jamshedpur Utilities and Services Company Limited (JUSCO) is 100% held by Tata Steel. It was formed in August 2004 and incorporated in April 2004 for improving the management of utility operations in the Tata Steel developed town of Jamshedpur and for leveraging this experience into other Indian markets. As Tata Steel's Town Division, JUSCO has managed municipal services in Jamshedpur since Tata Steel's foundation in 1907 and currently serves an area of 94Km with a population of 700,000, with a continuous water supply for 500,000 people. Since 2007, JUSCO has gained a series of O&M and concession contracts in India as well as a series of design and build and management contracts in Madhya Pradesh.

JUSCO, profit & loss account

Y/E 31/03 (INRmillion)	2007	2008
Water services	N/A	1,214.2
Total revenues	2,198.9	2,722.7
Operating profit	191.9	302.4
Pre-tax profit	185.0	284.5
Post-tax profit	111.1	177.4

JUSCO, service delivery in Jamshedpur

Y/E 31/03	2004	2005	2006	2007	2008
Network coverage	66.0%	67.0%	72.1%	73.8%	78.0%
Partnership connections	0	613	4,181	5,789	9,585
Bacteriological compliance	N/A	93.0%	96.0%	98.5%	100.0%
Non-revenue water	N/A	33.0%	16.8%	13.9%	11.5%
Failures in water system	N/A	44	34	14	3
Energy consumption (Kwh per Ml)	N/A	332	319	309	283

JUSCO, concessions & O&M contracts

2008	Haldia	25 year BOT	250,000, water

The West Bengal city's 113,500m^3 per day water treatment works are to be managed for 25 years, along with the construction and subsequent management for 25 years of a new 113,500m^3 per day water treatment works. Other work includes billing and bill collection and management of the distribution system. The contract has been awarded to JUSCO, with Ranhill (Malaysia) and IDFC (India). The facility will cost INR10billion to construct and concession fees of INR12billion will be payable to the Haldia Development Authority.

2007	Jamshedpur	4 year O&M	50,000, water

An O&M contract covering the Tata Motor's township's 22,700m^3 per day water treatment works, and the distribution system, which serves 8,000 domestic connections.

2007	Kolkata	30 year BOT	30,000, water & wastewater

A BOT for a 13,600m^3 per day water distribution network and an 8,300m^3 per day sewage treatment work are being developed by JUSCO and Voltas (India) for the Naba Diganta Industrial Township, Sector V, Salt Lake in Kolkata.

Contact Details

Name: Jamshedpur Utilities & Services Company Limited (JUSCO)
Address: Sakchi Boulevard Road, Northern Town,
Bistupur, Jamshedpur - 831001
Tel: 91 657 2431914
Fax: 91 657 2424219
Web: www.juscoltd.com

Arun Narayan Singh (Chairman)
Sanjiv Paul (MD)
G S Basu (General Manager, Water Management)

LARSEN & TOUBRO

Larsen & Toubro (L&T) specialises in construction and heavy engineering projects. The Power and Transmission division has been involved in water and wastewater construction projects for some years. A typical project being water treatment works for the Hubli-Dharwar Urban Water Supply Scheme in Karnataka. Contracts gained during 2004-05 included: Providing and laying of pipeline from Modhera to Dharoi as part of a lift irrigation project at Mehsana, Gujarat for Gujarat Water Resources Development Corporation Limited (INR2,530million) and providing water supply system to Bangalore under the Greater Bangalore Water Supply Project for Bangalore Water Supply and Sewerage Board (INR1,658million).

The first BOT contract gained by L&T is in Andhra Pradesh; the Visakhapatnam Industrial Water Supply Project. This is a 55.5km pipeline from the River Godavari to augment the 153km Yeleru Left Bank Canal. Some 15% of the output is going to domestic consumers. Larsen & Toubro has a 32 year concession for operating the pipeline, which started in December 2004, with equity financing from the municipality (Andhra Pradesh Industrial Infrastructure Corporation) and from the private sector; L&T Holdings and PSL Holdings, with a permitted return of 15% over the concession.

Larsen & Toubro, profit & loss account

Y/E 31/03 (INRmillion)	2004	2005	2006	2007	2008
Revenues	98,068	132,550	149,660	179,010	251,870
Operating profit	8,899	14,339	15,730	22,090	34,050
Pre-tax profit	7,688	9,330	12,350	19,820	30,680
Net profit	5,327	9,838	10,121	14,030	21,730
EPS (INR)	21.41	38.81	38.03	50.22	75.59

Contact Details

Name: Larsen & Toubro
Address: L&T House, Ballard Estate, Mumbai 400 001, India
Tel: +91 22 2268 5656
Fax: +91 22 2268 5858
Web: www.laINRentoubro.com

A M Naik (Chairman & Managing Director)
Y M Deosthalee (Finance Director)
K Venkataramanan (President, Engineering & Construction Projects)

JAPAN

MITSUI

After the aborted attempt by Mitsubishi to acquire Berlinwasser International, Mitsui is the only Japanese company to have developed an international presence in the water outsourcing market. In March 2006, Mitsui acquired 35% in Thai Tap (see Company entry) in Thailand. The company subsequently acquired 85% of Earth Tech's Mexican activities from Aecom in 2008.

Mitsui, profit & loss account

Y/E 31/03 (JPYbillion)	2004	2005	2006	2007	2008
Revenues	2,980	3,526	4,116	4,991	5,740
Pre-tax profit	87	176	253	330	402
Net profit	68	121	202	302	410
EPS (INR)	43	77	114	174	227

In June 2001, Earth Tech acquired Atlatec S.A. de C.V. (Atlatec), the Environmental Division of Cydsa. S.A. de C.V. Atlatec specialises in the provision of water and wastewater treatment services to the refinery industry and is moving into the water distribution market. Concessions include wastewater treatment facilities for Pemex refineries located in Cd. Madero, Tula, Cadereyta and Minatitlán.

2004	Chihuahua	20 year DBFO	250,000, wastewater

The original project was awarded to Atlatec in 1994. It serves the northern region the city and treats 5million gallons of wastewater per day. Earth Tech has operated the plant since 1995. The client is the Junta Municipal de Agua y Saneamiento de Chihuahua.

2004	Chihuahua	10 year DBFO	500,000, wastewater

The second facility has been located in the southern region of the city and it treats more than 50million gallons of wastewater per day having entered service in 2006. The two facilities will account for the entire city's wastewater.

2002	Orizaba	20 year DBFO	117,000 water & sewerage

In September 2002, the company gained a USD15.5million DBO for a wastewater treatment plant in Orizaba by Fideicomiso del Sistema de Aguas Residuales del Alto Rio Blanco (FIRIOB), a local industrial grouping. The system will treat 80,000m³ of wastewater daily with a biochemical oxygen demand of 109.9tons per day. The facility will treat wastewater from Orizaba, as well as wastewater from a brewery, a paper mill and 12 other industries. Work is scheduled for completion in August 2004. 70% of the finance comes from FIRIOB and 30% from municipal sources.

2003	Xalapa	20 year DBFO	400,000 water & sewerage

A USD55million DBFO water and wastewater contract for the town of Xalapa was awarded to ET's Aguas Tratadas de Xalapa, including increasing the connection rate to these services from 50% to 100%. Works will include a 65,000m^3 per day water treatment plant due to enter service in 2005. Base revenues from 2005 will be USD7.0million pa.

Contact Details

Name: Mitsui & Co Ltd
Address: 2-1 Ohtemachi 1-chome, Chiyoda-ku, Tokyo 100-0004 Japan
Tel: 81-3-3285-1111
Fax: 81-3-3285-9819
Web: www.mitsui.co.jp

Nobudo Ohashi (Chairman)
Shoei Utsuda (President & CEO)

MALAYSIA

EMS ENERGY LTD

Eco Water was renamed EMS Energy in October 2007. As a result, the company's core activities now relate to the regional market for oil, marine and gas equipment and services.

Eco Water (EW) provides sewage and effluent treatment systems and services for municipal and industrial customers, with all of 2005 revenues being accounted for by these services. The company was founded in 1995 to provide wastewater treatment services to the Malaysian rubber industry. Almost all activities continue to be in Malaysia, which accounted for 98% of turnover in 2005. Currently activities are mainly based in southern Malaysia. China has been identified as the principal target market. The company was floated on the Singapore exchange in 2003.

Revenues (mainly water related) from Eco Water Technologies (M) in Malaysia fell from USD11.6million in 2005 to USD5.3million in 2007. The Eco Water activities were renamed Sewage treatment services (STS) and Industrial wastewater treatment services (IWTS).

EMS, profit and loss

FY 31/12 (USDmillion)	2003	2004	2005	2006	2007
STS (Sewage treatment systems)	15.09	14.70	10.14	8.55	4.12
IWTS (Industrial effluent systems)	2.68	0.00	1.69	6.73	2.54
Water treatment systems	0.17	0.00	0.00	0.00	0.00
FEES (Energy)	0.00	0.00	0.00	0.91	24.38
Turnover	17.94	14.70	11.83	16.19	31.04
Pre-tax profit	3.17	-0.54	-4.79	-4.25	-0.45
Net profit	2.35	-0.93	-3.82	-4.34	-1.29
Earnings per share ([S]USD)	2.64	-0.92	-3.71	-4.09	-1.07

Industrial customers vary year by year due to the relatively short-term nature of contracts. The main customer is the Ramatex Berhad Group, which accounted for 13.5% of 2000 turnover and 3.3% in 2002 including EW's activities in Namibia. In all, 17 industrial customers have accounted for 5% or more of group turnover in any one year between 2000 and 2002.

In June 2004, Eco Water entered into a joint venture with China Yunnan Lanping TL Hydraulic Power Co., Ltd to incorporate a joint venture company in Yunnan (Yunnan Tian Long Eco Water Hydro Investment Co., Ltd) to seek business in water & wastewater treatment and environmental related projects and energy such as hydro power. Eco Water is initially subscribing MYR6million to the JV, which will have a registered capital of MYR86million, mainly accounted for by debt finance. Currently, the project is awaiting local approval before construction can commence.

Contact Details

Name: EMS Energy
Address: 10 Tuas Avenue 11
Singapore 639076
Tel: +65 6861 2722
Fax: +65 6861 5655
Web: www.emsenergy.com.sg

Ting Teck Jin (Chairman & CEO)
Tan Joo Chai (MD)
Tan Siew Hee (Group Finance Manager)

GOLDIS

Goldis is a holding company for a group of private equity projects ranging from property development to organic fish farming. The company was founded in 2000 as a merger of two holding companies and floated on the KLSE in May 2002. Crest Spring Pte Ltd is a subsidiary of Gold China Sdn Bhd, which is a subsidiary of Goldis Berhad and is the holding company for its Chinese water and wastewater treatment operations. The company believed that it could gain six or seven water contracts by early 2007 and aims to serve 4million households in China. To date, three or four contracts are under development, two of which have entered into service. Goldis is also seeking contracts in Thailand, Indonesia and Abu Dhabi.

Goldis Bhd, profit & loss account

Y/E 31/01 (MYRmillion)	2004	2005	2006	2007	2008
Turnover – Water	N/A	N/A	N/A	3.0	2.7
Group turnover	106.0	157.5	183.0	215.3	174.7
Pre-tax profits	81.4	48.2	34.5	65.4	31.9
Net profits	60.9	44.4	31.7	64.7	32.2
Earnings per share (MYR)	0.19	0.14	0.10	0.21	0.10

MYR81.6million was invested in Chinese projects in 2008. Gold China revenues were MYR68.7million in 2007 and MYR71.4million in 2008, with pre-tax profits falling from MYR1.4million to MYR0.6million.

To date, three contract gains have been identified, covering approximately 500,000 people. In June 2005, Goldwater gained a contract with Tie Ling City (Liaoning Province) for a 100,000m^3 per day sewage treatment plant and a linked 50,000m^3 per day water treatment and recovery plant. The construction work will cost MYR75million, with the cost of the concession contract being MYR125million.

In March 2006, Goldis via its 81% held subsidiary Jiangsu Gold Water & Co. Ltd acquired 77.5% of Ganyu Xin Cheng Sewage Treatment Co Ltd for MYR7.75million (MYR3.62million). This covers two contracts:

1. a 20 year operating concession for a sewage treatment plant in DaJiJia, Western District of Yantai Economic and Technical Development Zone, Yantai, Shandong Province;

2. a 20 year concession for a 20,000m^3 per day sewage treatment plant in Ganyu County, Lianyungang City, Jiangsu Province. Construction is anticipated to take 2-3 years.

The Ganyu (Jiangsu Province) BOT entered service in 2007 and the Dajijia (Shandong Province) BOT entered service in 2008.

Contact Details

Name: Goldis Bhd
Address: Penthouse, Menara Tan & Tan, 207 Jalan Tun Razak, 50400 Kuala Lumpur, Malaysia
Tel: 603-2163 1111
Fax: 603-2163 7020
Web: www.goldis.com.my

Tan Lei Cheng (Chairman & Chief Executive Officer, Goldis)
Mickey Ng Koon Yee (Chairman, Gold Water)
Gary How Kim Kong (Chief Financial Officer, Gold Water)

INTAN UTILITIES BERHAD

Intan Utilities Berhad's (IU) 46.19% - held associate company Jauhari Harapan Sdn Bhd (JHSB) owns Metropolitan Utilities Sdn Bhd (MUC) and Air Utara Indah Sdn Bhd (AUI). In 1989, MUC gained a 20 year concession for bulk water provision, treatment and supply to Lembaga Air Perak, the state government of Perak's water authority. Under the concession, MUC supplies water to Ipoh, the state capital, and the regions of Ulu Kinta, Sungai Tarap and Tanjung Talang. In 1996, the concession was extended to 2024. IU was founded in 1995 and floated on the Kuala Lumpur Stock Exchange in July 1997. In June 1998, Veolia Water Asia Pacific Pte Ltd (VWAP) acquired 26% of IUB to become its largest individual shareholder. This share was subsequently increased to 30%. In January 2003, IUB sold 30% of the share capital of MUC to VWAP for MYR36million, with VWAP selling back its 30% stake to IUB and its other major shareholders.

Vista Meranti Sdn Bhd, a wholly-owned unit of HQZ Credit Sdn Bhd, raised its interest in Intan Utilities from 57.7% to 98.70% in January 2007 and delisted the company.

Intan Utilities, profit and loss account

Y/E 31/12 (MYRmillion)	2003	2004	2005
Water provision	48.0	48.2	8.1
Group turnover	78.7	100.2	829.0
Operating profit	12.0	20.1	25.0
Net income	6.4	11.8	18.2
Earnings per share (MYR)	0.17	0.12	0.19

The concession serves 600,000 people. Profits for the water activities in 2002 were MYR25.2million, falling to MYR16.4million in 2003. The fall in revenues and profits reflects the end of the construction contract for a new pipeline serving the state. During 2004, revenues and margins have stabilised. Following VWAP's stake acquisitions, VWAP's CGE Utilities has taken over the operation of the concession, while IUB continues to own the concession itself.

The company announced that in 2006 it is seeking to divest its water interests to concentrate on developing its retail activities. These have been deconsolidated in 2005 as an associate company. JHSB generated revenues of MYR112.2million in 2005 and a pre-tax profit of MYR18.4million.

Contact Details
Name: Intan Utilities Berhad
Address: Level 13 (East Wing), Berjaya Times Square, No 1 Jalan Imbi,
55100 Kuala Lumpur, Malaysia
Tel: +60-3-2935-8888
Fax: +60-3-2935-8043
Web: www.intan.com.my (currently 'under construction')

Freddie Pang Hock Cheng (Chairman)
Low Ah Ha (Director)
Su Swee Hong (Corporate Secretary)
Wong Pooi Cheong (Corporate Secretary)

Contact Details
Name: HQZ Credit Sdn. Berhad
Address: Level 12 (East Wing), Berjaya Times Square, No 1 Jalan Imbi,
55100 Kuala Lumpur, Malaysia
Tel: +60-3-2148-1009

KUMPULAN PERANGSANG SELANGOR BERHAD

Kumpulan Perangsang Selangor Berhad (KPS) was incorporated in 1975 as part of the state of Selangor's Kumpulan Darul Ehsan Berhad (KDEB). KDEB is designed to encourage private sector investment and participation in developing the state's infrastructure and services. After a partial divestment from KDEB, KPS was listed on the Kuala Lumpur Stock Exchange on 22 July 2003 and remains 60.2% held by KDEB. In recent years, the company has concentrated upon property development, highways and water concessions.

Principal water service company holdings, 2008

Syarikat Pengeluar Air Selangor Holdings Berhad (SYBAS)	30%
Perangsang Water Management Sdn Bhd	40%
Konsortium ABASS Sdn Bhd	55%
Syarikat Pengeluar Air Selangor Holdings Bhd, (SPLASH)	30%
Taliworks Corporation Berhad (see Company entry)	20%

SYBAS started in January 2005, distributing water to 6million people and industrial and commercial clients in the Klang Valley. Puncak Niaga holds the other 70% (see Company Entry). A controlling 55% stake in ABASS was acquired in April 2006.

In July 2003, Selangor awarded KPS a MYR2.5billion water treatment project under the Langat Two Water Scheme. This involves the transfer and treatment of water from Pahang state to Selangor in four equal stages of 545,000m^3 per day, pending ratification from the Federal Government. It is anticipated that Puncak Niaga (see separate entry) will take a significant stake in the project.

Selangor's proposed consolidation

The Selangor Government is seeking to consolidate the various concessions under KDEB from 2009. This is in part due to the forthcoming 37% tariff increase in 2009 by SYABAS under its concession agreement. This will involve KDEB buying out the various stakes in these concessions that it does not currently hold at a cost in the region of MYR12billion.

FY 31/12 (MYRmillion)	**2003**	**2004**	**2005**	**2006**	**2007**
Sales – Infrastructure & Utilities	N/A	N/A	N/A	62.1	134.1
Net sales	237.6	236.2	308.9	378.6	425.6
Operating income	38.4	-43.9	-12.0	43.5	91.9
Infrastructure & utilities profit	59.0	N/A	N/A	N/A	N/A
Pre-tax profit	107.0	-20.1	-123.2	18.2	36.1
Net income	57.0	23.5	-48.8	18.8	32.0
Earnings per share (Sen)	14	5	-11	4	7

Indonesia

In August 2003, KDEB signed a memorandum of understanding with Indonesia's PT Pengembangan Investasi Riau in Sumatra. KDEB and Malaysia's Putera Capital Bhd entered an understanding with PT Pengembangan Investasi Riau to provide a water supply from the Rokan River to Dumai village in a project worth MYR280million.

Contact Details:
Name: Kumpulan Perangsang Selangor Berhad
Address: 16th Floor, Plaza Perangsang,
Persiaran Perbandaran, 40000 Shah Alam
Tel: 603-5510 3999
Fax: 603-5510 9977
Web: www.kps.com.my

YBhg Dato' Haji Abd, Karim bin Munisar (Executive Chairman)
YBhg Datin Paduka Juma'ah Binti Moktar (Managing Director)

PBA HOLDINGS BHD

Perbadanan Bekalan Air Pulau Pinang Sdn Bhd (PBA), a subsidiary of PBA Holdings BHD, is a water supply company operating in raw water abstraction, water treatment and supply. In 1999 the Penang Water Authority was corporatised as PBA. PBA operates a 30 year water concession in Northern Penang, Malaysia. The company was floated on the Kuala Lumpur Stock Exchange in April 2002, when 45% of PBA's equity was sold by the state Government, raising MYR194million (USD51million).

The state has six dams with a total water storage capacity of 46million m^3. Currently, PBA has a total design capacity to supply about 1.17million m^3 of treated water per day from its 10 treatment plants to meet the average supply demand of 0.819million m^3 and consumption of 0.660million m^3. The network is in relatively good order, with non revenue water falling from 19.4% in 2003 to 16.9% in 2007, compared with the national average of 38.9%. Water revenues rose from MYR153.7million in 2005 to MYR162.6million in 2006. Water consumption grew from 195.8million m^3 in 1999 to 262.5million m^3 in 2007. A tariff review has been under consideration since 2005, as operating costs rose by 39% between 2000 and 2005 and have not been increased since 2001. There were 461,327 customers at the end of 2007, 405,235 domestic and 56,092 trade customers, serving a population of 1.52million. There were 338,523 customers in 1999.

Perbadanan Bekalan Air Pulau Pinang Sdn Bhd, profit and loss account

Y/E 31/12 (MYRmillion)	2003	2004	2005	2006	2007
Sales	149.0	153.7	162.3	171.8	181.2
Profit before tax	51.1	49.6	42.5	43.8	51.6
Net income	40.6	39.8	37.5	32.9	42.6
Earnings per share (Sen)	12.3	12.0	9.9	9.9	12.9

China

2003	Yi Chun City	30 year BOT	250,000 water

The BOT was awarded to PBA's Pinang Water Ltd. PWL is 26% held by PBA, along with the Ranhill Utilities (37%) and YLI Holdings Bhd (37%). Yi Chun is in Jiangxi Province, near Shanghai. The project involves the construction of a 100,000m^3 per day water treatment plant in two equal phases, the first entering service delivering an initial 5,000m^3 per day in 2006 and the second phase during 2008. The project is forecast to generate revenues of MYR243million with an initial investment of MYR12million.

Contact Details:

Name: Perbadanan Bekalan Air Pulau Pinang Sdn Bhd
Address: 32/F Komtar, 10000 Penang, Malaysia.
Tel: +60-4-263-4200
Fax: +60-4-261-3581
Web: www.pba.com.my

Y.A.B. Lim Guan Eng (Chairman)
Ir. Jaseni Bin Maidinsa (CEO)
Ang Weng Joo (CFO)

PPB GROUP BERHAD

PPB Group Berhad was founded in 1968. It is a conglomerate active in sugar refining, flour and feed milling, edible oils processing, oil palm cultivation, film exhibition and distribution, property development, shipping and waste management. Utilities and environmental engineering activities are undertaken by its 55% held subsidiary Chemquest Sdn Bhd. Chemical Waste Management Sdn Bhd (CWM) is owned held by Chemquest. CWM has been developed for design and build water and wastewater treatment projects in Malaysia, with six such projects worth MYR259million being carried out between 2005 and 2006. Flood mitigation projects and water and sewage treatment works engineering projects in Malaysia generated revenues of MYR258million in 2007.

In October 2005, Chemical Waste Management Sdn Bhd sold its 25% equity interest in Konsortium Abass Sdn Bhd for a total cash consideration of MYR132.0million. Konsortium Abass has a 30-year concession with the Selangor State Government to undertake the operation and maintenance of the existing facilities of the Sungai Semenyih Water Supply Scheme. See Company Entry on KPS.

PPB Group Berhad, profit and loss account

FY 31/12 (MYRmillion)	2003	2004	2005	2006	2007
Sales – Environmental Eng			70.9	102.2	95.3
Net sales	9,319.8	10,999.7	10,688.0	2,590.5	2,989.4
Operating income	554.6	617.0	538.4	233.5	298.6
Net income	371.3	400.7	394.6	560.7	6,973.0
Earnings per share (Sen)	37.8	37.9	33.3	47.3	588.2

China

Through the Beijing Kerry Veolia Waste Water Treatment Co (51% held by Chemquest) PPB is leading a consortium to run the MYR201million Lugouqiao Sewage Treatment Plant (Phase I) project in Fengtai District, Beijing. The contract was awarded in July 2003. KUL holds 51% of Beijing Kerry Veolia Waste Water Treatment Company (BKV) with Veolia Environnement. Kerry Utilities is subscribing MYR21.4million to BKV, which funded the construction of the sewage treatment plant with a treatment capacity of 100,000m^3 per day for the 2008 Beijing Olympiad. The consortium raised MYR85million for the project while the BWDG funded the MYR116million balance with loans from the World Bank. A 20 year operating concession started in July 2004 and will generate total revenue in excess of MYR1billion over the concession period. This is the first international WWTW BOT in Beijing.

PPB is also involved with Veolia's Hohhot water treatment contract in Inner Mongolia.

Contact Details

Name: PPB Group Berhad
Address: Wisma Jerneh, 38 Jalan Sultan Ismail,
50250 Kuala Lumpur, Malaysia
Tel: 603 2141 2077
Fax: 603 2141 8242
Web: www.ppbgroup.com
www.chemquest.com

Datuk Ong Nam Siew (Chairman)
Dato' Lim Chee Wah (Deputy Chairman)
Tan Gee Sooi (Managing Director)
Leong Chy Ying (CFO)

PUNCAK NIAGA BERHAD

Puncak Niaga (PN) was incorporated in January 1997 and listed on the Kuala Lumpur Stock Exchange in July 1997. PN is the holding company for Puncak Niaga (M) Sdn Bhd (PNSB), which was incorporated in 1989 and gained the water treatment operation and management contract for facilities responsible for 70% of water supplied to the state of Selangor and the Federal Territory of Kuala Lumpur in 1994. A second contract, for expanding the state's water treatment capacity was awarded in 1997. The population of Selangor and Kuala Lumpur is projected to grow from 5.37million in 2000 to 7.94million by 2010. Demand is forecast to rise from 3,088Ml/day in 2000 to 5,382Ml/day by 2010.

The first privatisation/concession agreement was signed in September 1994 for the operation of 27 working WTPs. The second concession, signed in March 1995, is for a construction come operation agreement for the 950Ml/day Sungai Selangor Water Supply Phase 2 Project (SSP2) treatment plant. Two further agreements cover two additional water treatment plans. In 2007, total treatment capacity was 1,930Ml per day. The concessions are due to expire at the end of 2020. 33.9% of PN's equity is held by Central Plus (M) Sdn Bhd and 2.9% by Corporate Line (M) Sdn Bhd, the original investors in PNSB. In 2005, PN took over from Veolia as the operator of the water treatment works.

Non revenue water was 33.0% in 2007, down from 42.8% in 1994, but still short of the 15% target for 2015. After the replacement of 202,420 meteoric 2007, no water meters are more than seven years old. During 2007, PN spent MYR400million replacing 500km of water pipes. The company had previously replaced 336km of its 5,600km network.

It is understood that PN is looking at ways of managing Indah Water Konsortium, the renationalised national sewerage and sewage treatment company. The State of Selangor is considering acquiring all water assets in the state. Bids of USD1.8-3.7billion were mentioned in the press during 2008.

Puncak Niaga, profit and loss account

Y/E 31/12 (MYRmillion)	2003	2004	2005	2006	2007
Turnover – Water	N/A	N/A	1,071.1	1,265.9	1,333.1
Turnover	578.3	566.8	1,144.9	1,428.1	1,389.8
Pre-tax profit	183.4	77.1	196.8	367.3	115.4
Net income	129.6	46.4	99.3	331.6	97.6
Earnings per share (MYR)	N/A	0.15	0.31	1.45	0.24

The main project has been the development of the SSP2 water treatment plant. Stage 1 was completed in 2000 with a capacity of 475million L per day. Stage 2, costing MYR533.9million, entered service in 2001 and supplies a number of towns and parts of Kuala Lumpur. It also has a daily production capacity of 475million L. Delivery in 2003 was 897.5million L per day. PNSB is involved in the financing, design, construction, operations, maintenance and management of SSP2. PNSB now produces 1,926million L of water per day. It is likely that a third construction phase will be required by 2010.

In December 2004 PN's 70% held subsidiary Syarikat Bekalan Air Selangor Sdn Bhd (SYABAS) was awarded a 30 year concession for operating the water supply services in the state of Selangor and the Federal Territories of Kuala Lumpur and Putrajaya by the Federal Government. It is understood that MYR2billion will be needed to replace 6,000km of supply pipes. The concession started in January 2005 and covers 7.1million people via 1.48million customer connections, rising to 7.3million people and 1.522million domestic and business connections in 2007.

SYBAS plans a total spending of MYR110billion during the 30-year water concession period in Kuala Lumpur, Selangor and Putrajaya. This will include MYR10.7billion for capital expenditure, including development and upgrading of its distribution system (MYR4.8billion); asset management and replacement (MYR2.1billion); non-revenue water (NRW) reduction programme including pipe replacement (MYR2.7billion); and provision for land matters (MYR1.1billion).

International developments

PN has opened affiliated offices in Brunei, Philippines, Indonesia and Cambodia with the longer term aim of entering these markets on a JV basis. In November 2002, PN gained a MYR234million contract

to lay a 1,124km water pipeline to Chennai in India which entered service in 2004 and involves a five year management contract.

In May 2008, Sino Water, a joint venture between PN (80%) and Environmental Holding (20%) of Singapore was formed. Subsequently, Sino Water acquired 83% of Luwei (Pingdingshan) Water based in Lushan, Henan Province in August 2008 and Xinnuo Water (Binzhou) Limited, a company based in Yangxin County, Shandong Province in July 2008.

Contact Details

Name: Puncak Niaga Berhad
Address: 1401-06, 14th Floor, Plaza See Hoy Chan,
Jalan Raja Chulan, 50200 Kuala Lumpur, Malaysia.
Tel: +(60) 3 201 8648
Fax: +(60) 3 201 8658
Web: www.puncakniaga.com.my

Y Bhg Dato Rozali bin Ismail (Chairman)
Lee Miang Koi (Director, Business Development)
Tan Seng Lee (Director, Finance)
Ruslan bin Hassan (Vice Chairman)

RANHILL BHD

Ranhill Bhd bought back its Ranhill Utilities Bhd subsidiary in October 2004. SAJ Holding Sdn Bhd (SAJH), the state of Johor Water Company was set up to operate the state's water supply services in 1994. In 2000, SAJH was awarded a 30 year concession to operate these services. SAJH was then reversed into Ranhill Holdings, which was in turn 60% held by Ranhill. After the reconsolidation, Ranhill Water Services was incorporated in March 2005 to cover Ranhill's water operations. In 2007, 2% of revenues came from the water activities in Thailand and China. This is expected to rise to 25% by 2010.

Ranhill Utilities Bhd, profit and loss account

FY 31/12 (MYRmillion)	2003	2004	2005	2006 [1]	2007 [2]
Water sales	0.0	0.0	359.9	732.4	533.3
Net sales	423.6	490.3	531.9	818.5	638.4
Operating profit	147.2	152.3	239.5	405.3	389.5
Pre-tax profit	134.5	121.8	152.5	254.7	242.3
Net income	94.5	79.4	116.0	189.3	206.2
Earnings per share (Sen)	32.09	26.695	39.40	64.25	70.01

2006 and 2007 have a 30th June year end
[1] For 18 months
[2] For 12 months

SAJH has 43 water treatment plants and a 9,000km distribution network. Water provided meets WHO and Ministry of Health standards, and distribution losses are planned to fall to 20% as part of a 2000-2003 infrastructure investment plan costing MYR680million. The MYR650million Semangar water supply scheme is to be operational in 2003. The 2004-08 capital spending plan is for MYR999million. Long term plans include expanding water consumption from 1,163 Ml/day in 2000 to 1,764 Ml/day by 2010. SAJH serves 3.4million people in 2005 and had 850,000 domestic, industrial and institutional customers at the end of 2007 compared with 787,894 in 2005. Non-revenue water was 32.5% in 2006 and 31.5% in 2007, with the aim of reducing this to 20% by 2010.

FY 31/12 (MYRmillion)	2004	2005	2006	2007
Water sales	443	470	508	534
Water consumption (m m^3)	297	309	318	334
Domestic customers	681,011	702,781	723,286	746,952
Non domestic customers	92,245	95,637	98,579	103,774

China

Operations in China and Thailand are carried out through Ranhill's 70% owned Ranhill KWI (RKWI). In July 2003, RKWI gained a 30 year BOT to build and operate a 100,000m^3 per day water treatment plant for Yichun City in Xiangji Province, China in two equal phases. RKWI holds 26% of the operating company, which will invest MYR37million into the project. RKWI gained two 30,000m^3 /day wastewater treatment BOT contracts in 2007; one serving the Hefei Chemical Industry Park and the other serving Xiao Lan.

2003	Yichun City	30 year BOT	125,000, water treatment
2007	Xiao Lan	29 year BOT	30,000m^3 /day wastewater
2007	Hefei	25 year BOT	30,000m^3 /day wastewater

PN acquired Global Environmental Solutions' Xinnuo Water (Binzhou) Ltd which was transferred to Sino Water (80% held by PN) in July 2008. The company is based in Yangxin County, Shandong and specialises in waste water treatment. Sino Water is planning to spend MYR250million on seven projects in China (including in Jiaxing, Da Shi Qiao, Tai Zhou Development Zone and Nanyang City) and a proposed 'Take Over-Operate –Transfer' fort a 300,000m^3 /day wastewater treatment plant serving Jiaxing Province, all of which by 2013 will generate revenues of MYR100million pa.

RANHILL BHD

Thailand

2000	Amata City	15 year O&M	9,600m^3 /day wastewater
2000	Amata City	15 year O&M	10,500m^3 /day water
2000	Amata Nakom	15 year O&M	10,500m^3 /day water
2005	Amata Nakom	20 year BOT	16,000m^3 /day wastewater
2005	Amata Nakom	20 year BOT	20,000m^3 /day water
2006	Amata Nakom	20 year BOT	Recycled water

In Thailand, RKWI has been operating three wastewater and potable water treatment plants since 2000, serving Amata City Industrial Estate, through a 15 year BTO. RKWI received a Letter of Award in May 2005 for a second 20 year BOT for a 10.6 Ml/day water and a 9.6M/day wastewater and water recycling plant in Amata Industrial Estate (Phase 6). This will include a reverse osmosis facility and will be run by Anorak Water Treatment Facilities Co Ltd (AnuRAK), a special purpose vehicle. These contracts generated MYR2.5million of revenues in 2007.

Contact Details

Name: Ranhill Utilities Bhd
Address: 37th Floor, Empire Tower, 181 Jalan Tun Razak, 50400
Kuala Lumpur, Malaysia.
Tel: +60-3-2171-2020
Fax: +60-3-2775-8775
Web: www.ranhill.com.my
Web: www.saj.com.my

Tan Sri Dato' Paduka (Dr) Sallehuddin Jaafar bin Mohamed (Chairman)
Dato' Dr. Shahir bin Nasir (Non-Executive Director)
Hamdan Bin Mohamed (President)
Ahmad Zadhi Bin Jamal (CEO)

SALCON ENGINEERING BERHAD

Salcon Engineering Berhad (SEB) was set up as a subsidiary of Kumpulan Emas Berhad in 2002, building upon KEB's experience in the palm oil industry and engineering services for processing palm oil and treating process effluents and for providing water for these facilities. KEB has been involved in 450 water and wastewater engineering projects in Malaysia, Thailand, Vietnam and China since 1974. SEB was Listed on the Kuala Lumpur Stock Exchange in August 2003 via a reverse takeover of Seng Hup Corporation Bhd.

SEB concentrates on water and wastewater plant design, engineering, installing and O&M, along with related projects for the palm oil, timber and agricultural sectors. The Water & Environmental Division accounts for more than 50% of the company's turnover and profits. SEB was part of the consortium that gained the MYR308million Greater Ipoh Water Supply II BOT in Perak. In October 2002, SEB gained a 10 year O&M contract for the Sungai Terip water treatment plant in Negeri Sembilan, including five supply dams and a raw water pumping station. The contract is worth MYR200million. A non revenue water reduction contract in Sandakan was completed in 2005 and has entered a second phase from February 2006.

YE 31/07 (MYRmillion)	2003	2004	2005 [1]	2006	2007
Water & environment turnover	5.0	88.8	109.2	73.8	87.2
Wastewater turnover	1.4	51.5	42.4	38.9	36.4
Turnover	7.5	146.8	162.4	121.3	134.6
Water & environment profit	1.4	6.4	-29.8	-4.4	-10.9
Wastewater profit	0.1	4.2	1.7	2.2	3.3
Group operating profit	2.2	11.0	-27.7	-1.2	1.0
Net profit	6.2	9.3	-27.8	4.3	-7.8
EPS (MYR)	N/A	0.04	-0.10	0.02	-0.02

[1] 2005 is for the 17 month period ended 31st December 2005

Salcon has projects serving 3.4million people in Vietnam and China.

Vietnam

1999	Ho Chi Minh City	20 year O&M	400,000 water

In Vietnam, Salcon was part of the Malaysian consortium involved in the USD35.8million 100,000m³ per day Binh An Water Supply Scheme for the Thuan An District of Hi Chi Minh City. The O&M element runs for 20 years from 1999.

China

2005	Chenggong Country	30 year BOT	120,000 water

Salcon Yunnan (HK), a 100% held subsidiary of holds 60% of a concession to construct and operate a 20,000m³ per day expandable to 60,000m³ per day water treatment plant and managing the distribution services for the district of Chenggong, Kunming City. Chenggong is to house the new Kunming Municipal Government administrative buildings, at least 11 universities and a logistics centre for flowers and vegetable exports.

2006	Haining	30 year BOT	500,000 water

Salcon Zejiang (HK) holds 60% of a joint venture to build and operate a 300,000m³ per day water treatment plant in two 150,000m³ per day phases, the first was completed in November 2007 and the second will enter service in 2010.

2008	Nan An City	30 year BOT	1,000,000 raw water

SALCON ENGINEERING BERHAD

Salcon Fujian (HK) holds 65% of a consortium for a BOT project to supply raw water to Guan Qiao, Shui Tou and Shi Jing three towns in Nan An City in Fujian. The two phases will build a 48km pipeline to provide 345,000m³ of raw water per day at a total cost of MYR368million.

2004	Changle County	50 year BOT	600,000 water

The Shandong Salcon Changde Water Supply Company holds 75% of the equity of the Shandong Changle Salcon Water Supply Company, which has a 50 year water provision services concession for Changle County in Shandong. The stake was acquired for USD1.44million. The contract started in April 2005, involving managing a 20,000m³ per day water treatment plant and building a second one with a similar capacity. In 2008, the contract was extended to involve the construction of a new 100,000m³ water treatment plant.

2006	Changle County	Acquisition	600,000 wastewater

Shandong Salcon Changde Water Supply Company acquired the Shandong sewage treatment plant in April 2005. 20,000m³ per day water treatment plant and building a second one with a similar capacity. A 20,000m³ per day wastewater works (upgradable to 40,000m³ per day) is being taken over.

2008	Changle Country	30 year BOT	Raw water

Shandong Salcon Changde Water Supply Company will invest MYR109million in a BOT project to supply raw water from Gaoya Reservoir 38km to a new 100,000m³ of water treatment works which is also being built by Salcon.

2005	Linyi	30 year BOT	1,000,000 water

In November 2005, a Strategic Partnership Agreement for the development of a 0.15million m^3 per day water supply project in Linyi City, Shandong Province was signed. Salcon's other shareholders are the Linyi Municipality Industrial Product Jin Yin Real Property Development Company Ltd, China and the Linyi Municipality Water Supply Company. This is a 30-year concession to design, construct, operate, maintain, distribute potable water, with an estimated project cost of MYR600million. The JV company will have an initial registered capital of MYR200million. The project started in January 2006 and is currently delivering 80Ml/day of water.

Contact Details

Name: Salcon Engineering Berhad
Address: 15th Floor, Periaran Summit,
Persiaran Kewajipan, USJ 1,
47600 UEP, Subang Jaya, Selangor, Malaysia
Tel: 6(03) 8024 8899
Web: www.salcon.com.my

Dato Seri Goh Eng Toon (Chairman)
Lim See Teok (CEO)
Dr Teoh Seng Foo (President)

TALIWORKS CORPORATION

Taliworks Corporation (TC) has been involved in the management, operation and maintenance of water treatment plants and the supply of treated water since Malaysia's first privatisation in 1987. It supplies 1,039.5million m^3 per day of water to the state of Selangor, the federal territory, and Langkawi Island, serving 2million people through the operation of six water treatment plants.

Taliworks's Malaysian water companies are as follows:

1. Sungai Harmoni (100% held): Sungai Selangor Phase 1. One WTW, 950million L/day capacity, expires 2030.
2. Taliworks Langkawi (100% held): Five WTWs in Langkawi Island & Perlis, 89.5million L/day capacity; granted in 1995 and expires 2020. This includes 20,650 customer accounts.

In 2007, the two companies sold 772 MLD of water, with 733 MLD from SSP1 and 42 MLD from Langkawi.

Taliworks Corporation, profit and loss account

Y/E 31/12 (MYR)	2003	2004	2005	2006	2007
Water treatment	123.9	131.3	126.5	131.6	126.3
Total turnover	134.8	171.5	196.1	142.9	191.0
Pre-tax profit	50.8	38.3	57.4	50.3	46.7
Net profit	36.6	27.7	44.1	35.7	33.7
Earnings per share (Sen)	10.4	7.9	12.5	9.8	9.0

China and Indonesia

2003	Guanghan	30 year BOT	200,000 wastewater

Guanghan San Xin Dui is a 50,000m^3 per day wastewater treatment works in Sichuan Province, which is operated by Puresino (Guanghan) Water, an associate of Taliworks. The facility entered service in 2007.

