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Edition**

# Pinsent Masons Water Yearbook

**2007 - 2008**

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

*"A 'must read' for all those associated with the water industry..."*

*"An unparalleled reference work..."*



Pinsent Masons

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**Pinsent Masons**

**30 Aylesbury Street**

**London EC1R 0ER**

**Telephone: 020 7490 4000**

**Facsimile: 020 7490 2545**

**e-mail: enquiries@pinsentmasons.com**

**website: www.pinsentmasons.com**

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## PREFACE

The commercial temper of any industrial sector is inevitably determined by a tangle of interlocking, complementary and counter-intuitive factors, including cultural and social, which can be as intractable, or as formative, as economic and political developments in determining market trends. To these can now be added growing concerns about climate change.

Neatly demonstrating these interactions is the example of private sector participation (PSP) which, only a few years ago, was confidently forecast as the great white hope of, inter alia, the UK water and wastewater industry in the international marketplace. While it has not exactly gone down like a lead balloon, neither has its universal adoption been the galloping success of soothsayers' fantasies. Although the enormous investment shortfalls endemic in publicly-funded water infrastructure provision the world over make it the *ultimate* solution, it has, nevertheless, been massively impeded by this multiplicity of linkages, notably in central and eastern Europe, where lack of public confidence in private sector involvement in the supply of public services has combined with extreme political caution severely to circumscribe its uptake.

Elsewhere, the market for PSP currently remains a bit like the curate's egg – some parts good, some parts bad, with most of the promising prospects now centring on the Middle East, China and Latin America.

Corporate developments, too, particularly those involving the big beasts of the sector, play a significant part in shaping market sentiment. For the UK, recent moves have further curtailed the country's international PSP capability. With Thames Water divesting itself of its non-core activities and abandoning the international marketplace, and Yorkshire Water re-focussing, the UK list of international league players is shrinking. United Utilities is thus left as the UK PSP champion in world markets. The current players appear to be the French "Big Three" (Veolia, Suez-Lyonnaise and SAUR), plus Earth Tech, with a growing number of smaller, locally-based players. The planned spin-off of Suez Environmental out of the pending Suez/Gaz de France merger, prospectively leaves Suez Environmental as a much more powerful player, a formidable competitor for all and any presumptive (or presumptuous?) market entrants. How this plays out in the future is anybody's guess, but the UK potential in this strategic niche will be distinctly thin if not addressed.

### The UK market

Since privatisation, the middle years of the UK industry's asset management programmes (AMPs) have historically proved the most productive and the current five-year cycle is no exception. Contractors, consultants, manufacturers and suppliers are all working at or near capacity and the water companies themselves, together with the economic and environmental regulators, are already looking forward to the next Periodic Review of Prices. The now-familiar pattern of activity repeats itself and all appears normal – *business as usual* - one might say.

The market, then, has been characterised by a creeping (intentionally so?) start to the AMP4 programmes, with water companies collectively underspending on their Year 1 commitments by about GBP1billion, causing the Regulator to question their ability to make good the shortfall. Even Year 2 was not materially better and it is only as we approach the middle of the regulatory cycle that volumes of work reaching the supply chain appear to be hitting expected levels.

PR09, moreover, looms with a rising hope that the next determination will be set against 25-year plans from the water companies, which could mean that the spend on ongoing items like capital maintenance can be set against much longer-term goals, as opposed to the unrealistic five-year timetable of hitherto. There are even signs that the partnership framework agreements that have characterised the last three AMPs are being tested by competitive bidding in an effort to drive process lower.

Against this background, a slow realisation is developing that, beneath the surface of collective industry consciousness, lurks a threat to its previous exemplary record of delivering efficiency and, more importantly, its own functionality. Reasons for climate change, for example, may be the subject of debate in some circles but, whether due to natural causes or human agency, the extreme weather conditions of recent years have left little doubt about their potential impact on every aspect of water utility services, threatening the utilities' twin prime functions - to safeguard both public health and the environment-major challenges for the future.

Whether this pattern continues, lessens or worsens, animates the public discourse on the subject, but only time will tell. If, however, as the balance of prevailing scientific opinion suggests, the trend *does* continue, its effects will challenge the imagination and ingenuity of the entire supply chain for the foreseeable future - with the potential, perhaps, to change the face of the industry forever.

### International perspectives

Globalisation and climate change are triggering a process of convergence and consolidation of experience and theory across the world—overlying the existing market linkages above-as we grapple with the long-term sustainability of water resources, particularly for those in the water-stressed regions of the world.

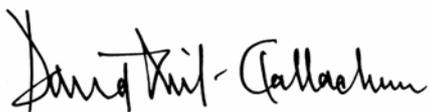
Water recycling, re-use, rainwater harvesting and increasing use of desalination are just some of the issues engaging international water strategy development. Governments, corporations, academics and non-governmental organisations are recognising the need for collaboration in depth, sharing technical and operational expertise to ensure access to potable water and sanitation services which matches the pace of urbanisation.