After gaining a waste management concession in Tianjin in 2004, the company is seeking water and wastewater concessions in China, Indonesia, Vietnam and the Middle East. In 2007, the company raised MYR225million through a bond issue for funding future expansion and aims to generate 50% of its revenues from international activities by 2012. In November 2007, the company was in talks regarding over 10 wastewater and waste management projects in China.

In April 2008, Salcon signed a two year cooperation agreement with Shenzhen Hanyang Investment Holding Co to develop water, wastewater and waste management projects in China. Shenzhen Hanyang has operations in twelve cities across the PRC.

Contact Details

Name: Taliworks Corporation
Address: No. 28, Jalan Wan Kadir 1, Taman Tun Dr. Ismail
60000 Kuala Lumpur, Malaysia
Tel: +60-3-7725-7110
Fax: +60-3-7725-7099
Web: www.taliworks.com.my
Web: www.saj.com.my

Y Bhg Dato Haji Karim bin Munisar (Chairman)
Dato Lim Ak Bak (Vice Chairman)
Tuan Haji Abdul Rahman Bin Haji Siraj (CEO)
Lim Chee Meng (Director)

YTL CORPORATION BHD

YTL Corporation Bhd (YTL) has interests in power generation, construction contracting, cement manufacture, property development and hotels, and resorts and leisure. YTL Power International (61% held by YTL) is one of the largest independent power producers in South East Asia and has investments in regulated utilities in Australia.

YTL Corporation Bhd, profit and loss account

Y/E 06/12 (MYRmillion)	2003	2004	2005	2006	2007
Water & sewerage turnover	1,735	2,037	2,328	2,369	2,649
Total turnover	4,027	4,409	4,937	5,496	6,015
Operating profit	1,439	1,770	1,870	2,253	2,423
Net profit	417	707	558	698	755
Earnings per share (Sen)	39	48	40	49	51

YTL acquired Wessex Water Plc (WW) for GBP1,240million in May 2002 when WW was sold by Enron. This is the first case of a company based in the developing economies acquiring a water and sewerage company from the developed world. In July 1998 Enron agreed terms with WW for a recommended cash offer for WW. The offer valued WW at GBP1.7 billion: GBP1.36 billion for WW's share capital and WW's net borrowings, which were GBP325million on March 31 1998.

It is understood that YTL is examining potential projects in Asia.

Wessex Water Services Ltd, profit and loss account for appointed businesses

Y/E 31/03 (GBPmillion)	2004	2005	2006	2007	2008
Water turnover	N/A	N/A	N/A	123.8	138.4
Sewerage turnover	N/A	N/A	N/A	237.6	252.3
Turnover	288.7	303.6	340.5	361.4	390.7
Operating profit	101.8	123.2	152.5	165.0	191.9
Pre-tax profit	59.0	53.1	84.2	100.4	122.9

Wessex Water supplies water to 1.2million people and sewerage services to 2.6million people in south west England. Leakage was eased from 73million L/day since 2004-07 to 72million L/day in 2008, which at 20% is seen as the economic level. During 2005-10, the emphasis in terms of projects has shifted from sewage treatment towards drinking water quality and avoiding sewage flooding.

Contact Details
Name: Wessex Water Services Ltd,
Address: Claverton Down Road, Bath BA2 7WW.
Web: www.wessexwater.co.uk

Colin Skellet (Chairman)

Contact Details
Name: YTL Corporation Bhd
Address: 11th Floor, Tiong Lay Plaza,
55 Jalan Bukit Bintang, 55100, Kuala Lumpur, Malaysia.
Tel: +60-3-2142-6633
Fax: +60-3-2141-2703
Web: www.ytl.com.my

Y Bhg Tan Dato Seri Yeoh Tiong Lay (Chairman)
Tan Dato Sri Francis Yeoh Sock Ping (MD)
Bhg Dato Yeoh Seok Kian (Deputy MD)

MEXICO

AQUASOL

Aquasol is a privately owned Mexican water engineering and operations company founded in 2000 to bid for municipal water treatment concessions in Mexico. In 2003-04, the company gained two concessions and was amongst the finalists for at least another two bids.

In December 2003, Aquasol secured a 20 year, USD30million BOT concession for a 1,200L per second (103,500m^3 per day) agricultural water plant in Michoacan state capital Morelia. The facility will enter into service by the end of 2004. In January 2004, Aquasol secured a USD25million, 20 year BOT concession in Hidalgo State's capital Pachuca. The 400L per second (34,500m^3 per day) Pachuca plant will provide two levels of water quality: one for agricultural use and another for industrial customers. Operations are expected to begin later in 2004. In each case, Aquasol is working in a 50-50 JV with Tecnologia Intercontinental (Ticsa, industrial wastewater treatment plant engineering) based in Mexico City.

Aquasol strategy is to bid for 20 year BOT concessions because of the federal government's commitment to provide up to 40% of project financing. Typically, private equity makes up another 25% of costs and loans account for the remaining 35%. The company aims to bid for other projects in Latin America when similar financial packages are made available.

Contact Details
Name: Aquasol SA de CV
Address: Paseo del Carmen 30, Col.
La Asuncion, 500000 Toluca, Mexico
Tel: + 722 271 02 73

Alfredo Marin Pasos (Operations Director)
Rigoberto Mena (Manager)

PHILLIPINES

BENGUET CORPORATION

Benguet Corporation was founded in 1903 and is the oldest mining company in the Philippines. Due to the long term decline of its copper and gold mining activities, the company has decided to enter the water concessions market in the Philippines.

Benguet Corporation, profit and loss account

FY 31/12 (PHPmillion)	2003	2004	2005	2006	2007
Net sales	264	296	307	257	299
Operating income	-82	-48	-134	-172	-136
Net loss	-419	-793	-270	-358	271
Loss per share (PHP)	-3.67	-6.95	-2.37	-3.14	2.31

In 2003, Benguet gained a 136 month contract to manage the Kailangan, Bukidnon water system in Mindanao state in the Southern Philippines. Kailangan had a population of 27,000 in 1995, with 940,000 living in the province of Bukidnon. This was handed over at the end of 2005.

In 2005, Benguet also gained a similar contract serving Itogon and Baguio City, the capital of north Luzon and the nation's summer capital. The Baguio City water project is estimated to cost USD60million and will include the construction and development of a water reservoir and distribution network for the entire city, providing 50-70million litres of water a day. Baguio City had a population of 250,000 in 2000, with the population growing at 5% pa. Benguet has been seeking to provide additional water to the city since 1995, using the former Antamok open mine in the area as a reservoir with a potential capacity of 9million m^3 to provide 50,000m^3 of water per day. The 25 year contract can be renewed for a further 25 years and is expected to enter service in 2008.

Contact Details

Name: Benguet Corporation
Address: 3F, Universal Re-Building, 106 Paseo de Roxas, Makati City, 1226 Philippines
Tel: 632 812 1380
Fax: 632 813 6663
Web: www.benguetcorp.com

Fernando Martin G Romalodez (Chairman)
Benjamin Philip G Romalodez (President and CEO)
Leopoldo S Sision III (VP, Water)
Salvador Pabalan (VP, Finance)

MANILA WATER CO

In 1997, Metro Manila gained the 25 year concession for operating Manila's East Zone, where 5.6million people live. 35% of the company's equity was sold when the company was Listed in 2005.

Manila Water Co, profit & loss account

Y/E 31/12 (PHPmillion)	2003	2004	2005	2006	2007
Water	3,062.3	3,357.2	4,538.4	5,250.2	6,241.1
Environmental Charges	305.9	339.9	464.9	532.1	637.3
Sewerage	198.6	213.6	279.8	308.1	348.7
Interconnection	1.2	0.0	0.0	0.0	0.0
Interest	89.9	127.2	218.9	295.0	152.7
Other	120.0	253.4	261.1	399.3	445.6
Total revenues	3,777.9	4,291.2	5,763.1	6,784.7	7,825.4
Net profits	1,150.5	1,329.7	2,011.5	2,394.2	2,419.0
Earnings per share (PHP)	0.60	0.85	0.93	1.05	1.06
Billed water (MLD)	767	825	864	948	1,040
Non revenue water (%)	50.7%	43.4%	35.5%	30.3%	23.9%
People served (million)	4.7	5.1	5.2	N/A	5.6
Service connections (000)	397	426	458	N/A	589
Households connected (000)	515	556	600	892	986
Urban poor - connections (000)	101.0	123.3	141.0	170.2	214.0

A number of service quality targets have been set. Sewerage and sewage treatment have made limited progress to date, but Manila Water almost achieved its goal of universal 24 hour water availability by 2007 against 26% availability in 1996, with 99% availability by the year end and by 2008, there had been a reduction in non revenue water from its 63% level in 1997 to 20%. Household connected have increased from 325,000 in 1997 to 741,000 by 1Q 2006 an increase of 3million people being served. Under the Tubig Para Sa Barangay scheme, 644 projects have resulted in 1.3million people from 214,000 poor households have been connected to the water network since 1998, including 450,000 since 2005.

Capex in 2007 was PHP4.4billion. The World Bank funded USD85million Manila Third Sewerage project aims to boost sewerage coverage from 10% to 30% by 2010, connecting 3.3million people. A PHP187billion 2007-22 investment plan has been drawn up. Sewerage coverage has increased from 3% in 1997 to 12% by 2007. This is well behind original expectations. The current plan is to increase coverage to 30% by 2012 and 63% by 2022.

Contact Details

Name: The Manila Water Company Inc
Address: 489 Katipunan Road,
Quezon City, 1105 Philippines
Tel: (632) 926 7999
Web: www.manilawater.com

Antionio Aquino (President)
Femando Zobel de Ayala (Chairman)

METRO PACIFIC INVESTMENTS

The Metro Pacific Investment Co (MPIC) is an investment holding company. In June 2008, MPIC acquired shares in Maynilad from First Pacific and Ashmore Funds for USD197million taking its interest to 51%. MPIC now holds 55% of Bidco (DMCI-MPIC Water Co), the company which gained the 84% stake in Maynilad Water from MMWSS in January 2007. D.M. Consunji holds the other 45% of Bidco.

Maynilad Water Services, Inc. (MWSI) was awarded the western half of the Metro Manila water distribution concession in August 1997. MWSI has suffered from a mid concession-life crisis when MWSI took on 90% (USD800million) of MWSS' foreign debt, which between 1997 and 2000 doubled in Peso terms from PHP20billion to PHP40billion due to the Peso's weakness. Although MWSI gave notice to halt the concession in March 2003, continuing arbitration and associated legal processes have meant that it continues to run under its current structure. The November 2003 and April 2004 agreement would have resulted in a write-off of PHP3.8billion (PHP3.2billion in equity and PHP629million in debt) and the loss of control in MWSI. On April 29, 2005, MWSI and its bank creditors, along with the MWSS executed a Debt Capital and Restructuring Agreement. As part of this, MWSS acquired 83.97% of the shares of MWSI, with Ondeo holding the remaining shares. In return, the creditors released it from loan obligations worth a total of USD220million.

MPIC, profit & loss account

Y/E 31/12 (PHPmillion)	2005	2006	2007
Total revenues	2,173	1,799	7,006
Maynilad – Net profit	N/A	1,004	1,255
MPIC – Net profit	209	-689	203
Earnings per share (Ps)	0.19	-0.72	0.06
Billed water (million m^3)	N/A	262	286
Non revenue water (%)	69%	68%	66%
People served (million)	N/A	N/A	5.9
Service connections (000)	660,000	677,985	703,519
Sewage connections (000)	N/A	N/A	67,420

The West Zone concession area covers eleven cities in Metro Manila (Pasay, Caloocan, Las Piñas, Parañaque, Valenzuela, Muntinlupa, Manila except portions of San Andres and Sta. Ana, some parts of Makati and Quezon City, Malabon and Navotas) and one city (Cavite City) and five towns in Cavite province (Rosario, Imus, Noveleta, Bacoor and Kawit).

There were 710,450 customers in March 2008. In February 2008, Maynilad repaid its outstanding USD232million loan and the company was released from administration. In 2007, 72% of the zone's 7.52million people were covered. 24 hour coverage for the entire concession area is planned for 2012, along with lowering NRW to 40%. A PHP44billion capex programme is underway from 2008 to 2012, with PHP8billion for 2008 against PHP5billion in 2007.

Contact Details

Name: Metro Pacific Investments
Address: 10/F MGO Building, Legazpi cor. Dela Rossa Street,
Legazpi Village 0721 Makati City, Philippines
Tel: (632) 888 0888
Web: www.mpic.com.ph

Manuel V Pangillan (Chairman)
Jose Ma K Lim (President & CEO)
Randolph T Estrellado (CFO)

SINGAPORE

ASIA ENVIRONMENT HOLDINGS LTD

Asia Environment Holdings (AEH) was listed on the Singapore Stock Exchange in November 2003. AEH operates in China under the Penyao trade name and since its foundation in 1984 has progressively moved from water engineering to turnkey contracting to BOT contracts. More than 300 projects have been completed to date. Since 2001, 13 BOT and TOT contract awards in China have been identified, including water provision contracts for 1.875million people and wastewater treatment contracts covering 800,000 people as well as a series of industrial wastewater treatment contracts.

AEH, profit & loss account

Y/E 31/12 (CNYmillion)	2003	2004	2005	2006	2007
Water engineering turnover	22.4%	29.8%	41.3%	27.1%	20.1%
Turnkey projects turnover	77.6%	70.2%	57.6%	72.9%	79.1%
BOT turnover	0.0%	0.0%	1.1%	0.0%	0.8%
Group turnover	93.6	78.5	225.3	272.6	483.5
Net profits	30.4	12.9	43.2	64.4	81.8
Earnings per share (RMB cents)	16.72	4.77	15.03	22.28	25.36

2008	Danyang	30 year BOT	500,000 water

In July 2008, AEH entered into a Preliminary Agreement with Danyang Municipal Government regarding a BOT project involving a group of six wastewater treatment plants in Fangxian, Daoshu, Erling, Xinqiao, Houxiang and Shitu towns in Danyang City, Jiangsu Province. This involves the construction and operation of six wastewater treatment plants and the installation of connecting pipes of approximately 48km long. The total planned capacity of the wastewater treatment plants is 140,000m^3/day, with a Phase 1 capacity of 55,000m^3/day.

2008	Xinning	30 year BOT	350,000 wastewater

In May 2008, AEH's Xining Penyao Wastewater Treatment gained a concession to acquire, expand and operate a wastewater treatment plant in Xining City, Qinghai Province. This involves an existing wastewater treatment plant with a capacity of 85,000m^3/day and expanding its treatment capacity to 135,000m^3/day. The investment value of the project is approximately CNY238million.

2008	Anqing	30 year BOT	Industrial wastewater

A contract for the Anqing Economic Development Zone for Anqing, Anhui province for a 30 year concession involving the construction of a 10,000m^3/day wastewater treatment plant.

2007	Lishui	28.5 year BOT	100,000 wastewater

In November 2007, AEH gained a concession to build and operate a wastewater treatment plant in Lishui county, Nanjing city, Jiangsu province for a wastewater treatment plant with total capacity of 40,000m^3/day.

2007	Jingdezhen	20 year BOT	250,000 wastewater

Jingdezhen City is in Jiangxi Province. The project involves the construction of a wastewater treatment plant with a total capacity of 80,000m^3/day. The total investment of the project, which was announced in June 2007 is estimated at CNY78million.

2007	Wangcheng County	27 year BOT	125,000 water

AEH's Jiangsu Penyao Environmental Engineering Contract Co. has entered into a BOT with Wangcheng County Government to build and operate a wastewater treatment plant in Wangcheng

ASIA ENVIRONMENT HOLDINGS LTD

County, Hunan Province. This involves the construction of a wastewater treatment plant with total capacity of 40,000m^3/day. The total investment of the project is CNY57million.

2007	Shanghai	26 year BOT	Industrial wastewater

In April 2007 AEH gained a BOT with the Shanghai Jinshan Zone Industrial Park II to build and operate a wastewater treatment plant in the Jinshan Industrial Park II. This involves the construction of a wastewater treatment plant with total capacity of 50,000m^3/day, of which the Phase 1 capacity is 25,000m^3/day. The total investment for the first phase of the project is estimated at CNY100million.

2007	Suzhou	20 year BOT	Industrial wastewater

A BOT for a wastewater treatment facility with a total capacity of 50,000m³ per day and laying of a wastewater piping network within the Fenhu Economic Development Zone. The first phase, costing CNY95million involves the construction of a 25,000m³ per day wastewater treatment plant and laying of the wastewater piping network.

2006	Harbin	20 year BOT	Industrial water & wastewater

In October 2006, a CNY185million contract for the Harbin Binxi Economic Development Zone was signed. When complete, the plant will have capacity to treat 60,000m^3 per day of water and to treat 50,000m^3 per day of wastewater discharged by the Harbin Binxi Economic Development Zone. Phase I of the project is estimated to be around CNY190million for half the capacity for both facilities.

2006	Zhangzhu	25 year TOT	100,000, wastewater

AEH's Yixing Penyao Water Company gained the TOT in September 2006 for Zhangzhu Town, Yixing City, Jiangzu Province, the People's Republic of China. This involves the acquisition of a wastewater treatment plant for SGD16million with a treatment capacity of 10,000m^3/day and operating the plant for a 25 years concession period. The total revenue to be derived over the concession period amounts to CNY114.6million. AEH has the right to develop the 2nd and 3rd phase of the wastewater treatment plant, each phase expanding the treatment capacity by 10,000m^3/day. The Company intends to fund the acquisition from its internal resources and bank borrowings.

2005	Pizhou	25 year BOT	250,000, water

In September 2005, AEH gained a CNY82million 25 year BOT contract for building a 100,000m^3 per day water treatment works serving Pizhou City: in Jiangsu Province. The work will be carried out in two equal phases, Phase 1 (CNY43million) being completed by the end of 2006. In November 2005, a joint venture was set up between AEH (25%), Dayen (50%, see Company Entry) and Lionguard (25%, Richfull Holdings of HK, an infrastructure investment company) for the project.

2004	Nanchang	25 year BOT	750,000, wastewater

The Nanchang wastewater treatment BOT was signed in 2004. It covers the construction of a 200,000m^3 per day wastewater treatment plant, with a 20 year operations contract. Construction was 62% complete by the end of 2005 and the facility is entering service during 2006 with a total investment of CNY171million. AEH holds 12.88% of the operating company. The 200,000m^3 per day facility entered service in November 2007. The contract will generate revenues of CNY625million. AEH's Nanchang Water Holdings Private Limited acquired the outstanding 49% of Nanchang Penyao Water Supply Co. in November 2007.

2004	Nantong	25 year BOT	550,000, water

ASIA ENVIRONMENT HOLDINGS LTD

In July 2004, AEH signed a CNY398million deal to build a water treatment plant in Nantong City in Jiangsu province. The 25 year BOT project will treat and supply 200,000m^3 of water daily to the city. AEH have an option to construct two more phases to provide extra capacity of 400,000m^3 of water per day. Since 2007, AEH has held 100% of the contract. In May 2006 SIIC Shanghai subscribed USD5million for a 30% holding in the company to provide working capital for the construction work.

Contact Details

Name: Asia Environment Holdings Limited
Address: 77 Robinson Road, 15-01 SIA Building,
Singapore 068896, Singapore
Tel: +65 6323 2343
Fax: +65 6323 4223
Web: www.asiaenv.com

Wang Chun Lun (Chairman)
Wang Hong Chun (CEO)
Koh Poh Yeoh (Chief Financial Officer)
Wang Chun Lin (Director, Chairman Penyao)

BOUSTEAD SINGAPORE LTD

Boustead Singapore is an investment company specialising in a range of engineering applications, information technology and investment services and dates back to 1828. Engineering activities include process control systems. Water engineering activities are carried out through Salcon Limited (not related to Salcon Bhd., see Malaysia company entry), of which Boustead acquired 63% in 2003, increasing this to 100% in 2006. Salcon Limited has to date completed 800 water and wastewater treatment projects in 57 countries, mainly in Asia and the Middle East.

Y/E 31/03 (USDmillion)	2004	2005	2006	2007	2008
Group turnover	227.0	227.4	289.3	343.9	438.3
Operating profits	29.9	44.6	54.4	54.0	75.8
Net profits	13.3	26.7	38.7	35.2	51.5
Earnings per share (USD c)	6.3	6.2	9.9	13.9	20.1

Indonesia

In July 2004 Boustead signed a Heads of Agreement with the Sultan of Yogyakarta, for the Government of Yogyakarta Province, Indonesia for a 25 year DBOT for the supply of treated water to the city of Yogyakarta and its sub districts of Sleman and Bantul with a total population of 2.2million people. Currently, just 19.8% of the Province is provided with potable water. With the completion of the whole project, it is expected that 60 to 70% of the population will be supplied.

The project is to be carried out in three phases. Phase 1 will have a capacity of 100,000m^3 per day and will cost USD35million to develop and will be completed by the end of 2006. Phase 2 is expected to be executed by 2009 and will expand the water supply facility to a capacity of 300,000m^3 per day for USD20million. Approval for Boustead's 51% investment in PT Citra Tirta Mataram was received in July 2005. The Engineering, Procurement and Construction (EPC) contract for the whole project will be carried out by Boustead's Water and Environmental Division, which includes Salcon Limited. The EPC portion of the contract is expected to generate material income for Boustead's Water and Environmental Division.

China

In July 2005, Boustead was awarded a CNY137million contract for the construction of a 40,000m^3 per day desalination facility serving Tianjin. The facility will enter service by the end of 2006, when the company will operate it for an unspecified period.

Contact Details

Name: Boustead Singapore Limited
Address: 63 Ubi Avenue 1, 06-01 Boustead House,
Singapore 408937, Singapore
Tel: +65 6747 0016
Fax: +65 6741 8689
Web: www.boustead.sg

Wong Fong Fui (Chairman and CEO)
Loh Kai Keong (Chief Financial Officer)
Saiman Ernawan (Deputy Chairman)

DARCO WATER TECHNOLOGIES PTE

Darco Water Technologies Pte (DWT) was listed on the Singapore Stock Exchange in July 2002 in order to improve corporate visibility when tendering for water contracts. The company was set up in 1999 by a group of individuals who had previously operated in the industrial water treatment sector. Target markets are Singapore, Malaysia, China, Taiwan, Indonesia and the Philippines.

Darco Water Technologies Pte, profit and loss account

Y/E 31/12 (SGDmillion)	2003	2004	2005	2006	2007
Water engineering turnover	20.83	36.04	43.83	54.44	71.45
Water management turnover	11.66	12.91	9.25	11.71	14.45
Group turnover	34.12	50.62	55.25	68.91	87.56
Operating profits	3.16	4.37	8.35	5.05	7.15
Net profits	2.35	2.06	5.72	2.08	3.24
Earnings per share (SGD)	1.40	1.00	3.06	1.29	1.53

China

2002 / 06	Deqing	25 year BOT	450,000, water

DWT has expanded from developing water treatment systems into offering BOT contracts. The company gained a 22 year potable water treatment plant BOT contract in July 2002 for Deqing in Zhejiang Province, China. The contract was awarded to Darco's 75% held subsidiary Globe Environmental (70%) with two provinces holding the outstanding 30% of the Zhejiang Deqing Globe Water Treatment Co Ltd. This is for the provision of 60,000m^3 of water per day, serving 450,000 people. The SGD13.2million facility entered service in May 2006 after being held up by a dispute, which was mediated by the World Bank, and will generate revenues of SGD4-5million per annum.

In May 2006, two further 25 BOT projects serving the city were gained. [1] For the extension to the existing BOT project, with the second phase of the current BOT project being the same size as the first, 60,000m^3 of water per day. Darco plans to invest SGD9.6million in the project which will generate a total revenue of SGD60-75million over 25 years, or SGD4-5million per year. [2] For a water treatment project with a capacity to produce 100,000m^3 a day. The estimated cost of investment for this project is SGD19.2million. The plant will supply water to residents and industries, with the major user of the water being a large brewery to be built in Deqing. The total revenue from the project is SGD82.5-105million over 25 years, or SGD3.5-4.2million per year.

Indonesia

2007	Bangka Island	20 year O&M	150,000, water

In October 2007, PT Darco Indonesia (PTDI) [fore]signed an agreement with Bangka Island for the Engineering Procurement & Construction (EPC), Operation & Maintenance (O&M) of a water treatment purification facility in Pangkalpinang City, Bangka Island, Indonesia, amounting to approximately IDR775billion (SGD130.8million). PT Darco shall receive IDR89.5billion (SGD15.1million) to upgrade the existing water treatment plant capacity from 12,000m^3/day to a capacity of 36,000m^3/day within 18 months, followed by a 20 year O&M contract, where PTDI shall receive 70% share of the revenue. The O&M contract is expected to generate a total recurring revenue of approximately IDR980.5billion (SGD165.4million) for the partnership, starting in mid 2009.

In May 2003, DWT paid USD3million to acquire a 10% stake in PT Air Bintan Biru (PTABB), with an option to increase this stake to 25%. PTABB was founded in September 2002 to develop water resources and concessions in Riau province of Indonesia and seeks to supply water from the province to Singapore under a 25 year supply agreement. In early 2004 Darco Environmental (Philippines) Inc. secured a six year BOO contract for the supply of ultra-pure water to SunPower Philippines Manufacturing Ltd., a company engaged in the manufacture of solar cells.

DARCO WATER TECHNOLOGIES PTE

Taiwan

2005	Hsin Chu	25 year BOT	150,000, wastewater

During 2005, Darco, in partnership with Taiwan's Leader Construction Co Ltd., gained the NTD1.66billion (SGD83.78million) turnkey contract awarded by the Interior Ministry of Taiwan for the engineering design, construction and commissioning of a 30,000m^3 per day wastewater treatment plant serving Hsin Chu City's Ker-Ya Municipal Water Resources Recovery Centre. Darco will run a five year operation and maintenance contract, worth SGD8.75million. The complete facility will have a 190,000m^3 per day cubic peak flow capacity. The O&M will commence in 2008.

Contact Details

Name: Darco Water Technologies Pte
Address: 41 Loyang Drive, Singapore
508952, Singapore
Tel: +65 6545 3800
Fax: +65 6545 3770
Web: www.darcowater.com

Thye Kim Meng (CEO/MD)
Lee Sue Lin (Director, Process Engineering & Design)
Teh Swee Heng (Director, Business Development)
Lim Boon Kuan (CFO)

EPURE INTERNATIONAL LIMITED

Beijing Sound Environmental Industry Group (Sound Group) was a privately owned company, founded in 1993 and had a turnover of CNY200million in 2000, employing 180 senior engineering staff. Sound Group entered the water and waste treatment sector in 1999 and had completed 600 projects in China. In September 2006, as Epure International, the company had its IPO on the Singapore stock exchange.

Epure, profit & loss account

Y/E 31/12 (USDmillion)	2004	2005	2006	2007
Group turnover	226.7	380.1	505.6	697.3
Operating profits	57.1	96.6	137.6	195.0
Net profits	47.2	79.9	110.6	164.4
Earnings per share (USD)	0.05	0.09	0.11	0.13

Sound Group's 'China Clear Water Project' was launched in 1999 to encourage the concept of locally funded WWTW BOT contracts. In June 2001, Sound Group signed agreements to build sewage treatment plants in 11 Chinese cities. These include Golmud in Qinghai Province, Jinshan District (of the Shanghai Municipality), Jianzhou, Jianyin, Huanggang and Xiangtan in Hubei Province. The 11 sewage treatment plants will have a combined daily handling capacity of more than 1.7million tons. This is equivalent to serving approximately 5million people. These facilities will require a total investment of about CNY2billion (USD240million). The BOT contracts signed are to last for 25 years. The company expects the facilities to pay off the project financing after ten years. These are the first privately financed and operated sewage treatment facilities in China. Further contract awards have subsequently been gained.

Facilities in operation or development, 2006-08:

Henan	Huixian
Henan	Gongyi
Henan	Anyang (CNY128million, 100,000m^3 per day WWTW)
Henan	Luoyang Chandong District
Beijing	Xiaojiahe WWTW (BOT, 2000)
Hebei	Zhengding (20,000m^3 per day WTW)
Shandong	Ningyang
Shandong	Jinan Changqing Economic and Technical Development Zone
Shandong	Feicheng
Shandong	Fenshang
Shandong	Linyi
Shandong	Dongping
Shandong	Xintaixinwen
Shanxi	Datong
Shanxi	Taiyuan Northern Middle of Hexi
Hubei	Jingmen Xiajiawan (BOT, 2003, 50,000m^3 per day WWTW)
Hubei	Xianning (25 year WWTW BOT)
Hubei	Xiangfan (SGD165million, 200,000m^3 per day WWTW)
Hubei	Zhushan (30,000m^3 per day WWTW)
Hubei	Danjiangkou (100,000m^3 per day WWTW)
Hubei	Yichang Yiling District (200,000m^3 per day WWTW by 2010)
Hubei	Yichang (440,000m^3 per day WTW)
Jiangsu	Wuxi Shuofang
Jiangsu	Wuxi Shitangwan
Jiangsu	Shuyuan (50,000m^3 per day WTW BOT)
Jiangxi	Nanchang Xianghu (SGD185million, 200,000m^3 per day WWTW)
Inner Mongolia	Xilinhaote
Inner Mongolia	Tonglaio (100,000m^3 per day 25 year WWTW BOT)
Inner Mongolia	Wuhai
Inner Mongolia	Baotou (CNY320million, 200,000m^3 per day WWTW BOT, 2006)

Gansu	Baiyin
Xinjiang	Dushanzi
Guangdong	Heyuan
Yunnan	Chuxiong
Zhejiang	Huzhou (30,000m^3 per day WTW BOT)
Zhejiang	Hecun, Tonglu (50,000m^3 per day WTW)

In 2006, the World Bank's IFC decided to invest CNY80million in the company in order to support its project development. Sound Group believes that it is the largest Chinese private sector WWTW operator.

Contact Details

Name: Epure International Limited
Address: 460 Alexandra Road, PSA Building 14-04
Singapore, 119963
Tel: 8610-6050-4718
Fax: 8610-6050-4766
Web:

Wen Zibao (Chairman)
Wang Zhili (CEO)
Choo Beng Lor (CFO)

HYFLUX LTD

Hyflux Ltd designs, manufactures and operates water and wastewater treatment and conditioning systems. In recent years, the company has entered into a number of industrial water outsourcing contracts. Its traditional customers have been the Singapore Public Utilities Board (PUB) and the Environment Ministry. The proportion of revenues in industrial projects shifted from 81% in 2004 to 44% in 2005 as various BOT projects entered their construction phase.

Between 2004 and 2007 Hyflux gained a series of water treatment BOT contracts with a total treatment capacity of 500,000m^3 per day, which will enter service between 2006 and 2008. These will generate SGD80-90million pa in operating revenue, some 30-40% of forecast group revenues.

In 2003, Hyflux gained a 20 year desalination BOT contract from the Singapore PUB. Construction of the Singspring facility will cost SGD250million. This contract supplies 136,380m^3 of water per day for the Government's Public Utilities Board since September 2005 and will run for 20 years, generating SGD30-50million pa. In June 2003, Hyflux acquired Suez's 30% stake in Singspring Pte Ltd for a "nominal consideration". The total equity investment in Singspring will be SGD50million with the other SGD200million coming from debt financing. Hyflux's share of the equity investment amounted to SGD35million with Suez's stake being sold to Singapore's Tamasek Holdings.

Industrial outsourcing in Singapore

In November 2002, Hyflux gained a construction and three year renewable operation contract for the provision of process water to ISK's Tuas titanium dioxide plant in Singapore. ISK is owned by Ishihara Sangyo Kaisha of Japan.

Hyflux Ltd, profit and loss account

Y/E 31/12 (USDmillion)	2003	2004	2005	2006	2007
Turnover	81.2	88.66	131.54	142.38	192.79
Operating profit	20.2	29.10	25.29	20.18	38.69
Net profit	19.5	27.88	49.19	15.36	36.65
Earnings per share (USD c)	7.7	5.4	8.9	3.0	6.2

Hyflux Water Trust

HWT was partially floated in November 2007. It is a special purpose company set up by Hyflux to manage its Chinese concession contracts. There are three water treatment works, eight wastewater treatment works and two water recycling plants in HWT's portfolio of 13 projects in 11 locations and a design capacity of 445,000m^3 per day. HWT may in time include concession contracts gained in other countries.
Four projects have an uncertain status as to their being set to be transferred from Hyflux to HWT.

2007	Tianjin	30 year BOT	Desalination

The facility is in Bohai Bay in Dagang and will have a daily capacity of 100,000m^3, expandable to 150,000m^3. This will be the largest seawater desalination facility in China.

2007	Mancheng	30 year TOT	250,000, wastewater

Serving Mancheng County in Hebei Province, the current 30,000m^3 per day plant will be supported by a new 80,000m^3 per day plant and a 30,000m^3 per day water recovery facility.

2007	Xiajin	28 year BOT	200,000, water

This will be the largest WTW in Xiajin, Shandong Province, with a capacity of 50,000m^3 per day.

2007	Xuzhou	25 year BOTs	Water & wastewater

HYFLUX LTD

Two BOTs for the Jiawang, Xuzhou Chemical Industrial Park in Jiangsu Province, with 30,000m³ per day of potable water and 25,000m³ per day of wastewater treatment.

Chinese contracts under Hyflux Water Trust since November 2007

2007	Changshu City	25 year BOT	Industrial wastewater

Serves an industrial park in Changshu City, Jiangsu Province with a design capacity of 30,000m³/day, which may be expanded to its concession capacity of 60,000m³/day.

2007	Tiazhou	20 year BOT	Industrial wastewater

In the Gao Gand District, in Jiangsu Province with a design capacity of 20,000m³/day, which may be expanded to include a water recycling facility.

2007	Wuxi City	20 year BOT	Industrial wastewater

Serves an industrial park in Wuxi City, Jiangsu Province with a design capacity of 20,000m³/day, which may be expanded to include a water recycling facility.

2007	Tiantai	20 year BOT	100,000, wastewater

For municipal and industrial wastewater in Tiantai County, Zhejiang Province with a design capacity of 20,000m³/day, which may be expanded and to include water recycling.

2007	Langfang	25 year TOT	400,000, wastewater

Mainly for municipal wastewater in Langfang City in Hebei Province. This has a design capacity of 80,000m³/day, and may in future incorporate a water recovery unit with a capacity of 40,000m³/day.

2007	Yangkou	30 year BOT	Industrial wastewater

Serves the Yangkou Chemical Industrial Park in Rudong County, Jiangsu Province with a design capacity of 20,000m³/day, which may be expanded to its concession capacity of 40,000m³/day. The facility will also provide 25,000m³/day of recycled water.

2007	Liaoyang	30 year BOT	Industrial wastewater

Serves municipal users and an industrial park in Lioyang City, Liaoning Province with a design capacity of 30,000m³/day, which may be expanded to its concession capacity of 60,000m³/day. The facility will also provide 25,000m³/day of recycled water to the local mining industry.

2007	Yangzhou	20 year BOT	Industrial water

Serves the Yangzhou Chemical Industrial Park in Yi Cheng, Nantong, Jiangsu Province. The facility will be developed in three phases with a final capacity of 100,000m³ per day and will incorporate water recovery.

2007	Defeng	30 year BOT	Industrial water

Serves the South Port area in Defeng, Jiangsu Province with a design capacity of 20,000m³/day, which may be expanded.

HYFLUX LTD

2007	Zunhua	25 year BOT	100,000, water

Serves municipal, commercial and industrial customers in the southern area of Zunhua City, Hebei Province, with a design capacity of 40,000m³/day, which may be expanded.

2007	Tianjin	30 year BOT	Industrial wastewater

Serves the Jing Jin hi-tech industries belt in Beichen, Tianjin with a design capacity of 50,000m³/day (wastewater treatment) and 30,000m³/day (water recovery) each of which may be doubled.

A further six projects with a combined design capacity of 290,000m^3/day and an approximate value of SGD180million are to be transferred to HWT during 2008-09:

[1] Wastewater Treatment Plant with a design capacity of 10,000m^3/day, in Huishan District Wuxi City, Jiangsu Province

[2] Two Water Treatment Plants with a combined design capacity of 60,000m^3/day, in Xuecheng District, Shandong Province

[3] Water Treatment Plant with a design capacity of 40,000m^3/day, in Gong Changling District, Liaoyang City, Liaoning Province

[4] Wastewater Treatment Plant with a design capacity of 30,000m^3/day, in Minguang City, Anhui Province

[5] Wastewater Treatment Plant with a design capacity of 30,000m^3/day and two Water Treatment Plants with a combined design capacity of 100,000m^3/day, all in Guanyun County, Lianyungang City, Jiangsu Province

[6] Wastewater Treatment Plant with a design capacity of 20,000m^3/day, in Rudong County, Yangkou City, Jiangsu Province

Contact Details
Name: Hyflux Ltd
Address: Hyflux Building,
202 Kallang Bahru, Singapore 339339
Tel: +65-6214-0777
Fax: +65-6214-1211
Web: www.hyflux.com

Olivia Lum Ooi Lin (President / CEO / MD)
Grace Goh (CFO)
Foo Hee Kiang (COO)

SEMBCORP INDUSTRIES LTD

Sembcorp Utilities (SU), a subsidiary of Sembcorp Industries Ltd, provides multi-utility services for 35 industrial customers on Jurong Island in Singapore. These include industrial process water (35,000m^3 per day via six reverse osmosis plants), demineralised water (26,600m^3 per day), cooling and refrigerated water and wastewater treatment via three dedicated facilities (5,520m^3 per day) and on an O&M basis. The company has two wholly owned utility subsidiaries in Singapore; SUT Sakra and SUT Seraya, which serve 27 corporate customers as well as other Sembcorp subsidiaries in Singapore's Jurong Island.

Sembcorp Utilities, profit and loss account

Y/E 31/12 (SGDmillion)	2003	2004	2005	2006	2007
Utilities	1,444	2,495	2,945	3,426	3,736
Total turnover	4,642	5,944	7,409	8,107	8,619
Net profit	285	391	303	1,031	526
Earnings per share	15.66	21.47	17.14	58.58	29.57

Sembcorp Utilities was established in 1999 to gain O&M and BOT contracts for municipal and industrial water and wastewater projects in the region. Sembcorp Water's 18% stake in Cathay International Water was sold back to Cathay and Cathay International Overseas Holdings for USD44.8million in June 2003.

41% of Sembcorp Utilities revenues in 2007 were from the UK, 49% from Singapore and 10% from the rest of the world. The company can treat 4million m^3 of water per day and treat 0.14million m^3 of water per day.

Singapore

2008	Changi	25 year BOT	400,000 water

Sembcorp NEWater Pte Ltd was awarded a 25-year NEWater agreement with PUB in February 2008, to design, build, own and operate Singapore's largest NEWater plant at Changi and supply PUB with 228,000m^3 of NEWater a day from 2010. The first-year price for NEWater is USD0.29966 per m^3. By 2009, the Changi NEWater Plant will be partially completed with an initial capacity of 15mgd.

UK

SembUtilities UK provides water services to industrial customers on the Wilton International on Teesside, including 120,000m^3 per day of raw water and 48,000m^3 per day of demineralised water. This was acquired for GBP106million and the company has invested GBP233million in the facility.

China

A BOT for a wastewater facility for the Nanjing Chemical Industrial Park (NCIP) in Jiangsu Province was awarded to Sembcorp in 2003. Sembcorp has a 75% stake in Nanjing Sembcorp Suiyu, along with Singapore Utilities International (20%) and Nanjing Chemical Industrial Park Company (5%). The USD10million first phase had an initial capacity of 12,500m^3 per day from 2005. A SD22million expansion to 30,000m^3 per day was announced in 2007. In September 2005, Sembcorp acquired 70% of NCIP SembCorp Water for a 100,000m^3 per day water treatment plant BOT serving the park.

In June 2005, SembCorp established an 80% / 20% joint venture to acquire, expand, own and operate a 35,000m^3 per day integrated industrial wastewater treatment plant in the ZhangJiaGang Free Trade Zone in Jiangsu Province, China.

A joint venture contract to build, own and operate an industrial wastewater treatment plant in Tianjin Lingang Industrial Area (TLIA) was announced in 2007. SembCorp Utilities holds 90% of the joint venture company, SembCorp TLIA Wastewater Treatment Company. The CNY70million facility will treat industrial wastewater from chemical industries in TLIA and have a capacity of 10,000m^3 per day.
SEMBCORP INDUSTRIES LTD

Upon completion early 2008, the facility will undergo an expansion of a further 20,000m^3 per day by end 2008 at a cost of CNY84million.