Once again, the private sector can offer not only the most effective and responsive project management skills necessary, but also the capital funding that is beyond the reach of the majority of those countries with the most pressing need. The UK industry continues to play a leading role in this process, with the experience of nearly 200 years of water management and infrastructure development behind its contribution.

India, for example, like China and many other countries in Asia, Africa and Latin America, is undergoing a dramatic increase in urban population, fed by swelling demographic trends and migration from rural areas in pursuit of opportunity and social progress in the industrialising urban centres. Surging demand for infrastructure services is driving the requirement for massive investment that outstrips the capacity of the public purse everywhere. Need, moreover, begets need and rapidly depleting groundwater resources force water suppliers increasingly to resort to their surface water resources, jeopardising long-term security of supply. These are not only important considerations in India, but affect many other countries, too, so the need to share expertise to resolve these issues is becoming more urgent by the day. One size does *not* fit all: diversity of need dominates the political and economic landscape in achieving a multiplicity of solutions.

One solution might lie in technological innovation, although there is currently less investment by UK water companies in innovation than in the aftermath of privatisation, perhaps leaving us ill-equipped to take advantage of such openings. On the other hand, maybe the water companies know something the others don't, as recent research suggests that, while innovation *can* lead to improved performance by companies and service providers, the link is not an automatic one and doesn't necessarily demand above-average levels of investment.

*Pinsent Mason's Water Yearbook* once again tells the story of the world water markets other industry reference works cannot do with the same authority and panache. It remains a remarkable joint enterprise between Pinsent Masons, the major international law firm which boasts, almost uniquely amongst law firms, a dedicated Water-Sector Group, and Dr David Lloyd Owen of Envisager, the specialist consultancy in environmental services for the water, wastewater and renewable energy sectors. As always, it is an incomparable market reference; they are again to be congratulated on its comprehensive analysis and insights.



David Neil-Gallacher  
Chief Executive of British Water  
October 2007

**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 a non-executive director of EnviroGene Limited, a member of the Pictet Funds Water Fund's advisory board and 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 is a full service law firm with around 260 partners, a total legal team of around 900 and more than 1500 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 outsourcing 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.

Examples of recent projects include the following:

- advising a bidder on its bid for the Riyadh 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 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 bid for the USD2.3billion Marafiq desalination project at Jubail, Saudi Arabia;
- 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.

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:

<b>Pinsent Masons</b>	
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

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## INTRODUCTION

This is the 9<sup>th</sup> edition of the Pinsent Masons Water Yearbook and, thanks to the onward march of new companies 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 start 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 South East Asia and Latin America.

### Company changes

16 companies are either held by what are essentially 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. After the sale of SmVaK of the Czech Republic to a listed company (FCC of Spain) in 2006, activity within the private equity sector has been on the rise, with SAUR, Southern Water, Mid Kent, South East Water and three Chilean companies being sold on to other private equity investors. For some, stability is the key, as Macquarrie has pointed out; it currently intends to hold onto Thames Water 'for decades'.

Ten new company entries have been made in this edition; two in Australia, one each in Kuwait and the Philippines and the remaining six in Western Europe. For Kuwait and the Philippines, there were new (local) owners for local companies and Australia's interest reflects their interest in private equity. The most significant of the new entries in Europe is Remondis of Germany, a privately held waste management company, with a growing involvement in wastewater treatment and sewerage systems, especially in Turkey. Four companies have left, two in Italy, one in Spain and one in the Philippines. In reality, only Ferrovial has really gone (by divesting its water interests) as the others are the results of M&A and stake re-sales, so are matched by new entries in Italy and the Philippines.

Last year, Brazil's COPASA was the largest municipal IPO seen since the Yearbook started. Some time in the next few weeks, it will be more than matched by the re-introduction of American Water Works to the New York Stock Exchange as RWE takes its divestment programme on step further. It also looks quite likely that Suez Environment will be spun off from Suez after the Suez-Gaz de France merger has gone through. If so, it is a case of welcome back La Lyonnaise!

### Companies covered

	1999	2000	2001	2002	2003	2004	2005	2006	2007
Number of countries	13	15	16	15	18	22	28	27	28
Number of companies	70	81	82	84	102	117	128	142	146
- OECD countries	59	69	70	68	73	72	77	74	77
- Advanced developing	2	2	2	2	6	13	13	18	19
- Developing	9	10	10	14	23	32	38	50	50

### 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, with 707 million people served. The increase reflects hitherto overlooked contracts being found as well as new contracts gained as various databases have been brought into play.