In July 2008, SembCorp gained a 30 year (plus 20 year option) to own, manage & operate three water treatment works in the Shenyang Economic & Technological Development Zone in Liaoning Province, with a design capacity of 160,000m^3 per day.

Contact Details

Name: Sembcorp Industries Ltd
Address: 30 Hill Street, #05-04,
Singapore 179360
Tel: +65-6723-3113
Fax: +65-6822-3254
Web: www.sembcorp.com.sg

Peter Seah Lim Huat (Chairman)
Tang Kin Fei (President & Chief Executive Officer)
Lim Joke Mui (Chief Financial Officer)

THAILAND

THAI TAP

Thai Tap holds two water concessions in Thailand, Thai Tap Water (TTW), formed in 2000 and entering service in 2001 and Pathum Thani Water, a concession dating back to 1995. The contracts were originally developed between Thames Water (UK) and CH Karnchang (Thailand) until the former company pulled out of its international activities. CK Karchang increased its stake in TTW from 29.1% to 90.2% during 2005 after buying Thames out of the Joint Venture. In 2006, 35% of TTW was sold to Mitsui Water Holdings (Thailand) Limited and 5% to Bangkok Expressway PCL, retaining 48% of the company. In May 2008, 25% of Thai Tap was floated on the Bangkok stock exchange.

Y/E 31/12 (THOmillion)	2004	2005	2006	2007
Water sales (000m^3 / day)	141	209	221	274
Water sales – company	N/A	1,356	1,698	1,987
Water sales – PWA	N/A	N/A	N/A	580
Water sales – total	N/A	1,356	1,698	2,567
Group Revenues	N/A	N/A	1,722	2,623
Operating profit	N/A	N/A	1,121	1,595
Net profit	N/A	N/A	674	920
Earnings per share (THO)	N/A	N/A	0.21	0.28

1995	Northern Bangkok	25 year BOOT	800,000 water

The contract was awarded to Pathum Thani Water Supply Co., Ltd a joint venture between Thames Water and CH Karnchang. The contract in Pathum Thani (a northern area of Bangkok) has performed to expectations, with the THO5.0billion (USD152million), 0.288million m^3 per day water treatment plant entering service in October 1998. Karnchang coordinated a THO4,072million long-term debt facility with two Thai banks in 1998. The Provincial Water Authority will be responsible for collecting customer payments. The contract can be extended by up to 20 years. In 2007, CH Karchang sold its remaining shares in Pathum Thani to Thai Tap. Thai Tap holds 98% of Pathum Thani's equity, with the PWA holding the other 2%.

2001	West Bangkok	30 year BOT	400,000 water

A THO9,639million (USD240million) contract originally signed between Thames Water and CH Karnchang of Thailand and the Provincial Water Authority (PWA) is to develop a 0.32million m^3 per day distribution system, which serves 400,000 people and industrial customer in Bangkok's Nakorn Pathom and Samut Sakhon districts. From 2004, the minimum take-up was 0.20million m^3 per day, rising to 0.30million m^3 per day in 2008. CH Karnchang coordinated a THO7,200million long-term debt facility with three Thai banks in 1998. In 2007, Thai Tap provided 93million m^3 of water to the PWA, 12% up from 2006.

Contact Details

Name: Thai Tap Water Supply Company Limited
Address: 30/10 Moo 12, Buddhamonthon 5 Road, Tambol Rai Khing,
Sam Phran District, Nakhon Pathom Province, Thailand
Tel: +66 2811-7526
Fax: +66 2420-6064
Web: www.thaitap.com

Plew Trivisvavet (Chairman)
Sompodh Sripoom (Managing Director)

EASTERN WATER RESOURCES DEVELOPMENT & MANAGEMENT PUBLIC CO LIMITED

The Eastern Water Resources Development and Management Public Company Limited (EASTW) was set up in 1992 as the sole supplier of water to the eastern seaboard of Thailand. The company was wholly owned by the Provincial Waterworks Authority of Thailand (PWA). In 1997, after an increase in its capital, it was partly floated on the Stock Exchange of Thailand. EASTW is developing water supply services to the provinces of Chonburi, Sakaew, Rayong, Chachengsao, Chanthaburi and Prachinburi, all located in the most industrialised area of Thailand. Currently the water infrastructure in these provinces is unable to meet the demands of industrialisation. 40% of the company's shares are held by the Provincial Waterworks Authority, 19% by Electricity Generating Plc and 5% by the Industrial Estate Authority of Thailand.

Diversification to date has been led by the Universal Utilities Company Limited (UUC), which is developing BOT and O&M contracts in other districts of Thailand. UUC has gained ten contracts to date. These involve managing the water treatment works and distribution system, reducing water losses and increasing water production capacity over the concession's life:

Chachoengsao Water Supply Company Limited (CWS, 99% held by EASTW) supplies 51,600m^3 of drinking water per day to 18,000 households in the Chachoengsao Waterworks Office in Chacheongsao. A 25 year agreement running from 2002.

The Bangpakong Water Supply Company Limited (BWS, 99% held) supplies 43,200m^3 of drinking water per day to the Bangpakong Waterworks Office in Chacheongsao under a 25 year concession from 2003.

The Nakornsawan Water Supply Company Limited (NWS, 84% held) supplies 9,600m^3 of drinking water per day to the Nakorn Sawan Ork Waterworks Office in Nokornsawan. A 25 year agreement running from 2003.

The 30 year O&M contract for Sattahip Waterworks was awarded to UUC by the Provincial Waterworks Authority in 2000. 11,000 households are covered. It has a 31,200m^3 per day capacity and under the contract, UUC is to expand its capacity to 38,400m^3 per day and the water distribution network and has installed a THO14.5million Supervisory Control and Data Acquisition (SCADA) and Geographic Information System (GIS).

UUC has a 6 year O&M contract with Egcom Tara Co., Ltd. in 2004 to operate the Ratchaburi and Samut Songkhram Waterworks, serving the area of Muang District and Dumnern Saduak District in Ratchaburi and Muang District, Samut Songkhram for a community of over 25,000 households.

A 15 year BOT to UUC for the Si Chang island municipality's waterworks was signed in August 2000. The THO55million reverse osmosis desalination plant produces 250m^3 of water per day for 1,600 households since 2006.

A 15 year contract for UUC for a reverse osmosis desalination plant with a capacity of 3,000m^3 of water per day started in 2005 and expanded in 2007 to Koh Samui PWA.

A reverse osmosis desalination plant with a capacity of 250m^3 of water per day for the island municipality of Koh Lan, serving 4,000 households.

A 25 year BOT agreed in 2006 for Rayong Waterworks, supplying 44,000 households in the Muang and Baankai districts.

The Jaopraya Surasakmontree Municipality and Bo Win Sub District Administrative Organization agreed a 25 year BOT in 2004 with UUC for distributing water to 9,000 households with an initial production capacity of 2,400m^3 per day, rising to 2,880m^3 per day.

EASTERN WATER RESOURCES DEVELOPMENT & MANAGEMENT PUBLIC CO LIMITED

Water resources have been developed in three stages in recent years. In 2005 the production capacity rose from 171.7m^3 per annum to 191.3m^3 per annum in (Rayong River) and to 243.1m^3 per annum in 2007 (Bangpakong) and to 339.1m^3 per annum in 2008 with the opening of the Prasae and Klongyai reservoirs. Further projects are anticipated in 2013 to meet increased demand by then.

Wastewater management is at an earlier stage, with an O&M contract for the Hadyai Municipal Wastewater Treatment Plant.

EASTW, profit and loss account

Y/E 30/09 (THOmillion)	2003	2004	2005	2006	2007
Group turnover	1,349.9	1,401.7	1,515.3	2,400.9	2,430.2
Operating profits	590.4	801.8	807.6	783.2	754.5
Net income	352.5	441.3	500.1	507.8	440.7
Earnings per share (THO)	0.35	0.44	0.39	0.39	0.33

Million m^3 pa	2003	2004	2005	2006	2007
Raw water sales	178	157	190	199	211
Tap water sales	14	21	31	39	61

Revenues by customer type (%)

Y/E 30/09	2003	2004	2005	2006	2007
Raw Water	83%	68%	65%	57%	60%
Service Income	8%	8%	5%	19%	18%
Tap Water	8%	10%	13%	15%	19%
Drinking Water	1%	5%	12%	1%	0%
Pipes	1%	9%	5%	8%	3%

Current tariffs are THO6 per m^3 for domestic and commercial use and THO9 per m^3 for industrial use. In July 1999, EASTW raised THO2.5billion through a bond issue to fund expansion into non-regulated activities and to upgrade the distribution network. EASTW anticipates spending more than THO3.4billion on completing its water distribution network in Rayong, Prachinburi and Chachoengsao provinces.

In 2000, Electricity Generating Pcl (Egco) sold a 15% stake in Egcom Tara to East Water for USD2.1million. Egco is the leading Thai private sector power generation company. In July 1999, Egco acquired 70% of Egcom Tara from Require Construction Co for THO398million (USD11million). Egcom Tara has a 30 year THO690million BOT contract for water supply in Ratchaburi and Samut Songham provinces. EASTW has set up a partnership with VE and Aquathai Co of Thailand to bid for a THO800million water supply BOT for the central area of Lampang province. This consortium was the only group to pass PWA screening for the contract. East Water is currently negotiating with Egcom to acquire a majority stake in the venture. Egcom Tara also has a 10-year contract to supply tap water in Sattahip for the Provincial Waterworks Authority, a business that could generate long-term income to the company. East Water is seeking to increase its stake in Egcom Tara to 50%.

EASTW is currently spending THO2 billion (USD44.5million) to expand its drinking water provision activities; first through Egcom Tara, where it plans to increase its stake and also through spending THO1billion in a reservoir and pipeline project in Chachoengsao province to increase its water capacity from 160 to 240m^3 pa. A THO2.3billion 52.5km pipeline connecting Bangpakong to Chonburi is being built from June 2005 and will enter service in 2007, delivering 50million m^3 pa.

Contact Details

Name: Eastern Water Resources
Development & Management Public Company Limited
Address: 9/9 Vibhavadi Rangsit Road,
Laksi, Bangkok, 10210 Thailand
Tel: +66 2 940 9974-6
Fax: +66 2 561 3793
Web: www.eastwater.co.th

Sujarit Patchimnum (Chairman)
Wanchai Lawatanarakul (President and CEO)
Thidarut Kraiprasit (SVP, Finance)

UNITED STATES OF AMERICA

AECOM

Tyco International Ltd acquired Earth Tech in 1996. Earth Tech has a turnover of approximately USD1.3billion in 2007. In February 2008, Earth Tech was sold to Aecom Technology Corporation for USD510million. Aecom is involved in a number of infrastructure markets and 80% of its 2007 revenues derived from professional and technical services with 20% from management support services. It had its IPO in 2007. Tyco is retaining Earth Tech's water and wastewater contracts in Australia, New Zealand and Brazil (see separate company entry).

AECOM, profit and loss account

Y/E 31/12 (USD million)	2004	2005	2006	2007
Turnover	2,012	2,395	3,421	4,237
Operating income	87	99	103	156
Net income	50	54	54	100
Earnings per Share (USD)	0.78	0.84	0.74	1.15

Earth Tech operated more than 200 water and wastewater treatment facilities in the United States, Canada, United Kingdom, Ireland, Hungary, China, Australia, Thailand, Venezuela, and Brazil. Earth Tech's water and wastewater treatment facilities serve more than 10million people worldwide in 2007.

Aecom is divesting the water and wastewater operations. It sold the Mexican activities to Mitsui of Japan (see company entry) and the US water contract operations to United Water (see Suez company entry). The Chinese contracts are currently under negotiation to Suez / New World and the British and Irish interests are also expected to be sold.

Earth Tech, populations served

Country	Water	Sewerage	Total
Australia	0	50,000	**50,000**
Brazil	180,000	300,000	**300,000**
China	3,850,000	550,000	**4,250,000**
United Kingdom	700,000	63,000	**763,000**
Grand Total	**4,730,000**	**963,000**	**5,363,000**

China

1999	Changli	30 year 'concession'	150,000 water & sewerage
2001	Guangzhou	20 year DBFO	400,000 sewage treatment
2002	Tianjin	20 year DBFO	3,700,000 water treatment

The Changli concession covers engineering, project management, construction, and O&M of the county's water supply system. The JV Company, Qing Huang Dao Pacific Water Company, is responsible for billing customers in Changli. Earth Tech is developing a water supply, treatment, and distribution system that will produce up to 60,000m^3 per day of water to serve a projected population of 150,000, plus a tourist population of 75,000 during peak periods at a cost of USD10million.

In December 2001, Earth Tech started work on the Xi Lang wastewater treatment plant in Guangzhou. The USD120million 20 year DBFO contract is a JV. The 2 phase project will treat 0.26million m^3 of effluent per day. The first phase will treat 0.13million m^3 of wastewater per day for 400,000 people and serve most of the city's Fang Cun District, the largest and fastest-growing district in Guangzhou. It entered service in 2003 and Earth Tech will manage and operate the system for 18 years. The second phase will provide for treatment of an additional 0.13million m^3 per day of wastewater.

A USD400million, 20 year DBFO project for the Jie Yuan Water Treatment Plant in Tianjin was awarded by the Tianjin Water Works Group Co to Earth Tech Jieuan Water Co Ltd in May 2002. The AECOM

plant is capable of treating more than 500,000 m³ of water per day and will be comprehensively renovated and upgraded.

Venezuela

2000	Jose	DBFO	Industrial water & wastewater

Aguas Industriales de Jose (AIJ) is a JV between Earth Tech (75%) and PDVSA, Venezuela's national petroleum company (25%). AIJ is providing water and wastewater services to 12 petrochemical consortiums at the Jose Industrial Complex. Earth Tech will initially invest USD75 million in the project. AIJ owns and operates a facility which treats and supplies industrial water at a rate of 112Ml/day. This facility has been upgraded to have a 260Ml/day capacity.

Hungary

2003	MOL	15 year industrial outsourcing	Wastewater services

The contract with MOL, the Hungarian Oil & Gas Company involves expanding, upgrading and managing the 23,850m^3 per day wastewater treatment facilities at the Duna refinery in Szazhalombatta, near Budapest. Total construction costs were USD45million and Earth Tech has managed the wastewater assets and services at the refinery for 15 years from June 2005. The project has been financed with the support of the EBRD.

United Kingdom

2005	Project Alpha	25 year PFI	700,000 water treatment

Project Alpha, one of the two PFI projects for Northern Ireland concerns the building and upgrading of four water treatment works which will serve approximately half the population of Northern Ireland. It was awarded to Dalriada Water (Earth Tech 45%, Kelda 45% & Farrans 10%) and involves GBP10million of capex and a treatment capacity of 0.4million m^3 per day from 2008.

2003	UK MoD	25 year PFI	Water & wastewater services

Bray Utilities, consisting of Kelda (45%), Earth Tech (Tyco International, 45%) and Kellogg Brown & Root (USA, 10%) gained Package A of Project Aquatrine, serving some 1,000 military sites in South West England, the Midlands and Wales. The contract is worth GBP1billion and operations commenced in December 2003.

2001	Newry	30 year BOT	63,000 sewage treatment

This contract is for a 30,750 m^3 per day PFI sewage treatment plant in Northern Ireland.

Contact Details

Name: Aecom
Address: 555 South Flower Street
Los Angeles, CA 90071-2300
Tel: 001 213 593 8000
Web: www.aecom.com

Richard Newman (Chairman, Aecom)
John M Dionisio (President & CEO, Aecom)

AECOM

Contact Details

Name: Earth Tech
Address: 100 West Broadway, Suite 240, Long Beach CA, 90802, USA
Tel: +562 951 2000
Fax: +562 951 2100
Web: www.earthtech.com

ALLIANCE WATER RESOURCES

Alliance Water Resources (AWR) is a privately held company (SCW) operating in Midwestern USA and employing 250 staff. The company was founded in 1976, and over the past 25 years, has operated in excess of 100 water and wastewater treatment facilities. It is the leading water services outsourcing company in Missouri. Currently, it serves 314,521 people through a series of O&M contracts in the states of Missouri and Iowa, up from 272,800 people in 2003.

Activities by client category

Commercial & industrial	10%
District	30%
Municipal	60%

Contract services provided include water treatment (55% of clients), water distribution (68%), wastewater treatment and sewerage (82%), water & wastewater (55%), meter reading (55%) and complete services management (32%).

Bowling Green, MO	Water & wastewater (municipal, 1994-)	5,166
Cameron, MO	Wastewater (municipal, 1990-)	11,500
Cape Girardeau, MO	Water (municipal, 1992-)	37,500
Elsberry, MO	Water & wastewater (municipal, 2000-)	2,000
Fulton, MO	Water & wastewater (municipal, 1992-)	12,100
Lake Ozak, MO	Wastewater (municipal, 1999-)	10,000
Lexington, MO	Wastewater (municipal, 1993-)	5,000
O'Fallon, MO	Water & wastewater (municipal, 1993-)	60,000
Maquoketa, Iowa	Water & wastewater (municipal, 2001-)	6,100
Tipton, Iowa	Water & wastewater (municipal, 1999-)	3,155
Parkville, MO	Wastewater (municipal, 2002-)	4,000
Buchanan Co, MO	Water (district, 2001-)	2,500
Franklin Co, MO	Water & wastewater (district, 1994- & 2005-)	10,000
Henry Co, MO	Water (district, 1983- & 2002-)	13,000
Lincoln Co. MO	Water & wastewater (district, 1995-)	12,000
Platte Co. MO	Water (district, 2002-)	4,000
Ralls Co. MO	Water & wastewater (district, 2001-)	6,300
St Charles' Co, MO	Water & wastewater (district, 1980- & 1986-)	85,000
Troy, MO	Wastewater (municipal, 2005-)	8,900
Bonne Terre, MO	Wastewater (municipal, 2005-)	6,400
Phelps Co, MO	Wastewater (district, 2006-)	1,200

Contact Details

Name: Alliance Water Resources
Address: 206 South Keene Street
Columbia, MO 65201
Tel: +1 573 874-8080
Fax: +1 573 443-0833
Web: www.alliancewater.com

AMERICAN WATER WORKS

USA – American Water Works

American Water Works (AWW) has a considerable historic presence; one of its main subsidiaries, E'town Water dates back to 1854 and the American Water Works & Guarantee Company was founded in 1886. AWW has been seeking to create a national presence in the USA water market through a long-term acquisition programme that started in earnest during 1996. AWW seeks to concentrate on developing regional strength in water utility operation rather than merely further the numbers served. Thus in August 2001 AWW sold certain activities in New England to Kelda Group as Kelda's Aquarion had a stronger presence in this region.

In September 2001, American Water Works agreed to a USD4.6billion bid by RWE after rejecting a USD3.5billion bid in August 2001. AWW was merged with Thames Water in 2003 and renamed American Water. In addition, E'town Water, which was acquired by Thames in November 1999 after an agreed USD948million bid has been integrated within AWW. The AWW transaction was subject to the approval of utility regulatory commissions which was completed in January 2003. In 2006, it was announced that AWW would be spun off from RWE via an IPO during 2007. As part of this process, American Water was renamed American Water Works and RWE sold 36% of AWW's equity on the NYSE in April 2008.

AWW, profit & loss account

Y/E 31/12 (USDmillion)	2003	2004	2005	2006	2007
Regulated business	N/A	N/A	1,836.1	1,854.6	1,987.6
Non-regulated business	N/A	N/A	469.9	468.7	500.1
Group turnover	1,890.3	2,017.9	2,136.7	2,093.1	2,214.2
Operating income	439.2	430.4	111.6	252.5	15.1
Interest paid	336.8	305.0	335.7	361.5	270.6
Net income	42.1	59.1	-275.1	-155.9	-342.3
Earnings per share (USD)	0.26	0.37	-2.03	-1.01	-2.14

AWW, breakdown of revenues and volumes

Y/E 31/12 2007	Revenues	Water volumes
Residential	57.6%	52.8%
Commercial	19.4%	21.9%
Industrial	4.8%	10.6%
Public & other	12.5%	14.7%
Other water revenue	1.9%	N/A
Total Water	96.2%	100.0%
Wastewater	3.8%	N/A

AWW has 72 regulated and non-regulated subsidiaries in the USA and Canada and provides wastewater services in 11 states. The 3.3million regulated customers account for 89.8% of operating revenues. The company anticipates capex of USD4,000-4,500 million between 2007 and 2011.

Major acquisitions, 1996-2002

Year	Company	People served	Cost (USD million)	Turnover USD million
1996	PAWC	2,000,000	409	N/A
1998	EHCS	35,000	17	N/A
1999	NEI	1,700,000	700	N/A
1999	American Anglian (50%)	1,000,000	32	31 (1999)
2000	UWR subsidiaries	122,500	50	N/A
2001	City of Coatesville	53,000	48	7 (2001)
2001	Azurix North America	2,000,000	160	134 (2001)
2002	Citizens Utilities subsidiaries	1,100,000	859	140 (2001)

AMERICAN WATER WORKS

In December 2007, the company announced that it was seeking to acquire the assets of the city of Trenton's water system located in Ewing, Hamilton, Hopewell and Lawrence townships. The proposed purchase price is USD100million. This would add 39,000 new customers. In November 2007 AWW acquired South Jersey Services Inc. adding 7,200 customers via the Pennsgrove Water Supply Company of Salem County and the South Jersey Water Supply Company of Gloucester County.

AWW, regulated activities in 2007

State	Customers	People (million)	Revenues
Pennsylvania	644,720	2.10	416.2
New Jersey	634,957	2.59	505.3
Missouri	465,087	1.55	179.9
Indiana	283,088	1.26	146.5
Illinois	306,740	1.27	179.1
California	171,455	0.63	124.4
West Virginia	167,744	0.58	105.6
Others	638,847	N/A-	330.6
Total	**3,312,628**	**N/A-**	**1,987.6**

AWW had a total of 3,171,295 regulated water customers and 141,333 regulated wastewater customers in 2007. There are 9.98million people served in the leading seven states and an estimated 2.4million people served in the 12 other states, or a total of 12.4million people. A further 4.2million are served by non regulated activities in the USA and 0.4million in Canada.

AWW, tuck-in acquisitions, 1998-2003

Year	Transactions completed	Customers served	Customers per deal	Total cost (USD million)	USD per customer
1996	13	N/A	N/A	36.9	N/A
1997	9	N/A	N/A	2.9	N/A
1998	22	26,770	1,785	47.2	1,756
1999	21	14,000	666	12.4	857
2000	12	38,000	3,167	52.1	1,368
2001	10	20,000	2,500	56.3	2,795
2002	9	29,000	3,625	31.9	1,100
2003	10	N/A	N/A	4.6	N/A
2004	8	N/A	N/A	1.9	N/A
2005	7	N/A	N/A	5.0	N/A
2006	11	N/A	N/A	12.5	N/A
2007	8	N/A	N/A	18.0	N/A

After being bought by RWE, acquisitions were effectively wound down and have been revived as the company prepared for its partial divestment since 2006.

Non-regulated activities: American Water Services

American Water Services is responsible for the company’s non-regulated activities. It serves some 6 million people and in 2002 generated revenues of USD222million through 800 contracts operating 700 water treatment works and 300 wastewater treatment plants.

Anglian Water Group (AWG) of the UK formed American Anglian Environmental Technologies (AAET) in 1993, a 50:50 JV with AWW to pursue opportunities for water and sewerage projects. AWG sold its stake in the JV to AWW in October 1999 for USD32million. AAET serves 1million people through managing 175 water and wastewater treatment facilities in seven states, with a 1999 turnover of USD31million.

AMERICAN WATER WORKS

In August 2001, AWW acquired all of the North American activities of Azurix from Enron for USD153.3million plus USD6.5million in debt. Azurix had built a broad portfolio of activities in the USA and Canada, including a small utility, and municipal and industrial outsourcing services, water rights and a web based water trading system. The latter, water2water.com is now a web site selling fish tanks. Azurix acquired Philip Utilities Management Corporation for USD106million in May 1999. Azurix North America (ANA) had a turnover of USD131.5million in 2001, serving approximately 2 million people, including 1.82million for water provision and 0.35million for sewerage and wastewater treatment services (estimated).

Azurix contract gains in the USA (USD million)

Date	Contract	Location	Value	Duration (Years)	Annual revenues
05-2000	O&M water provision	Jefferson, Louisiana	30	15	2.0
05-2000	O&M water provision	Brunswick, New Jersey	120	20	6.0
05-2000	O&M water provision	Wildwood, New Jersey	71	20	3.6
11-1999	O&M water & wastewater	Gary, Indiana	10	5	2.0

AWW's Millitary Services Group made two major contract gains in September 2008: a contract for ownership, operation and maintenance of the water and the wastewater systems at Fort Polk Army Installation, Louisiana worth USD348million over a 50-year period and a contract for ownership, operation and maintenance of the water distribution system and wastewater collection system at Fort Hood Army Installation, Texas worth USD329million over a 50-year period.

One other major contract gain was the 1996 USD410million contract for Pennsylvania Enterprises' water systems near Scranton, Pennsylvania. AAET also manages the operation of 2 New Jersey systems and 15 in Indiana, most of which are for small communities.

Canada

American Water Services provide O&M outsourcing services Ontario. In September 2001 Azurix NA was awarded a 10 year contract to operate and maintain the Lake Huron and Elgin Area Primary Water Supply Systems in Ontario. ANA bid was priced at CAD71.2million (USD47.5million) over the length of the contract, a saving of approximately CAD1million pa. The contract has an option for an additional five years and serves a population of approximately 420,000.

Contact Details
Name: American Water Works
Address: 1025 Laurel Oak Road, Voorhees, NJ 08043, USA
Tel: (609) 346-8200
Fax: (609) 346-8360
Web: www.amwater.com

George MacKenzie (Chairman)
Donald L. Correll (President & CEO)
John S. Young (COO)
Ellen C. Wolf (CFO)

AMERICAN STATES WATER

American States Water (AWR) owns the Golden State Water Company (SCW), which was founded in 1929 and floated in 1931. It is a utility company engaged principally in the purchase, production, distribution and sale of water. SCW operates in three regions, serving 75 communities in 10 counties in the state of California and provides water services in 21 customer service areas. Approximately 73% of SCW's water customers are located in the greater metropolitan areas of Los Angeles and Orange County. SCW also provides electricity services to the City of Big Bear Lake and surrounding areas in San Bernardino County. Combined revenues derived from commercial and residential water customers accounted for approximately 86% and 93% of total water revenues in 2007 and 1997, respectively. SCW served 254,546 water customers (1 in 30 Californians) at the end of 2007. 52% of water requirements are met from company owned resources and the company's immediate priority is to secure its longer term supplies in compliance with Californian legislation which calls for a minimum of 20 years of guaranteed water supplies for all new developments in the state.

AWR is expanding through a series of local acquisitions in California and other states. In December 1999, AWR sought to acquire Peerless Water, a company serving 1,900 customers in Bellflower, California. Regulatory clearance was anticipated by the end of 2001. In October 2000, AWR acquired Chaparral City Water Company (CCWC) from MAXXAM Inc. for USD31.2million, less outstanding debt. CCWC provides water to 13,500 customers in the towns of Scottsdale and Fountain City in Arizona.

AWR, profit and loss account

Y/E 31/12 (USD million)		2004	2005	2007
Water customers:	SCW	251,381	252,845	254,546
	CCWC	12,750	13,001	13,448
Turnover:	SCW	194.4	198.5	N/A
	CCWC	6.5	7.0	N/A
	ASUS	1.8	3.5	34.9
Operating profits:	SCW	52.5	54.9	N/A
	CCWC	1.3	2.1	N/A
	ASUS	N/A4.9	N/A2.7	2.0

Y/E 31/12 (USD million)	2003	2004	2005	2006	2007
Residential & commercial	169.4	181.2	185.4	198.3	213.6
Industrial	2.6	2.6	2.7	2.6	2.5
Fire service	1.6	1.6	1.5	1.5	1.6
Other water	13.8	16.3	16.1	20.4	20.2
Contracted service revenue	1.0	1.8	5.2	16.5	34.9
Customers					
Residential & commerecial	255,349	257,206	258,428	259,708	260,193
Industrial	355	359	372	371	377
Fire service	3,425	3,471	3,596	3,681	3,797
Other	3,124	3,189	3,450	3,553	3,667

Y/E 31/12 (USD million)	2003	2004	2005	2006	2007
Water	187.2	200.6	205.5	222.91	237.88
Electricity	24.5	25.6	27.2	29.27	28.57
Group turnover	212.7	228.0	236.2	268.63	301.37
Operating income	33.6	36.1	40.4	56.61	67.73
Interest paid	-18.1	-17.9	-13.6	-18.30	-19.21
Net income	11.9	18.5	26.8	23.08	28.03
Earnings per share (USD)	0.78	1.18	1.57	1.33	1.61
Dividends per share (USD)	0.88	0.89	0.90	0.91	0.96

The company's American States Utility Services (ASUS) was founded in 1998 and provides outsourcing, billing and meter reading services to a further 97,000 non-regulated customers in California and Arizona. This includes 33,000 customers in the city of Torrance, CA whose services

AMERICAN STATES WATER

were outsourced to ASUS in 2000. ASUS is also entering the water rights market having acquired 5,000 acre-feet of perpetual rights in the Sacramento River in 2006.

In October 2004 ASUS started an own, operate and maintain contract for the water and wastewater systems at Ft. Bliss, located near the City of El Paso, Texas, through a wholly-owned subsidiary, Fort Bliss Water Services Company. Revenues for the contract are estimated at more than USD196million over its 50-year period and are subject to periodic price re-determination adjustments and adjustments for changes in circumstances. A similar 50 year O&M contract for water & wastewater services for the Andrews Air Force Base in Maryland, and Fort Story, Fort Eustis and Fort Monroe and the wastewater system at Fort Lee in Virginia started in February 2006, which will generate USD238million in revenues. These services are provided by the company's Terrapin Utility Services Inc and Old Dominion Utility Services Inc.

Contact Details

Name: American States Water Company
Address: 630 East Foothill Boulevard,
San Dimas, CA 91773, USA
Tel: (909) 394-3600
Fax: (909) 394-0711
Web: www.aswater.com

Lloyd E. Ross (Chairman)
Floyd E. Wicks (President/CEO)
Robert J Sprowls (SVP/CFO)
McClellan "Bud" Harris III (SVP, AS Utility Services)

AQUA AMERICA INC

Philadelphia Suburban Corporation was incorporated in 1968 and is the second largest investor-owned water utility in the USA, with 951,000 customers and serving over 3million people. It changed its name to Aqua America (AA) in January 2004. AA owns the Philadelphia Suburban Water Company (PSW) and the Consumers Water Company (CWC). PSW supplies water to approximately 426,000 residential, commercial, industrial and public customers in a service territory of 481 square miles in the suburban area west and north of the City of Philadelphia, serving 1.3million people excluding 6,000 customers served by an O&M contract. The company has subsequently expanded into 12 other states, which now account for 44% of revenues.

AA, development of regulated customer base

Year	Customers
1992	244,788
1996	284,141
1999	548,937
2003	749,491
2006	926,823
2007	950,732

Tuck-in acquisitions (USD million)

Year	Number	Consideration	Turnover added	Customers
1997	4	1.23	0.36	1,700
1998	5	25.38	4.69	9,007
1999	16	39.16	4.90	17,250
2000	18	11.84	2.63	14,418
2001	20	14.88	4.74	25,550
2002	25	11.66	2.92	9,175
2003	17	1.61	0.98	N/A
2004	27	3.84	1.23	N/A
2005	30	12.31	6.97	N/A
2006	27	24.56	9.63	N/A
2007	26	11.85	4.43 [1]	N/A

[1] Turnover added during the year

USD270million has been spent on acquisitions between 1999 and 2003 and USD338million in cash and shares between 2003 and 2007. Since the start of 1995, PSW has acquired 200 local water systems and three wastewater utilities in areas adjacent to its current operations. These have added in excess of 120,000 customers to AA's original activities. In March 1999, PSC acquired the CWC for 13.01million shares, valuing the company at USD463million. CWC serves approximately 232,000 customers (700,000 people) in service territories covering parts of Pennsylvania, Ohio, Illinois, New Jersey and Maine.

Acquisitions noted in 2008 include Honesdale Consolidated Water Company (HCWC) which serves approximately 6,000 people in Honesdale Borough and Texas Township, Wayne County (USD6.7million in September), South Haven Sewer Works, Inc., a wastewater company (USD9.7million in August), which serves 4,000 customers in South Haven in Porter County in northwest Indiana and a wastewater and local irrigation system (U$1.6million in May) serving 3,000 residents in the Fountain Lakes development in Estero, Lee County, Florida.

Capital spending for 2007-2011 is expected to be at USD250million pa compared with USD201million pa for 2002-2006 and USD101million pa for 1997-2001.

AQUA AMERICA INC

Agreed bids for AquaSource, Florida Water, Heater Utilities and New York Water Service

In July 2002, AA launched an agreed bid with DQE to purchase AquaSource. The USD190.7million bid was completed in July. AquaSource has approximately 130,000 customers in 600 operating systems along with 40,000 O&M customers. Most of these customers are in Texas, Florida (21,000 customers), Virginia, Indiana, North Carolina, New Jersey and Missouri with a smaller number of customers in five other states. After arbitration, in 2004, the bid price was revised to USD178.4million.

In June 2004 AA acquired Allete's North Carolina-based water and wastewater systems, Heater Utilities, Inc., for USD48million in cash and USD28million in debt. Heater Utilities was formed in 1964 and had revenues of USD19.5million in 2003. Heater Utilities serves 50,000 customers, 45,000 for water and 5,000 for wastewater services through 245 water and 15 wastewater systems. In July 2004, AA completed the acquisition of 63 water and wastewater systems from Allete's Florida Water Services Corporation for a total of USD14.7million.

In January 2007 AA acquired New York Water Service Corporation for USD26.6million and USD23million in debt. New York Water Service Corporation provides water service to 44,792 customers in several water systems located in Nassau County, Long Island, New York.

The agreed bid for Pennichuck in May 2002 was terminated in February 2003 when a referendum in Nashua, New Hampshire sought to authorise the municipal acquisition of Pennichuck.

AA, geographical split of turnover

YE 31/12	Revenues	Customers
Pennsylvania	279.7	438,000
Ohio	39.9	84,000
Illinois	35.3	70,000
Texas	38.0	N/A
New Jersey	22.6	150,000
Virginia	8.3	70,000
Florida	15.3	117,000
Indiana	16.9	38,000
Maine	9.4	16,000
Missouri	N/A	3,750
New York	N/A	48,000
North Carolina	29.8	8,500

Revenues are for 2005 and customers are for 2007.

Other states include Maine (16,900 customers), Indiana (1,500 customers), Missouri (4,000 customers) and North Carolina (25,000 customers). These figures are for the final quarter of 2003, and reflect the contribution made by AquaSource's activities.

AQUA AMERICA INC

AA, profit and loss account (including the CWC acquisition)

Y/E 31/12 (USDmillion)	2003	2004	2005	2006	2007
Residential	218.49	264.91	295.47	317.77	360.54
Commercial	61.34	65.61	73.46	76.08	85.55
Industrial	17.68	17.38	18.36	18.75	19.55
Other water	40.05	44.59	50.83	51.26	58.27
Wastewater	17.87	35.93	42.18	48.91	52.89
Other revenues	9.82	11.56	13.16	13.53	12.94
Group turnover	367.23	442.04	496.80	533.49	602.50
Net income	70.79	80.01	91.16	92.00	95.01
Earnings per share (USD)	0.59	0.64	0.71	0.70	0.71
Metered customers					
Residential	624,355	702,367	724,954	780,828	797,899
Commercial	33,015	33,720	33,975	36,280	37,056
Industrial	1,397	1,365	1,356	1,337	1,322
Other	20,483	15,700	15,584	15,587	16,683
Wastewater	70,421	82,360	89,025	92,791	97,772
Total – regulated	**749,491**	**835,512**	**864,894**	**926,823**	**950,732**

Condemnations

In December 2002, as a result of the settlement of a condemnation action, the Ohio operations were sold to Ashtabula County for USD12.2million, with a net after-tax gain of USD3.7million. AA is continuing to operate this water system for Ashtabula County under a 1 year operating contract that should provide over USD300,000 in operating revenues in 2003. Other sales have been for peripheral operations in Kentucky and Connecticut (some peripheral Aquasource activities) while the Fort Wayne (Aquasource) activities were sold to the municipality for USD16.9million under eminent domain in February 2008.

Contact Details

Name: Aqua America Inc
Address: 762 Lancaster Avenue,
Bryn Mawr, PA 19010, USA
Tel: +1 610 525 1400
Fax: +1 610 645 1061
Web: www.aquaamerica.com

Nicholas DeBenedictis (Chairman/President/CEO)
David P. Smeltzer (SVP - Finance/CFO)
Christopher H. Franklin (Regional President, AA Southern Operations)
Karl M. Kyriss (Regional President, AA Mid-Atlantic Operations)
Robert G. Liptak (Regional President, AA Northern Operations)

ARTESIAN RESOURCES CORPORATION

Artesian Resources Corporation (ARC) is the parent holding company of Artesian Water Company, Inc. (AWC). AWC was founded in 1927 as the successor to the Richardson Park Water Company, founded in 1905. In 1984, the company was renamed Artesian Resources Corporation and the utility assets were vested to a newly formed subsidiary, Artesian Water. In 2007, Artesian had 75,100 metered water customers (68,049 in 2002) and 414 metered wastewater customers (none before 2005) and served a population of approximately 250,000, representing approximately 29% of Delaware's total population, a 32% increase since 1991). Artesian also has 39 customers in Pennsylvania, which will be augmented by four developments serving 350 customers. .

Since 1993, Artesian has added to its service territory by acquiring exclusive service areas in Delaware. This expansion, which has occurred in southern New Castle, Kent and Sussex Counties, has increased the exclusive service area in Delaware by approximately 40% since 1993. In 1998, ARC acquired the rights to provide water to two municipalities and neighbouring developments in Sussex County serving some 10,000 new customers from 2005. This area has accounted for 38% of ARC's customer growth since 1998. Facilities serving 4,400 customers in these areas are currently being developed. Artesian also entered into agreements in 1998 to supply water to two municipalities in New Castle County. In 2003, residents in Broad Run Ridge, Pennsylvania were connected to the Delaware system. The company has also identified a number of wastewater treatment opportunities.

Artesian Water, revenue by customer class

Revenue by customer class	2003	2004	2005	2006	2007
Residential	59.83%	59.07%	57.05%	55.8%	57.6%
Commercial	24.00%	23.66%	22.61%	22.2%	22.3%
Industrial	0.88%	0.79%	0.63%	0.8%	0.7%
Government and other	12.17%	12.45%	11.66%	12.3%	11.7%
Other water revenues	2.05%	2.19%	2.37%	2.6%	3.2%
Non-utility operating revenues	1.07%	1.84%	5.68%	3.6%	4.5%
Number of customers	69,726	70,993	72,383	73,800	75,514

Artesian Water Maryland and Artesian Wastewater Maryland were established in 2007 to provide regulated water and wastewater services in the state. 141 water customers in Cecil County were added in August 2007. Artesian Wastewater (AW) was created in 1996 as a non-regulated subsidiary to provide wastewater treatment services in Delaware. Services started in 2005 and the company had 414 customers in six communities in the state in 2007. Artesian Utility specialises in non-regulated operates two wastewater treatment plants serving 10,000 customers in Middletown entered service in 2002. These contracts have a 20 year term, which can be extended by an additional 20 years.

ARC, profit and loss account

Y/E 31/12 (USDmillion)	2003	2004	2005	2007	2007
Turnover	36.30	39.58	45.29	48.59	52.22
Operating income	8.53	9.87	10.64	11.80	11.77
Net income	3.92	4.40	5.04	6.07	6.26
Earnings per share (USD)	0.64	0.72	0.81	0.97	0.90
Dividends per share (USD)	0.53	0.55	0.58	0.61	0.66

Contact Details
Name: Artesian Resources Corporation
Address: 664 Churchman's Road, Newark, DE 19702
Tel: (302) 453-6900
Fax: (302) 453-5800
Web: www.artesianwater.com

Dian C. Taylor (Chairman/President/CEO)
David B. Spacht (Vice President/CFO/Treasurer)

CADIZ INC

Cadiz Inc (Cadiz) is involved in the development of water and agricultural resources, as well as selected water-related technologies. Cadiz has created a portfolio of assets encompassing undeveloped land with groundwater resources in central and southern California with secure and reliable water rights that are situated near to the state's aqueduct system. In 1996, Cadiz acquired Sun World International Inc (Sun World), one of the largest agricultural companies in California. The company holds 34,500 acres in the Cadiz Program area along with 9,000 acres in Piute Valley and 1,800 acres in Danby Dry Lake. The latter two are supplementary to its main programme.