Our revised forecast for the extent of PSP in 2015 is 1,148million, an upwards adjustment of 3million on the forecast made in 2006. That in turn was an increase of 60million from the projection of 1,085million people made in 2005. That forecast had represented a fall of 40million from the 1,025million forecast made in 2004 (16% of the global population) on top of a 2004 decrease of 35million from the 2003 forecast of 1,160million people (17% of the 2015 population). Thus the overall forecast is maintained at of 16% the population by 2015.

### 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 42% by the end of 2007. Perhaps it is time to reshuffle the pack a little, as FCC continues to grow, along with the larger national players.

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. Last year it was Veolia's numbers that were restated and this year, Suez sees its population served in France fall from 17.0million to 12.3million. Restating numbers aside, Suez and Veolia have enjoyed an impressive year, wrapping up their rationalisations and moving onwards, especially in India, the Middle East and China.

Along with identifying many new players (especially using World Bank data and comparing it with our extant databases) some studies by the World Bank have highlighted both the emergence and the extent of formal small players (those providing new investment and services) and informal operators, such as water vendors. The latter exist because there is nothing being provided by the incumbent utilities. The great challenge is to integrate them within the formal services to boost the level of people with adequate water and sanitation services at affordable prices.

### **Still a contentious sector to operate in**

Since 1997, contracts involving 67.5million people have ended. Even taking into account the 4.7million where the contracts expired at the end of their allotted span, this is 11% of all identified contracts and represents a high attrition rate. According to the World Bank, 31% of contracts (in terms of total investment) were either cancelled or in distress in 2006, compared with 4-11% for telecoms, electricity and transport, but this represents an improvement from 37% in 2005.

Water will never be a simple sector to operate in and communicating its complexities remains an urgent priority. We noted the various initiatives taken in 2004-05 a couple of editions ago and hoped that the private sector would engage in some serious research on the subject. It is worrying to note that hardly any tangible progress has been made since then.

### **America opens up, a little bit**

Han's Technologies, a small contract player specialising in town level projects in China has joined Tyco's Earth Tech in flying the American flag. More encouragingly, GE is stepping up its international water activities and the contract awards in Algeria are unlikely to be isolated instances. America's withdrawal from the global services market was perplexing and given its access to finance and technology, not in the least bit welcome.

### **Multi utilities have less virility**

United Utilities in the UK has decided to move away from the asset owning side of power and Suez is seeking to split Suez Environnement from its enlarged power activities post the Gaz de France merger. Amongst the major players, the multi utility strategy for the time being is becoming very much the exception 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.

### **Country changes**

It is likely that we will not be hearing much more good news with regards to any aspect of the water cycle in Iraq. The partial restoration of the southern marshlands aside, evidence exists that services are on the decline and that the promised investment has failed to materialise. The prospects of Iraq being included in the next cycle are poor. Balkan politics meanwhile continues to create new markets with the fragmentation of the former Yugoslavia and contracts have been noted both in Kosovo and Montenegro, while prospects for a major contract serving Belgrade in Serbia evolves at a stately pace.

### **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 particularly productive in gaining an insight into lesser known players in Asia and Latin America. 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 and the author looks forward to returning to the markets in Asia and the Americas next year.

**Dr David Lloyd Owen**  
**October 2007**

## 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 Europe, the Middle East and Africa. 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 along with suggestions for further reading.

### 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. Greater shortages indicate that remedial action will be needed in the medium term.

Two tables containing information about companies and contracts in each country are designed to provide access to company entries where different names are used for the same company or company circumstances have changed or are about to change.

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 about these 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 2007-08**

**THE WORLD OF WATER 2007-08****CORPORATE CHANGES, 2006-2007**

16 companies are either currently or set to be 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. After the sale of SmVaK of the Czech Republic to a listed company (FCC of Spain) in 2006, activity within the private equity sector has been on the rise, with SAUR, Southern Water, Mid Kent, South East Water and three Chilean companies being sold on to other private equity investors. For some, stability is the key, as Macquarie has pointed out; it currently intends to hold onto Thames Water 'for decades'.

10 new company entries have been made in this edition; two in Australia, one each in Kuwait and the Philippines and the remaining six in Western Europe. For Kuwait and the Philippines, there were new (local) owners for local companies and Australia's interest reflects their interest in private equity. The most significant of the new entries in Europe is Remondis of Germany, a privately held waste management company, with a growing involvement in wastewater treatment and sewerage systems, especially in Turkey.

Last year, Brazil's COPASA was the largest municipal IPO seen since the Yearbook started. Some time in the next few weeks, it will be more than matched by the re-introduction of American Water Works to the New York Stock Exchange as RWE takes its divestment programme on step further. It also looks quite likely that Suez Environment will be spun off from Suez after the Suez – Gas de France merger has gone through. If so, it is a case of welcome back La Lyonnaise!

Four companies have left, two in Italy, one in Spain and one in the Philippines. In reality, only Ferrovial has really gone (by divesting its water interests) as the others are the results of M&A and stake re-sales, so are matched by new entries in Italy and the Philippines.

Finally, it is already clear that plenty is happening behind the scenes and that corporate make up of the sector will change appreciably over the course of the next year. The most fascinating speculations will revolve round Suez, where in the wake of the incipient Suez – Gaz de France merger, La Lyonnaise is set to re-emerge on its own once again.

**Financial sector parent companies****Operating Company**

Utilities Inc (USA)  
South Staffs Water (UK)  
ESSCO (Chile)  
ESVAL (Chile)  
East Surrey Water (UK)  
Aquarion (USA)  
Thames Water (UK)  
AWG (UK)  
SAUR (France)  
Southern Water (UK)  
ESSEL (Chile)  
ESSBIO (Chile)  
ANSM (Chile)  
Portsmouth Water (UK)  
Mid Kent Water (UK)  
South East Water (UK)

**Private Equity / Bank [1]**

AIG (USA)  
Arcapita Group (Bahrain)  
Consorcio Financiero (Chile)  
Ontario Teachers Pension Plan (Canada)  
Deutsche Bank (Germany)  
Macquarie (Australia)  
Macquarie (Australia)  
Osprey Acquisitions (Canada)  
CDC, Axa & Seche (France)  
JP Morgan (USA)  
Southern Cross (Chile)  
Ontario Teachers Pension Plan (Canada)  
Ontario Teachers Pension Plan (Canada)  
South Downs (UK)  
Westpac (Australia)  
Westpac (Australia)

**Water subsidiaries****Operating Company**

American Water Works (USA)  
Bristol Water (UK)  
Cambridge Water (UK)  
Casca (UK)  
Earth Tech (USA)  
EMC (USA)  
Ondeo / Lyonnaise des Eaux  
SmVaK (Czech Republic)  
Veolia Water / Generale des Eaux  
Wessex Water (UK)

**Parent Company(s)**

RWE (pending relisting)  
Aqualia / FCC (Spain)  
Cheung Kong Holdings (China)  
Bewater (UK)  
Tyco International (USA)  
BOC (UK) / Linde (Germany)  
Suez (France)  
Aguas de Barcelona (Spain)  
Veolia Environnement (France)  
YTL Holdings (Malaysia)

**Major Changes since 2006****New Entries**

Acque Potabili (Italy)	Partly listed Iride subsidiary
DM Consunji (Philippines)	Acquired Maynilad Water
Iride (Italy)	Merger with Amga (Italy)
Macquarie (Australia)	Thames Water (UK) & Aquarion (USA)
Mediterranea delle Acque (Italy)	Partly listed Iride subsidiary
Mota-Engil (Portugal)	Water contracts in Portugal, Spain & Brazil
Remondis (Germany)	Activities in Germany, Poland & Turkey
Sacyr (Spain)	Water contracts in Portugal
Utilities Development Co (Kuwait)	Concession in Kuwait
Westpac (Australia)	SWCs in England

**Companies Removed**

Amga (Italy)	Taken over by Iride (Italy)
Ayala (Philippines)	Maynilad Water sold
Ferrovial (Spain)	Sold its water activities
Meta Modena (Italy)	Taken over by Hera (Italy)

**Anticipated forthcoming changes**

American Water Works (USA)	IPO due by end of 2007
ASM Brescia (Italy)	Merger with AEM (Italy) by end of 2007
MWA (Thailand)	Government stake sale expected
PWA (Thailand)	Government stake sale expected
Suez (France)	Merger with Gaz de France & possible demerger

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

**NUMBER OF PEOPLE SERVED BY COUNTRY AND COMPANY****Developments during 2006-07**

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 and 2007, this continued, with the end of the corporate clear out in Argentina and Bolivia and a continued resurgence of activity in Brazil and China.

The other important change this year has been the boost to numbers for 2004 to 2007 as information has filtered through about contracts awarded then. This is especially important in China, where information tends to take some time to emerge.

PSP contracts awarded by year (million people served)

	<b>Water</b>	<b>Sewerage</b>	<b>Overall</b>	<b>Number</b>
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	2.24	3.69	6
1993	17.04	14.60	23.97	13
1994	15.67	4.85	17.04	27
1995	13.29	4.19	13.50	24
1996	30.09	22.89	37.78	36
1997	40.83	7.85	45.53	44
1998	22.47	8.98	23.45	29
1999	41.25	26.70	46.39	74
2000	44.95	20.59	51.53	74
2001	25.92	25.43	42.03	61
2002	14.19	10.73	22.38	42
2003	31.37	22.01	38.74	70
2004	38.34	23.57	56.01	115
2005	39.75	32.72	64.80	102
2006	32.49	21.96	46.08	68
2007 [2]	19.06	3.97	22.23	13
<b>Total</b>	<b>482.21</b>	<b>311.12</b>	<b>605.22</b>	<b>818</b>

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

[2] To the end of September

At the time of writing, 818 contracts had been identified, which represents a notable increase on the 548 contracts identified for the 2006-07 edition and the 459 contracts identified in the 2005-06 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. This year's work has benefited especially from an attempt at integrating World Bank contract data with the Envisager contract database.