In 1997, Cadiz entered into an interim agreement with the Metropolitan Water District (MWD) of southern California to develop a 50 year agreement for the Cadiz Groundwater Storage and Dry-Year Supply Program. The Program will enhance southern California's water supply reliability by providing a new dry-year water supply and new storage capacity. The infrastructure for the water transfer will cost USD150million (over the contract period) and will allow the district to store up to 500,000 acre-feet of water in wet years and to transfer up to 1.1million acre feet from Cadiz's holdings during dry years. The first 400,000 acre-feet will be purchased by the MWD for USD92million. The total value of the contract has been estimated at USD1billion. An agreement drawn up in 1993 with the San Bernardino County Board of Supervisors allows for the withdrawal of more than 1million acre-feet of groundwater from the Company's underground water basin. In August 2002, the US Department of the Interior supported the proposals, but in October 2002, the MWD's final vote rejected the water-storage project and no subsequent progress has been made. Claims against the MWD for compensatory and punitive damages were filed in November 2005. Further hearings too place between 2006 and 2008. In August 2008, the MWD announced that mandatory water rationing would be considered from 2009 in the wake of continuing shortages and reduced allocations.

In September 2008 Cadiz announced a 99 year lease with the Arizona and California Railroad Company for conveying water to the Colorado River Aqueduct. Although more expensive, this will obviate the environmental concerns arising from the original conveyancing project.

Cadiz Inc., profit and loss account

Y/E 31/12 (USDmillion)	2003	2004	2005	2006	2007
Turnover – Sun World	2.86	0.00	0.00	0.00	0.00
Turnover - other	0.30	0.05	1.20	0.61	0.43
Total turnover	3.16	0.05	1.20	0.61	0.43
Net income	-14.05	-16.04	-23.03	-13.83	-13.63
Earnings per share (USD)	-6.39	-2.32	-2.14	-1.21	-1.15

In January 2003, Sun World was placed under Chapter 11 protection because of the need to refinance some USD40million in debt. Sun World's assets were sold in 2005. The company has raised USD35million from private placements in 2003 and 2004, along with a refinancing of its corporate debt in order to pursue the development of its water rights portfolio.

Contact Details

Name: Cadiz Inc
Address: 550 South Hope Street, Suite 2850,
Los Angeles, CA 90071 USA
Tel: +1 213 271 1600
Fax: +1 213 271 1614
Web: www.cadizinc.com

Richard Stoddard (CEO)
Mark A Liggett (Senior Vice President)

CALIFORNIA WATER SERVICE CO.

The California Water Service Company (CWSC) was formed in 1926, and was transformed into a holding company in 1997. The company is the largest investor-owned water company in California and the fourth largest in the USA, serving 2million people with water and wastewater and providing water meter reading for a further 175,000. Since 2000, customer gains have been running at 5,000-7,500 per annum. CWSC provides water and wastewater services to 487,600 residential, commercial and industrial customers in regulated contracts in California, New Mexico, Washington and Hawaii and 107,700 customers through unregulated water activities. Regulated customers generated revenues of USD753 each in 2007 against USD692 in 2006. These regulated contracts are mainly in the San Francisco Bay, Sacramento Valley, Salinas Valley, San Joaquin Valley and Los Angeles. Due to the shortage of water in its operating area, 51% of water supplied by the company was purchased from third parties in 2007.

Customer base, 2008

[Non-regulated customers are for 2005]

	California	New Mexico	Washington	Hawaii	Total
Regulated	463,600	7,500	15,800	3,770	**490,670**
Regulated – sewerage	0	1,700	0	0	**1,700**
O&M	35,300	0	3,900	0	**39,200**
15 year lease	6,100	0	0	0	**6,100**
Meter reading	13,400	49,000	0	0	**62,400**
Total	**511,500**	**57,180**	**19,211**	**3,770**	**600,070**

Rio Grande Utilities Corporation (Rio Grande) was acquired in 2001 (approval gained in 2002) for USD2.3million, with USD3.1million in assumed debt. Rio Grande has annual revenues of USD1.2million. In May 2000, CWSC merged with Dominguez Services Corporation (DSC), a water provision company serving 150,000 people in the Los Angeles area. DSC's main holding is the Dominguez Water Company (32,637 customers, 120,000 people in 18 communities in the Carson/Torrance area of Los Angeles County), along with 3 smaller subsidiaries; the Kern River Valley Water Company (1,271 customers), the Antelope Valley Water Company (4,096 customers) and Redwood Valley Water Company (1,912 customers). In addition, DSC Investments generates revenues from the transfer of water rights between third parties. DSC had revenues of USD28.5million in 1999. In May 2003, CWSC acquired Kaanapali Water Corporation, now renamed Hawaii Water, which provides water service to 1,500 customers on the island of Maui, including several large resorts and condominium complexes, 500 customers from the original acquisition and approximately 1,000 from acquisitions and developments on Maui and Big Island.

Non regulated revenues were USD13.56million in 2007, with operating profits of USD4.44million. Non-regulated revenues were USD9.26million in 2005, with operating profits of USD 2.98million.

California Water Service Co., profit and loss account

Y/E 31/12 (USDmillion)	2003	2004	2005	2006	2007
Residential	194.90	221.32	222.63	232.81	253.75
Business	49.67	55.80	56.96	60.37	65.46
Industrial	11.26	13.59	14.24	16.29	17.40
Public authorities	12.79	15.12	14.97	15.73	17.95
Other customers	8.52	9.73	11.93	9.53	12.53
Group turnover	277.13	315.57	320.73	334.72	367.08
Net income	19.42	26.03	27.22	25.58	31.16
Earnings per share (USD)	1.21	1.46	1.47	1.34	1.50
Dividend per share (USD)	1.13	1.13	1.14	1.15	1.16

CALIFORNIA WATER SERVICE CO.

In September 2008, Hawaii Water acquired Waikoloa Resort Utilities, Inc., Waikoloa Water Company, Inc., and Waikoloa Sanitary Sewer Company, Inc. (West Hawaii Utilities). West Hawaii Utilities serves 1,970 customers in homes, condominiums, hotels, golf courses, and shops at Waikoloa Beach Resort and in Waikoloa Village in Big Island.

Contact Details

Name: California Water Service Group
Address: 1720 North First Street,
San Jose, CA 95112 USA
Tel: +1 408 367 8200
Fax: +1 831 427 9185
Web: www.calwater.com
Web: www.dominguezh2o.com / www.calwatergroup.com

Robert W. Foy (Chairman)
Peter C. Nelson (President/CEO)
Martin A. Kropelnicki (CFO)

CH2M HILL

CH2M Hill is an employee-owned civil engineering company. It was founded in 1946 by Messrs Cornell, Howland, Hayes & Merryfield who in turn merged with Claire A Hill Associates in 1971. The company employs 14,400 staff. In Puerto Rico, CH2M Hill was involved in the design and upgrading or construction of 600 water and wastewater facilities as part of a USD2.1billion investment completed by 2003. Other international projects include advanced effluent treatment at a number of coastal cities in Australia and New Zealand. In 2007, the company had revenues of USD5.8billion compared with USD3.8billion in 2005.

Operations Management International (CH2M Hill OMI)

As the name suggests, CH2M Hill OMI specialises in water and wastewater O&M contracts for municipal and industrial clients. The company was founded by CH2M Hill in 1980. Its first O&M contract was awarded by Lebanon, Oregon in 1982 and this was renewed for a further 10 years in 2007. OMI currently operates 200 water and wastewater facilities, against 150 in 1999 and has 1,600 staff. It is estimated that the company serves 3.5million people and is the fourth largest municipal O&M player in the USA, with revenues of USD181million in 2005. In addition, CH2M Hill OMI serves a number of industrial clients, generating revenues of approximately USD30million pa. The company is currently active in 30 states in the USA and in Canada and Puerto Rico.

OMI – some major contracts

2001	Seattle, WA	25 year DBO	Water treatment
2002	Sandy, Oregon	5 year O&M	Wastewater treatment
2002	Genoa, Michigan	3 year O&M	Water & wastewater treatment
2002	Rio Rancho, NM	5 year O&M	Water & wastewater treatment
2002	Stockton, CA	20 year O&M	Water & wastewater treatment
2003	Havana, Florida	3 year O&M	Wastewater treatment
2003	Fort Campbell, KY	50 year O, O&M	Water & wastewater treatment
2004 [1]	Eldorado, NM	4+4 year O&M	Water treatment
2005	Clovia, CA	15 year DBO	Wastewater treatment & reuse
2007 [1]	Lebanon, Ore	10 year O&M	Water & municipal services
2008 [1]	Grants, NM	20 year O&M	Water & wastewater treatment
2008 [1]	Prescott Valley, AZ	5 year O&M	Water & wastewater treatment

[1] Contract renewals

The Fort Campbell contract covers all the ownership and all operations for the 101st Airborne Division's headquarters, covering 3,000 buildings and 4,000 housing units, with a 7.6million gallon per day water treatment plant and a 4million gallons per day wastewater treatment plant. The total contract is worth USD700million. In Seattle, the new Cedar Treatment Facility will provide 70% of the water used by the city's 1.3million people and will save Seattle USD50million over the life of the contract. The water treatment facility is expected to be operating by the end of 2004 and will cost USD109million to design, build and operate for 25 years. The Stockton contract was originally awarded to OMI's joint venture with Thames Water and is intended to save the city USD65million in engineering fees and USD110million in other operational costs.

Contact Details

Name: CH2M Hill
Address: 9191 South Jamaica Street,
Englewood CO, 80112, USA
Tel: (303) 771 0900
Fax: (303) 286 9250
Web: www.ch2m.com
Web: www.omiinc.com

Ralph R. Peterson (Chairman and CEO)
Lee A McIntire (President & COO)
Mark Lasswell (President, Water Business Group)

CONNECTICUT WATER SERVICE COMPANY

The Connecticut Water Service Company (CWS) was founded in 1956 as Suburban Water Service, Inc and has concentrated on acquiring and operating water companies through controlling stock ownership. The oldest system in CWS's franchise was formed in 1849. Since 1969, the company has been selling off its excess real estate holdings. In 1975, the company changed its name to Connecticut Water Service Inc., after acquiring all of the outstanding Common Stock of CWS. In 1999 CWS established Connecticut Water Utility Services (CWUS) to handle the non-regulated business activities previously transacted by CWS, its regulated subsidiary. 9% of revenues in 2005 were derived from the non-regulated activities. CWS was subsequently renamed New England Water Utility Services (NEWUS).

FY 2003 activities by operating company (USDmillion)

Water Company	Customers	People served	Revenues
Connecticut	70,714	241,000	39.01
Unionville	5,999	20,000	2.58
Crystal	5,050	17,000	2.07

CWS supplies water to 86,000 customers in 2007, against 87,676 in 2004. 90% of customers are residential, 7% industrial and commercial and 3% other customers. These are based in three separate operating regions including 54 towns in Connecticut. The service areas have a total population of 300,000. In 1999 CWS acquired Gallup Water Service Inc., and Crystal Water Utilities Corporation. These two systems were merged as the Crystal Water Company of Danielson in 2005. In December 2001, the company made a USD6.3million agreed bid for Unionville Water, a CT based company with 5,400 customers or 14,000 people at the time.

In July 2008, the company acquired the Ellington Acres Company which serves 750 customers (2,300 people) in Ellington, CT. The acquisition cost USD1.495million and links to the 36,000 customers already served in the vicinity by the company.

In January 2008, the company acquired Birmingham Utilities' Eastern Operations, which serve 2,200 customers (7,500 people) in 15 towns in the state for USD3.5million. The activities are expected to generate revenues of USD1.6million pa. Two small acquisitions completed in 2007 (Avery Heights and the Hilldale Park Homeowner's Association) added a further 300 connections (1,000 people) to the company's activities in CT.

Connecticut Water Service Co., profit and loss account

Y/E 31/12 (USDmillion)	2003	2004	2005	2006	2007
Turnover					
Residential	27.83	28.95	29.98	29.07	38.35
Commercial	5.33	5.44	5.62	5.65	6.76
Industrial	1.62	1.63	1.54	1.59	1.76
Public Authorities	1.30	1.24	1.63	1.51	1.92
Fire & Non-Metered	8.052	8.49	8.67	9.13	10.22
Total turnover	47.12	46.01	47.45	46.45	59.03
Utility operating profits	11.68	11.04	10.54	7.53	13.25
Net income	8.89	9.16	7.17	6.71	8.78
Earnings per share (USD)	1.12	1.15	0.89	0.81	1.06
Dividends per share (USD)	0.83	0.84	0.85	0.86	0.87

In February 2001, CWS acquired Barnstable Holding Company for USD6.5million. Barnstable owns the Barnstable Water Company, which serves 7,200 customers in Barnstable, Massachusetts. In 2005, the town of Barnstable acquired this system and allied real estate for USD11million under the terms of its original charter agreed in 1911.

CONNECTICUT WATER SERVICE COMPANY

The New England Water Utility Services, Inc. (NEWUS), provides water and wastewater related services to residential, commercial, industrial and municipal clients throughout Connecticut, Massachusetts, and Rhode Island. Services include: Contract operation of water and wastewater systems for other utilities, businesses, municipalities, and the University of Connecticut's Storrs Campus and emergency water delivery to hospitals, businesses and private well owners via tanker truck.

Contact Details

Name: Connecticut Water Service
Address: 93 West Main Street,
Clinton, CT 06413
Tel: +1 860 669 8636
Fax: +1 860 669 9326
Web: www.ctwater.com

Eric W Thornburg (Chairman, President and CEO)
David C. Benoit (VP Finance/Treasurer)
Terrance O'Neill (VP Operations)

COVANTA HOLDING CORP

Covanta had a series of water and wastewater contracts in New York State, Alabama and Florida. In April 2002, the company filed for Chapter 11 protection. CE (Covanta Energy) has withdrawn from a number of loss making project areas to concentrate on renewable energy generation and water provision. In December 2003, an agreed bid from Danielson Holding Corporation was agreed as a way of releasing Covanta from Chapter 11 status. This plan was accepted by the Bankruptcy Court in March 2004 and in September 2005, the company was renamed Covanta Holdings. Its main activity now is in the operation of waste to energy facilities.

Covanta Holding Corp, profit and loss account

Y/E 31/12 (USDmillion)	2003	2004	2005	2006	2007
Revenue	41.1	576.2	978.8	1,268.5	1,433.1
Operating profit	-14.3	76.9	146.2	226.8	236.6
Pre-tax profit	-14.3	35.5	77.6	122.2	148.0
Net income	-69.2	34.1	59.3	105.8	130.5
Earnings per Share (USD)	-1.05	0.37	0.46	0.72	0.85

Prior to 2004, CW (Covanta Water) had O&M contracts serving six municipalities in New York State with a total treatment capacity of 17million gallons per day and a 50million gallons per day wastewater facility for Bristol Meyer Squibb. The main contract, for a 10million gallon per day wastewater treatment facility, was awarded in 1994 and renewed for 10 years in 1999. These contracts were handed back to their clients as part of the reorganisation procedures during 2003-04.

Tampa Bay

In 2000, the company was awarded a 20 year operating contract for the facility. In Tampa Bay, Florida, Covanta and Poseidon constructed a USD74million 25million gallons per day desalination facility. This facility was completed in 2003, but soon ran into a series of operational and financial difficulties. When the facility emerged from the various bankruptcy proceedings, it was bought out by the Southwest Florida Water Management District and operations were assumed by American Water – Pridesa.

Bessemer, Alabama

Bessemer Covanta has developed a USD56million 24million gallons per day water treatment facility serving a suburb of Birmingham, Alabama in 1997. It entered service in 1999 under a 20 year contract. Covanta is paid a fixed-fee plus pass-through costs for delivering processed water to a municipal water distribution system.

Contact Details

Name: Covanta Holdings Corporation
Address: 40 Lane Road,
Fairfield NJ 07004, USA
Tel: + 973 882 9000
Web: www.covantaenergy.com

Samuel Zell (Chairman)
Anthony J Orlando (President and CEO)
Craig Albot (CFO)

HAN'S TECHNOLOGIES INC

Hans Technologies is a privately held USA based company, which has gained a series of BOT contracts in China through its Western Water subsidiary since 2004. The company has been developing engineering projects in China since 1998, with a total treatment capacity of 1.0m^3 per day having been installed to date.

2004	Bijie	BOT	80,000, water

A 75,000m^3 per day WTW and 30 miles of piping was built between 2004 and 2006 to serve Qian-Xi, Bijie Prefecture in Guizhou. It entered service in September 2006.

2004	Na-yong	BOT	50,000, water

A 25,000m^3 per day WTW and 10 miles of piping was built between 2004 and 2005 to serve the town in Guizhou. The BOT was later sold back to the government.

2004	Zhi-jin	BOT	70,000, water

A 22,500m^3 per day WTW was built between 2004 and 2005 to serve the town in Guizhou. It entered service in 2005.

2005	He-zhang	BOT	50,000, water

A 15,000m^3 per day WTW was added to the extant WTW along with seven miles of piping to serve the city in Guizhou. It entered service in October 2007.

2005	Da-fang	BOT	80,000, water

A WTW, new piping and a dam are being built between 2005 and 2010 to overhaul the county in Guizhou's water services. They currently serve 25% of the population.

2005	Xi-tang	30 year BOT	100,000, wastewater

A 75,000m^3 per day WWTW that can be doubled in size entered service in July 2007, serving the town and industries in Guizhou.

2008	Yiliang	BOT	Wastewater

A 20,000m^3 per day WWTW is to serve the Huaxing Water Town in Yiliang County, Kunming, Yunan.

2008	Ninghua	BOT	150,000, wastewater

A 40,000m^3 per day WWTW is to serve Ninghua County, Sanming Prefecture in Fujian Province. Construction started in August 2008.

Contact Details

Name: Han's Technologies
Address: 1300 Clay Street, Suite 600,
Oakland C 94612
Tel: +1 510 464 8018
Fax: +1 510 464 8001
Web: www.hanstech.net

James Li (CFO)

GLOBAL WATER RESOURCES

Global Water Resources, Inc. is a regulated water utility that provides water, wastewater and recycled water utility services. The Company owns and operates 16 water and wastewater utilities in metropolitan Phoenix, Arizona. It serves 38,000 customers (110,000 people) in a 378 square mile service areas. At the start of 2005, the company served 20,000 people. In May 2008, the company filed a registration statement for an IPO on the NASDAQ Global Select Market. It appears that the IPO has been held back due to market conditions.

The company opened a groundwater recharge facility in February 2007, which is permitted for 50,000 acre-feet of recharge per year and has started operating at 25,000 acre-feet per year. The facility is adjacent to the Central Arizona Project canal and the Hassayampa River. Colorado River water is extracted from the canal and introduced to the bed of the Hassayampa River where it recharges the underlying aquifer.

In June 2005 the company acquired Sonoran Utilities Services, LLC in the City of Maricopa, adjacent to the companys's Santa Cruz Water Company and Palo Verde Utilities Company. The City of Maricopa has seen over 600 building permits requested each month, fitting in with GWR's plans to add over 300 customers a month in the area. The Cave Creek Water Company, which operates utilities in the Phoenix area was acquired in March 2005.

In July 2006 Global Water Resources acquired West Maricopa Combine, the parent company of Valencia Water Company in the City of Buckeye, Willow Valley Water Company near Bullhead City, Water Utility of Greater Buckeye near Buckeye, Water Utility of Greater Tonopah west of the Hassayampa River and Water Utility of Northern Scottsdale located in northeast Scottsdale. These companies serve an area of 80 square miles, earmarked for 135,000 houses.

In October 2007 Global Water Resources acquired Balterra Sewer Corp., a wastewater provider for an area in unincorporated western Maricopa County known as Tonopah. The Water Utility of Greater Tonopah ("WUGT"), a Global Water affiliate, is currently the area's primary water supplier.

In September 2008, Global Water Resources announced that it had entered into a Memorandum of Understanding with the City of Eloy in Arizona for the provision of water, wastewater and recycled water infrastructure for the eastern portion of Eloy's planning area.

Contact Details

Name: Global Water Resources LLC
Address: 21410 N 19th Avenue, Suite 201
Phoenix, AZ 85027
Tel: 623-518-4000
Fax: 623-518-4100
Web: www.gwresources.com

Trevor Hill (President & CEO)

MIDDLESEX WATER COMPANY

Middlesex Water Company (MWC) is involved in wholesale and retail water supply for domestic, commercial, industrial and fire protection customers in New Jersey and Delaware, (with New Jersey being the main market). The company was incorporated in 1897 and operates water utility systems in central and southern New Jersey and in Delaware, as well as a wastewater utility in southern New Jersey. MWC serves approximately 375,000 people with water and 10,000 people with sewerage.

The Middlesex System in central New Jersey produced 69% of the MWC's 2005 revenues, providing water to 59,400 retail customers, primarily in eastern Middlesex County, New Jersey, a population of 303,000. 7% of the Middlesex System's water was purchased from E'Town Water. The remaining 23% was obtained through groundwater. There are seven further subsidiaries:

1 Tidewater Utilities Inc.; Founded in 1964, serving 31,600 retail customers in 271 separate community water systems in Kent, Sussex and New Castle Counties, Delaware, along with 5,100 water and wastewater customers served by White Marsh through 62 O&M contracts.

2 Pinelands Water Company services 2,400 residential customers in Burlington County, New Jersey.

3 Pinelands Wastewater Company services 2,300 primarily residential retail customers and, under contract, one municipal wastewater system in Burlington County, New Jersey with about 200 residential customers.

4 Utility Service Affiliates Inc, along with MWC, started a 5 year contract with the City of South Amboy, New Jersey to operate and maintain the city's 2,600 customer water system in May 1995. The contract has been renewed to 2045.

5 Utility Service Affiliates (Perth Amboy) Inc, along with MWC, signed an agreement in 1998 with the city of Perth Amboy to operate and maintain the City's water and wastewater systems for its 9,300 customers (40,000 people) for 20 years. USA-PA will be paid a fixed fee and a variable fee based on increased system billings.

6 Bayview has 300 customers in Cumberland County, NJ. Bayview was incorporated into the Middlesex system at the start of 2006.

7 In September 2008, the water and wastewater systems serving 1,500 people in the Blue Ridge Moiuntain Estates in North Carolina were taken over.

Middlesex Water Co., turnover by activity (USDmillion)

	2003	2004	2005	2006	2007
Residential	25.27	28.32	31.29	34.58	38.79
Commercial	6.30	6.77	7.30	8.11	8.39
Industrial	7.13	7.71	8.18	8.66	8.51
Fire protection	6.83	7.34	7.74	8.64	8.88
Contract sales	8.46	9.09	10.02	9.94	10.75
Contract operations	8.07	7.93	8.08	8.88	8.83
Other	2.06	3.83	2.00	2.26	1.99

Middlesex Water Co., profit and loss account

Y/E 31/12 (USDmillion)	2003	2004	2005	2006	2007
Turnover	64.11	70.99	74.61	81.06	86.11
Operating profits	14.74	16.93	17.22	21.32	22.67
Net income	6.63	8.45	8.48	10.04	11.84
Earnings per share (USD)	0.61	0.73	0.71	0.82	0.87

MIDDLESEX WATER COMPANY

Contact Details

Name: Middlesex Water Company
Address: 1500 Ronson Road, Iselin, NJ 08830 USA
Tel: +1 732 634 1500
Fax: +1 732 750 5981
Web: www.middlesexwater.com

J Richard Tompkins (Chairman)
Dennis W Doll (President and CEO)
A. Bruce O'Connor (VP/CFO)
Ronald F Williams (VP/COO)

PENNICHUCK CORPORATION

Pennichuck Corporation (PC) owns three subsidiaries operating in southern and central New Hampshire. Pennichuck Water Works Inc. (Pennichuck), Pennichuck East Utility Inc. (Pennichuck East) and Pittsfield Aqueduct Company Inc (Pittsfield), provide drinking water to 30,032 residential and 2,000 commercial and industrial customers. The company was founded in 1983 to operate the assets of Pennichuck Water Works, which was first established in 1852. Pennichuck East & Pittsfield were both acquired in 1998. In January 2005 three water systems were acquired: the Locke Lake water system in Barnstead, the Birch Hill water system in Conway and the Sunrise Estates water system in Middleton. When the acquisitions have been approved, they will be incorporated into the Pittsfield operations. In addition, the Pennichuck Water Services Corporation provides O&M services to Hudson, New Hampshire. Overall, PC serves 130,000 customers in 23 towns and cities in New Hampshire. Pennichuck East gained 146 new customers from the acquisition of three small systems in 2007 and a further 48 connections were acquired in the Windham part of the Pennichuck East area in May 2008.

Pennichuck Corporation breakdown

FY 31/12/2007 (USDmillion)	Customers	Revenues
Pennichuck Water	25,800	21.8
Pennichuck East	5,313	4.7
Pittsfield	1,755	0.8

Non-regulated water contract operations generated revenues of USD2.05million in 2005, against USD1.93million in 2004. The principal contracts gained to date have been for Hudson, New Hampshire (contract awarded 1998, renewed in 2005), Salisbury, Massachusetts (awarded 2001, and re-awarded in September 2007 to 2012, serving 9,000 people) and Barnstable, Massachusetts (commencing in 2006).

Pennichuck Corp., profit and loss account

Y/E 31/12 (USDmillion)	2003	2004	2005	2006	2007
Turnover – Utilities	18.68	19.60	21.55	21.97	27.22
Turnover – Water management	1.70	1.93	2.05	2.33	2.29
Turnover – Other	0.58	1.36	0.26	0.17	0.03
Turnover	20.97	22.89	23.86	24.48	29.94
Net income	1.25	1.82	0.48	0.57	3.58
Earnings per share (USD)	0.39	0.57	0.13	0.14	0.85

Aborted bid by PSC and Municipal counter-bid

Philadelphia Suburban Corp (now Aqua America) made an agreed bid for Pennichuck in May 2002. The bid was abandoned in February 2003 when a referendum in Nashua, New Hampshire sought to authorise the municipal acquisition of Pennichuck. This process is still ongoing (at a cost to the town forecast by 2007 at USD4million) and in April 2004 Pennichuck started a legal action claiming USD5million in damages over this, with costs to the end of 2007 estimated at USD7.0million. In May 2003, the town of Pittsfield voted to seek to acquire the Pittsfield Aqueduct Co, which was acquired by Pennichuck in 1998. Various hearings were held through 2007 without any progress being made by either side. In July 2008, the New Hampshire Public Utilities Commission announced that the city could acquire the system for USD243million, but the bid remains unresolved.

Contact Details

Name: Pennichuck Corporation
Address: Four Water Street, Nashua, NH 03061, USA
Tel: +1 603 882 5191
Fax: +1 603 882 4125
Web: www.pennichuck.com

Duane C Montopoli (President and CEO)
Thomas C Leopard (VP, Treasurer and CFO)

PICO HOLDINGS INC

The Physicians Insurance Company of Ohio (PICO) is a holding company specialising in the acquisition of apparently undervalued assets. The company seeks to develop a portfolio of water assets for sale to municipal and industrial clients.

PICO Holdings Inc, profit and loss account

Y/E 31/12 (USDmillion)	2003	2004	2005	2006	2007
Turnover	31.50	22.12	142.11	82.72	33.93
Operating profit	-13.62	-10.64	40.33	50.87	2.01
Net profit	-3.24	-10.56	16.20	29.24	-1.27
Earnings per share (USD)	-0.26	-0.85	1.25	1.95	-0.07

PICO entered the water rights market in 1995 through the acquisition of Vidler Water Co. Currently, Vidler controls water rights in Nevada (11,306 acre-feet plus applications for up to 100,000 acre-feet outstanding), Arizona (37,795 acre-feet plus 13,764 acre-feet under option) and Colorado (268 acre-feet, these operations are in the process of being sold off). Revenues are generated by the sale of land and water rights and from the selling of water to third parties. Nevada Land and Resource Company (NLRC) was acquired in 1996 for USD48.6million. NLRC currently owns 5,582 acre-feet of water rights in Nevada and is applying for up to 105,506 acre-feet of additional water rights. In Arizona, the Vidler Arizona Recharge Facility has an estimated capacity of 1million acre-feet with an annual recharge capacity of 35,000 acre-feet. The Semitropic water storage facility in California holds the right to store 30,000 acre-feet of water until 2035, with an annual recovery of 2,700-6,800 acre-feet per annum. In July 2008 Vidler Water sold the company's interests in Semitropic to the San Diego Water Authority for USD11.7million resulting in a net gain of USD8.7million.

Water Rights held by Pico, 09-2008

System	State	Status	Acre-feet
Harquahala, La Paz County	Arizona	Owned	3,840
Fish Springs Ranch	Nevada	51% owned	13,000
Lincoln County	Nevada	Application	40,000
Sandy Valley	Nevada	Owned	415
Sandy Valley	Nevada	Application	1,000
Muddy River	Nevada	Owned	267
Carson River	Nevada	Owned	2,069
Carson River	Nevada	Option	1,652
Colorado	Colorado	Owned	180
Boise	Idaho	Owned	7,044

In March 2002, PICO sold 2,645 acre-feet of transferable ground water in Harquahala Valley, Arizona for USD1,450 per acre-foot. A further 480 acre-feet were sold in May 2002 for USD2,083 per acre-foot. Sales since 2001 have generated USD15.6million in revenues and USD4.8million in gross margins. In 2001, Vidler Water Company sold 83.8% of its original interests in the Semitropic Water Banking and Exchange Program for USD10.2million, with a gross margin of USD5.7million. Vidler sold 44,000 acres of land in 2003, generating USD14.8million in revenues and USD4.6million to gross margins. In 2005, Vidler sold 42,000 acre-feet of water rights in the Harquahala Valley Irrigation District of Arizona for USD94.4million at USD2,200 per acre-foot, with a net gain of USD55.5million.

Vidler and NRLC, profit and loss account

Y/E 31/12 (USDmillion)	2003	2004	2005	2006	2007
Vidler					
Turnover	16.8	2.0	106.4	3.0	7.9
Pre-tax profit	-0.5	-5.7	56.2	-2.5	-5.3
NRLC					
Turnover	5.9	11.6	21.8	41.4	13.5

Pre-tax profit	2.0	5.3	12.0	30.5	8.1

Vidler and NRLC aim to secure and develop water rights where needed for strategic municipal and industrial customers. These assets can then either be sold, leased or traded as market conditions permit. NRLC's income derives from land sales and royalties. These markets fluctuate from year-to-year. To date NRLC has sold water rights worth USD894,000.

Contact Details

Name: PICO Holdings Inc
Address: 875 Prospect Street, Suite 301,
La Jolla, CA 92037-4264, USA
Tel: +(858) 456 6022
Fax: +(858) 456 6480
Web: www.picoholdings.com
Web: www.vidlerwater.com

John D Weil (Chairman)
John R Hart (President and CEO)
Richard H Sharpe (COO)
Maxim C. W. Webb (CFO)

PURE CYCLE CORP

Pure Cycle Corporation was founded in 1976 to provide water and wastewater services to customers located in the Denver metropolitan area. The Company designs, constructs, operates and maintains systems serving the customers. Water and wastewater services are provided to cities, municipalities and special districts. The Company also owns patented water recycling technologies for the recovery of wastewater into potable water.

In 1996, the Company entered into a long-term agreement to provide water and wastewater services to the Lowry Range, a district with 27,000 acres of primarily undeveloped land in the greater Denver metropolitan area, with 26,700 acre-feet of water which has the potential to serve 78,100 single family equivalent households.

Rights	**(acre feet)**
Denver basin groundwater, Lowry Range	26,700
Junior South Platte River water	8,125
Surface storage	29,262
Senior Arkansas River 1883 water rights	60,000
Conditionally decreed water rights	**(acre feet)**
Paradise Water Supply, Colorado	70,000

In 2006, the company acquired 23% of the Fort Lyon Canal Company and through this the rights to 60,000 acre feet of senior Arkansas River water rights with 40,000 acre-feet per year withdrawal and 17,500 acres of farmland. The river water will be diverted from agricultural irrigation (with the farmland being restored as non-irrigated land) and piped from the Fort Lyon Canal to Denver via a 150 mile USD400million pipeline. As the transfer is to be self-financed, it is not going to commence for many years. This increases the company's capacity by 102,000 single family equivalent households, with potential usage fees of USD100million pa at annual fees of USD600 for water and USD400 for wastewater per household.

Y/E 31/08 (USD 000)	**2003**	**2004**	**2005**	**2006**	**2007**
Water usage revenues	156	145	152	164	150
Wastewater processing revenues	57	55	58	59	60
Other revenues	12	4	25	49	56
Total revenues	225	205	234	272	266
Operating profit	-136	-785	-1,151	-1,359	-2,654
Net profit	-321	-1,976	-1,051	-793	-6,915
Earnings per share (USD)	N/A	-0.22	-0.08	-0.05	-0.37

In May 2004, Pure Cycle signed a long-term contract to provide water service to the Hills at Sky Ranch, a planned unit development in unincorporated Arapahoe County. Plans for the Hills at Sky Ranch provide for approximately 850 residences along with parks, open space and retail and commercial areas. The Hills at Sky Ranch is situated on 160 acres located about 8 miles south of Denver International Airport and adjoins the 760-acre, 4,000 dwelling unit Sky Ranch development to which the Company will also provide water service.

Revenues are currently gained from delivering water to the Fairgrounds on Lowry Range (44.4million gallons in 2007), operating a wastewater treatment plant (20,000 gallons per day treated with an operational capacity of 130,000 gallons per day)

Contact Details

Name: Pure Cycle Corporation
Address: 8451 Delaware Street,
Thornton, CO 80260, USA
Tel: +1 303 292 3456
Web: www.purecyclewater.com

Harrison H Augur (Chairman)
Mark W Harding (President and CFO)

SJW CORP

SJW Corporation (SJW) was incorporated in California in 1985, serving what is now called Silicon Valley. It is a holding company with two wholly owned subsidiaries, San Jose Water Company and SJW Land Company. In addition, SJW also holds 1.10million shares in the California Water Service Group (CWSG). Altogether, 99% of revenues over the past 3 years have been generated by the water activities, while dividends from CWSG have contributed 7% of profits during the same period.

The San Jose Water Company was incorporated in 1931, succeeding a business founded in 1866. The Company provides water to approximately 1million people via 225,000 connections in an area of 138 square miles in the metropolitan San Jose area, an increase of 50,000 over the 2000 figure. Population growth within its service area has resulted in long term growth in its customer base. The company provides water services to customers in parts of Cupertino and San Jose and in Campbell, Monte Sereno, Saratoga, Los Gatos, and the surrounding areas in the County of Santa Clara in California. 40-45% of SJW's water is bought from third parties, the cost of which has risen from USD36.7million in 2003 to USD48.6million in 2007. Since 1997, a programme for renovating and replacing the company's water assets has been under way, most of which were developed between 1945 and 1980. Capital spending for 2008-12 has been budgeted at USD263million.

In October 1997, SJWC commenced operation of the city of Cupertino municipal water system under terms of a 25 year lease. The system is adjacent to the existing San Jose Water Company service area and has 4,400 customers. SJWC made a USD6.8million lease payment to the city, which will be amortised over the lease term. The company is responsible for all aspects of system operation, including capital improvements.

SJW Corp., profit and loss account

Y/E 31/12 (USDmillion)	2003	2004	2005	2006	2007
Water – Residential & commercial	N/A	N/A	161.62	169.25	182.92
Water – Industrial	N/A	N/A	1.04	1.12	1.29
Water – Public authorities	N/A	N/A	8.90	8.90	10.47
Water – Others	N/A	N/A	3.96	4.54	5.33
SJW Land	N/A	N/A	3.32	4.32	6.49
Other	N/A	N/A	1.26	1.11	0.11
Group Turnover	150.45	166.91	180.11	189.24	206.60
Operating profit	23.20	24.12	29.02	31.55	29.75
Net income	18.68	19.79	21.84	38.58	19.23
Earnings per share (USD)	1.02	1.08	1.20	2.11	1.05
Dividends per share (USD)	0.49	0.51	0.53	0.57	0.60

SJWTX Water Inc, a 97.5% owned subsidiary of SJW Corp was incorporated in the State of Texas in September 2005 for the purpose of acquiring the assets of Canyon Lake Water Supply Corporation (CLWSC), a Texas nonN/Aprofit water supply corporation. CLWSC is a memberN/Aowned nonN/Aprofit water utility headquartered in Canyon Lake, Texas and serves a population of approximately 36,000 with more than 7,900 connections in 78 square miles of western Comal County and southern Blanco County near San Antonio. CLWSC was acquired for USD3.2million along with the assumption of USD20million in corporate debt.

Contact Details

Name: SJW Corporation
Address: 374 West Santa Clara Street,
San Jose, CA 95196, USA
Tel: +1 408 279 7800
Fax: +1 408 279 7934
Web: www.sjwater.com

W. Richard Roth (President / CEO)
David Green (CFO / Treasurer)
R S Yoo (COO)

SOUTHWEST WATER COMPANY

Southwest Water Company (SWC) was incorporated in California in 1954 and reincorporated in Delaware on June 30, 1988. The company provides water and wastewater services to some 2million people through 700 contracts for managing 460 water treatment plants and 200 wastewater treatment plants in 36 states, mainly California, New Mexico, Texas and Mississippi. The company has two operating groups; the Utility Group and the Services Group.

Utility operations

The Utility Group operates the company's regulated water activities in California, New Mexico and Texas. Suburban Water Systems (SWS) operates in California, New Mexico Utilities Inc (NMUI) in New Mexico, Texas Utilities (TU) in Texas and in Alabama, Mississippi and Oklahoma. The division currently serves 510,000 people.

SWS was founded in 1907 and serves 311,000 people (70,968 domestic customers) in Los Angeles and Orange County. The city of West Covina's water system was acquired in February 2000 for USD8.5million. This system has 7,000 connections and is near to SWS's existing activities. Customer growth is limited to acquisitions and growth within its existing franchise. In 2007, 73% of Suburban's turnover came from sales to domestic customers, 18% to industrial and commercial customers and 9% to other customers. NMUI was acquired in 1969 and operates in Albuquerque and Bernalillo County, New Mexico, now serving 53,000 people having grown from 800 connections in 1969 to 17,318 connections in 2007. A small system in northern Mississippi was acquired in 2007, serving 279 water connections and 378 wastewater connections. The company has a further 250 water and wastewater connections in Oklahoma (800 people).

Texas Utilities consists of the Windermere Utility Company and Hornsby Bend Utility Company (acquired for USD4million in October 2000, based in the suburbs of Austin, with 6,081 connections) and 87 water utilities and 12 wastewater utilities acquired from Tecon Water Holdings for USD66million in July 2004. The activities, now called Monarch Utilities currently serve approximately 21,000 water and 3,500 wastewater connections in Texas. A USD0.7million acquisition in 2005 added 370 new water connections and 2,600 connections in 13 water systems in the San Antonio area were acquired in 2007 for USD 5.8million. In total, 116,000 people are served in Texas through 105 water systems.

Southwest Water Company, regulated water / wastewater customer breakdown

Customers served	2003	2004	2005	2006	2007
SWS	75,027	75,077	75,170	75,186	75,322
NMUI	12,949	14,311	15,671	16,896	17,318
Texas	6,081	28,405	32,835	33,519	36,741
Alabama	N/A	N/A	4,618	4,243	4,393
Mississippi	N/A	N/A	N/A	N/A	387

A wastewater system in Birmingham, Alabama was acquired in January 2008 with 4,100 connections. This is the second largest transaction by SouthWest Water, serving more than 12,000 residents and generating revenues of USD5.2million in 2007. It is adjacent to the company's Shelby County wastewater system which was acquired in 2005 and serves 14,500 people via 4,000 connections.

SWW – regulated utility system acquisitions since 2004

System	State	Year	Water connections	Wastewater connections	Cost (USDmillion)
Monarch Utilities	Texas	2004	21,000	3,500	66.0
Shelby County	Alabama	2005	0	4,000	8.6
Midway Water	Texas	2005	370	0	0.7
Austin	Texas	2006	244	244	1.4
Mississippi	Mississippi	2007	275	355	0.6
San Antonio	Texas	2007	2,600	0	5.8
Madison County	Alabama	2007	0	120	1.7
Shelby County	Alabama	2008	0	4,100	22.5

SOUTHWEST WATER COMPANY

Service operations

The Services Group primarily operates in Texas, New Mexico, California, Colorado, Alabama, Mississippi, Georgia and New Jersey and had 700 contracts in 2007. Its main subsidiary ECO Resources Inc, (ECO) is a wholly owned subsidiary that operates and manages water and wastewater treatment facilities owned by municipalities and other companies. ECO was acquired in 1985 and has 173 municipal utility contracts (MUDs) and 29 operations and management contracts. ECO serves approximately 600,000 people in Texas. In 2007, 95% of O&M contracts were renewed.