## Frequency of contract awards

	<b>Water</b>	<b>Wastewater</b>	<b>Combined</b>	<b>Contracts</b>
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	0	4	6
1993	5	5	3	13
1994	11	6	10	27
1995	12	2	10	24
1996	14	5	17	36
1997	17	6	21	44
1998	11	5	13	29
1999	23	12	39	74
2000	28	13	33	74
2001	19	13	22	61
2002	12	9	21	42
2003	27	20	23	70
2004	47	41	27	115
2005	41	42	19	102
2006	24	33	11	68
2007	8	4	1	13
<b>Total</b>	<b>308</b>	<b>217</b>	<b>286</b>	<b>818</b>

The one significant development has been the increasing frequency of sewerage and sewage treatment contract awards since 1999. 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.

	<b>Water</b>	<b>Wastewater</b>	<b>Combined</b>
1987	50%	0%	50%
1988	100%	0%	0%
1989	23%	0%	77%
1990	N/A	N/A	N/A
1991	50%	25%	25%
1992	33%	0%	67%
1993	38%	38%	23%
1994	41%	22%	37%
1995	50%	8%	42%
1996	39%	14%	47%
1997	39%	14%	48%
1998	38%	17%	45%
1999	31%	16%	53%
2000	38%	18%	45%
2001	31%	21%	36%
2002	29%	21%	50%
2003	39%	29%	33%
2004	41%	36%	23%
2005	40%	41%	19%
2006	35%	49%	16%
2007	62%	31%	8%
<b>Total</b>	<b>38%</b>	<b>27%</b>	<b>35%</b>

## Average size of contract awards (millions of people)

	<b>Water</b>	<b>Wastewater</b>	<b>Net</b>
1987	3.50	1.50	3.50
1988	0.54	0.00	0.54
1989	3.11	5.23	3.11
1990	N/A	N/A	N/A
1991	0.25	2.14	1.14
1992	0.38	0.56	0.62
1993	2.13	1.83	1.84
1994	0.75	0.30	0.63
1995	0.60	0.35	0.56
1996	0.97	1.04	1.05
1997	1.07	0.29	1.03
1998	0.94	0.50	0.81
1999	0.67	0.52	0.63
2000	0.74	0.45	0.70
2001	0.63	0.73	0.69
2002	0.43	0.36	0.53
2003	0.63	0.51	0.55
2004	0.52	0.35	0.49
2005	0.66	0.54	0.64
2006	0.93	0.50	0.68
2007	2.12	0.79	1.71
<b>Average</b>	<b>0.81</b>	<b>0.62</b>	<b>0.74</b>

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.

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 Aires, Manila and Jakarta respectively, which with the exception of Manila Water, have not proved to have been the gentlest of experiences for their owners.

**Distribution of contract awards – by region**

Europe's figures are marked by two especial trends; the privatisation of the water and sewage companies of England & Wales in 1989 and gradual impact of the Galli Law in Italy from 1999. While contract activity has decreased materially in the Americas since 2000, it has remained at least steady in Asia due to the expansion of the market in China and the emergence of the market in India and has materially increased in Africa and the Middle East.

**Distribution of contract awards – by awardee**

<b>Water</b>	<b>1985-99</b>	<b>1990-94</b>	<b>1995-99</b>	<b>2000-04</b>	<b>2005-06</b>
Local – Developed	39.17	0.00	9.13	15.62	1.64
Local – Developing	2.60	4.73	41.43	47.39	19.14
Expatriate	0.00	0.00	0.00	3.30	0.88
Multinational	6.24	31.05	96.46	77.54	20.84
<b>Total</b>	<b>48.01</b>	<b>35.78</b>	<b>136.05</b>	<b>142.85</b>	<b>42.50</b>

<b>Wastewater</b>	<b>1985-99</b>	<b>1990-94</b>	<b>1995-99</b>	<b>2000-04</b>	<b>2005-06</b>
Local – Developed	55.03	3.80	7.65	13.34	0.95
Local – Developing	0.00	0.47	22.55	42.65	17.23
Expatriate	0.00	0.00	0.00	2.36	1.21
Multinational	1.50	19.94	47.00	34.41	14.46
<b>Total</b>	<b>56.53</b>	<b>24.21</b>	<b>57.94</b>	<b>92.76</b>	<b>34.05</b>

It appears that a shift away from contracts being awarded to multinational companies to local and expatriate companies is taking place. This shift is even more dramatic when you consider Brazil's SABESP (partly privatised in 1996, with further subsequent share issues) served 24million people. While these changes are in part due to the problems encountered by multinational companies since the mid 1990s, especially regarding political and foreign exchange risk, it also demonstrates that local capacity building is starting to have an effect.