In May 2000, ECO Resources was awarded a 5 year, USD10million extension of its contract to operate and maintain a portion of the water and wastewater utility system of the city of Sugar Land, Texas. As part of the newly approved contract, ECO will expand its service from 7,500 to 12,225 customer connections and will operate and maintain the entire First Colony utility system, located within the city of Sugar Land. In August 2001, SWC acquired 90% of AtlantaN/Abased Operations Technologies Inc. (OpTech), a provider of contract water, wastewater and public works services in the south eastern United States for USD8.2million. OpTech was founded by Robert W. Monette in 1994 and operates utilities in Georgia and Mississippi. In June 2003, a USD30million 10 year water and wastewater O&M contract was gained covering 30,000 households in Pascagoula, Missouri.

In November 2002, SWC acquired the majority of AquaSource's water and wastewater contract operations business for USD10.3million. These include AquaSource's contract operations in Colorado and the Houston area.

Southwest Water Co., profit and loss account

Y/E 31/12 (USDmillion)	2003	2004	2005	2006	2007
Utility customers	94,057	118,403	120,840	130,094	134,411
Utilities Group	56.90	69.42	78.88	86.32	93.37
Services Group	116.00	110.18	124.30	132.48	123.98
Total turnover	166.68	179.42	197.60	218.80	217.35
Operating profits	14.18	11.39	18.47	22.42	2.86
Gains on land sales	0.73	0.00	0.00	0.00	0.00
Net income	7.17	4.51	2.38	9.38	-8.07
Earnings per share (USD)	0.44	0.26	0.37	0.43	-0.21
Dividends per shares (USD)	0.16	0.18	0.20	0.21	0.23

In January 2000, SWC formed Inland Pacific Water Company (IPWC) a JV designed to develop waterN/Arelated and wastewaterN/Arelated opportunities in Southern California's San Bernardino and Riverside counties. On February 25, 2000, SWS purchased West Covina's water distribution system and facilities, assuming ownership and operation of West Covina's water system on that date. The transaction added approximately 7,000 connections to SWS's customer base, an increase of approximately 11%. Covina generates USD5.5million pa in revenues.

Contact Details

Name: Southwest Water Company
Address: 624 South Grand Avenue,
Los Angeles, CA 90017 USA
Tel: +1 213 929 1800
Fax: +1 213 929 1888
Web: www.swwc.com

Mark A Swatek (Chairman and CEO)
Cheryl L Clary (CFO)

TYCO INTERNATIONAL LTD

Tyco International Ltd. (TI) is a manufacturer and supplier of industrial products and systems. TI acquired Earth Tech in 1996. In 2008, Tyco sold Earth Tech to AECOM (see company entry) but retained the activities in Brazil, Australia and New Zealand.

Tyco International Ltd, profit and loss account

Y/E 30/09 (USDmillion)	2003	2004	2005	2006	2007
Turnover	14,726	16,029	16,665	17,336	18,781
Operating income	-439	345	581	823	-2,519
Net income	966	2,822	3,094	3,590	-1,742
Earnings per Share (USD)	1.94	5.64	9.15	7.14	-3.52

Tyco, populations served

Country	Water	Sewerage	Total
Australia	0	50,000	**50,000**
Brazil	180,000	300,000	**300,000**
Grand Total	180,000	350,000	**350,000**

Australia

2004	Cranbourne	25 year BOT	Wastewater

The AUD38million, 30,000 M^3 per day facility is designed to provide recycled water for a number of horticultural and agricultural businesses in the Melbourne area.

2003	Echuca & Rochester	25 year BOT	Wastewater

The 25N/Ayear contract is to design, build, finance, own and operate a water reclamation project for Victoria's Coliban Water. The project will generate revenues in excess of USD80million, serving two agricultural communities in the state. It involved the development of an integrated advanced sewage treatment system for the two towns for water recovery for irrigation use on farmland. Construction of the 2 wastewater treatment plants will cost AUD40million and they entered service in 2004.

1998	Virginia Plains	20 year management	Wastewater

The 20 year management project is for the provision of 10million m^3 of high grade irrigation water each year for 240 clients. This project uses 10% of Adelaide's wastewater.

New Zealand

2005	Mangawhai	15 year BOT	Wastewater

Mangawhai Township is a beach resort north of Auckland. Earth Tech will operate the USD 20million scheme for 15 years in partnership with the Kaipara District Council.

Brazil

1999	Nova Friburgo	25 year concession	180,000 water and wastewater

Nova Friburgo is near Rio de Janeiro. Earth Tech is responsible for constructing a new sewage treatment facility, expanding the existing water treatment plant, providing ongoing O&M services for plants and distribution and collection systems, installing water meters, and managing the utility billing program. USD70million of investments will be made during the operating period

2000	Jau	25 year DBFO	120,000 wastewater

Jau is in Sao Paulo state. The contract is worth USD80million. Both contracts in Brazil were gained through Earth Tech's MultiserviceN/Aengenharia Ltd subsidiary.

TYCO INTERNATIONAL LTD

Contact Details
Name: Tyco International
Address: The Zurich Centre, 2nd Floor, 90 Pitts Bay Road, Pembroke HM 08. Bermuda
Web: www.tycoint.com

Edward D Breen (Chairman and CEO, Tyco)
Christopher J Coughlin (CFO, Tyco)

UTILITIES INC

Utilities Inc was founded in 1965 and is the holding company for approximately 94 subsidiaries providing residential water and/or wastewater services to more than 300,000 customers (over 1million people in May 2008) in 400 municipalities in Arizona (2 companies), Florida (22 companies), Georgia (2 companies), Illinois (24 companies), Indiana (3 companies), Louisiana (2 companies), Maryland (3 companies), North Carolina (18 companies), Nevada (4 companies), New Jersey (2 companies), Pennsylvania (3 companies), South Carolina (5 companies), Tennessee (Tennessee Water Service), Virginia (2 companies) and Kentucky (2 companies). 10 subsidiaries were acquired during 2003, increasing the number of people served by 80,000. In 2002, Utilities Inc.'s revenues were USD61million. In 2004, they had increased to USD85million and are approximately USD100million in 2008. 90% of the 2008 customer base is residential, with the rest mainly being light industrial. The 2007 acquisition of the Perkins Mountain Water Company in Arizona added 40,000 customers.

Customers by State, 2002

State	Customers
Arizona	5,450
Florida	81,000
Georgia	11,200
Illinois	17,400
Indiana	8,300
Kentucky	7,000
Louisiana	17,100
Maryland	7,000
Mississippi	1,800
New Jersey	1,100
Nevada	12,800
North Carolina	61,100
Ohio	1,100
Pennsylvania	5,500
South Carolina	31,900
Tennessee	500

The activities in Ohio and Mississippi have since been sold. Nuon of the Netherlands acquired Utilities Inc of Chicago in March 2002 for USD275million, having announced the bid in the previous March and undergone regulatory clearance. In May 2005, Nuon announced that it was selling Utilities Inc to Hydro Star. The divestment reflects Nuon’s strategy of focusing on the energy markets of NorthN/AWest Europe. Hydro Star is a subsidiary of AIG Highstar Capital II, L.P, a private equity fund which invests in infrastructure related assets and businesses and is sponsored by AIG Global Investment Group (AIGGIG). AIGGIG member companies are subsidiaries of American International Group, Inc (AIG). The sale was completed in April 2006.

Contact Details

Name: Utilities Inc
Address: 2335 Sanders Road, Northbrook
Il 60062, USA
Tel: 001 800 831 2359
Fax: 001 775 727 7752
Web: www.utilitiesincN/Ausa.com

Larry Schumacher (CEO)

WESTERN WATER

Western Water (WW) seeks to identify undervalued water assets and develop and sell them to customers in densely populated areas in the arid western USA. The company operates through the acquisition of water rights and other interests in water, the purchase of real estate for their water rights and the sale or lease of water at various locations in California and Cherry Creek, Colorado. Due to regulatory delays, since 2000, WW has rationalised its operations due to the increased cost of energy, making the pumping of water less competitive, along with the company's increasingly weak financial position. No water sales were made in the 2002 financial year and only one in the 2003 financial year (which generated a gain of USD964,000). As a result, only the Cherry Creek project is currently being actively developed.

In June 2003, WW sold its shares in the Bear Valley Mutual Water Company (South California) to a local city water department, generating cash proceeds of approximately USD723,000 and a gain on the sale of USD79,000. In May and June 2004 WW sold Loma Rica Ranch (Yuba County, California) and Cardozo Ranch (San Bernardino County, California) for USD1.05million, with an aggregate gain of approximately USD85,000 for the Company.

In March 2005, the company sought Chapter 11 protection. In February 2006 a reorganisation plan was approved. This involved the delisting of the company as it no longer has publicly traded shares. On 17th November 2005 the company sold its Cherry Creek assets to the Cherry Creek Project Water Authority for USD14million. Cherry Creek Project Water Authority is an intergovernmental entity formed by four local water districts.

After the Cherry Creek sale and the settlement with its debtors, the company will have approximately USD2.6million with which to develop its Yuba Goldfields Water Rights project in California. Currently the water rights are valued at USD0.12million. This water is near to local agricultural distribution systems, including the Yuba County Water Agency's South Yuba Canal which runs through the Goldfields, and the stateN/Awide water distribution system cantered on the Sacramento/San Joaquin River Delta.

In 1998, Aguas de Barcelona (Agbar) acquired 10% of WW. Agbar originally intended to increase its stake to 20%, but declined to do so in the light of WW's ongoing difficulties. Currently, Agbar holds 6.7% of WW's equity, along with all of the Class F preferred stock, but this investment has been written down by Agbar.

Contact Details

Name: Western Water Company
Address: 102 Washington Avenue,
Point Richmond, CA 94801
Tel: +(877) 928N/A9282
Fax: +(510) 307N/A7863
Web: www.wwtr.com

Michael Patrick George (President, Chairman, CEO and CFO)
Reginald M Norris (Director)
Dennis J Kenny (Director)

YORK WATER

The York Water Company (YWC) has provided water services in York County, Pennsylvania, since 1816. The company's water abstraction has a safe daily yield of 35million gallons, compared with an average daily consumption of 19.1million gallons in 2007. YWC's service territory has been gradually expanded through the laying of new mains and contracts to sell water to adjoining boroughs. Three service extensions were completed in 2002 and two neighbouring townships (Conewago and Springfield) were connected during 2003. In 2007, 63% of turnover was obtained from residential customers (58% in 1999), 29% from commercial and industrial (31% in 1999) and 8% from other sources (12% in 1999), mainly fire service related.

Industry within the Company's service territory is diversified, manufacturing such items as furniture, electrical machinery, food products, paper, ordnance, textile products, air conditioning equipment and weight training equipment.

York Water, operational data

Customers & consumption	2003	2004	2005	2006	2007
Consumption (gallons/day)	17,498,000	18,116,000	18,657,000	18,769,000	19,058,000
Number of customers	51,916	53,134	55,731	57,578	58,890
Population served	156,000	158,000	161,000	166,000	171,000

The company has two impounding reservoirs. Lake Williams, the lower reservoir, covers 220 acres and holds about 0.87billion gallons of water and Lake Redman, the upper reservoir, covers 290 acres and holds about 1.36billion gallons of water. York Water has a filtration plant half a mile south of the city of York. The company's Spring Gardens filtration unit has a capacity of 31million gallons per day and is capable of filtering 46million gallons per day during periods of peak demand. YWC installed a 15 mile pipeline from Lake Redman to the Susquehanna River for USD23million in 2004, which boosted the system's yield from 23million gallons per day to 35million gallons per day.

York Water, profit and loss account

Y/E 31/12 (USDmillion)	2003	2004	2005	2006	2007
Turnover	20.89	22.50	26.81	26.66	31.43
Operating profit	9.33	9.91	12.79	12.90	14.16
Interest paid	2.52	2.13	3.42	3.73	3.92
Other income	0.01	-0.17	-0.15	0.11	-0.14
Net profit	4.45	5.30	5.83	6.09	6.41
Earnings per share (USD)	0.46	0.53	0.56	0.58	0.57
Dividends per share (USD)	0	0	0	0	0

During 2004 and 2005, an additional 351,679 feet of mains were added to the network, more than double the average in the previous three years. A further 307,133 feet of mains were added during 2006 and 2007. 1,110 customers were added to the network due to two tuckN/Ain acquisitions made during 2005. In 2007, the Pennslyvannia Public Utility Commission authorised an increase in the number of municipalities the company can serve from 42 to 46. The water system of the borough of Adamstown was acquired in January 2007, adding 400 customers and the acquisition of West Mannheim Township system, which is expected to be completed in 4Q 2008 will add 2,100 more customers.

Contact Details

Name: York Water Company
Address: 130 East Market Street, York
PA 17405N/A7089 USA
Tel: +1 717 845 3601
Fax: +1 717 843 3793
Web: www.yorkwater.com

Jeffrey R Hines (President and CEO)
Kathleen M Milner (CFO)

APPENDIX 1:

THE WATER CYCLE AND WATER SERVICES

APPENDIX 1: THE WATER CYCLE AND WATER SERVICES

Distribution of water resources

The world's water resources are not a problem. It is their distribution and management in relation to current and future demand that presents challenges. The 'Blue Planet' is aptly named. Evenly distributed upon a perfectly smooth sphere, water would cover the earth to a depth of 2.7km. Freshwater alone would cover the surface to a depth of 70m. However, only 0.16% of the world's water is contained in freshwater lakes and rivers.

Global breakdown of all water resources (km^3)

Salt water	1,348,000,000	97.390%
Freshwater	36,020,000	2.610%
- Frozen	27,820,000	2.010%
- Groundwater	8,062,000	0.583%
- Lakes and rivers	225,000	0.016%
- Atmosphere	13,000	0.001%

Freshwater

Saline or brackish water has at best little utility for life on the land surface. Life upon the land depends on a minimum access to freshwater in a useable form. As the table below highlights, barely 10% of freshwater supplies are even potentially readily available for abstraction. The fragment held in the atmosphere constantly replenishes the river system, in itself a fraction of surface water supplies.

Global breakdown of freshwater resources

Frozen	77.230%
Groundwater (800-4,000 metres)	12.350%
Groundwater (>800 metres)	9.860%
Freshwater lakes	0.350%
Soil	0.170%
Atmosphere	0.040%
Rivers	0.003%
Plants & animals	0.003%
Water bearing minerals	0.001%

The water cycle

The water cycle refers to the process whereby water is circulated through the biosphere. The cycle begins with water being precipitated on to the land surface. On reaching the ground, it either infiltrates the soil or runs off into the river system. Water in the soil is either taken up by plants where it is returned to the atmosphere through transpiration, or it percolates through the soil. Once through the soil, it either enters the river system or recharges aquifers (water bearing rock). From the aquifer, water seeps into the river system, is discharged into the sea through coastal springs or is stored in the rock. Some water from both river and ground water is taken up by plants and in turn transpired, but most is discharged into the sea. Evaporation from seawater, along with a small amount from surface waters, is the main source of atmospheric water.

The global water balance

Even though more water is precipitated upon the oceans than the land surface in relation to their total surface area, the actual process involves more water being taken up from the sea than is returned by precipitation. In total, 500,000km^3 pa of water is taken up and returned through evapotranspiration and precipitation. While 430,000km^3 pa is removed through evaporation from oceans and 70,000km^3 pa in evapotranspiration from land, 110,000km^3 pa is returned to the land through precipitation against 390,000km^3 pa precipitation into the sea. This results in a net gain of 40,000km^3 pa on to land. It is this net gain that sustains life upon the earth's surface.

Residence times

The longer water is held in a particular place, the less enjoins in the water cycle. While water in the atmosphere and rivers may account for a small fraction of the global total at any one time, its relative

mobility means that on average 33 times more water is precipitated each year than is held in the atmosphere at any one time.

Average residence time for water

Oceans	2,500 years
Groundwater	1,400 years
Lakes	17 years
Rivers	16 days
Atmosphere	8 days

Water usage

The intensity of water withdrawal depends to a large extent upon how much water is used for power station cooling and for irrigation. Groundwater resources are used mainly for domestic and industrial use, especially in urban areas. These resources are not degraded by domestic and industrial effluents in the direct way that surface waters are. Instead, aquifers may originate well away from areas of effluent discharge and thus their integrity remains relatively unimpaired for quite some time after urban watercourses become unsuitable for use.

Surface water	**Groundwater**
42,650km^3 pa renewable resources	<10,952km^3 annual recharge
3,414km^3 pa withdrawn	760km^3 pa withdrawn
9% domestic	24% domestic
20% industry	72% industry
71% agriculture	5% agriculture

Desalination plays a localised role in water production. Generation rose from 3.0km^3 in 1990, rising to 5.3km^3 by 2001. This is equivalent to 1.3% of global water withdrawal.

Supply and demand – a growing imbalance

If freshwater supplies and humanity were evenly distributed across the land, water resources would not be an issue. However, sources of water supply tend to be mismatched with regard to areas of need. Population growth and urbanisation are placing further pressure on water resources and their management. The number of people living in water stressed countries is projected to climb from 470million to nearly 3billion by 2025. Water stress is defined as countries where there is 1,000–1,700m^3 of freshwater per capita per annum, while water scarcity is where there is less than 1,000m^3 of freshwater per capita per annum. Meanwhile, the population of urban areas in developing economies has been forecast to grow by 160% between 1990 and 2030.

% of population living in:	**1975**	**2000**	**2015**
All urban areas	37.9	47.2	53.7
10million or more	1.7	3.7	4.7
5million to 10million	3.0	2.8	3.7
1million to 5million	8.2	11.1	13.3
500,000 to 1million	4.3	4.8	4.9
Fewer than 500,000	20.8	24.8	27.1

% population increase		**Developed**		**Undeveloped**
	1975-200	**2000-2015**	**1975-200**	**2000-2015**
10million or more	2.4%	0.3%	9.5%	11.1%
5million to 10million	-1.7%	0.6%	5.3%	8.8%
1million to 5million	5.4%	2.6%	20.6%	25.7%
500,000 to 1million	0.7%	-0.3%	7.9%	6.7%
Fewer than 500,000	5.7%	2.4%	44.2%	42.0%

There are 14 discrete areas where more than 10million people live in close proximity and water shortages and sanitation problems are one of the central constraints to their development. Over the next 25 years, at least 12 more such areas will exist, none of which currently have adequate water or sewerage infrastructures. At the same time, water use is set to rise by 40% by 2020, with 40% more water being needed for food and 20-70% more for industrial and municipal demand.

People living in areas of water stress and scarcity (million people)

	1995		2025	
Million people	**Countries**	**People affected**	**Countries**	**People affected**
Water stress	24	460.0	48	2,849.5
Water scarcity	18	166.5	29	803.7

A slum future?

In 2001, 926million people, or 31.6% of the world's urban population lived in slum areas. 43% of the urban population of less developed economies live in slum areas, compared with 6% in developed economies. The UN ('The Challenge of Slums' 2003) anticipates this figure rising to 2.0billion by 2033 and 3.5billion by 2050.

Percentage of urban population living in slums, 2001

Sub-Saharan Africa	71.9%
South-central Asia	58.0%
East Asia	36.4%
Western Asia	33.1%
Latin America & Caribbean	31.9%
North Africa for	28.2%
Southeast Asia	28.0%
Oceania	24.1%

Access to safe water and sanitation

According to the United Nations Environment Programme (UNEP), the number of people without access to safe drinking water will rise from 1.4billion in 1999 to 2.3billion by 2025 in the absence of accelerated capital spending programmes. Approximately 2.6billion people currently do not have adequate access to suitable sanitation. In consequence, some 60,000 people die every day due to waterborne diseases.

At current rates of progress, many countries in Sub-Saharan Africa are unlikely to meet the 2015 Millennium Development Goals (MDGs) before 2100. Indeed, as far as household connection to water goes, coverage in that region and in South Asia has decreased.

Percentage of urban population with access to improved water supply within regions, 2006:

	Improved - Total	Improved - Piped to house	Improved - Shared	Unimproved
Sub-Saharan Africa	81%	35%	46%	19%
North Africa	96%	91%	5%	4%
Middle East	95%	93%	2%	5%
South Asia	95%	51%	44%	5%
East Asia/Pacific	92%	87%	11%	2%
Latin America & Caribbean	97%	97%	7%	3%
CIS	99%	90%	9%	1%
Developed Countries	100%	98%	2%	0%
World	96%	78%	18%	4%

The CIS, Southern Asia and Sub-Saharan Africa are not on target to meet their sanitation MDGs by 2015. Such is the shortfall, that the global target is currently unlikely to be met. The work still needed is emphasised by the fact that 158million people in urban areas in 2006 had no option but to defecate in the open. One of the chief challenges for both water and sanitation is the somewhat perverse tendency of western donors to channel their aid towards the least needy, with appreciably less aid (especially in per capita terms) being directed towards countries in South Asia and Sub-Saharan Africa.

Percentage of urban population with access to improved sanitation within regions, 2006:

	Improved	Shared	Unimproved	Open defecation
Sub-Saharan Africa	42%	31%	19%	8%
North Africa	90%	6%	4%	0%

Middle East	94%	6%	0%	0%
South Asia	57%	20%	8%	15%
East Asia/Pacific	78%	8%	4%	10%
Latin America & Caribbean	90%	0%	5%	0%
CIS	94%	0%	6%	0%
Developed Countries	100%	0%	0%	0%
World	79%	11%	5%	5%

The Millennium Development Goals have made some impact, with the number without access to improved water supplies falling to 1.1billion by 2004, a fall from the 1999 figure, but marginal progress since 1990. In contrast, the sanitation data shows less progress and a greater disparity between the MDG aims and currently projected outcomes.

Million People	**1990**	**2004**	**2015 - Target**	**2015 - Projected**
Water				
Served	4,092	5,320	6,425	6,300
Unserved	1,187	1,069	794	919
Unserved – urban	107	170	N/A	240
Sanitation				
Served	2,569	3,777	5,414	4,829
Unserved	2,170	2,612	1,805	2,390
Unserved - urban	475	611	N/A	692

The growth in unserved numbers reflects the rapid growth of slum and informal settlements.

Source: WHO / UNICEF (2006) Meeting the MDG drinking water and sanitation target: the urban and rural challenge of the decade. WHO, Switzerland & WHO / UNICEF (2008) Progress on drinking water and sanitation: special focus on sanitation, WHO Geneva

Connection rates in major cities:

	Household tap	**Sewer**
Europe	96%	92%
North America	100%	96%
Latin America & Caribbean	77%	35%
Africa	43%	18%
Asia	77%	45%
Oceania	73%	15%

In excess of 95% of people living in high income countries had satisfactory access to potable water and appropriate sanitation services by 1990, along with 74% access to potable water and 68% access to appropriate sanitation services by 1990 in medium income countries. Concerns in the more developed economies are increasingly being driven by environmental and aesthetic considerations, while those in the less developed economies remain rooted to those of basic public health.

The cost of 'free' water

Safe supplies of water are not free, but neither are the consequences of inadequate provision. The economic cost of poor water supplies and sewerage are in illness (500million affected each year), debilitation (15million rendered 'economically inactive' each year) and death (2-5million dying each year) from water borne diseases and environmental impairment. Yet such supplies are not cheap. In slums around many cities, the cost of (vended) water accounts for a large part of household expenses; 18% in Onitsha, Nigeria and 20% in Port-au-Prince, Haiti, for example.

Pressure points in the water cycle

Of the 42,650km^3 annual net gains through precipitation on to land, 24,000km^3 is lost as surface run-off in floods, leaving a net 16,000km^3 of useable water input. Approximately 9,000km^3 pa is readily accessible, with an annual abstraction of 3,414km^3 highlighting the scope for local imbalances between water availability and its need. It is evident that the element of the water cycle used by the human economy is not optimally managed. Much of the water abstracted is not put into productive use.

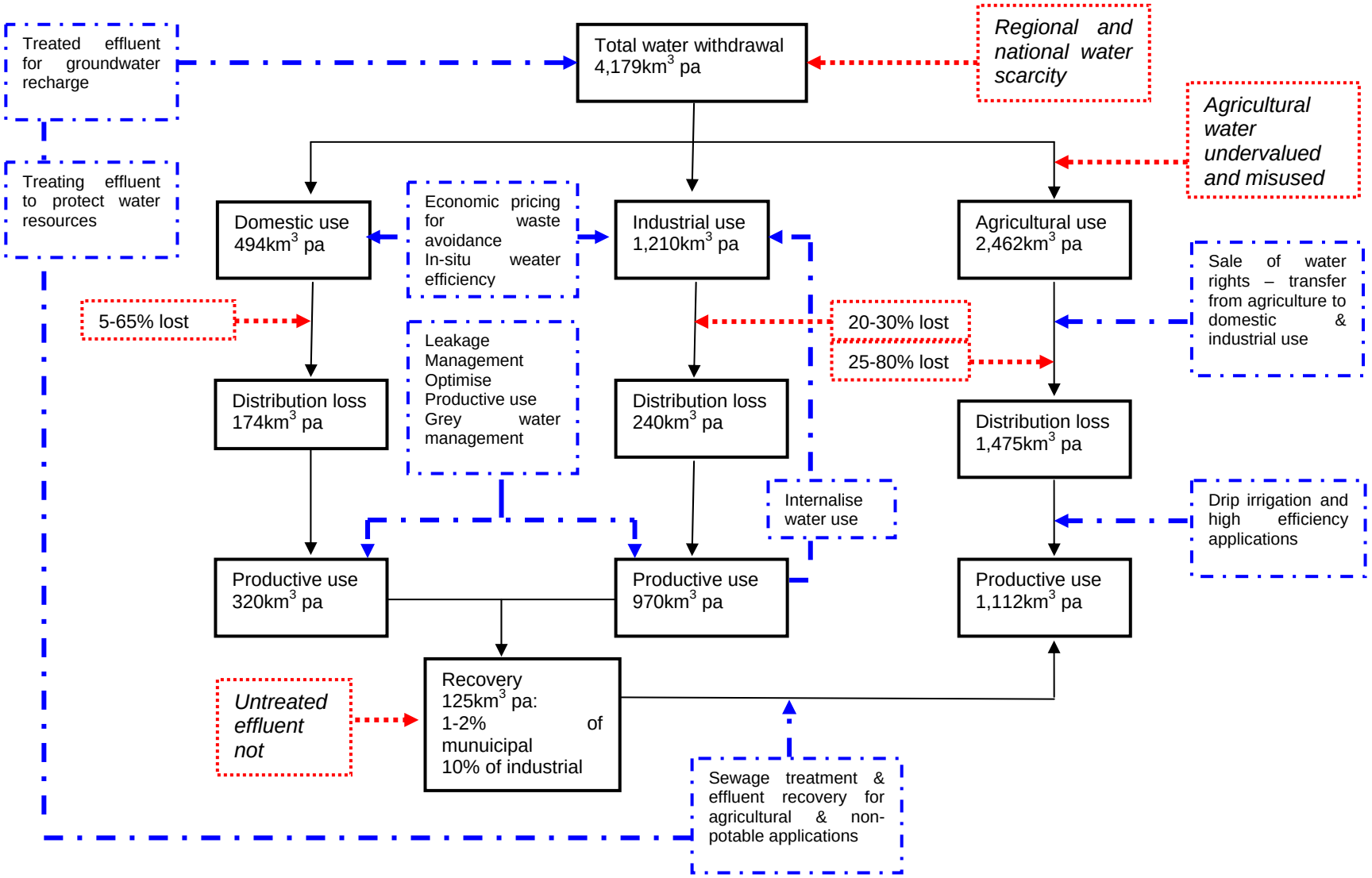
Optimising the water cycle

The water cycle needs to be managed in urban areas due to the need for reliable supplies of water of a given quality in a limited area along with the treatment of wastewaters generated by human agency. The management of the water cycle can be broken into four distinct sections: [1] water abstraction and transfer; [2] water treatment and distribution; [3] sewerage; and [4] sewage treatment, disposal and recovery.

Supplies need to be managed so as to maintain the integrity of the water cycle through optimising the productive use of water, preventing over-abstraction from surface water resources, enabling the recharge of groundwater and preventing the pollution of surface and groundwater resources. The flow chart below demonstrates how water technology can be used to mobilise water resources already abstracted into productive use.

Distribution losses for municipal provision can realistically be reduced to 20%, releasing 74km^3 pa for productive use. Assuming that industrial leakage can be reduced to 10%, this releases 120km^3 pa for productive use. Improving irrigation efficiency to 50% releases 244km^3 pa for productive use, along with a further 325km^3 pa of treated municipal water (50% treatment) and industrial water (25% treatment).

Pressure points in the water cycle and their amelioration



APPENDIX 2:

PRIVATE SECTOR PARTICIPATION

APPENDIX 2: PRIVATE SECTOR PARTICIPATION

Types of privatisation

One of the difficulties currently facing the water sector's internationalisation is the lack of a common understanding as to the forms of private sector participation. One person's lease contract can, *in extremis*, be another's concession, and so on. An internationally agreed set of concession contract definitions is currently being developed by a number of concerned companies and multilateral organisations.

Preludes – privatisation through evolution and revolution

Consulting and strategy development and implementation contracts are not regarded as full private sector participation contracts as they are not involved in the management of the actual assets. These contracts are increasingly being used as ways of developing the relationship between a municipality and the private sector company so as to decide on the framework for bringing in private sector management. Privatisation contracts can be gained outright through a bidding process, or they can evolve from contacts established through consulting, construction or engineering activities. A world of opportunities beckons.

Markets can broadly be classified as being primary markets (first privatisations in a country), secondary markets (initial privatisation contracts already awarded, but to less than 10% of population), tertiary markets (major private sector contracts in place, covering 10-50% of the population) and mature markets (significant private sector participation, covering over 50% of people). These market types also reflect the ideas of David Hosein and Paul Rathbone of Andersen, who look at markets in terms of emotion, economic and ideology.

Each market offers a risk - opportunity payoff. Primary markets clearly offer more in terms of opportunities, especially for a new entrant with no established presence in the country. Against this, the privatisation process may be volatile, since there will be limited practical guidance as to how to gauge political, regulatory, economic or operational risk. In mature markets, risk management can be finely tuned, but this information will probably be shared with a broad range of potential competitors, so that the bidding process will be appreciably more competitive. In such a market, an established player will seek to benefit from economies of scale via its extant operations, but may prove vulnerable if there is a desire for change for change's sake.

Primary markets (first wave)

Primary markets are those yet to experience their first wave of private sector contract awards. These markets may also be split into those where private sector participation is actively under consideration, such as in the Netherlands, South Korea, Nepal and Egypt and those countries such as Switzerland, Iran and Japan that for various reasons have ruled out any material changes for at least the short to medium term. Despite the progress made by the private sector to date, a clear majority of countries remain as primary markets. Privatisation may be initiated through four broad approaches.

Initial public offering of a corporatised utility. This approach was first adopted in Brazil through the partial flotation of SABESP (Sao Paulo). The state government still holds 72% of SABESP's equity and has adopted a gradualist strategy towards selling more shares in the company. A more extreme example was in the Czech Republic in 1993, where shares in a number of regional utilities were offered to municipal, institutional and international investors.

Private sector concession award for one or more small contracts. A foot in the door approach that concentrates on gaining experience of private sector participation through local contract awards. This approach has been used in a number of European countries without a history of private sector participation such as Norway and Portugal and more recently in Sweden.

Lease, management and O&M contracts. A gradualist approach, whereby municipalities and the private sector get to know each other through the increasing delegation of responsibility to the private sector. This approach can be seen at various stages of evolution in Mexico, Mozambique and Kazakhstan. It can be argued that these in turn stem from contacts made with private sector construction and engineering companies over a long period of time as in Egypt and South Africa.

Major city concession awards. This is the most abrupt approach, designed to channel private sector investment and management towards infrastructure that has been unable to meet the demands of urban expansion. This approach is popular in developing economies (for example, Casablanca in

Morocco and Manila in the Philippines), with city contracts being on occasion divided into zones (Manila in the Philippiners and Jakarta in Indonesia) or into water and sewerage services (Budapest in Hungary). These contracts typically concentrate on capital cities because they are seen as having a lower risk profile than other areas and can thus attract private sector funding more easily. Such is the impact of these contract awards that they often result in countries by-passing the second stage of the market penetration criteria as outlined below.

Outside city-states and special regions such as Macao, national contract awards remain distinctly the exception. Indeed, the only example to date has been for urban sewerage services for Malaysia. Regional contract awards tend to concentrate on rural regions and their provincial towns as in the Czech Republic. The only example of a regional privatisation including major cities to date was the water and sewerage services privatisation in England and Wales.

Secondary markets (second wave)

While cases such as the Czech Republic or Malaysia experienced a far-reaching initial wave of privatisation awards, the initial impact of privatisation is typically of a more piecemeal nature. Secondary markets are defined as countries where less than five contract awards have been made to date and less than 10% of the population receive either water or sewerage services via the private sector. Normally one or two water companies would provide these services.

Tertiary markets (third wave)

Tertiary markets are defined as countries that have between 10% and 50% of their population served by the private sector, usually via six or more separate contracts provided by at least two companies. Such a market share can be attained via a single major city concession award as in the case of major city contracts, via a single award. Examples of the former include Spain and the USA, while examples of the latter include Estonia and Bulgaria.

Mature markets

This covers countries where more than 50% of the population is served by the private sector. Opportunities exist as new markets are developed in response to environmental compliance (for example, sewerage services in France) or through a specific regulatory exercise (for example, inset appointments and MOD privatisation in England and Wales). Otherwise, apart from acquiring extant companies, most opportunities are to be found in rural areas and small towns, placing the emphasis on developing economies of scale and integrating a large number of small contracts into a coherent management structure. To date, the only examples are to be found in France, the Czech Republic, Chile and England and Wales.

Differing levels of private sector involvement

Commercialisation

Commercialisation calls for the municipal water and/or sewerage entity to be operated as a free standing concern that does not involve cross subsidies with other municipal services and runs on a self-financing basis. A commercialisation strategy has been adopted in a wide number of countries either as an end into itself or as a prelude to more extensive private sector participation. Madrid's Canal Isabel II has operated as a commercialised entity since 1853, without any firm plans for privatisation to date. In Australia, Sydney Water has been commercialised, with bulk water provision services being handed over to the private sector. Prior to the current privatisation programme, Chile has used commercialisation allied with short-term service contracts, delegating responsibility to the private sector for a narrow range of services such as meter installation. Santiago's EMOS is the most notable example, having been commercialised in 1989 and sold in 1999. Other examples include a number of German cities (e.g. Hamburg), South Africa's Umgeni Water and Thailand's municipal and provincial water authorities.

A hybrid privatisation has emerged from a number of these commercial entities where the municipality floats some of the shares of the entity while retaining majority ownership and therefore management control. The best example is in Brazil, where Rio's SABESP is actively traded on the national Bourse, while the municipality for the time being retains 72% of the company's equity. 49% of Belgium's Aquafin has been sold to a number of corporate and institutional investors, with overall control being retained by MVW, the region's sewerage management agency.

O&M and lease contracts

The next step up involves awarding O&M or lease contracts. Operations & Maintenance (O&M) contracts usually operate on a fixed fee basis. Lease contracts typically involve asset operation and tariffs, but not capital expenditure. These two types of contract do not delegate full financial responsibility to the private operator, especially with regards to private capital investments.

Concessions

Concessions involve the private sector operation of assets in order to pay for new facilities and upgrading work. Build-own-operate (BOO) and build-operate-transfer (BOT) contracts sell specific services to the municipality in relation to a specific programme of capital improvements, while the full utility concession contract embraces all aspects of service provision and capital spending. These contracts require a much more specific regulatory environment so as to account for the elements of risk involved. Other varieties sometimes seen are BOTT (build, operate, train and transfer) and DFBOT (design, finance, build, operate and transfer) contracts.

A BOO/BOT project's cash flow is usually contractually pre-determined, often with government backing. There is an element of construction risk, but the absence of market risk means that the project can have more debt loaded in than in a full utility privatisation. A project's construction risk can be mitigated whereby a facility already generating cash flow gets taken over for expansion by the private sector. Therefore BOT/BOO projects are an effective means of rapidly organising private capital and management towards a narrow range of services. However, some of the simpler project-oriented contracts do not affect the utility's management and operation, thus underlying problems such as leakage (and illegal interception), over-staffing and poor tariff collection may not be addressed. In these cases, the underlying utility remains uncreditworthy, and it can be argued that a BOO/BOT contract may therefore in fact delay system-wide improvements.

In full utility concessions, existing revenues can be used immediately to service debt, thereby mitigating construction risk. Over a period of time, a utility can benefit from a steady flow of revenues from a diversified customer base and, if it integrates horizontally, from a diversified asset base. A more robust balance sheet can be created, allowing for internal finance as well as the use of capital markets to sell long term debt.

Asset sale

The most dramatic and politically contentious form of privatisation is the outright sale of the utility's assets. To date this has been used in the 1989 sale of the English and Welsh water and sewage companies (WASCs), in two examples in the Czech Republic, in one in Belize (subsequently bought back) and in Chile up to 2000. While the assets are in private hands, the licence to operate them can be subject to renewal. In the case of the UK WASCs, a 30 year operating licence was awarded to each entity in 1989. It is evident that the assets carry no value unless one can operate them, while the cost of building a duplicate network would be prohibitive.

The problem with losing stakeholder participation in utility services is that it can erode the customers' sense of civic duty. During the 1976 drought, water consumption in England and Wales fell and standpipes and supplies brought in by tankers were accepted stoically. "Share a bath with a friend" suggested Dennis Howell, the then Minister for Drought. In contrast, during the 1995 drought, consumption rose amidst intense bitterness even at the possibility of water restrictions being imposed. They were not, but it was evident that an unexpectedly large element of the public's goodwill was unintentionally divested in 1989. In contrast, Aguas de Barcelona (Agbar) experienced a significant drop in consumption during the 1994-96 drought in Spain. Agbar is a private sector operator of municipally owned assets on a concession basis.

Privatisations – Contract size and extent of privatisation compared

	O&M	BOT	Full Concession	Asset Sale
Local /	USA	France	UK PFI & inset	USA
Single site			appointments	
Town /	USA	Germany	Germany	China
Small city	Kazakhstan	Czech Towns		USA
City	Mexico	Atlanta	Manila	India
	City	Budapest	Jakarta	UK WOCs
River Basin	Greater	Czech	Argentina	UK WASCs
/ Region	Amman	Regions	Italy	Chile
Country	Chad (Phase 1)	Ghana (urban)	Chad (Phase 2)	N/A

Characteristics of the main types of water and wastewater privatisation contracts

Because of the elastic nature of definitions at present, the five forms of privatisation outlined below ought to be regarded as indicative. It is quite likely that a contract could offer elements from the differing categories. This can be a material concern in markets such as China, where the authorities are seeking foreign investment and management while seeking to impose the most restrictive terms that they can get accepted.

Operations & management contract (O&M)

Time horizon	2-5 years, up to 10	**Ownership**	Public
Customer	Government / Municipality	**Investment**	Public
Cash flow profile	Fixed fee for service	**Operation**	Public
Construction risk	None	**Tariff collection**	Public / Private
Regulatory risk	None		

O&M contracts allow the private and public sectors to get to know each other in a relatively low risk environment. They do not address problems of municipal inefficiency. The short term nature of the contract means that political stability can be poor and there is limited scope for the private sector to improve the performance of the utility. Examples include: metering, leakage reduction and systems management for Mexico City (Mexico, four contracts held by Suez, VE and United Utilities) and water management for Antalya (Turkey, Suez).

Lease contract

Time horizon	10-15 years, up to 25	**Ownership**	Public
Customer	Retail Customer	**Investment**	Public
Cash flow profile	Subject to market risk	**Operation**	Private
Construction risk	None	**Tariff collection**	Private
Regulatory risk	Medium		

The municipality controls the assets, while the private sector controls their operation. Risk elements start emerging, with the private sector now dealing directly with the customers, and thus this can be the focus of discontent. Examples include: water and sewerage management in urban areas of Guinea (SEEG, Bouygues/Veolia) and water services for Dakar and other major urban areas of Senegal (DSE, Bouygues).

BOOT/BOT/BOO/TOT concession

Time horizon	10-30 years, up to 95	**Ownership**	Public
Customer	Govt /Municipal	**Investment**	Private
Cash flow profile	Pay on completion	**Operation**	Private
Construction risk	High	**Tariff collection**	Public
Regulatory risk	Low		

Asset ownership under the four concession types

BOO	Build Own Operate	Concessionaire retains ownership of assets permanently
BOT	Build/Operate/Transfer	Hands over assets at end of concession, never having owned them
BOOT	Build Own Operate Transfer	Hands over ownership of assets at end of concession
BOOT	Transfer Operate Transfer	Assets handed to operator, taking ownership of assets during contract and returning them at end of concession

Concession contracts call for a full understanding of the financial risks involved with the project. These concession contracts can be regarded as the classic water privatisation model. Examples include: water treatment BOO for Riverland (Australia, United Utilities) and a sewage treatment works BOOT for Puerto Vallarta (Mexico, Biwater). The UK's Private Finance Initiative sewage treatment contracts are being awarded on a BOT basis.

In many cases, the concession award takes place with the splitting of the water and sewerage entity into a service provision entity and an asset owning entity. The concession winner gains control of at least a significant proportion of the service provision entity's equity, along with management control. The municipality in turn retains at least a controlling stake in the asset owning entity. The latter entity is subsequently responsible for the extant assets and new assets are vested into this entity at an agreed date.

Full utility concession

Time horizon	20-30 years	**Ownership**	Public
Customer	Retail Customer	**Investment**	Private
Cash flow profile	Subject to market risk	**Operation**	Private
Construction risk	Low	**Tariff collection**	Private
Regulatory risk	High if politics volatile		

In this case, the private sector is allowed to get on with upgrading and operating the services, while developing new assets for handing over to the municipalities in the longer term. There have been mixed results to date, but some outstanding successes such as Metro Manila in the Philippines. Examples include: water and sewerage operations for Tallinn (Estonia, Tallinna Vesi) and water provision for Malacca (Malaysia, VE).

Asset sale

Time horizon	In perpetuity	**Ownership**	Private
Customer	Retail Customer	**Investment**	Private
Cash flow profile	Subject to market risk	**Operation**	Private
Construction risk	Very low	**Tariff collection**	Private
Regulatory risk	Very high		

Problems of public perception and changes in regulatory priorities have meant that with the exception of Chile and two companies in the Czech Republic, the 'British model' (as asset sales have been dubbed), has not been copied abroad. In the USA and in one example in India, companies developed the assets in the first place.

The 'British', 'French' and 'German' models

The World Bank calls delegated water management through concession awards the 'French model.' The 'French model' is typically used to contrast it with the 'British Model' of asset sales. In fact, the real 'French Model' is the Affermage lease as traditionally used in private sector contracts in France. To make matters more complex, there is a recent tendency to refer to the 'German Model' as well. This approach is where the operating assets are corporatised and a minority of the shares in the asset-holding company are held by one or more private sector companies, who in turn operate the concession. This is known as the 'Kooperationmodel' or the 'German Model'. A further variant of the 'German Model' is the 'Beteribermodell', where the private sector operator pays a fixed rate for the right to operate the water or sewerage services. The 'Kooperationmodel' probably best describes the majority of concession contracts.

The models compared:

Name	Description	Examples
British Model	Asset sale	UK Water Plcs
French Model 1	Affermage lease	Suez/VE/SAUR (home)
French Model 2	Concession	Suez/VE/SAUR (international)
German Model 1	Kooperationmodel	Berliner Wasser (VE/RWE)
German Model 2	Beteribermodell	Gelsenwasser

Generally speaking, the confusion caused by these names and the contracts that they refer to highlights the need for globally agreed definitions of contract types. They ought not to play a significant role outside discussions about privatisation approaches and philosophies.

The popularity of each approach

The table below is based upon water and sewerage privatisation awards identified by the World Bank in developing economies during 1990 to 2007.

Private participation in water and sewerage in developing countries, by contract type, 1990–07:

Investment in projects by type (USDmillion)	
Concession	38,618
Divestiture	7,099
Greenfield project	9,161
Management & lease contract	1,593
Total	56,471

Investment in projects by subsector (USDmillion)			
Subsector	**Segment**	**Projects**	**Investment**
Treatment plant	Water & sewerage	12	292
	Water	120	8,113
	Segment	163	3,945
	Total	295	12,320
Utility	Sewerage collection	1	43
	Sewerage & treatment	9	2,726
	Water utility with sewerage	215	31,326
	Water utility only	64	10,026
	Total	289	44,121

Source: World Bank, PPI database 2008

It is understood that the O&M entry in the above table includes lease contracts. While there are many of these contracts, the lack of private sector investment involved highlights their role as a partial privatisation that does not mobilise new sources of private sector investment. The experience to date, especially in developing economies, suggests that O&M and lease contracts are becoming a stepping stone towards concession awards at a later date or will continue to be used to address specific areas of concern, especially when linked with aid finance and loans from multilateral institutions. Greenfield operations are typically of a site specific nature, involving the construction of a water or sewage treatment facility, as seen in the UK's PFI. In recent years, a number of greenfield contracts have been awarded in areas earmarked to become new housing or industrial zones. This approach has had some popularity in the Philippines. Divestitures have been seen to date in Chile. Given the confusion between contract types, it is not perhaps worthwhile to classify the concession contract types more specifically. Nevertheless, the concession approach, allied with the splitting of water and sewerage entities into operating and asset holding companies is becoming the favoured approach towards water privatisation in many countries.

Water and power contracts compared

Water is too often seen as power's poor relative. It lacks the glamour of the major power contracts in terms of immediacy of delivery and the prospect of expensive new plant. Even so, its lower profile offers the prospect of more attractive returns.

Power and water privatisation pros and cons compared:

Service sector	Water / Wastewater	Power
Political risk Politics	High political risk 'God's gift' ought to be free Essential for life & health	At the national level Essential for modern comforts A new resource needs to be paid for
Rate of return	High (15-25%) A few global and local players Lower degree of competition	Medium (10-15%) Many global and regional players Highly competitive market
Size of project (for first 5 years)	Small to medium USD50–400million capex	Medium to large USD250–1,100million capex
Technology import	Low part of overall cost Mainly local construction	The main cost component Imported or via joint ventures

It is interesting to note that some of the arguments against water, when compared with power, appeal to the sense of the irrational. These arguments are being eroded by the expediencies noted in the sections above. One of the more common arguments against private sector involvement in water and sewerage services against power (and telecommunications) is that the former are more 'essential' or 'basic' than the latter, especially for poorer people. The manifest shortcomings of the status quo tend to be overlooked in such debates, along with the fact that water and sewerage programmes can largely be put into place with the judicious use of local manufacturing and technological capabilities. This is not to denigrate energy provision projects, but to highlight the importance of adequate water and sewerage services in economic development.

The bad news (except for project arrangers) is that the amount of legal and preparatory work for a water/sewerage and a power project is broadly similar. It is tempting, given the disparity in size between these projects to stint on such work. It is to be hoped that the examples included in this publication will demonstrate the paramount importance of due diligence in both bid preparation and contract negotiation, while treating each contract on its own.

The politics of PSP and service extension

One of the most common political arguments against privatising water and sewerage services is that it will mean that water will be too costly for poorer people. In fact, pragmatic pricing policies based upon charging more per unit of water for households who use water for non-essential purposes has made private water provision both affordable and viable. Cross-subsidies and social provisioning lie at the core of service extension. Appropriate and safe water and sanitation services can be provided for 2-5% of household income. Questions about affordability and private sector involvement in developing economies tend to ignore the fact that under the current arrangements, it is the poorer people living in urban areas who have to pay over the odds to water vendors for supplies of distinctly dubious quality. People are willing to pay an economic price for water services if it comes with guarantees of quality and availability.

Comparing the cost of water supplied from household connections and informal vendors

USD per m^3	Household tap	Public tap	Water vendor
Bandung, Indonesia	0.38	0.26	3.60
Dhaka, Bangladesh	N/A	0.08	0.84
Kathmandu, Nepal	0.18	0.24	2.61
Bombay (Mumbai), India	0.07	0.07	0.50

Source: McIntosh, A & Yniguez, C. (1997)

It is the absence of piped water that costs more both in financial and public health terms. Popular support exists for adequate supplies of water and improved public health at an affordable rate. Opposition is most visible amongst the better off households who oppose paying an economic price for piped water supplies for gardens, swimming pools and other non-essential household uses. Indeed, with the lack of metering or progressive tariff structures, they are subsidised by poorer

households. The fact that these are also the people with the most political influence means that the political picture is often distorted.

The practicalities of delivering service extension

What can the private sector offer to the unserved urban poor? For multilateral institutions, governments, municipalities and the private sector, when seeking to use PSP in service extension; three questions need to be answered:

- Can these projects be delivered more cheaply?
- Can new sources of finance be mobilised?
- Can extant assets be operated more efficiently?

These questions apply to all water and sewerage PSP projects, but are particularly pertinent here. UU's water and sewerage contract in Manila (Philippines) involved a price cut of 65% in 1997 and is performing satisfactorily in terms of finances and service delivery (see company entry). Finance has become problematic, with the project finance market currently running at perhaps 25% of its peak capacity seen in the late 1990s. The private sector has two real strengths, mobilising extant assets to optimise their efficiency and developing new assets so that they provide a given level of performance at the lowest price.

The challenges in arranging finance stems from poor risk management and concerns about foreign currency exposure. A mix of foreign and international debt can help to ameliorate this, as is being used in Malaysia and China. Otherwise, it remains essential for multilateral institutions, development banks, politicians and international aid agencies to create the right conditions to encourage these capital flows. One of the most important issues here is deciding if a concession is to be supported by outright grants designed to lower the cost of service extension.

At the same time, cost recovery in the medium to longer term is essential. The key here has to be getting the cost of service provision down to affordable levels by using an appropriate and upgradeable infrastructure.

Privatising water and sewerage services can reduce capital spending by 20-45% and through economies of scale and efficiency measures, service provision costs by 10-25%. Capital spending costs are reduced by shifting construction work away from technology for its own sake to a performance-related basis, along with ordering through the contract holder's parent company. Cost reductions are driven by competitive tendering whereby the competing bidders are motivated to find the most cost effective ways of delivering a set of service criteria for a satisfactory rate of return. This approach creates incentives for the bidders to identify areas where they can drive operating costs down while at the same time improving service quality. Often the two will be linked. People are more willing to pay when they receive a reliable service, with demonstrable improvements in water quality. Reducing distribution losses allows more water to be provided to the customer without needing to mobilise new resources. Progressive tariff policies, allied with effective billing and the removal of illegal connections, drive down the overall cost of water provision for the less well off.

The private sector's role

In 2000, Suez served 46million people in developing economies and 8.5million people classified as among the urban poor. VE, UU, Bouygues and RWE, among others, also provide services to the urban poor where there were none prior to privatisation. Suez's 2002 publication 'Bridging the Water Divide' provides a number of case studies. The emphasis lies in developing a new infrastructure that meets current needs (piped water and sewerage) that can be upgraded as and when higher standards of service delivery are needed. By mobilising local labour at street level, the costs of developing these services can be greatly reduced. Finally, PSP has much to offer in making sure that the greatest benefits can be delivered for a minimal cost.

Dealing with corruption

There have been several highly publicised cases of corporate malpractice relating to the World Bank supported Lesotho Highlands Dam project. While no companies directly involved in the water and wastewater sector have been included in the World Bank's listing of proscribed entities, the perception of corporate corruption in the procurement of private sector participation in the sector has been relentlessly exploited by the various anti privatisation bodies.

At the same time, the private sector's response to these allegations has been reactive in nature. A number of wide ranging statements, commitments and charters have been launched, but these have tended to avoid directly addressing the complaints raised by the various anti privatisation lobbies. As is the case with most research on the performance of Public Sector Participation ('PSP'), investigations into corruption have chiefly been carried out by academics attached to anti-privatisation lobbies and a range of NGOs, principally in North America. This gives the anti-privatisation lobbies a great advantage when communicating ideas to the media. In consequence, anti-PSP polemics are effectively unchallenged.

In terms of perception, it is fair to say that the international media, politicians and NGO lobbies see the private sector in general and privatisation in particular as causing corrupt practices to take place in the provision of water and sewerage services. In reality, corruption tends to be endemic under public ownership and operation. This is because water and wastewater per se are exposed to corrupt practises at a number of operational levels due to the nature of the services they operate. Such practices get minimal exposure at anything beyond the local level, as it is accepted modus operandi for providing these services.

The Camdessus Report's Recommendations

'Corruption' is mentioned 11 times and 'corrupt' a further two times in the Camdessus Report on "Financing Water for All" (CR). CR notes that corruption can arise among public and private, local and international participants in the water sector. The impact of independent NGOs such as Transparency International has been limited by the reluctance of governments, multilateral institutions and companies to adopt their recommendations on a consistent basis. CR's specific recommendations with regards to water and corruption can be summarised as:

- Capacity building is to be encouraged
- Water policies need to be defined and implemented
- Leadership ought to be of a high calibre
- The multiplicity of opportunities ought to encourage healthy competition
- NGOs and stakeholders should be encouraged to expose corrupt practices
- Companies are urged to co-operate to develop methods for promoting ethical behaviour
- The public sector needs to develop standards that place their behaviour above reproach
- Private participation transactions should be made more transparent
- Develop best practice and model clauses in the legal agreements for private participation

Its recommendations are well meaning and hard to dispute. Indeed, they are of such a broad and generous nature that at first it appears churlish to query them. They do, however, need to be implemented and to take effect by the CR's proposed 2006 reporting deadline.

The private sector needs to acknowledge its structural failings in communicating that there are challenges to PSP playing a leading role in developed economies while being a material part of the process of providing universal access to water and sanitation services in urban areas. There is an urgent need for the private sector to sponsor independent research so that a process of engagement can begin.

Define corruption

The cost of corruption can only be understood when stakeholders know where it happens and how it affects people's lives. So, before concerns about corruption can be addressed, we need a commonly accepted set of definitions as to what corruption is and is not. There is also a need to differentiate between what might be called 'actual' or fiscal corruption and 'moral' corruption, where bidders abuse the tender process by submitting a loss-leading bid in anticipation of a successful re-negotiation procedure afterwards.

<u>What is it?</u>
Country – Bribes demanded at the Government/Ministerial level
Municipal – Bribes for contracts, bribes for services or for avoiding billing/penalties
Corporate – Companies bribing in order to gain contracts

<u>When does it take place?</u>
Water allocation and billing – Avoidance of bills, setting up illegal connections, getting access, etc
Regulation – Avoidance of penalties over illegal abstraction/connection, discharges, etc
Procurement and contracting – Bribes for the award of goods/service provision contracts

During the privatisation process – Bribing to influence the tendering/award process

Why is it wrong?
It needs to be spelt out that corruption hampers service provision, affordability and the efficiency of service provision, along with public health and environmental implications. For politicians, companies and municipalities this does mean acknowledging that corruption occurs both in the public and private sectors and that it is measurable.

While 'moral' corruption may be seen by some as 'part of the game,' it has consistently undermined confidence in the PSP contract award process and has unduly politicised the re-negotiation process.

Transparency International's Business Perception Index ('BPI', how businesses from varying countries are seen when dealing in developing economies - surveys in 1999 and 2002) and annual Corruption Indexes (a synthesis of national surveys on the perception of corruption within each country) are a useful starting point. It is of interest to note in the 2002 BPI survey that public works / construction scored the lowest of all categories given, with 46% of all recipients stating that this sector was seen as likely to offer the biggest bribes.

Consistent bidding and financing criteria

Bid criteria need to be developed that are applicable in developed and developing economies. The greater the replicability of contract types and procedures, the less scope there is for abuse to take place as all parties are increasingly familiar with the system, especially those involved in overseeing the probity of the bidding process. This also reduces the cost of independent scrutiny and would allow for such scrutiny to take place on a regional basis.

Talks have been going on since at least 1998 about developing commonly accepted definitions/templates for contract types, so that all interested parties know what is going on at each point in the contract development and negotiation process. This process needs to be expedited with the aim of developing legally binding (and therefore fungible or supra-national) contract definitions that could be brought into play by the World Bank and regional banks ('regional' refers to groupings of countries).

A re-evaluation of renegotiation attitudes and procedures

Re-negotiation of contracts is seen by stakeholders and NGOs as a cynical attempt to maximise profits once the contract award process is out of the way. There is no doubt that water contracts in developing economies are more volatile than most. Between 1990 and 2001, 3.5% of World Bank funded water contracts were cancelled against 1.9% for infrastructure projects in general. In value terms the difference is even more marked: 11.3% for water versus 3.2% for infrastructure projects overall. During the same time, 71% of 89 World Bank supported concessions were renegotiated, 5% by the companies and 66% by the Governments. While almost all contracts were subject to a bidding process, regulation was generally notable by its absence.

A formal re-negotiation process needs to be built into contracts, based upon agreed-on performance and price criteria. Such a process can work both ways, as when circumstances swing favourably in the concession's direction (some currencies appreciate against the US Dollar over time), this ought to release a mechanism to compensate for previous adjustments where appropriate.

Windows of transparency (1): Regularising bidding and negotiation procedures

Contract Stage	**Information placed in the public domain**
Call for tender	Tender documents & bid criteria
Bids received	Ballpark figures (non company specific)
Final bids received	Ballpark figures (more specific)
Award of contract	Relate award to bid criteria
Announcement of terms	Explain any changes to original bid criteria
Announce regulatory process	Criteria and current performance data
Contract commences	Performance prior to PSP
Quarterly / half year key criteria	Critical issues highlighted
Annual review	Regulatory returns & independent reviewing
Outstanding issues highlighted	Performance against targets, new targets

In each case, the idea is to release information to interested parties in an open, consistent and controllable manner. Once final bids are in, competitive secrecy is of historic importance. If pre-award negotiations need to take place, stakeholders need to have confidence in this process. The entire process can be extended into making clear to all parties the criteria that are to be material when bringing the re-negotiation process into play.

Communicating best practice

This calls for a holistic approach to countering corruption. The regulatory climate in England and Wales may be onerous, but no stakeholder could reasonably complain about being deprived of data. Comparative data of increasing accuracy (and methodological rigour) at all operational levels not only creates an unrelenting drive towards 'ideal' operational efficiency; it also makes it increasingly hard for financial malpractice to take place.

Windows of transparency (2): Eliminating malpractice, rewarding efficiency

National/regional database for:
Best practice – specific examples of utility performance and their replicability
Benchmarking – developing comparative criteria (avoiding Ofwat's 'cult of the comparator')
Operational efficiency – knowing what a system can deliver under given circumstances

Global database for (PPP weighted, as appropriate):
Cost of technology – ballpark figures for widely used technology
Cost of construction – what it costs to build/install units of infrastructure
Cost of professional services – general range of expected costs

The latter will doubtless prove particularly contentious. In reality, this refers to hourly rates and so on, since flexibility and experience is essential in professional services, especially when dealing with more inexperienced clients.

Engaging NGOs and stakeholders

NGOs (Non Governmental Organisations) need to be made part of the reporting process. Attacking corruption is in their interest and as it is also in the interest of reputable PSP players, they have little to fear from each other. One of the reasons for faltering levels of ODA (Overseas Development Assistance) in recent years, especially in water and sanitation, is the feeling that money is not being spent where it ought to go.

Giving NGOs access to information through the mechanisms outlined above will allow confidence in the process to be built. They also have a role to play in whistle-blowing at all levels of malpractice. It is essential that the private sector have a formal set of procedures to protect people within their companies who wish to expose corruption.

Stakeholders, especially customers also need to be formally involved within this process. Therefore a reporting mechanism needs to be set up for reporting their concerns about corruption (and other concerns about service delivery). The NGO community has a role to play here, along with liaising with the regulators to ensure that such information is channelled in a controlled manner.

Regulators and regulation

Independent regulators are essential. As the UK experience has shown, regulation is not cheap (Ofwat is arguably an industry in itself) and it takes time for a regulator to know its market. It places a great emphasis on efficiency and meeting targets, both of which minimise the scope for corruption. In Scotland, the Water Commissioner is adopting a similar approach with the state-held Scottish Water, demonstrating that regulation and reporting can take place within the public sector. This experience has highlighted why municipal entities need to be exposed to independent regulation.

Regulation of a suitably robust nature (and allied reporting systems) needs to be in place before the privatisation process starts. Perhaps the initiation of such schemes ought to mark the effective beginning of the privatisation process. These reporting systems need to be developed on a tripartite basis (economic regulation, water quality and service delivery and environmental protection and resource management), ensuring that the various reporting functions operate independently of each other, so as not to compromise their separate interests. To address the cost of regulation, the World Bank, regional development banks and other interested parties should support the setting up of regional regulators along with supporting capacity building for analytical and comparative work. These

regulators would be responsible for developing comparative data on a regional basis and assisting the implementation of a national regulator for each country where PSP is about to take place.

Opening windows of transparency

If confidence in the bidding process is undermined by its perceived opacity, then windows of transparency ought to be opened at suitable stages in the process as outlined in this section, allowing stakeholder scrutiny and building external confidence in the process.

Too much is said about commercial secrecy. As CR notes, healthy competition is the scourge of corruption. Free economies deserve freedom of disclosure and the right to make a free choice based on information which stakeholders and NGOs can also have confidence in. A number of mechanisms exist which can be used to ensure the generation of such information is part of the privatisation process. For example, certification with the ISO 9000 (total quality management) and ISO 14000 (environmental management systems) standards, externally audited by an international agency ought to be required within a given timeframe.

Externally recognised and monitored operational quality criteria have a significant role to play in the capacity and confidence building process. This means that the OECD Convention needs to be an integral part of each process (the 1998 Convention on Combating Bribery in International Business Transactions), placing pressure upon countries that have yet to adopt it. The World Bank's 1996 Guidelines for Procurement under IBRD Loans and IDA Credits remain valid and need to be seen as an effective sanction against potential transgressors.

Concern has also been expressed about perceived information asymmetries that favour private sector companies with a wide experience of market conditions and strategies. This can lead to stakeholders regarding the bidding (and re-negotiation) process with scepticism. These concerns are best addressed through a capacity building programme designed to ensure that local and national interests are suitably addressed, while a formal disclosure system before, during and after the privatisation programme allows stakeholders to have the information they need to be able to constructively engage with the service provider, the private sector and the regulators.

Many of the mechanisms called for are necessary for building up competitive domestic markets along with the ability to compete effectively on a regional basis. Therefore the capacity building exercise will benefit the local private sector as well as the regulators and NGOs.

The need for independent and unbiased analysis of the role PSP can play in assisting the aim of universal service provision, as well as the challenges facing the private sector remains paramount. The absence of such research undermined the credibility of the Kyoto process and must not continue to be allowed to undermine the credibility of the private sector as a whole.

APPENDIX 3:

THE PRIVATE SECTOR AND THE MILLENNIUM DEVELOPMENT GOALS

APPENDIX 3: THE PRIVATE SECTOR AND THE MILLENNIUM DEVELOPMENT GOALS

In order to move forward on this contentious issue, a multi-stakeholder review should be undertaken. We believe that it is only through such a review (similar to the World Commission on Dams) that the final, authoritative word can be made on whether PSP benefits the poor. We also believe in the necessity of building the capacity of civil society actors to influence privatisation processes and to hold governments and the private sector to account. This needs to start with improving their knowledge and understanding of the issues surrounding failing water services, and enabling civil society groups around the world to learn from each other's experiences of intervention in privatisation processes.'

Source: New Rules, New Roles: Does PSP benefit the poor? Tearfund, 2003

This Appendix contains some personal thoughts about issues affecting the private sector and the need for it to play an appropriate role in assisting extension of access to safe water and sanitation services over the next two decades.

2000-2025: The World Water Vision

The World Water Vision (WWV) for 2025 was launched at the Second World Water Forum at The Hague in March 2000. It was designed to represent a multilateral and multinational consensus for gaining universal access to water and sanitation by 2025. In September 2000, 189 United Nations member states adopted the Millennium Development Goals (MDGs), including to 'Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation.' The Second Earth Summit in Johannesburg (2002) ratified the MDG targets and as with The Hague's World Water Vision, emphasised the role of the private sector in providing financial and management resources.

According to figures developed by the World Bank in the late 1990s (for basic services) and various sources in the EU and the USA (enhanced services), the funding needs identified for providing basic (driven by public health concerns) or enhanced (driven by environmental standards) water and sanitation services over the coming decade are as follows:

USD billion required	**Basic services**	**Enhanced services**
Asia	220-300	10-30
Latin America	200-250	0
Africa	80-100	0
Middle East	45-65	0
Eastern Europe	30-50	0-20
N America & W Europe	25-35	300-450
Total	**600-800**	**310-500**

Prior to the World Water Vision, traditional assumptions for private sector participation (World Bank) expected to see the private sector contribute 5-15% of funding needs in developing economies. This is equivalent to USD4-12billion pa. The increase in forecast capex needs from USD30billion to USD80+billion pa has been accompanied by an increase in the anticipated scope for private sector finance to USD10-20billion pa. Such a financial commitment will not take place unless adequate investment conditions exist and these require private sector participation in the management of these services.

WWV 2025: Water, sewerage and sewage treatment spending, 1995 to 2025

The need for basic service provision

Developing countries	**2000**	**2025**
Population (million)	4,760	6,530
Lacking safe water (million)	1,300	330
Lacking sanitation (million)	2,600	330
Forecast Investment (USD billion pa)	70-80	180

Water and sewerage spending, 1995 to 2025

USD billion pa	**1995**	**2000-25**
Drinking water	17	17

Sanitation	1.5-2.5	15
Wastewater treatment	11.5	50-60
Total	**30**	**82-92**

Source: Prynn P & Sunman H, Getting the water to where it is needed and getting the tariff right. FT Energy Conference, Dublin 11-2000.

The World Water Vision assumes that USD2,050-2,300billion in total needs to be invested over a 25 year period. Assuming that all contracts will be debt financed (where PSP is being used, it will in fact be 70-80% debt financed), and on the basis of 7% for servicing the cost of assets, 10% for the operation of these assets and an overall return of 5% on assets for debt repayment and returns for the private sector where appropriate, this points to costs of 22% on the total investment. This could point to a market with USD450-500billion per annum in the developing economies. Assuming in reality that USD40-50billion each year will be spent (factoring in the private sector's ability to bring the cost of capex down by 15-25%), this still points to a market worth USD220-275billion pa by 2025. There will be 7.7billion people in developing economies by 2025, with approximately 2.9billion living in urban areas. This equates to USD75-95 per person per annum, which is a fairly demanding figure for these economies. The problem is that the World Water Vision figures assume that USD500 per capita needs to be spent 'conservatively' to connect all people to water and sewerage services in urban and rural areas.

Estimates for current and extra annual spending need for universal service provision

USD billion	**Vision 21**		**Briscoe**		**GWPFA**	
	2000	**Future**	**2000**	**Future**	**2000**	**Future**
Water	N/A	N/A	N/A	N/A	13	13
Sanitation	N/A	N/A	N/A	N/A	1	17
Water & sanitation	N/A	75	25	N/A	14	34
Municipal wastewater	N/A	N/A	N/A	N/A	0	70
Industrial wastewater	N/A	N/A	N/A	N/A	7	30
Total wastewater	N/A	75	N/A	N/A	21	100
Total	N/A	150	N/A	N/A	35	134

Vision 21: World Water Council 2002
Briscoe, John: International Journal of Water Resources Development, 1999
GWPFA: Global Water Partnership, Towards Water Security: A Framework for Action, 2000

The UN Millennium Project Task Force on Water & Sanitation 2005's report gives a round-up of general estimates for spending needs (USDbillion pa):

Source	**Year**	**Total**	**Water**	**Sanitation**
Global Water Partnership	2000	30.0	13.0	17.0
Vision 21, WSSCC	2000	8.9	5.2	3.7
WHO / UNICEF	2000	NA	3.1	12.6
World Bank	2002	29.0	13.0	16.0
Camdessus Report [1]	2003	40.0	23.0	17.0
Smets [2]	2003	32.0	NA	NA
Evans & Hutton	2004	13.7	2.1	11.6
UN MDG Task Force	2004	6.7	4.5	2.2

Notes
[1] 32 more for full WATSAN
[2] 20 for new facilities, 12 for rehabilitation

The variable nature of these forecasts is a real cause for concern and more serious analysis of these costs, rather than extrapolations of other people's figures are badly needed. The expression 'back of

envelope calculation' was invoked in one review of these figures and it is not an unfair one. This also is reflected in expectations about the cost of providing new sanitation and sewage treatment services.

To halve the proportion of people without a safe water supply by 2015, an estimated USD2billion to USD23billion per year would be required, depending on the approach taken in each particular case. Based on the provision of basic sanitation for the poor, USD2billion to USD17billion would be needed per year. The sheer range of these estimates suggests that they are not estimating the same outcomes. Currently total overseas development assistance (ODA), runs at USD53billion a year. The question here is: how much ODA will ever be directed at 'unglamorous' sectors such as water and sewerage?

2003: Kyoto's road to nowhere?

There were 406 sessions at the World Water Forum in 2003. Of these, 12 sessions covered finance, along with 15 on the private sector and six sessions devoted to opposing private finance. There was one session on industry and water. It was no great surprise to find that no regional or national targets for water and sanitation coverage were considered.

This sums up the piecemeal nature of 2003. In June 2003, the European Parliament sought to create a European Water Fund of EUR1billion from both public and private sources to fund water supply and purification in developing countries. Paul Lannoye MEP, the European Parliament's Rapporteur on water management saw the proposed sum as inadequate and suggested that a tax of EUR0.005 on every bottle of mineral water sold in Europe.

In May 2003, The Group of Eight's (G8) "Water Action Plan" called for efforts to secure more safe drinking water but declined to provide funds. The G8's offered to support countries that prioritised safe drinking water. The G8 added they would promote public-private partnerships (PPPs), where appropriate. There has been no official development of this plan since this date.

What aid there is does not to appear be going where it is needed most. A survey carried out for the OECD in 2002 (OECD (2003) Aid activities in the water sector 1997-2002, OECD Paris, France) found that 12% of all aid going to the water sector that year went to countries where less than 60% of the population had access to safe water. Annual aid going into water is some USD3billion, with another USD1.5billion in loans. The largest donor is Japan, which gives 33% of total water aid and has an extended loan programme to complement the funding.

2004-05: Meeting these goals – already a cause for concern

In 2004, the first surveys commissioned by the UN towards these goals were published and they indicate that there is already slippage from the intended targets. This is especially noticeable in Africa and South Asia.

Progress in water and sanitation coverage, 1990-2002

	Water		**Sanitation**	
% **served**	**2002**	**1990-02**	**2002**	**1990-02**
Western Asia	88%	+5%	79%	0%
Latin America & Caribbean	89%	+6%	75%	+6%
Northern Africa	90%	+2%	73%	+8%
South Eastern Asia	79%	+6%	61%	+13%
Oceania	52%	+1%	55%	-3%
Eastern Asia	78%	+6%	45%	+21%
South Asia	79%	+13%	37%	+17%
Sub-Saharan Africa	58%	+9%	36%	+4%

Sanitation coverage, interim progress and targets

Source: WHO / UNICEF, Mid-Term Assessment of Progress, 2004

People in urban areas who need to gain access to safe water or sanitation services by 2015

Million people	**Water**	**Sanitation**
Eastern Asia & Pacific	290	330

Sub-Saharan Africa	175	178
South Asia	243	330
South-Eastern Asia	115	208
Latin America & Caribbean	121	132
Former Soviet Union	27	24
Total	**961**	**1,032**

Source: UN Millennium Project Task Force on Water & Sanitation, Interim Report, 2005

2005: The UN 'Water for Life' decade and World Water Forum 4 (WWF4), Mexico 2006

The United Nations International Decade for Action, "Water for Life", 2005-2015 was launched at World Water Day, 22 March 2005. The Decade for Action is designed to highlight the disparity between progress to date and the work needed to attain the water and sanitation MDGs as highlighted in the 2004 study by UNICIEF and the WHO. Again, the UN explicitly recognises the contribution needed from the private sector to attain these goals. The Fourth World Water Forum was held in Mexico City in March 2006. Unlike at Kyoto, the meetings on financing water were not physically broken up by protestors, but it did highlight how limited has been the engagement between the private sector and various stakeholders for the implementation of effecting management strategies.

Towards 2015 and 2025: Industry Initiatives Noted

World Business Council on Sustainable Development

In March 2004 the World Business Council on Sustainable Development (WBCSD) launched a two year council project on water to define the business contribution to the debate.

WBCSD (2004). Water and sustainable development: a business perspective.

WBCSD (2005). Water facts and trends.

WBSCD (2005) Collaborative actions for sustainable water management. The role business can play as an active stakeholder in collaborative processes for water management. World Business Council for Sustainable Development, Geneva, Switzerland

WBSCD (2006) Business in the world of water: WBCSD Water Scenarios to 2025. World Business Council for Sustainable Development, Geneva, Switzerland

PSP Water

'Policy Principles and Implementation Guidelines for Private Sector Participation in Sustainable Water Supply and Sanitation Services' launched in April 2004 by the Swiss Agency for Development and Cooperation (SDC), the Swiss State Secretariat for Economic Affairs (SECO), and Swiss Re. PSP Water seeks to propose formal approaches for private sector participation (PSP) at the policy, operational and practitioner level, based on work being carried out since 2002 (web site www.partnershipsforwater.net). The first drafts were published in April 2005.

PSP Water (2005) Policy Principles: Framework for sustainable partnerships

PSP Water (2005) Implementation Guidelines: Manual for sustainable municipal water services

Global Water Scoping Process

Jointly developed by ASSEMAE (Brazilian Association of Municipal Water and Sanitation Public Operators), Consumers International, Environmental Monitoring Group, Public Services International, RWE Thames Water, BPD and WaterAid. A scoping report has been published and a workshop held in Berlin in June 2004 decided that this project is to be taken further. Meetings and dialogues have subsequently been held, but no significant new research has been identified.

Urquhart P. & Moore D. (2004). Global Water Scoping Process: Is there a case for a multi-stakeholder review of private sector participation in water and sanitation?

Business Partners for Development

BPD is British based, with a global membership. The Water and Sanitation Cluster covers water and wastewater issues. A Tri Sector Partnership approach developed in a 1998-2001 study, looking at the potential of business working with governments and civil society for promoting sustainable development. A series of five brief reports were published in 2002. BPD is concentrating on developing partnerships at the local level.

Evans B., McMahon J. & Caplan K. (2004) The Partnership Paperchase: Structuring Partnership Agreements in Watyer and Sanitation in Low-Income Communities.

Brocklehurst C. (in preparation) Local Management Models for Water Supply and Sanitation for the Urban Poor

Stott L, & Keatman T (in preparation) Tools for Exploring Community Engagement in Partnerships

Newborne P & Caplan K (2006) Creating Space for Innovation: Understanding Enablers for Multi-Sector Partnerships in the Water and Sanitation Sector

Trémolet, S (2006) Adapting regulation to the needs of the poor: Experience in 4 East African countries

Schaub-Jones, D, Eales K, & Tyers L (2006) Sanitation partnerships: Harnessing their potential for urban on-site sanitation

Valfrey-Visser, B, Schaub-Jones, D, Collignon B & Chaponnière, E (2006) Access through innovation: Expanding water service delivery through independent network providers: Considerations for practitioners and policymakers

The World Economic Forum

The WEF's Water Initiative was launched in June 2003. It covers three areas: The Water Project Exchange (joint projects between the private sector and other stakeholders); The Water Practices Exchange (highlighting good corporate practice in water management) and; The Water Business Case (promoting market based instruments for water and watershed management).

WEF (2005) Development-Driven Public-Private Partnership in Water: Emerging Priorities from the Second Roundtable Discussion

The Green Globe Network

The Green Globe Network assists UK Government's international sustainable development activities by providing advice and information, organising meetings and seminars, and by developing proposals for new policy initiatives. It was established in 1997 by the Foreign Secretary and is funded by the Foreign and Commonwealth Office. It also has links with other government departments. The water and sanitation Millennium Development Goals were taken on as part of their 2003-04 work programmes. The Green Globe Network is run by the Green Alliance.

The Fourth World Water Forum: Smaller visions, greater realisations

The 2006 World Water Forum in Mexico City represented progress of sorts. When Jose Angel Gurria, the former Mexican Finance Minister and Director General designate of the OECD presented his 'Task Force on Financing Water for All' report, the session was briefly disrupted by hostile chanting. In contrast, Michel Camdessus' session at Kyoto three years earlier ended in chaos after eight minutes as a room packed with pre-warned journalists witnessed a stage invasion worthy of a British football match in its 1980s hooligan heyday. Certainly, security was tighter, but perhaps expectations on all sides are lower as reflected by WWF4's theme of 'local actions for a global challenge'.

Looking back, the Camdessus panel realised that they have 'not been good political communicators' not least because nobody asked them to be this in the first place. They did however manage to create a conceptual framework for developing financial strategies and policies, which the Gurria Task Force has sought to sell to the developed countries through proposals based on realisable objectives. The emphasis on preparing a broad range of case studies here is a good start as they demonstrate what can be achieved through Sub-Sovereign Debt initiatives.

This also means that whatever the purists say, water services need to be able to cover their operating costs and to finance debt. The 1992 Dublin Statement recognising water as an economic good and its

universal access as a human right holds good today. It also recognises that private finance supporting municipal water projects is a quite separate issue from the private sector owning or operating municipal water assets.

The various presentations in the run up to, during and follow ups from WWF4 demonstrate that for developing countries, funding and the capacity needed to put this to effective use remains a critical issue.

The Fifth World Water Forum: Who knows?

Preparatory work is well under way for the Fifth WWF to be held in Turkey in March 2009. The lack of public corporate engagement has been generally noticeable, perhaps reflecting changed priorities in recent years. Given the rate of progress on various fronts, it is to be hoped that the private sector will be treated in a more mature manner than in recent years.

Official Development Assistance remains a subject for dry humour

Official Development Assistance (ODA) from the OECD nations via its Development Assistance Committee (DAC) to less developed economies has fallen as a percentage of the DAC members' Gross National Income from 0.33% in 1992 to 0.22% by 1997, partially recovering to 0.26% by 2004. By 2010, it is anticipated to rise to 0.36%. The DAC anticipate ODA rising to USD130billion by 2010 but no decisions have been made as to the relative priority of water and sewerage projects within this.

Total DAC water-related ODA commitments fell from an annual average of USD3,161million in 1999–2000 to USD2,706million in 2001–02 (country commitments falling from USD2,569million to USD1,692million, with those from multilateral institutions rising from USD592million to USD1,014million over the same period). Actual disbursements by countries rose from an annual average of USD2,404million in 1999–2000 to USD3,038million in 2001–02 (country data only is available, Source: OECD (2004) Aid for Water and Sanitation, OECD, Paris). Given the lag between commitments and disbursals, the USD2billion in extra ODA committed between 2002 and 2004 will not be felt until 2010–12.

OECD commitments and disbursements for water projects, 2002–04 (USDm, %)

Average spend pa	Commitments		Disbursements	
2002–04	**USDm**	**%**	**USDm**	**%**
Policy & administration	1,057	17%	298	12%
Water resources protection	118	2%	43	2%
Watsan - large projects	2,467	41%	1,021	40%
Watsan - small projects	766	12%	383	15%
River development	206	3%	138	5%
Education & training	22	0%	15	1%
Wastewater treatment	214	3%	71	3%
Agricultural resources	931	15%	289	11%
Water transport	417	7%	274	11%
Total	**6,198**		**2,530**	

Source: OECD DAC Database

ODA commitments for large systems water and sanitation projects peaked at USD2.1billion (2003 dollars, five-year moving average) in 1998 before falling to USD1.6billion in 2000, recovering to USD1.8billion in 2002. Although there was a significant increase in 2004, the overall increase since 1990 has not matched population growth in the less developed economies. (Source: World Water Council (2006) Official Development Assistance for Water from 1990 to 2004, WWC, Geneva)

Africa remains the greatest challenge

In real terms, Official Development Assistance (ODA) for water projects in Africa since 1992 have varied between USD900million and USD1,100million per year, with the only increase during that period seen amongst the Least Developed Countries. Although overall global ODA has increased since 2000, and is promised to rise further by 2010, no promises have been made as far as water funding goes.

There is a depressing tendency for this to get misappropriated, meaning even less is done and donors are discouraged. Only anecdotal data is available, but Transparency International believes that anything up to 60% of operations and management costs can be absorbed by corrupt practices where water is managed by unaccountable municipal entities. Such a mighty degree of malpractice depends on a culture of compliant collusion, where funding flows are not subject to scrutiny. This is found where a utility does not need to fund itself through recovering its own costs, but depends on cross subsidies which are unrelated to service delivery.