This is not necessarily a good thing as while local or expatriate funding obviates exchange rate risk, it plays a limited role in mobilising new sources of funding needed to attain the Millennium Development Goals as expatriate funding has to date only been identified as being used in China to date.

### South East Asia and China: The People's Flag is Deepest Blue

South East Asia in general and China in particular is the most dynamic market in the world both in its absolute size and the rapidity of its development. Since 1988, contracts serving a total of 256 million people have been identified, 175 million for water services and 96 million for sewage services.

#### A shift towards more local players is taking place

We have differentiated between contracts awarded to international companies (companies seeking to operate in a number of countries, some outside their region), regional companies (contracts restricted to a particular region) and national companies (within one country). In the case of Hong Kong and China, companies based in Hong Kong gaining contracts in China are regarded as national players.

#### Contract awards in China, Taiwan, HK & Macao (million people served)

Water	International	Regional	National
To 1994	4.41	0.00	0.00
1995-99	25.54	0.00	7.34
2000-04	30.24	2.50	25.56
2005-	14.75	5.27	9.55

Sewage	International	Regional	National
To 1994	0.54	0.00	0.00
1995-99	0.15	0.00	0.00
2000-04	11.97	3.04	36.41
2005-	6.80	6.96	20.79

China is the dominant market, with some 180 million people currently served, all since 1992. There has been a shift from international to regional and national players since 2000, most markedly in the sewerage sector, where contracts have been gained by companies seeking to drive down capital costs for developing treatment plants through technological and process innovation.

#### Contract awards in the rest of SE Asia (million people served)

Water	International	Regional	National
To 1994	1.77	0.00	6.70
1995-99	20.37	0.00	2.53
2000-04	1.04	0.80	6.44
2005-	0.00	0.00	5.29

Sewage	International	Regional	National
To 1994	6.10	0.00	0.00
1995-99	1.52	0.00	0.00
2000-04	1.31	0.00	0.00
2005-	0.00	0.00	0.70

What the two tables above highlight is the sheer impact of the World Bank sponsored concessions for Jakarta and Manila in the late 1990s and the impact of the 'Asian Flu' currency crisis which followed soon afterwards. The latter effectively curbed interest in foreign currency denominated debt being serviced by local currency revenues.

As a result, international players have seen their profile fade away this decade and these figures do not include contracts which have been ended, which further highlights the changes taking place. Into this breach a new generation of regional players have emerged, especially in Singapore, where the Government and the private sector have sought to make this a priority.

**China – a global and regional driver**

<b>Contract awards in China</b>			
<b>Million people</b>	<b>Water</b>	<b>Sewage</b>	<b>Total</b>
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	14.99	0.00	14.99
1998	5.99	0.00	5.99
1999	4.65	0.15	4.65
2000	10.01	2.75	12.76
2001	5.18	13.84	19.02
2002	11.11	6.10	17.21
2003	11.58	6.27	17.85
2004	17.17	12.76	29.93
2005	17.55	23.24	40.79
2006	5.27	8.13	13.40
2007	7.00	0.67	7.67

Notes:

2006 – provisional data

2007 – contracts identified by 7<sup>th</sup> October 2007

It is difficult to overstate the impact of China as an emerging market globally, let alone within SE Asia. It is unlikely that there has been a notable fall off in contracts gains in 2006, rather it is a case of an increase in lag times in identifying such contracts as companies become smaller and more localised. Thus the Tianjin contract won by Veolia in October 2007 is included, but many local contracts gained during 2006 have yet to have been identified.

**Average contract size****Average contract size of contracts in China**

<b>Million people</b>	<b>International</b>	<b>Regional</b>	<b>National</b>
To 1994	1.29	N/A	N/A
1995-99	1.34	N/A	1.22
2000-04	0.98	0.50	0.85
2005-	1.21	0.42	0.54

While the number of people being served by the international companies has remained pretty constant over nearly two decades, there has been an appreciable shift towards smaller contracts by the more locally based players. This reflects the number of contract awards being made in smaller towns and cities which are more attractive to local players as the market moves beyond the main urban centres.

**Average contract size of contracts in the rest of SE Asia**

<b>Million people</b>	<b>International</b>	<b>Regional</b>	<b>National</b>
To 1994	1.97	N/A	2.23
1995-99	1.85	N/A	0.42
2000-04	0.34	0.40	0.81
2005-	N/A	0.10	0.76

It is less easy to discern a pattern in the rest of SE Asia, although the 2005- data is somewhat distorted by the re-awarding of the Maynilad Water concession.