There is an increasing reluctance just to disburse ODA funding at projects in the hope that they will look after themselves. At the same time, conditions are generally pretty unattractive for private finance. Hopes that the structured finance concept can deliver in the region are not well founded. Currently, only Cote d'Ivoire, Senegal and parts of Uganda have effective cost recovery policies for urban areas. Despite negative publicity, long standing contracts in these West African countries appear to be working, as have local contracts in Uganda. In each case, there is a reasonable amount of cost and performance data in the public domain, allowing people to query where their money goes. These 'windows of transparency' (see the Appendix for illustrations) grind away at the fiscal slack the corruption depends on. They also create a climate of confidence that may encourage further funding flows. While it is sadly unlikely that the water and sanitation goals will be met in most of Africa, hope lies in the lessons to be learnt.

Globally, there is much to do

The World Health Organisation and UNICEF didn't mince their words in their report on 'Meeting the MDG drinking water and sanitation targets' in September. This coverage figures up to 2004 and makes it pretty clear that much needs to be done in urban areas if these targets are to be met, let alone in rural areas. Even though the number of people unserved is meant to be halved between 2000 and 2015, population growth and political inertia in urban areas is clearly outweighing many urban service provision initiatives:

Urban people with access to improved services (Global)

Million people	**1990**	**2004**	**2015**
Water			
Served	2,172	2,933	3,648
Unserved	107	170	240
Sanitation			
Served	1,804	2,502	3,176
Unserved	475	611	692

Source: WHO (2006) Meeting the MDG drinking water and sanitation targets

Urban demand for access to safe watsan services by 2015 (million people)

	Water	**Sanitation**
Eastern Asia & Pacific	290	330
Sub-Saharan Africa	175	178
South Asia	243	263
South-Eastern Asia	115	208
Latin America & Caribbean	121	132
Former Soviet Union	27	24
Total	**961**	**1,032**

Source: UN Millennium Project Task Force on Water & Sanitation, Interim Report, 2005

It is also evident that major projects cannot hide neglect in secondary cities (water coverage in the Philippines fell from 95% to 87% between 1990 and 2004, despite the transformation of Manila's services), while bulk water treatment and provision projects need to be pushed further down the pipes (a fall from 99% to 93% water coverage in China).

The most encouraging aspect of this report has been the gradual diminution of official 100% (or for the ultra realists, 99%) coverage rates, no matter how bleak other realities appear to be. Even so, it is unlikely that Zimbabwe really offered 'just' a 98% water coverage rate in 2004 against 100% in 1990. Expect further progress (or rather, regress) here as the 2015 targets start to loom.

Taking one example, India:

WHO 2004 Report	1990	2002
Urban drinking water access	88%	96%
Household connections	51%	51%
WHO 2006 Report	**1990**	**2004**
Urban drinking water access	89%	95%
Household connections	53%	47%

There is some significant slippage between these two yearly surveys, in turn suggesting a change in methodologies and mindsets and the cooler realisation that international largesse is becoming increasingly results oriented, which means that being bleakly honest about matters past and progress to the present does at least open up the prospect of future improvement, as long as those fickle sources of funds can be harnessed.

Along with the fear of losing face (while trying to attract foreign funds, always a subtle balancing act), there are the shifting sands of defining what 'access' means in the first place. There is a bare honesty about the household access data. In India, urban access means one standpipe per 30 households, or one every 162 people, while in the developed world, it means water delivered to your property. While overall access varies between countries and surveys, there is far less room for ambiguity about having a functioning tap within each household.

Urban households with individual access to improved water supplies

% Household connection	1990	2004
Developed world	99%	99%
Developing world	70%	70%
Northern Africa	83%	92%
Sub-Saharan Africa	45%	36%
Latin America	85%	90%
Eastern Asia	82%	87%
Southern Asia	56%	50%
Western Asia	83%	94%

Sub-Saharan Africa and Southern India are in severe danger of being left behind the rest of the developing world, unless profound remedial action is taken over the next 9 years, along with some commitment to meeting the World Water Visions' 2025 target of universal water and sanitation coverage.

Getting the funding together

Water projects remain riskier than almost all other forms of capital intensive projects. Between 1990 and 2005, 39% of all projects involving World Bank funding were either cancelled or in a risk position. The cancellation of the various Argentinean concessions during 2006 will not have helped this. Even so, the ongoing quality of the portfolio has improved more rapidly than any other sector, perhaps due to the lessons learnt from the loans of the 1990s, especially that foreign exchange rate collapses do happen and they have to be taken seriously when local people have to pay for their consequences.

Sector	1995	2000	2005
World Bank overall	30%	15%	14%
Infrastructure	28%	15%	10%
Water & Sanitation	49%	14%	9%

Source: World Bank, (2005) Water Supply and Sanitation Lending: Volume Rises, Quality Remains High, Water Supply and Sanitation Feature Stories, Washington DC, USA

There is a general commitment from the various development banks to increase funding in the sector, but this funding is increasingly tied to higher expectations about operational reform and cost recovery. Thus the higher funding outlined below remains dependent on institutional reform and capacity building.

Water & sewerage disbursements (USDmillion pa)	2000-05	2006-10
World Bank	1,280	2,500
African Development Bank	70	200

Asian Development Bank	790	2,250
European Bank for Reconstruction & Development	75	150
Inter American Development Bank	200	400

Problems

NGO and political pressure

Opposition towards the private sector by NGOs has been extensive. This has partly arisen through the conflation of a right to water as a human right with the right to free water (see Barlow & Clarke 2002 and Barlow 2007), along with opposition to globalization (e.g. Brennan at al 2004) and private sector participation per se (summarised by Hall & Lobina 2006). While no firm evidence exists of any of these campaigns resulting in a concession being rescinded in developing economies, this may have been a contributory factor in Cochabamba and La Paz & El Alto in Bolivia.

Contract instability

The World Bank has been involved with 522 water & sewerage projects in 58 countries between 1990 and 2006 (World Bank 2007). The 54 cancelled or distressed contracts at the end of 2006 represented 10% of contracts and 31% by value. The distress level of 31% compares poorly with Electricity (10%), Telecoms (4%) and Transport (11%). The quality of the overall water and sanitation portfolio has improved during this time, with 49% of projects by value being identified as cancelled or at risk in 1995 against 28% for infrastructure overall, falling to 9% in 2005 against 10% for infrastructure overall (World Bank 2005).

The threat of a contract being rescinded has become a material disincentive for the international players, especially since 2000. 43 contracts serving a total of 47.9million people which have ended have been identified. In 11 cases (3.6million people) this was at the end of the contracts agreed life, while in the other 32 cases (44.3million people) contracts were ended either by the operating company or the municipality. In population terms, 14% of contracts have been rescinded; 2% of contracts awarded to local companies, 15% to regional companies and 23% for TNCs. All three rescinded contracts in the least developed economies (1.1million people) had been awarded to TNCs.

Having the wrong contract in the wrong place

Impossible conditions, such as unrealistic demands being placed upon current and future customers (even when the bidder does not appreciate these at the time) are not an encouragement for further investment. These can be particularly important when seeking to make a concession politically acceptable. In Buenos Aires, under Argentinean law, if a consumer was within a certain distance of a pipeline, they were obliged to connect to it (Lindfield, 1998) which led to the perception in some cases that these services were being imposed on poor areas.

In Bolivia, contract conditions were even more divisive. The Cochabamba concession attracted a single proposal, which was then developed through negotiation (World Bank & PPIAF, 2006). Aguas de Tunari was awarded the concession in October 1999 with the concession starting in January 2000. Law 2029 meant that the concession covered all water resources in its area and all actual and potential customers had to connect to the system and well owners were obliged to use the company's water irrespective of their ability to pay (Castro, 2006). No public consultation was taken either over the law or the concession process (Slattery, 2003). Contract disputes were to be dealt with through the International Centre for the Settlement of Investment Disputes, the International Chamber of Commerce and the United Nations Commission on International Trade Law (Castro, 2006).

Regulators, dispute mechanisms and dealing with poor data

The Aguas Argentinas contract was based on performance targets (connections, levels of service, metering) rather than capital spending. A price formula was drawn up, which would be reviewed every five years (Lindfield, 1998). But ETOSS was staffed by former OSN employees and not formally qualified for their new roles. It has been suggested that the monitoring process was politically motivated (Zerah and Graham, 2001).

In 1994, a tariff rise of 13.4% was imposed because the infrastructure condition was found to be worse than expected. Since 1996, AA and ETOSS went into a series of contract renegotiations over bill collection and charging. By 2001, it appears that AA was experiencing financial problems and from 2001, ETOSS imposed a series of fines relating to AA's performance as the company reduced spending in the wake of the 2001 economic crisis and the 2002 peso devaluation. Between 2003 and

2005, further renegotiations took place but were inconclusive and the contract was handed back in 2006 (Castro, 2006).

Foreign exchange risk

It is surprising that some highly reputable companies, with a long track record in international business have run into major difficulties with foreign exchange risks. The inability to avoid these losses reflects a fundamental tension between using a TNC to attract hard currency debt and the TNC having to use soft currency tariff revenues to service this debt. The argument that foreign exchange crises are exceptional is facile, as they have affected TNC concessions in Argentina, Indonesia and the Philippines, amongst others.

The unexpected

The best two examples involve sewerage and sewage treatment concessions in Malaysia and Thailand. They are relevant for the water sector as the operators are the same and the perceptions likewise. In Malaysia, a recession meant that in order to stimulate the economy, price restraints were imposed on the contract making it unviable. In Thailand, operational constraints (allowed working hours) were imposed on the contract, along with a revised specification (more infrastructure work than anticipated), which led to exceptional losses.

References:

Barlow M & Clarke T (2002) Blue Gold: The Fight to Stop the Corporate Theft of the World's Water. The New Press, NY, USA.
Barlow M (2007) Blue Covenant**:** The Fight for Water as a Human Right. Toronto, McClelland & Stewart
Brennan B., et al (2004) Reclaiming Public Water! Participatory alternatives to privatization, TNI Briefing Series 2004/7, TNI, Amsterdam, The Netherlands
Castro J P (2006) Water Services in Latin America: Public or Private? (Discussion of Four Case Studies). MSc Thesis, Erasmus University, Rotterdam
Hall, D. & Lobina, E. (2006) Pipe dreams: The failure of the private sector to invest in water services in developing countries. World Development Movement / PSIRU, London, UK
Lindfield M R (1998) Institutions, Incentives and Risk Preparing Markets for Private Financing of Urban Infrastructure. The Australian Housing and Urban Research Institute. Brisbane, Queensland University of Technology / Erasmus University Rotterdam

Slattery K (2003) What Went Wrong? Lessons from Cochabamba, Manila, Buenos Aires, and Atlanta. Water & Wastewater Annual Privatization Report, The Reason Foundation. Los Angeles USA
World Bank (2007) Private activity in water sector shows mixed results in 2006. Public-Private Infrastructure Advisory Facility, World Bank, Washington DC
World Bank (2005) Water Supply and Sanitation Lending: Volume Rises, Quality Remains High, Water Supply and Sanitation Feature Stories, Washington DC, USA
World Bank & PPIAF (2006) Approaches to Private Participation in Water Services: A Toolkit, Appendix A. World Bank, Washington DC
Zerah M H & Graham K (2001) The Buenos Aires Concession: The Private Sector Serving the Poor. In Asia, WASP-S. (Ed.) New Delhi, WSP.

Some new approaches considered

New approaches: Making sub-sovereign debt a viable proposition

Sub-sovereign entities in developing economies, such as municipal water utilities, have considerable problems in raising debt funding for infrastructure extension and upgrading, because neither they nor their municipality are likely to have a credit rating. This means that funding is either unavailable (making companies dependent on ODA) or municipal/state funding) or very expensive as it has to be raised either from bank loans or from unrated debt issues. In addition, their relatively small size means that the credit rating and fundraising process is also expensive and any bonds so raised will face liquidity problems. Local government bond issues are very rare in developing economies, even when denominated in local currencies. Their high coupon makes the financing of their repayment more challenging. For example, municipal bonds in India (except for Hyderbad in 2002, AA+ rated with a coupon of 7.00%) have a coupon of 11.50–14.75%.

Both the Camdessus and Gurria reports look at the potential for multilateral institutions, such as the development banks, to play a role in bringing in domestic private capital for infrastructure finance. The Camdessus Panel Report identified the need for new sources of municipal project finance with guarantees for projects with capital spending in the region of USD0.1–100million. A number of municipal water and sanitation project financing initiatives have been developed to date. The World Bank through the IFC and related initiatives is seeking to develop sub-sovereign debt support. USAID, the US ODA entity is also recognised as a significant partner in these initiatives.

New approaches – learning to live with risk

The first step for financiers and investors is to get to know the sub-sovereign debt markets outside Western Europe and North America. The EBRD is an example. Since 1991, it has always been allowed to lend to sub-sovereign entities. Between 1997 and 2003, it fundamentally altered the nature of its central Europe and Russia infrastructure portfolio:

EBRD – structure of central Europe and Russia portfolio, 1997 and 2003

Portfolio	1997	2003
Sovereign	82%	37%
Municipal	16%	36%
Private	2%	27%

Source: EBRD

This shift has been reflected in its Municipal & Environmental Infrastructure loan portfolio where significant loans are being extended towards sub-sovereign entities. This has been important in raising the profile of such lending, but these markets are decidedly at the advanced end of the developing economies.

New approaches – pooled finance in the Philippines

When projects are too small for funding, pooling them helps to drive down administrative costs and provides a more attractively-sized bond. In the Philippines in 2003, the Land Bank of the Philippines developed the Water District Development Project (WDDP), a local dedicated fund for water and sanitation projects. The driver behind the fund was to enable local municipalities to raise finance for capital projects by applying to a common pool of funds to reduce their costs. USD36.3million was raised with a 12-year term and a coupon of 12% with a 0.25% per annum commitment fee. At least 10% of the project equity has to be raised by the municipality and the WDDP provides technical assistance.

By June 2003, 13 projects obtained loans of USD27.6million, ranging from USD0.4million to USD7.6million. Individual projects currently have to pay the Land Bank interest at 15% pa, implying a decrease in the debt coupon of 3% being gained through project pooling. Pool financing is also a risk management tool, as it allows for the diversification of risk through a group of similar projects and municipalities.

New approaches – innovative bond structures in India

Tamil Nadu in India has seen a series of initiatives designed to take the pooled finance concept a stage further by enhancing the credit rating of the project pool through structuring the debt to provide a series of credit guarantees that can be used to create an investment grade product, with a significant reduction in the debt's coupon.

In 2002, USAID helped develop the Water and Sanitation Pooled Fund (WSPF), a bond that was partially guaranteed by USAID for providing water and sewerage infrastructure finance to seven municipalities in Tamil Nadu in India. Structuring the debt using a guarantee means that the bond was issued in Indian Rupees (eliminating foreign currency risk), had an enhanced credit status (AA investment grade ratings from two leading Indian rating agencies: L AA (SO) by ICRA and Ind AA (SO) by Fitch), with the bond's repayment supported by a portfolio of loans on-lent to the municipalities, while pooling a number of projects reduced the bond issue's transaction and rating costs and made the issue more attractive to investors.

Three levels of credit enhancement were used:

1. The escrow of the property tax and other collections made by the municipalities, covered under a tripartite agreement among the WSPF, municipalities and their banker;
2. A Debt Service Reserve Fund, called the Bond Service Reserve Fund (BSRF), was set up by the government of Tamil Nadu with liquid investments of INR69million;
3. A guarantee issued by USAID to the extent of 50% of the principal, with the balance covered by an undertaking by the Government of Tamil Nadu, in the form of a government order that the shortfall would be replenished by the Government of Tamil Nadu to the BSRF by deducting their respective share of State Finance Commission (SFC) funds accruing to the municipalities involved.

The bond had an issue size of INR304.1million and a coupon of 9.20% pa, with a tenor of 15 years, carrying a put and call option at the end of the 10th year. The bond is to be redeemed in 15 equal annual instalments with an annual payment of coupon on a diminishing balance method.

Subsequent events have shown this concept remains a work in progress. For example, the monthly municipal repayment mechanism did not take into account the effect of the monsoon season on repayment scheduling. Even so, the WSPF has set an encouraging precedent. Similar bonds have been developed in Chennai and Karnataka, each raising USD22million. There is room for flexibility with the escrow accounts, as individual municipalities can select the most effective repayment revenue source – water bills, electricity bills, rental or tax income, for example. The figure below outlines the relationship between funding sources for a structured obligation.
From this, it is evident that structuring can be used to enhance credit quality, especially when allied with the optimum use of credit enhancement (limited funds need to be disbursed with care) and that they need credit enhancement by multilateral agencies or the government. The structured obligation operates through the escrowing of dedicated revenue streams from the municipalities. A full guarantee from an entity with superior credit profile needs to be allied with a partial guarantee mechanism for pledging of cash collateral and partial guarantees covering the amount raised, its tenor and interest rate.

Structured finance enables ODA to act as a catalyst for municipal water and sewerage infrastructure projects, with the total guarantee funding supporting approximately three times of private sector investment in bond issues.

Spreading the word - International initiatives

The World Bank, IFC and regional development banks all support such initiatives, principally through supplying finance for the national municipal funding agencies. The active development of structured and pooled financing has been pioneered by USAID and more recently by Japan's ODA organisation, the Japan Bank for International Cooperation (JBIC) and the UK's DfID. The challenge is to mobilize enough new funding for these good ideas to make a greater difference.

New approaches: Driving down the cost of capital spending

The scope for technical innovation in delivering basic services appears to be limited. Yet there is a great deal to be done, especially in developing devolved technologies and making systems operate more efficiently so that technological innovations allow funding to go further. At one end, this involves the rehabilitation and upgrading of extant systems (remote water metering and pipeline monitoring and rehabilitation systems), while upgrading their treatment capabilities (devolved, non chlorine based forms of drinking water treatment such as low maintenance UV systems and the application of electrodes), along with efficient methods of introducing appropriate and upgradeable forms of water and wastewater treatment and recovery.

The latest figures provided by the UN (the UN Millennium Project Task Force on Water & Sanitation, 2005) include an assumed 15% for overheads & unspecified O&M costs, implying that capital spending costs account for 60-80% of the figures for sanitation and sewage treatment services cited below:

New service connection	USD per person
Improved traditional practice	10
Simple pit latrine	45
Ventilated improved pit latrine	65
Pour-flush latrine	70
Septic tank	160
Sewer (local labour)	175
Conventional sewer	300
Sewerage and secondary treatment	450
Sewerage and tertiary treatment	800

In fact, for medium to larger cities, the western experience shows that the cost of sewerage and secondary and tertiary treatment is more likely to be in the range of USD350-500 per population equivalent (PE). Much of the disparity is due to the relentless drive for lower costs in countries such as the UK. In Europe, using the private sector to develop sewage treatment assets has driven down capital costs by 15-40% since the early 1900s.

It is also clear that labour costs are a significant element in the laying of basic infrastructure and need to be factored into regional estimates. For treatment facilities, differences in labour costs are less significant as most of the costs are taken up by equipment.

The World Health Organization's 'Global Water Supply and Sanitation Assessment 2000 Report' (WHO, Geneva, 2000) used the following capital spending estimates for its projections. Capital spending costs only:

USD per capita		Africa	Asia	Latin America
Water	House connection	102	92	144
	Standpipe	31	64	41
Sanitation	Sewer connection	120	154	160
	Small bore sewer	52	60	112
	Septic tank	115	104	160

NGO estimates for connecting urban water and sanitation projects

USD per capita		Mali	Burkina Faso	Niger	Nepal	Tanzania
Water		106	104	88	40	150
Sanitation		41	46	22	45-95	50

Sources:

Mali: ISW (2005) Blue book Mali, ISW, Montreal, Canada
Burkina Faso: ISW (2005) Blue book Burkina Faso, ISW, Montreal, Canada
Niger: ISW (2005) Blue book Niger, ISW, Montreal, Canada
Nepal: WaterAid (2004) The Water & Sanitation MDGs in Nepal, WaterAid, Nepal
Tanzania: WaterAid (2005) USD2 billion dollars, the cost of water and sanitation MDGs for Tanzania, WaterAid, UK

The per capita cost of water and sewage treatment facilities is related to their size, so comparative data has been restricted to the medium to large scale facilities found in larger towns and cities (more than 100,000 people).

Treatment facilities (USD per capita)	Range
Water	20 - 100
Sewage treatment (primary)	20 - 60
Sewage treatment (secondary)	150 - 180

Source: Envisager

The private sector has a broad remit for driving down costs. Small bore sewerage networks built with local labour in El Alto, Bolivia between 2000 and 2002 under AISA, the concession managed by Suez until this year cost USD90 per capita. Given the contentious nature of private sector participation, it remains likely that more expensive municipally operated approaches will usually be adopted.

In per capita terms, improving urban water, sewerage services and wastewater treatment ought not to exceed USD100-140 per capita, while providing these services from scratch should not cost more than USD300-450 per capita, less USD120-160 without full wastewater treatment. Suez has been able to provide basic water and sewerage services in Latin America for USD100 per capita. Rural service provision is appreciably cheaper, concentrating on the ready availability of water a short distance from each house, along with sanitation and effluent recovery and composting systems.

APPENDIX 4:

GLOSSARY OF WATER AND FINANCE TERMS AND ABBREVIATIONS

APPENDIX 4: GLOSSARY OF WATER AND FINANCE TERMS AND ABBREVIATIONS

Abstraction. The taking of water from surface water (rivers, lakes and reservoirs) and groundwater (boreholes and springs from water bearing rocks such as chalk, limestone and sandstone).

Acre-Feet. Expression used in the USA to describe groundwater resources. 1 acre foot = 1.482 Ml (1,482 m^3)

ADB. African Development Bank / Asian Development Bank. The former is sometimes known as the AfDB and in general are not to be confused with each other.

Affermage. See Lease.

AMP. Asset Management Period, the five yearly operating cycles in England and Wales set out by Ofwat, the industry regulator since 1989. AMP4 runs from 2005-10.

Ammoniacal nitrogen (NH_3). Ammoniacal nitrogen is often found in water as a result of the discharge of sewage effluent with high levels affecting the quality of fisheries.

Aquifer. Rock and soil which holds water, an underground water source for groundwater.

Artesian. Water abstracted from groundwater resources.

ASEAN. Association of South-East Asian Nations.

Asset Sale. The full privatisation of utility services via the outright sale of their assets and an operating licence to shareholders or to a private sector company. This is known as the 'British Model' after the 1989 privatisation of the WASCs of England and Wales. Placing the operating assets in private hands in perpetuity has proved politically very contentious and, as a result, has not been used elsewhere, save in Chile and to a lesser extent, in the Czech Republic and in Belize.

ATO. Ambito Territoriale Ottimale. The ideal area for water and wastewater contracts in Italy as designated by the 1994 Galli Law. This law broadly seeks to rationalise some 6,800 water distribution regions into a more manageable 89.

BATNEEC/BAT. Best available technology not entailing excessive cost/Best available technology. The former's expediencies have earned it the nickname CATNIP, or cheapest available technology not involving prosecution.

Biosolids. The new expression for sewage sludge which has been processed for recycling. The latter refers to its application on agricultural land or after further treatment, as compost sold for horticulture and domestic gardens. As far as PR goes, a better term than refined human excreta.

Biotic. Plant, bacterial or animal life. Biodiversity refers to the optimal diversity of species in an ecosystem. The greater the number of species in a given ecosystem in relation to its ideal number, the less perturbed the habitat is.

Blue Flag. Under the EU's bathing waters directive, designated bathing areas that meet the stricter 'Guideline' standard for water quality, as well as satisfying standards for safety, can be awarded a 'blue flag'.

BMO. Build, manage, operate, a form of O&M contract.

BOD/COD. These are chemical/biochemical determinants of water quality. As plants and animals do not necessarily respond to numbers and engineering standards, there is a move towards complementing these criteria with a biological assessment of the water's quality. For example, in several families of invertebrates, better water quality results in a greater degree of species diversity. Indicator species are used to measure water quality.

- **Biochemical oxygen demand (BOD).** This is the amount of dissolved oxygen in water consumed in test conditions over a period of five days by the microbiological oxidisation of biodegradable organic matter contained in effluent. BOD measures the amount of oxygen consumed, usually by organic pollution (mainly sewage effluent and effluents from the wood and paper industry), so lower values indicate better quality.

- **Chemical oxygen demand (COD).** Unlike BOD, this includes all the oxygen consumed by effluents.

BOT. See Concession.

'British Model'. See Asset Sale.

CAO. Chief Accounting Officer.

CAP. The Common Agricultural Policy of the European Union.

Capex. Capital spending. Money spend on new assets or replacing or upgrading extant assets.

Carcinogen. A substance which is believed to be a cause of cancers in humans.

CEO. Chief Executive Officer.

CFO. Chief Financial Officer.

Coliform bacteria. Gut living bacteria that are discharged with excreta. Drinking water contaminated with coliform bacteria is the main cause of diarrhoea and other intestinal infections. The most useful indication that sewage effluent is being discharged into a body of water.

Combined sewers. A sewer that carries both sewage and storm water runoff.

Common Ownership. A form of privatisation where the operating assets are corporatised and a minority of the shares in the asset-holding company are offered to one or more private sector companies. This is known as Kooperationmodel or the German Model. A further variant is the Beteribermodell, where the private sector operator pays a fixed rate for the right to operate the services.

Concession. The granting of the right to operate given utility services for a locality for an agreed period of time. Unlike outright privatisation (see Asset Sale), the assets are transferred to municipal ownership at the end of the concession's life. In a full utility concession, the collection of water and sewerage tariffs is included. There are also four main variants of the concession model (BOO, BOT, TOT and BOOT) where tariff collection usually remains in municipal hands. These versions are typically seen where the municipality needs private sector finance and management for new facilities.

- **BOO (Build Own Operate).** The private sector company builds, owns, maintains and operates the facility for the length of its operating life.

- **BOOT (Build Own Operate Transfer).** Similar to the BOO contract, save that the private sector company hands over the assets to the municipality at the expiry of the concession.

- **BOT (Build Operate Transfer).** Similar to the BOOT except that the private sector company hands over the assets to the municipality on completing construction work.

- **TOT (Transfer Own Transfer).** Take over an existing facility, rehabilitate and subsequently operate it and hand over the assets to the municipality at the expiry of the concession.

COO. Chief Operating Officer.

Corporatised. A utility that is in municipal ownership while being run in a manner similar to that of a private sector entity. A corporatised utility will be structured as a limited liability company, with its share capital controlled by the municipality, while publishing the equivalent of an annual report replete with a profit and loss account, balance sheet and cash flow data.

Cryptosporidium. Parasitic micro-organisms which live in water and are a cause of diarrhoea. The presence of 'crypto' is arguably an indicator of an under-maintained distribution network.

CSD. Commission on Sustainable Development of the UN.

DBFO. Design, Build, Finance and Operate. A form of BOT concession.

DBO. Design, Build and Operate. A form of BOT concession.

DBOT. Design, Build, Operate and Transfer. A variant of the BOT contract incorporating the design of the facility.

DfID. The UK Government's Department for International Development, a government agency for promoting development initiatives.

Digestion. Process for stabilising sewage sludge before application to land. Digestion involves heating the sludge to 40^{o}C to reduce the number of bacteria and pathogens. Anaerobic digestion (see Pasteurise) generates methane, which can be extracted for energy recovery.

Distribution Loss. Non-contentious expression for leakage (q.v.) which also includes other losses including theft of water.

Dry tonne. Sewage sludge or industrial effluent after all water has been removed. This is the standard measure used for comparing sewage sludge generation and disposal statistics.

EBITDA. Earnings before interest, taxation, depreciation and amortisation.

EBRD. European Bank for Reconstruction and Development. Loans for municipal and private services, with an emphasis on the EU candidate countries.

Ecosystem. The community of organisms associated with a particular habitat. It ought to be noted that there is no such thing as 'ecological', as in 'ecologically friendly', since ecology is the science of studying the environment. Expressions such as 'environmentally sound' do, however, make sense.

Effluent. Liquid wastes typically discharged into a body of water. Strictly speaking, it is the liquid discharged from a wastewater treatment plant into a body of water, which is meant to meet various quality criteria.

EIB. European Investment Bank. Loans for municipal and private enterprises, priority within the EU.

EPA. (National) Environmental Protection Agency.

EU. The European Union's directorate general for environmental issues is DG XI. The EU acts as a driver for and against water quality. In subsidising inefficient forms of industrial (intensive) agriculture, it is possible that the EU's Common Agricultural Policy (CAP) does more damage to water resources than all of DG XI's environmental initiatives combined.

Eutrophication. The process by which lakes and ponds become enriched with dissolved nutrients, resulting in increased growth of algae and other microscopic plants. Nitrogen and phosphorous enrichment of water, which causes algal growth to extend beyond that associated with the particular aquatic environment. Degrades the quality of the ecosystem and impairs water quality. The main causes are industrial agriculture (fertilisers and slurry) and excess effluent discharges.

Evapotranspiration. The removal of water from a surface through evaporation.

FAO. Food and Agriculture Organisation of the United Nations.

'French Model'. Also known as affermage, (see Lease).

Fresh water. Water that contains less than 1000 milligrams per litre of dissolved solids such as metals and nutrients.

FY. Financial Year.

GEF. Global Environment Facility (World Bank)/Global Environment Fund (privately held).

'German Model'. Also known as Kooperationmodel and the Beteribermodell (see Common Ownership).

GDP. Gross domestic product – most effectively compared through using the Purchasing Power Parity tool, PPP.

Groundwater. The supply of fresh water found beneath the earth's surface (usually in aquifers) which is often used for supplying wells and springs.

Groundwater recharge. The inflow to an aquifer.

Habitat. United Nations Centre for Human Settlements (see UNCHS).

Hague. The second world water forum, held in the Hague in 2000. Unveiled the 2025 target for universal water and sanitation provision, allied with greater private sector investment.

IADB. Inter-American Development Bank. Development Bank primarily concerned with financing infrastructure projects in Central and South America.

IFC. International Finance Corporation (World Bank, investment banking and privatisation).

IMF. International Monetary Fund – encourages the sale of assets as part of state refinancing.

Inset Appointment. Term for water provision contracts awarded to a new company within an incumbent company's service area. A form of water service provision competition, mainly seen in the UK.

IPO. Initial Public Offering, whereby a company's shares are listed and subsequently traded on a recognised stock exchange for the first time.

IPPC. Integrated pollution prevention and control regulates the discharges from industrial processes into the air, land and water.

ISPA. Instrument for Structural Policies for Pre-Accession. EU funding for Accession Candidates, providing up to 75% of the cost of transport and infrastructure projects.

IWRM. Integrated Water Resources Management.

Johannesburg. The Second Earth Summit was held at Johannesburg in 2002. Targets to halve the proportion of people not connected to water or sanitation by 2015 were agreed.

K. The percentage above (or below) the Retail Price Index that Ofwat allows a water company in England and Wales to alter its fees in a given year. This has evolved from the 'RPI-X' regulatory model pioneered by Oftel when British Telecommunications was privatised in 1984 and is an example of price driven regulation as opposed to the rate of return model used in the USA.

Kyoto. The third world water forum was held at Kyoto in March 2003. Despite hopes that it would develop a framework to implement The Hague and Johannesburg proposals at the country level, little of substance took place due to NGO disruptions.

L. Litre

Leakage. Loss of water through the distribution system either at joins between pipes or due to cracks in pipes. Because the perceived wastage of water is a contentious subject, definitions of leakage rates tend to vary. Pipes are affected by cold weather (ice-cracking) and dry weather (subsidence) as well as structural deterioration. Approximately one third of leakage takes place within the customer's pipe network. It is also affected by water pressure, leading to a pay-off between water supply pressure and leakage rates.

Lease (Affermage). Privatisation model pioneered in France whereby the private sector company rents the assets from the municipality for a given length of time. The municipality is responsible for investment while the company does the tariff collection. In France, this evolved into a form of concession model, with the company carrying out an agreed programme of asset improvements over the life of the contract.

M^3. Cubic metre, or 1,000 litres. Measure of water volume. One cubic km is one million m^3.

Mains. Pipes that carry treated drinking water to the customer's supply pipe via a connection pipe. Also called the distribution mains.

Management Contract. The simplest form of privatisation, where the private sector company provides management support for the operation of the assets. Usually seen as a means for the private and public sector entities to get to know each other.

Mexico City. The fourth World Water Forum was held at Mexico City in 2006. A low key event, but one where issues about funding and meeting the MDGs were taken more seriously than in the past.

MDG. The Millennium Development Goals were drawn up in 2000 and ratified in 2002 by the United Nations as a series of human development targets to be reached by 2015. The water and sanitation MDGs aim for a halving of people worldwide without access to safe water and sanitation by 2015.

MENA. Middle East and North Africa.

Ml/day. Megalitres per day (1,000m^3 per day). Measure of water availability.

Monitoring Techniques. Monitoring needs to take greater account of water quality in biological, not chemical terms. Sometimes this is good for standards – lowland, slow flowing rivers can have low levels of dissolved oxygen – but usually this will mean tighter criteria.

Mt/pa. Million tonnes per annum.

MWA. Municipal Water Authority. The body controlling the water and wastewater service activities in Bangkok, Thailand.

N/A. Not Available.

Nitrates (NO_3). Nitrates are formed naturally in the soil by micro-organisms, but are also produced industrially and used as fertilisers. Nitrates are the nutrients, which in most saline waters control the production of algal growth with high levels of nitrates in the water causing eutrophication through algal and macrophyte growth. Furthermore 'blue baby disease', an affliction of the blood's oxygen-carrying capacity, is associated with drinking water containing nitrogen in the form of nitrates.

NGO. Non Governmental Organisation.

Non-accounted for water. The proportion of water put into a system that does not end up being paid for either directly or indirectly.

O&M (Operation and Maintenance). A step further from management contracts, but not a privatisation in the sense of a concession or asset sale. Here the private sector company operates and maintains the extant assets for a given period of time, but is not involved in the development of these assets or new facilities.

ODA. Overseas Development Assistance. Infrastructure development aid.

OECD. Organisation for Economic Co-operation and Development. Global grouping of 24 more developed economies.

OFWAT. Office for water services, the water regulator for England and Wales.

Opex. Operating expenditure. Money spent maintaining the extant infrastructure and using it to provide a service.

PAH. Polyaromatic hydrates. A toxic industrial pollutant of increasing concern in EU and WHO water quality assessment criteria.

Parastatal. A state held entity that operates at least nominally independently of the state. A Parastatal may also operate as a corporatised (q.v.) entity.

Pasteurise. Sewage sludge which is more extensively treated than digested sludge (q.v.). After heating the sludge to 60^oC for several days, all pathogens and bacteria are removed, making it satisfactory for a wide range of agricultural applications. The main techniques are known as anaerobic digestion and composting.

Pathogen. An organism which is capable of causing a disease.

PCBs. Polychlorinated biphenyls were mainly used for electrical transformers. They do not degrade and are understood to be carcinogens which can bioaccumulate (build up in an organism's body, typically in fat reserves) to a dangerous degree. Their manufacture was banned in 1977, but some 60% of all PCBs manufactured remain in use.

PE. The population equivalent or amount of oxygen demand (see COD/BOD) generated and discharged by the average person each day. In a typical town, it is 1.5 to 2.0 times the population.

P/E. Price Earnings Ratio (PER), a company's share price divided by its historic financial year (FY) earnings per share.

Pesticides: There are two main classes of pesticides: chlorinated hydrocarbons are long-lived and capable of being concentrated up the food chain (this is called bioaccumulation). The second group is the organophosphates which are short-lived and presumably degrade to 'harmless' end products, but whose long-term environmental impact is not yet known.

Chlorinated hydrocarbons:	Organophosphates:
Aldrin, Endrin, Benzene, Hexachloride,	Azodrin, Malathion, Parathion, Diazinon,
DDT, Dieldrin, Endosulfan and others	Trithiopn, Phosdrin and others

PFI. Private Finance Initiative, a tool developed in the UK in the mid 1990s for awarding single projects to the private sector on a concession basis.

Phosphates. Phosphates are another nutrient, responsible for the eutrophication that mostly stems from sewage effluent with the remainder mainly from agricultural inputs and from extensive use of detergents.

Physicochemical treatment. The treatment of liquid wastes to reduce their environmental impact (see BOD/COD).

Plumbsolvency. The ability of water to dissolve lead from piping or solder. Soft waters (e.g. granite) are more plumbsolvent than hard waters (e.g. chalk). Soft water is defined as water that has less than 60 milligrams of calcium carbonate (lime) per litre.

Potable. Water that is fit for human consumption, as defined by World Health Organisation (WHO), EU or national standards.

PPP. Polluter pays principle, whereby a discharger of polluting substances pays a fee relating to the pollution load discharged. PPP can either be used to encourage dischargers to minimise their pollution loads or to finance the development of an appropriate effluent treatment network.

PPP. Purchasing Power Parity, a tool developed to illustrate the relative purchasing power of a common currency (in GDP per capita terms) in different economies. One US dollar goes further in India than it does in Japan.

PPP. Public-Private Partnership, where the private sector manages state or municipally held assets on a partnership basis. 'PPP' is a common TLA (triple letter acronym) affecting the water sector.

PSP. Private Sector Participation. Another TLA for PPP.

PWA. Provincial Water Authority. The body controlling the water and wastewater service activities in urban areas outside Bangkok, Thailand.

Raw water. Water from surface or ground sources prior to treatment.

Red List. Substances deemed harmful to the environment. Their discharge into the environment is to be brought under the control of the EU's IPPC directive. Grey List substances are of intermediate toxicity and are subject to a less stringent set of controls.

Reservoir. A body of water, usually artificially impounded, for maintaining controllable supplies of raw water. Prior to distribution, it is usually sent to a treatment works to be made potable and held in a service reservoir.

River basin. A term used to designate the area drained by a river and its tributaries.

Sanitary sewers. Underground pipes that carry off only domestic or industrial waste, not storm water.

Septic tank. Tank used to hold domestic wastes when a sewer line is not available to carry them to a treatment plant; part of a rural on-site sewage treatment system.

Sewage. Domestic sewage mainly consists of human excrement. Agricultural sewage has the same environmental impact, but its legal status is more ambiguous (as long as it is not discharged directly into watercourses).

Sewage sludge. The House of Lords, in its 1991 paper on the EU's UWWTD perhaps harks back to school when describing sewage sludge as having "the consistency of thin semolina." The principal by-product from sewage treatment. Typically consisting of 96-97% water and 3-4% dry solids, it is usually measured in terms of dry solids to allow international comparisons to be made.

Sewage treatment. This usually involves a series of phases, each designed to progressively reduce the environmental and health impact of the effluent. Sewage is carried in the effluent either as solid matter or in dilute, suspended solids. While several performance criteria are used to assess the performance of a sewage treatment works (mainly, the removal of silts, BOD and ammonia), each level of treatment can be judged by its ability to remove these solids from the effluent stream prior to its final discharge. There is a fairly close relationship between ultimate solids removal and the lowering of an effluent stream's BOD.

Level of treatment	**Process involved**
None and preliminary	Screening out of solids
Primary	Settlement to remove solids from effluent
Secondary	Biological treatment to remove suspended solids
Tertiary and advanced	Further nutrient removal via filtration, etc.

Level of treatment	**Percentage of sludge removed**	**BOD removal**
None and preliminary	2% (range 0-5%) of sludge removed	0-5%
Primary	30% (range 10-40%) of sludge removed	2-35%
Secondary	90-95% of sludges removed	75-90%
Tertiary and advanced	99-100% of sludges removed	95-98%

- **Preliminary / Screening.** Intended to remove solids flushed down lavatories, such as condoms, tampons and nappies. Reduces the aesthetic impact of the sludge without affecting its environmental impact.

- **Primary.** Physical treatment, where the effluent is placed in a settlement tank, so that solids are left behind and the liquid effluent is then discharged.

- **Secondary.** Biological treatment, where the effluent trickles through inert materials such as slag, clinker, gravel or more recently, moulded plastic, so that it comes into contact with micro-organisms, which oxidise and clarify the effluent.

- **Tertiary.** A bit of a catch-all expression, usually referring to chemical treatment. Usually concerned with the removal of nutrients such as nitrogen and phosphorous.

- **Advanced treatment and disinfection.** In addition, reverse osmosis membranes are being adopted where space is at a premium. For example, for serving a bathing area directly backing onto cliffs. Treatment can be extended to include further disinfection by exposing the effluent to ultra violet light or ozone prior to its final discharge.

Sewerage. The collection and distribution network linking domestic and industrial properties with the sewage treatment system.

Storm sewer. A system of pipes (separate from sanitary sewers) that carry only water runoff from building and land surfaces.

STW. Sewage treatment works. Sewage effluents are collected at a STW for treatment, with the sewage sludge being separated from water for discharge.

Supply pipe. The part of the water distribution network which is on the customer's property and thus usually owned by the customer, not the water supplier. The statutory obligations of water provision companies usually do not extend to the supply pipe.

Surface water. All water naturally open to the atmosphere (rivers, lakes, reservoirs, streams, seas, estuaries). It also refers to springs and wells, which are directly influenced by surface water.

SWC. The statutory water companies are private sector companies with a statutory obligation to provide water in England and Wales under the 1973 Water Act. Also known as water only companies (WOCs) and are distinct from the Water Plcs.

TOT. Transfer, Operate and Transfer. A variant of the BOT contract where extant assets are taken over and operated for a set period of time.

Trade effluent. Dilute wastewater (effluent) discharged by industry into the sewerage network. Increasingly subject to restrictions under IPPC whereby it is to be treated separately from domestic sewage.

Tuck-In. Acquisitions by a major water company of small water companies within or adjacent to their service area, which are 'tucked-in' or integrated into their networks.

Turbidity. Cloudiness caused by the presence of suspended solids in water; an indicator of water quality.

UFW. Unaccounted for water. Distribution losses or leakages (q.v.), either expressed as a percentage of water put into the system or in terms of million litres per day (or year). Percentage losses are typically avoided due to their emotive impact. Often also includes illegal abstraction and unmetered supply that has not been billed for.

UNCHS. United Nations Centre for Human Settlements (Habitat). Research and aid relating to urban areas.

UNDP. United Nations Development Programme

UNEP. United Nations Environment Programme.

USAID. US direct aid programme for supporting international development project.

USEPA. US Environmental Protection Agency.

UWWTD. The EU's 1991 Urban Wastewater Treatment Directive (91/271/EC). All populations of more than 2,000 to have suitable sewage treatment from 2005.

WASC. Water and sewerage company, see Water Plc.

Wastewater. Typically either sewage (q.v.) or an effluent (q.v.). Water that carries wastes from homes, businesses, and industries. A mixture of water and dissolved or suspended solids.

Water consumption. Consumption is the part of a withdrawal of water that is ultimately used and removed from the immediate water environment whether by evaporation, transpiration, incorporation into crops or a product, or other consumption.

Water contamination. Impairment of water quality to a degree which reduces the usability of the water for ordinary purposes, or which creates a hazard to public health through poisoning or spread of diseases.

Water for Life. The United Nations' Decade for Action launched on World Water Day, 22nd March 2005 for meeting the 2015 Millennium Development Goals of halving the number of people without access to improved water supplies and sanitation.

Water Plc. Colloquial expression for the ten water and sewerage companies (WASCs) of England and Wales, which were privatised in 1989.

Water pollution. Industrial and institutional wastes, and other harmful or objectionable material in sufficient quantities to result in a measurable degradation of the water quality.

Water quality. Classification of inland waters. EU classifications range from 'Very Good' (IA) quality waters that have no appreciable indicators of human activities and are capable of supporting more sensitive species such as Brown Trout, to 'Poor' (III) quality waters that support a significantly degraded community of plant and animal species, and 'Bad' (IV) quality waters that (with the exception of some fungi and algae) are usually incapable of supporting life.

Water use. Water use is usually defined and measured in terms of withdrawal (q.v.) or consumption (q.v.) that which is taken and that which is used up. Not all water withdrawn is consumed, but is instead returned to a surface or ground water source from a point of use and becomes available for further use.

Water withdrawal. Withdrawal refers to water extracted from surface or ground water sources

WB. World Bank. Loans targeting services and infrastructure at the pre-privatisation phase. Broad remit to encourage cost recovery and commercialisation.

WBCSD. World Business Council for Sustainable Development.

Wet tonne. A weight of measure for sewage sludge or industrial effluent. In the case of sewage sludges, this usually refers to material removed from the sewage treatment process. Sewage sludge usually consists of 95-98% water, falling to 75-85% after basic drying. The variability of the water content makes wet tonnes an inconsistent measure of sewage generation, hence the use of dry tonnes when comparing sewage data.

WFD. The EU's 2000 Water Framework Directive. Inland waters to be of "good ecological quality" by 2012-15. Calls for cost recovery from 2010 and water management at the river basin level. The expected practical compliance date will be during the third assessment cycle, ending in 2029.

WHO. World Health Organisation. Sets Global Standards for drinking water quality, as specified in its 'Guidelines for Drinking-water Quality' (3rd edition published in 2004).

WOC. See SWC.

WRI. World Resources Institute, United States. Independent body researching the use and abuse of natural resources.

WTW. Water treatment works render raw (untreated) water potable or fit for human consumption.

WWC. World Water Council. Organises the triennial World Water Fora (WWF, q.v.)

WWF. World Water Forum. A global gathering of people involved in water issues that as in 2000 has the potential to set the policy agenda or as in 2003 to become mired in polemic. Four have been held to date and the fifth is in preparation: WWF 1; Morocco 1997, WWF 2; The Netherlands 2000, WWF 3; South Africa 2003, WWF 4; Mexico 2006 and WWF5; Turkey 2009.

WWTW. Wastewater treatment works, another term for sewage treatment works.

WWV. The World Water Vision. Drawn up at the Second World Water Forum (see WWF) in 2000, this project envisages universal access to safe water and sanitation by 2025.

APPENDIX 5:

REFERENCES AND FURTHER READING

APPENDIX 5: REFERENCES AND FURTHER READING

Important sources of country information are included in the relevant country entries. Information on individual companies and privatisation contract awards has been obtained from company annual reports, press releases and web sites, along with analyst briefings and visits since 1989. Copious use of the following periodicals has been made:

- Source Water & Sanitation Weekly (fortnightly)
- The Global Water Report (fortnightly, to October 2006)
- Global Water Intelligence (monthly)
- Asian Water (monthly)

This survey mainly covers secondary sources, reviews and overviews rather than reports on field data and primary academic papers, except where they illustrate particular points or the state of the art at the time. It is a provisional list and in general excludes press releases, internal studies and material solely posted on the Internet.

General reviews

The country data entries have broadly been based upon the publications below. The exceptions are where other sources are more recent, or where they have provided information not available in these publications.

GEO-3 (2002) Global Environment Outlook 3. UNEP, Earthscan, London, UK

Human Development Report 2003 (2003) Millennium Development Goals: A compact among nations to end human poverty. UNDP, United Nations, New York, USA

Human Development Report 2004 (2004) Cultural Liberty in Today's Diverse World. UNDP, United Nations, New York, USA

Human Development Report 2005 (2005) International cooperation at a crossroads: Aid, trade and security in an unequal world. UNDP, United Nations, New York, USA

Human Development Report 2007/08 (2007) Fighting climate change: Human solidarity in a divided world. UNDP, United Nations, New York, USA

OECD Environmental Performance Reviews, OECD, Paris:

- Austria (2003, 2008)
- Australia (2008)
- Belgium (2007)
- Canada (2004)
- Chile (2005)
- China (2007)
- Denmark (2008)
- France (2008)
- Germany (2001)
- Hungary (2008)
- Ireland (2000)
- Italy (2001)
- South Korea (2006)
- Japan (2002)
- Mexico (2003)
- Netherlands (2003)
- New Zealand (2007)
- Poland (2003)
- Portugal (2001)
- Romania (2008)
- Spain (2004)
- Sweden (2004)
- Switzerland (2007)
- Ukraine (2008)
- United Kingdom (2002)
- USA (2006)

Sarukhan J. & Whyte A. (2005) Millennium Ecosystem Assessment: MEA Synthesis Report (www.millenniumassessment.org)

Transparency International (2008) Global Corruption Report 2008: Corruption in the Water Sector Cambridge University Press, Cambridge

United Nations (2007) World Urbanization Prospects: The 2007 Revision; Data Tables and Highlights. Population Division, New York, Department of Economic and Social Affairs, UN Secretariat

UNEP (2006) Challenges to International Waters – Regional Assessments in a Global Perspective. United Nations Environment Programme, Nairobi, Kenya.

UNCHS Habitat (2007) Enhancing urban safety and security: Global Report on Human Settlements 2007. United Nations Human Settlements Programme, UN-HABITAT, Earthscan, London

UNCHS Habitat (2006) Meeting development goals in small urban centres: Water and sanitation in the world's cities 2006. United Nations Human Settlements Programme, UN-HABITAT, Earthscan, London

UNCHS Habitat (2003) The Challenge of Slums: Global Report on Human Settlements 2003. United Nations Human Settlements Programme, UN-HABITAT, Earthscan, London

UNCHS Habitat (2003) Water and Sanitation in the World's Cities: Local Action for Global Goals, Earthscan, London, UK

UNCHS Habitat (2001) Cities in a Globalizing World: Global Report on Human Settlements, 2001. Earthscan, UK

UNESCO (2003) World Water Development Report - Water for People, Water for Life, United Nations Educational, Scientific and Cultural Organization (UNESCO), Paris, France

UNESCO (2003) Water a shared responsibility - The United Nations World Water Development Report 2, United Nations Educational, Scientific and Cultural Organization (UNESCO), Paris, France

United Nations Development Programme (2006) Beyond scarcity: Power, poverty and the global water crisis Human Development Report 2006. UNDP, New York, USA

WHO / UNICEF (2008) Progress on drinking water and sanitation: special focus on sanitation, WHO Geneva

WHO / UNICEF (2005) Water for life: making it happen, JMP, Geneva

World Bank (2003) Water Resources Sector Strategy: Strategic Directions for World Bank Engagement, World Bank Washington DC, USA

World Bank (2003) World Development Report, 2004: Making Services Work for Poor People, World Bank, Washington DC, USA

World Development Report 2005 (2004) A Better Investment Climate for Everyone. WRI, UNDP, UNEP, World Bank, OUP, Oxford, UK.

World Development Report 2006 (2005) Equity and Development. WRI, UNDP, UNEP, World Bank, OUP, Oxford, UK.

World Development Report 2007 (2006) Development and the next generation. WRI, UNDP, UNEP, World Bank, OUP, Oxford, UK.

World Investment Report (2008) Transnational Corporations and the Infrastructure Challenge, UNCTAD, Geneva

WRI (2003) World Resources, 2002-04: Decisions for the Earth. World Resources Institute, Washington DC, USA

Overviews of water provision issues

ADB (2004) Water in Asian Cities, Asian Development Bank, Manila, Philippines

ADB (2007) Water development outlook, Asian Development Bank, Manila, Philippines

Eisebreich S.J., ed. (2005) Climate Change and the European Water Dimension, EU Report 21553, DG JRC, Italy

Cairncross S, ed. (2003) Water & Sanitation in the Worlds Cities: Local Action for Global Goals. United Nations Human Settlements Programme. UN-HABITAT, Earthscan, London

Gleick, P.H. et al. (2004) The World's Water 2004-2005: The Biennial Report on Freshwater Resources. Island Press, Washington, D.C.

Gleick, P.H. et al. (2002) The World's Water 2002-2003: The Biennial Report on Freshwater Resources. Island Press, Washington, D.C.

Gleick, P.H. (2000) The World's Water 2000-2001: The Biennial Report on Freshwater Resources. Island Press, Washington, DC

Gleick, P.H. (1998) The World's Water 1998-1999: The Biennial Report on Freshwater Resources. Island Press, Washington, DC

Kundzewicz, Z.W., L.J. Mata, N.W. Arnell, P. Döll, P. Kabat, B. Jiménez, K.A. Miller, T. Oki, Z. Sen and I.A. Shiklomanov, 2007: Freshwater resources and their management. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change,* M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 173-210.

Le Quesne, T, Pegram, G, & Von Der Heyden, C (2007) Allocating scarce water. A WWF primer on water allocation, water rights and water markets. WWF-UK, United Kingdom

Mcintosh, A. C. (2003) Asian Water Supplies: Reaching the Urban Poor. Asian Development Bank / IWA Publishing, London

Owen, D A Ll (2006) Financing Water and Wastewater 2006-2025: From Necessity to Sustainability. Thomson Financial, London

Pearce F (2006) When the rivers run dry: What happens when our water runs out? Eden Project Books, London

Prüss A , Kay D, Fewtrell L & Bartram J (2002) Estimating the Burden of Disease from Water, Sanitation, and Hygiene at a Global Level, Environmental Health Perspectives, 110 / 5, 537-542

UNESCO-WWAP (2006) Water a shared responsibility: The United Nations World Water Development Report 2. UNESCO, Paris, France

Water Supply and Sanitation Collaborative Council (2004) Resource Pack on the Water and Sanitation Millennium Development Goals, WSSCC, Geneva, Switzerland

WHO (2000) Global Water Supply and Sanitation Assessment. WHO, UNICEF & WSSCC, USA.

WHO (2004) Guidelines for Drinking-water Quality. Third edition. WHO, Geneva

Water Supply and Sanitation Collaborative Council (2004) Resource Pack on the Water and Sanitation Millennium Development Goals, WSSCC, Geneva, Switzerland

WSP (2008) Performance Improvement Planning: Developing Effective Billing and Collection Practices, Water & Sanitation Program, South Asia, New Delhi

WSP (2008) Performance Improvement Planning: Designing an Effective Leakage Reduction and Management Program, Water & Sanitation Program, South Asia, New Delhi

WSP (2008) The Sanitation Business: 100 million customers await you! The National Development Planning Agency, Jakarta, Indonesia

WSP (2008) Economic Impacts of Sanitation in Southeast Asia: A four-country study conducted in Cambodia, Indonesia, the Philippines and Vietnam under the Economics of Sanitation Initiative(ESI), The World Bank, Jakarta, Indonesia

WSP (2007) Performance Improvement Planning: Upgrading and Improving Urban Water Services, Water & Sanitation Program, South Asia, New Delhi

WSP (2007) Taking Water and Sanitation Services to the Urban Poor, Water & Sanitation Program, South Asia, New Delhi

Water economics and policy

Ahmed R. (2003) DSK: a model for securing access to water for the urban poor. WaterAid, London, UK

Baietti A, Kingdom W & van Ginneken M (2006) Characteristics of well Performing Public Water Utilities. Water Supply & Sanitation Working Notes Note No. 9, May 2006 The World Bank, Washington, DC, USA

Bannister, M (2003) Corruption in development – a killing virus. 29th WEDC International Conference Abuja, Nigeria, 2003. WEDC, Loughborough, UK

le Blanc, D (2007) A Framework for Analyzing Tariffs and Subsidies in Water Provision to Urban Households in Developing Countries. Division for Sustainable Development, United Nations

Brikké F. & Rojas J. (2001) Key Factors for Sustainable Cost Recovery in the context of community-managed water supply. Occasional Paper Series 32-E, IRC International Water and Sanitation Centre, Delft, The Netherlands

Cardone R & Fonseca C (2006) Financing Facilities for the Water Sector , Thematic Overview Paper 13, IRC International Water and Sanitation Centre, IRC, Delft, The Netherlands

Collignon, B & Vezina, M (2000). Independent Water and Sanitation Providers in African Cities. World Bank, Washington DC, USA

Cosgrove, W J & Rijsbnerman, F R (2000). World Water Vision: Making Water Everybody's Business. WWC, Earthscan, UK. In addition, 18 regional documents were published in 1999

Dole, D. and Bartlett, I. (2004). Beyond cost recovery: setting user charges for financial, economic, and social goals. (Technical note /ERD-ADB; no. 10). Manila, Philippines, Asian Development Bank

Dubreuil C (2006) The Right to Water: From concept to implementation World Water Council. 2006

Elshorst H & O' Leary D (2005) Corruption in the Water Sector: Opportunities for Addressing a Pervasive Problem, Transparency International

Emerton, L & Bos, E (2004) Value: Counting ecosystems as water infrastructure. IUCN, Gland, Switzerland

FAO (2006) Stakeholder-oriented valuation to support water resources management processes Confronting concepts with local practice, FAO Water Report 30, UN, Rome, Italy

Foster, V and Yepes T (2005) Is Cost Recovery A Feasible Objective for Water and Electricity? A background paper commissioned for the World Bank, and quoted in Fay, M & Morrison M (2005) Infrastructure in Latin America & the Caribbean: Recent Developments and Key Challenges. Volume I: Main Report & Volume II: Annexes, Report No. 32640-LCR, World Bank, Washington DC, USA

Frankhauser S & Tepic S (2005) Can poor consumers pay for energy and water? EBRD, London

Foxwood, N. and Green, J. (2004). Making every drop count: an assessment of donor progress towards the water and sanitation target. Teddington, UK, Tearfund

Gunatilake, H, Yang, J-C, Pattanayak, S & van den Berg, C, (2006) Willingness-to-pay and design of water supply and sanitation projects: A case study. ERD Technical Note No 19, ADB, Manila, Philippines

Hearne, R. R. & Trava, J. L. (1997) Water Markets in Mexico: Opportunities and Constraints Discussion Paper D 97-01, Environmental Economics Programme, IIED, London

Hutton, G & Haller, L (2004) Evaluation of the costs and benefits of water and sanitation improvements at the global level. WHO / SDE / WSH. World Health Organization 2004

IIED (2002) Financing for Sustainable Development. IIED, London

Johnstone, N. (1997) Economic Inequality and the Urban Environment: The Case of Water and Sanitation. Discussion Paper D 97-03, Environmental Economics Programme, IIED, London

Kingdom, B, Liemberger, R & Marin P (2006) The Challenge of Reducing Non-Revenue Water (NRW) in Developing Countries How the Private Sector Can Help: A Look at Performance-Based Service Contracting. Water Supply and Sanitation Sector Board Discussion Paper Series, Paper No.8, World Bank, Washington DC, USA

Komives K, Halpern J, Foster V & Wodon Q (2006) The Distributional Incidence of Residential Water and Electricity Subsidies World Bank Policy Research Working Paper 3878, April 2006 The World Bank, Washington, DC, USA

Lenton R. (2003) Background Paper of the Taskforce on Water and Sanitation, Millennium Project, UNDP

Littlefair, K. (1998) Willingness to Pay for Water at the Household Level: Individual Financial Responsibility for Water Consumption, Occasional Paper No. 26, SOAS Water Issues Study Group, University Of London

Marshall J. et al (2002) Water and Sanitation in Tanzania: Poverty Monitoring for the sector using national surveys. WaterAid, London, UK

McGranahan, G. et. al. (2001) The Citizens at Risk: From Urban Sanitation to Sustainable Cities, SEI / Earthscan, London UK

McGranahan, G. (2002) Demand-Side Water Strategies and the Urban Poor, PIE Series No.4, IIED, London

McIntosh, A. (2003) Asian Water Supplies: Reaching the Urban Poor, Asian Development Bank / International Water Association, London

Mehta, M. (2004) Meeting the Financing Challenge for Water Supply and Sanitation: Incentives to promote reforms, leverage resources, and improve targeting. The World Bank, Washington DC, USA

Mohajeri M et al (eds) (2003) Aqualibrium: European water management between regulation and competition, European Commission, Directorate 1, Brussels

Nigan A. (1996) 'Sustainable financing of WATSAN' 22nd WEDC Conference, WEDC, Loughborough, UK

OECD (2002) Environmental benefits of foreign direct investment: A literature review, OECD Paris, France

OECD (2003) Financing Strategies for Water and Environmental Infrastructure, OECD Paris, France

OECD (2003) Aid activities in the water sector 1997-2002, OECD Paris, France

OECD (2003) Improving Water Management: Recent OECD Experience, OECD, Paris, France

OECD (2003) Social Issues in the Provision and Pricing of Water Services OECD, Paris, France

OECD (2006) Cost-Benefit Analysis and the Environment OECD, Paris, France

OECD (2006) Water: the Experience in OECD Countries OECD, Paris, France

Ofwat (2006) International comparison of water & sewerage service, 2006 Report, Ofwat, Birmingham, UK

Palmer K, Cockburn M, Storer D & Hulls D (2003) Funding Johannesburg – Beyond the Rhetoric, Delivering the Water and Sanitation Targets Cambridge Economic Policy Associates, Cambridge, UK

Pieris, M E (1994). Water treatment for high incomes, in 'Affordable Water Supply & Sanitation', 20th WEDC Conference, Colombo, Sri Lanka, 1994. WEDC, Loughborough University, UK

PricewaterhouseCoopers (2001) Water: a World Financial Issue – A Major Challenge for Sustainable Development in the 21st Century. Sustainable Development Series. Paris, PricewaterhouseCoopers

Prüss-Üstün A, Bos R, Gore F, Bartram J. (2008) Safer water, better health: costs, benefits and sustainability of interventions to protect and promote health. World Health Organization, Geneva

Prynn P. & Sunman H, (2000) 'Getting the water to where it is needed and getting the tariff right' (Financial Times Energy, Conference, Dublin, November 2000)

Rijsberman, F (2004) The Water Challenge. Copenhagen Consensus Challenge Paper. Copenhagen Consensus project of the Environmental Assessment Institute, Copenhagen, Denmark

Rogers P., Bhatia R, & Huber A. (1998) TEC Background Paper No 2: Water as a Social and Economic Good: how to Put the Principle into Practice. Global Water Partnership, Stockholm

Rogers P. & Hall A. (2003) TEC Background Paper No 7: Effective Water Governance. Global Water Partnership, Stockholm

Schwartz, K (2006) Managing Public Water Utilities An assessment of bureaucratic and New Public Management models in the water supply and sanitation sectors in low- and middle-income countries. UNESCO-IHE, Delft, the Netherlands

SIWI (2005) Making Water a Part of Economic Development: The Economic Benefits of Improved Water Management and Services, SIWI, Stockholm, Sweden

Stockholm International Water Institute (2005). Can International Water Targets be Met without Fighting Corruption? Stockholm World Water Week Seminar, 21 August, 2005. Background for Case Presenters

Tearfund (2001) Running on Empty: A call for action to combat the crisis of global water shortages. Tearfund, Teddington, UK

Tearfund & WaterAid (2002) The Human Waste: A call for action to combat the millions of deaths caused by poor sanitation. Tearfund, Teddington, UK

Terry G. & Calaguas B (2003) Financing the Millennium Development Goals for domestic water supply and sanitation. WaterAid, London, UK

Toubkiss J (2006) Costing MDG Target 10 on Water Supply and Sanitation: Comparative Analysis, Obstacles and Recommendations World Water Council (2006)

Trémolet S. & Hunt C (2006) Taking Account of the Poor in Water Sector Reguation, Water Supply & Sanitation Working Notes, Note No. 11, August 2006 The World Bank, Washington, DC, USA

Triche T, Requena S & Karuiki M (2006) Engaging local private operators in water supply & sanitation services. Water Supply & Sanitation Working Notes, No 12, December 2006, World Bank, Washington DC, USA

Tynan N. & Kingdom B. (2003) A Water Scorecard: Setting Performance Targets for Water Utilities. Public policy for the private sector Note 242, World Bank (April 2002): 2

Van den Berg, C, Pattanayak, S Yang, J-C & Gunatilake H (2006) Getting the Assumptions Right: Private Sector Participation Transaction Design and the Poor in Southwest Sri Lanka. Water Supply and Sanitation Sector Board Discussion Paper Series, Paper No.7, World Bank, Washington DC, USA

Van Dijk M P (2003) Liberalisation of Drinking Water in Europe and Developing Countries, UNESCO-IHE Institute for Water Education, Delft, The Netherlands

Van Hofwegen P (2006) Task Force on Financing Water For All: Enhancing access to finance for local governments Financing water for agriculture, Chaired by Angel Gurria, World Water Council (2006)

Vives, A, Paris A M Benavides J, Raymond, P D Quiroga D & Marcus J (2006) Financial Structuring of Infrastructure Projects in Public-Private Partnerships: An Application to Water Projects, IADB, Washington, USA

WaterAid & Tearfund (2003) New Rules, New Roles: Does PSP benefit the poor? Tearfund, Teddington, UK

WaterAid (2006) Bridging the gap: Citizens' Action for accountability in water and sanitation, WaterAid, London

WaterAid (2008) Think local, act local: Effective financing of local governments to provide water and sanitation services, WaterAid, London

WaterAid (2008) Beyond Construction: Use by all, WaterAid, London

WaterAid (2004) The education drain, WaterAid, London

WMO (1992), International Conference on Water and the Environment: Development Issues for the 21st Century: The Dublin Statement and Report of the Conference, World Meteorological Organization, Geneva

Winpenny J. (2003) 'Financing water for all. Report of the World Panel Financing Water Infrastructure, Chaired by Michael Camdessus' Global Water Partnership / World Water Council / 3rd World Water Forum

World Bank (2005) Water Supply and Sanitation Lending: Volume Rises, Quality Remains High Water Supply and Sanitation Feature Story The World Bank, Washington, DC, USA

World Business Council for Sustainable Development (2006) Business in the world of water: WBCSD Water Scenarios to 2025

Zabel T (2002) Pricing Mechanisms in the Water Sector in Selected OECD Countries, in Promoting Environmentally Sustainable Development in Asia, OECD Emerging Asian Economies Programme, OECD Paris

History of water provision issues

Allan, J.A. (2001) The Middle East Water Question: Hydropolitics and the Global Economy. I B Taurus, London

Barty-King, H (1992). Water, The Book. WSA, London

Cosgrove W.J. (2003) Water Security and Peace: A Synthesis of Studies Prepared under the PCCP-Water for Peace Process, UNESCO IHP PCCP Series No 29, Montreal, Canada

De Villiers M (1999). Water Wars. Weidenfeld & Nicholson, London

Hassan F.F., et al (2001) History and Future of Shared Water Resources, UNESCO IHP PCCP Series No 6, Montreal, Canada

Jacobson, Charles D., and Joel A. Tarr. 1996. "No Single Path: Ownership and Financing of Infrastructure in the 19th and 20th Centuries." In Ashoka Mody, ed., *Infrastructure Delivery: Private Initiative and the Public Good.* Washington D.C. World Bank

Tynan, Nicola. 2002. "London's Private Water Supply, 1582-1902." In Paul Seidenstat, David Haarmeyer, and Simon Hakim, eds., *Reinventing Water and Wastewater Systems: Global Lessons for Improving Management.* New York: John Wiley and Sons, Inc

Private sector participation and water

Bakker K (2003) An Uncooperative Commodity: Privatizing Water in England and Wales, OUP, Oxford, UK

Balen M (2006) Water for Life: The case for private investment and management in developing country water systems. Globalisation Institute, London UK

Banco Interamericano de Desarrollo (2007) Salida de operadores privados internacionales de agua en América Latina, IADB, Washington DC

Berg C. van den (2000) Water Concessions: Who Wins, Who Loses, and What To Do About It, Public Policy for the Private Sector Note 217, World Bank, Washington DC, USA

Bitran G.A. & Valenzuela, E.P. (2003) 'Public Services in Chile: Comparing Private and Public Performance'. Public Policy for the Private Sector Note 255, World Bank, Washington DC, USA

Budds, J. & McGranahan, G. (2003) Privatization and the provision of urban water and sanitation in Africa, Asia and Latin America. Human Settlements Discussion Paper Series. Theme: Water-1. IIED, London

Castro J P (2006) Water Services in Latin America: Public or Private? (Discussion of Four Case Studies). MSc Thesis, Erasmus University, Rotterdam

Chenoweth J & Bird J ed. (2005) The business of water and sustainable development, Greenleaf, Sheffield, UK

Cowen P.B. & Tynan N. (1999) 'Reaching the Urban Poor with Private Infrastructure' Public Policy for the Private Sector Note 188, World Bank, Washington DC, USA

Dalton G. (2001) 'Private sector finance for water sector infrastructure: what does Cochabamba tell us about using this instrument?' Water Issues Study Group, School of Oriental and African Studies (SOAS), University of London (Occasional Paper No 37, 2001)

Elhadj, E (2001a) Islamic Finance to Aid Water Utilities, Occasional Paper No. 36, SOAS Water Issues Study Group, University Of London

Elhadj, E (2001b) Financing Major Water Projects in the Poorest Economies, Occasional Paper No. 36, SOAS Water Issues Study Group, University Of London

Europe Economics (2003) Scope for Efficiency Improvement in the Water and Sewerage Industries. Europe Economics, London

Fellows W. et al (2003) Reforming the Nigerian Water and Sanitation Sector. 29th WEDC International Conference Abuja, Nigeria, 2003. WEDC, Loughborough, UK

Finger, M. & Allouche J. (2001) Water Privatisation, Spon Press, UK

Franceys, R (1997). Private Sector Participation in Water and Sanitation Services. Water Resources Occasional Paper No. 3, WEDC, Loughborough University, UK

Galiani S., Gertler P. & Schargrodsky E. (2002) Water for Life: The Impact of the Privatisation of Water Services on Child Mortality, Stanford Institute for Economic Policy Research, Stanford University, USA

Ginneken, M. van, Tyler, R. & Tagg, D. (2004) Can the Principles of Franchising be used to Improve Water Supply and Sanitation Services? – A Preliminary Analysis. World Bank Water Supply and Sanitation Sector Board Discussion Paper Series, No 2

Gomez-Lobo A., Foster V. & Halpern, J. (2000) Infrastructure Reform, Better Subsidies, and the Information Deficit, Public policy for the private sector Note 212, World Bank (June 2000)

Green J (ed) (2001) Community participation in urban water services. Tearfund, Teddington, UK

Guash, J.L., Laffont, J-J. & Straub. S. (2003) Regulation of Concession Contracts in Latin America, World Bank Discussion Paper, Washington DC, USA

Guasch J L, Laffont, J J & Straub S (2005) Infrastructure Concessions in Latin America: Government-led Renegotiations World Bank Policy Research Working Paper 3749, October 2005 The World Bank, Washington, DC, USA

GWP (2000) TEC Background Paper No 4: Integrated Water Resources Management. Global Water Partnership, Stockholm

GWP (2003) TEC Background Paper No 8: Poverty Reduction and IWRM. Global Water Partnership, Stockholm

Haarmeyer, D. & Mody, A. (1998) Worldwide Water Privatisation, Financial Times Energy, London

Harris, C., Hodges, J., Schur M. & Shukla P. (2003) 'Infrastructure Projects: A Review of Canceled Private Projects' Public policy for the private sector Note 252, World Bank (January 2003)

Harris, C., Hodges, J., Schur M. & Shukla P. (2003) 'Infrastructure Projects: A Review of Canceled Private Projects' Public policy for the private sector Note 252, World Bank (January 2003)

IADB (2006) Financial Structuring of Infrastructure Projects in Public-Private Partnerships: An Application to Water Projects, IADB, Washington DC

Johnstone, N. & Wood, J. (2001). Private Firms and Public Water, IEED, London, UK

Johnstone, Nick and Libby Wood (2000), 'Private Sector Participation in Water and Sanitation: Realising Social and Environmental Objectives in Developing Countries', Edward Elgar (forthcoming)

Kessides, I. N. (2004) Reforming Infrastructure: Privatization, Regulation and Competition, World Bank, Washington DC, USA / Oxford University Press, UK

Komives K. & Prokopy L. S. (2000) Cost Recovery in Partnership: Results, Attitudes, Lessons and Strategies. Business Partners for Development, London, UK

Lauber, W (2006) Privatisierung des Wassersektors in Europa: Reformbedarf oder Kapitalinteressen? Österreichischer Städtebund, Vienna, Austria

Lee, S (2007), Water and Development in China, Studies on Contemporary China Vol. 6, World Scientific, Singapore

Lovei, M & Gentry, B S (2002). Implications of Privatization: Lessons for Developing Countries. World Bank Discussion Paper 426, The World Bank Washington, D.C. USA

Mohajeri. S et al (2003) Aqualibrium: European Water Management between Regulation and Competition. EU, DG I, Brussels, Belgium

Moore P. & Urquhart P. (2004) Global Water Scoping Process

OECD (2000) Global trends in urban water supply and waste water finance and management: changing roles for the public and private sectors, OECD, Paris

Ononski K (2006) The Water Revolution: Practical Solutions to Water Scarcity, International Policy Press, London

Plummer, J. (2002) Focussing Partnerships: A Sourcebook for Municipal Capacity Building in Public-Private Partnerships, Earthscan, London, UK

PPIAF (2002) Private Infrastructure: A Review of Projects with Private Participation, 1990-2000. Public Policy for the Private Sector Note 246, World Bank, Washington DC, USA

Rees J. A. (1998) TEC Background Paper No 1: Regulation and Private participation in the Water and Sanitation. Global Water Partnership, Stockholm

Rees J. A. (2002) TEC Background Paper No 6: Risk and Integrated Water Resources Management. Global Water Partnership, Stockholm

Riskong K, Hammond M E & Locussol (2007) Using management and lease-affermarge contracts for water supply: How effective are they in improving water supply? Gridlines 12, The World Bank, Washington DC

Rivera, D. (1996) 'Private Sector Participation in Water Supply and Sanitation: Lessons from Six Developing Countries', World Bank, Directions in Development, Washington DC, USA

Sohail M. ed. (2002) 'Public Private Partnerships and the Poor' 8 papers, WEDC, Loughborough, UK

Solo, T. M. (2003) Independent Water Entrepreneurs in Latin America: The other private sector in water services. World Bank, Biblos, Lima, Peru

Tremolet, S. (2003) Rural Water Service: Is a Private National Operator a Viable Business Model? Public Policy for the Private Sector Note 249, World Bank, Washington DC, USA

Tynan N. (2000) 'Private sector participation in infrastructure and the poor: Water and sanitation' Infrastructure for Development: Private Solutions and the Poor, London, UK

Tynan N. & Kingdom B. (2003) A Water Scorecard: Setting Performance Targets for Water Utilities. Public policy for the private sector Note 242, World Bank (April 2002): 2

World Bank (2002) Water Supply and Sanitation in PRSP Initiatives: A Desk Review of Emerging Experience in Sub-Saharan Africa (SSA). World Bank, Washington DC, USA

World Bank (2004) East Asia & Pacific Private Investors in Infrastructure: Perception Survey. World Bank, Washington DC, USA

World Bank (2006) Approaches to Private Participation in Water Services: A Toolkit. The World Bank, Washington, DC, USA

World Bank (2006) The challenge of reducing non-revenue water in developing countries: How the private sector can help – A look at performance-based service contracting. The World Bank, Washington, DC, USA

WBSCD (2005) Collaborative actions for sustainable water management. The role business can play as an active stakeholder in collaborative processes for water management. World Business Council for Sustainable Development, Geneva, Switzerland

WBSCD (2006) Business in the world of water: WBCSD Water Scenarios to 2025. World Business Council for Sustainable Development, Geneva, Switzerland

WWC (2004) Proceedings of the Workshop on Water & Politics: Understanding the Role of Politics in Water Management, Marseille, February 26-27, 2004

Water resources

Alghariani, S. A. (2003) Water Transfer versus Desalination in North Africa: Sustainability and Cost Comparison. Occasional Paper No. 49, SOAS Water Issues Study Group, University Of London

Allan, J.A. (2003) Virtual Water - The Water, Food, and Trade Nexus Useful Concept or Misleading Metaphor? IWRA, Water International, Volume 28, Number 1

Bates, B.C., Z.W. Kundzewicz, S. Wu and J.P. Palutikof, Eds., (2008) Climate Change and Water. Technical Paper of the Intergovernmental Panel on Climate Change, IPCC Secretariat, Geneva

Fisher FM & Huber-Lee A (2005) Liquid Asseys: An economic approach for water management and conflict resolution in the Middle East and beyond. Resources for the Future, Washington DC, USA

Gleick, P. H. (2000) The changing water paradigm: A look at twenty-first century water resources development. Water International, Vol. 25, No. 1, pp. 127-138.

JHU (1998) Solutions for a Water-Short World, Population Information Program, John Hopkins University, USA

Merrett, S. (2003a) Virtual Water and the Kyoto Consensus: A Water Forum Contribution. International Water Resources Association, Water International, Volume 28, Number 4, Pages 540–542

Merrett, S. (2003b) 'Virtual Water' and Occam's Razor. Occasional Paper No. 62, SOAS Water Issues Study Group, University Of London

Serageldin, I (1994). Water Supply, Sanitation and Environmental Sustainability: The Financing Challenge. IBRD/World Bank, USA

Corporate approaches towards water provision

This is, to the author's best knowledge, a comprehensive listing of English-language stand-alone corporate publications addressing the need for the private sector to play a role in extending water and sanitation services.

Aquafed (2007a) Practitioners' Views on the Right to Water, Aquafed, Brussels, Belgium

Aquafed (2007b) 2005-2008 Progress on CSD13 decisions on water and sanitation – Perception of Private Water Operators. Aquafed, Brussels, Belgium

Lyonnaise des Eaux (1998) Alternative Solutions for Water Supply and Sanitation in Sectors with Limited Financial Resources, Lyonnaise des Eaux, Paris

Suez (2002) Bridging the Water Divide, Suez Ondeo, Paris

Suez (2006) Water for All, Suez Environnement, Paris

Suez (2007) Human Rights and Access to Drinking Water and Sanitation. Contribution to OHCHR Consultation, Suez, Paris

Thames Water (2002) 'Planet Water' 1st edition, Thames Water Plc, Reading UK

Thames Water (2003) 'Planet Water' 2nd edition, Thames Water Plc, Reading UK

Veolia (2007) The right to water: from concept to effective implementation, Veolia Environnement, Paris

WEF (2008) World Economic Forum Water Initiative Realizing the Potential of Public-Private Partnership Projects in Water, Davos, Switzerland

Critiques of PSP and water

This is a selection of the more influential books, publications and papers either highlighting areas which the private sector needs to address or by the outright opposition of the use of private sector finance and management. With one illustrative exception, publications which include exclamation marks in their titles have been omitted.

Recent research initiatives looking at European water provision from a historic perspective (WaterTime, sponsored by the European Union) and Latin America and Africa (Prinwass – Barriers to and conditions for the involvement of private capital and enterprise in water supply and sanitation in Latin America and Africa: Seeking economic, social, and environmental sustainability) highlight an informed critical engagement with PSP by the academic community in general.

Barlow M. & Clarke T. (2002). Blue Gold: The Fight to Stop the Corporate Theft of the World's Water. The New Press, NY, USA

Barlow M (2007) Blue Covenant**:** The Fight for Water as a Human Right. Toronto, McClelland & Stewart

Brennan B., et al (2004) Reclaiming Public Water! Participatory alternatives to privatization, TNI Briefing Series 2004/7, TNI, Amsterdam, The Netherlands

Consumers International (2004) Water Works: A consumer advocacy guide to water & sanitation, CI, London

Food & Water Watch (2006) Faulty Pipes: Why Public Funding – Not Privatization – is the Answer for U.S. Water Systems. Food & Water Watch, Washington DC, USA

Foxwood, N. and Green, J. (2004) Making every drop count: an assessment of donor progress towards the water and sanitation target. Teddington, UK, Tearfund

Gleick P. H. et al. (2002) The New Economy of Water: The Risks and Benefits of Globalization and Privatization of Fresh Water. Pacific Institute, Oakland, California

Hall, D. (1999) Privatization, Multinationals and Corruption, Development in Practice 9 (5)

Hall, D. (2004) Water Finance – A Discussion Note. PSIRU, University of Greenwich, UK

Hall, D., Lobina, E. & de la Motte, R. (2003) Public solutions for private problems? Responding to the shortfall in water infrastructure investment, PSIRU, University of Greenwich, UK

Hall, D. & Lobina, E. (2006) Pipe dreams: The failure of the private sector to invest in water services in developing countries. World Development Movement / PSIRU, London, UK

Hall, D. & Lobina, E. (2007) Water as a public service. PSIRU, Business School, University of Greenwich

Hall, D., & de la Motte, R. (2004) Dogmatic Development: Privatisation and conditionalities in six countries. PSIRU / War on Want, PSIRU, University of Greenwich, UK

Hukka, J.J. and Katko, T.S. (2003) Water privatisation revisited: panacea or pancake? (Occasional paper series; no. 33-E) Delft, The Netherlands: IRC International Water and Sanitation Centre

Lobina, E. (2003) Problems with private water concessions: a review of experience. PSIRU, University of Greenwich, UK

Lobina, E. & Hall, D. (2003) Water privatisation and restructuring in Latin America, 2007. PSIRU, Business School, University of Greenwich

Hasan, S. (2001) The Privatisation Process of Water and Sewerage Services in an Asian Metropolis: Global Politics, Organisations and Local Poor; a Case Study of Karachi Occasional Paper No. 34, SOAS Water Issues Study Group, University Of London

Oxfam (2006) In the Public Interest: Health, Education, Water and Sanitation for all. Oxfam / Wateraid, Oxford, UK

Wagner J. M. et al. (2003) Human Rights and the Environment. Earthjustice, Oakland, California

WaterAid Tanzania (2002) Water utility reform and private sector participation in Dar es Salaam, WaterAid and Tearfund, London