**From services to treatment**

Where is the money going—on improving water distribution and sewerage or water and sewage treatment? The following two tables compare the award of contracts where distribution networks are involved (including treatment and distribution contracts) and those which are for treatment alone.

**Water and sewage contracts by service provided (million people)**

<b>Water</b>	<b>Networks</b>	<b>Treatment</b>
To 1994	9.34	3.54
1995-99	26.37	29.40
2000-04	16.40	55.09
2005-	12.47	22.74

<b>Sewage</b>	<b>Networks</b>	<b>Treatment</b>
To 1994	6.10	0.00
1995-99	1.67	0.00
2000-04	4.80	47.93
2005-	0.70	34.55

Remembering the American expression 'the closer you get to the customer, the more chance you have of screwing up' makes good sense here. Water distribution contracts certainly can succeed (Manila Water being the most visible example) when customers see the benefits of the new service. Such benefits are less swiftly discernable when it comes to sewerage. In both cases, there have been a general shift towards treatment, but the most dramatic one has been in the case of sewage.

### Ended contracts

Overall, with 10% of contracts having ended, the attrition rate is comparable with that of the rest of the world. What is of interest is to compare the rate of losses between the international and the regional players.

### Contracts ended – International players

<b>Million people</b>	<b>Water</b>	<b>Sewage</b>	<b>Combined</b>
SE Asia	6.80	6.10	12.40
China	12.90	0.00	12.90
<b>Total</b>	<b>19.70</b>	<b>6.10</b>	<b>25.30</b>

### Contracts ended – National and regional players

<b>Million people</b>	<b>Water</b>	<b>Sewage</b>	<b>Combined</b>
SE Asia	0.04	0.00	0.04
China	1.49	0.25	1.74
<b>Total</b>	<b>1.53</b>	<b>0.25</b>	<b>1.78</b>

Certain sub-texts are in play here. For example, when the Malaysian sewerage contract was announced (the 6.1million people served by sewage services above), it was very much an international venture. As funds for the project dried up, it turned out to be a little local difficulty. Then there is the impact of hard currency debt being paid for by soft currency tariffs, which led to the demise of the original Maynilad Water concession. Finally, in China, a law passed in 2002 outlawed international companies enjoying a fixed rate of return for certain concessions. This ended a number of contracts such as Thames Water's Shanghai water treatment concession, but has not applied to local companies operating in the same field.

### Where the money goes

A different perspective is provided by the World Bank's 2007 water & sanitation sector review. This covers all loans for contracts in all developing economies between 1990 and 2006. All the data in this section is adapted from this report.

### Overview of World Bank water & sewerage PSP lending, 1990 to 2006

Number of countries with private participation	58
Projects reaching financial closure	522
Region with largest investment share	East Asia (48%)
Type of PPI with largest share in investment	Concessions (71%)
Type of PPI with largest share in projects	Concessions (40%)
Projects cancelled or under distress	53 representing 31% of total investment

The distress level of 31% compares poorly with Electricity (10%), Telecoms (4%) and Transport (11%). But it was 37% in 2005, so matters are apparently improving.

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)

<b>Region</b>	<b>Projects</b>	<b>Total Investment</b>
East Asia and Pacific	23	7,724
Europe and Central Asia	2	8
Latin America & Caribbean	24	8,687
Middle East and North Africa	1	0
Sub-Saharan Africa	3	9
<b>Total</b>	<b>53</b>	<b>16,428</b>

## 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	6
1993	3	2	6	0	0	1	12
1994	4	3	10	0	0	0	17
1995	4	3	10	0	0	1	18
1996	5	4	16	1	0	1	27
1997	14	3	22	0	0	0	39
1998	13	2	17	0	0	1	33
1999	8	6	21	2	0	5	42
2000	13	10	19	0	1	1	44
2001	13	7	16	0	1	4	41
2002	19	5	17	1	0	1	43
2003	25	8	7	1	0	1	42
2004	29	6	18	0	0	0	53
2005	41	5	5	4	0	1	46
2005	34	9	1	1	0	2	47
<b>Total</b>	<b>226</b>	<b>73</b>	<b>189</b>	<b>11</b>	<b>2</b>	<b>21</b>	<b>522</b>

The number of projects invested year by year has remained fairly stable 1998, 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	16	525	0	0	0	1,362
1995	520	22	1,293	0	0	0	1,835
1996	149	950	192	0	0	20	1,312
1997	8,033	196	1,933	0	0	0	10,161
1998	943	108	1,276	0	0	0	2,327
1999	273	122	6,011	0	0	82	6,488
2000	4,064	1,397	3,003	0	0	31	8,495
2001	673	466	1,165	0	2	3	2,309
2002	915	110	604	0	0	0	1,629
2003	679	282	296	169	0	9	1,434
2004	3,122	407	1,133	0	0	0	4,661
2005	937	23	160	510	0	0	1,629
2006	1,412	292	305		0	0	2,008
<b>Total</b>	<b>25,381</b>	<b>4,389</b>	<b>22,041</b>	<b>679</b>	<b>2</b>	<b>146</b>	<b>52,638</b>

In contrast to the number of projects, actual funding mobilised through these projects has not recovered to the levels disbursed between 1993 and 2000. 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 and 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	3	12
1994	8	0	5	4	17
1995	9	1	3	5	18
1996	7	1	9	10	27
1997	16	2	9	12	39
1998	18	1	12	2	33
1999	13	8	8	13	42
2000	28	3	6	7	44
2001	12	1	13	15	41
2002	22	5	7	9	43
2003	12	1	20	9	42
2004	26	0	21	6	53
2005	18	0	29	9	56
2006	12	0	22	13	47
<b>Total</b>	<b>210</b>	<b>23</b>	<b>169</b>	<b>120</b>	<b>522</b>

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.

## 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	16	1,362
1995	1,563	20	228	25	1,835
1996	122	36	1,125	28	1,312
1997	9,164	499	333	166	10,161
1998	1,676	266	385	0	2,327
1999	1,684	4,411	347	45	6,488
2000	7,140	554	790	11	8,495
2001	1,138	56	937	178	2,309
2002	997	448	130	55	1,629
2003	804	47	555	29	1,434
2004	3,334	215	931	180	4,661
2005	698	13	908	10	1,629
2006	1,192	0	368	448	2,008
<b>Total</b>	<b>37,301</b>	<b>6,565</b>	<b>7,583</b>	<b>1,189</b>	<b>52,638</b>

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 and lease contract	Total
East Asia and Pacific	92	7	116	11	226
Europe and Central Asia	9	5	7	52	73
Latin America & Caribbean	107	11	40	31	189
Middle East & North Africa	0	0	4	7	11
South Asia	0	0	1	1	2
Sub-Saharan Africa	2	0	1	18	21
<b>Grand Total</b>	<b>210</b>	<b>23</b>	<b>169</b>	<b>120</b>	<b>522</b>

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 and lease contract	Total
East Asia and Pacific	21,243	306	3,376	456	25,381
Europe and Central Asia	1,633	260	1,825	671	4,389
Latin America & Caribbean	14,350	5,999	1,689	4	22,041
Middle East & North Africa	0	0	679	0	679
South Asia	0	0	2	0	2
Sub-Saharan Africa	76	0	12	57	146
<b>Total</b>	<b>37,301</b>	<b>6,565</b>	<b>7,583</b>	<b>1,189</b>	<b>52,638</b>

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.

Subsector	Segment	Project Count	Total Investment
<b>Treatment plant</b>	Potable water & sewerage treatment plant	7	231
	Potable water treatment plant	106	7,091
	Sewerage treatment plant	132	3,458
<b>Total Treatment plant</b>		<b>245</b>	<b>10,781</b>
<b>Utility</b>	Sewerage collection and treatment	7	2,461
	Water utility with sewerage	221	30,408
	Water utility without sewerage	49	8,989
<b>Total Utility</b>		<b>277</b>	<b>41,857</b>
<b>Grand Total</b>		<b>522</b>	<b>52,638</b>

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 Aires and Manila which were intended to cover the comprehensive rehabilitation and extension of a major city's water and sewerage services.

**Contract awards, 2005-07**

The table below summarises all contract awards identified by the author which have been awarded between the start of 2005 and the end of September 2006.

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	1.000	0.000
2005	Algeria	Taksebt	Suez	2.000	0.000
2005	Algeria	Algiers	Suez	3.500	3.500
2005	Armenia	Yerevan	Veolia Environnement	1.000	1.000
2005	Australia	Perth	Suez	1.500	0.000
2005	Austria	Gerasdorf	EVN	0.011	0.000
2005	Chile	Antofagasta	OHL	0.000	0.000
2005	China	Pizhou, Jiangsu	AEH	0.160	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	1.000	0.000
2005	China	Xuzhou, Jiangsu	Beijing Capital	1.500	0.000
2005	China	Lianyungang, Jiangsu	Bio Trech Technology	0.000	0.400
2005	China	Lianyungang, Jiangsu	Bio Trech Technology	0.000	0.500
2005	China	Suqian, Jiangsu	Bio Trech Technology	0.160	0.300
2005	China	Jiangdu, Jiangsu	Bio Trech Technology	0.250	0.000
2005	China	Nanjing, Jiangsu	Bio-Treat Technology	0.000	0.200
2005	China	Tianjin	Boustead	0.100	0.000
2005	China	Zibo	China Everbright	0.000	1.000
2005	China	Hai Yang, Shandong	China Evergreen	0.000	0.080
2005	China	Henan	China Evergreen	0.000	0.433
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, Zhejiang	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	Zhenyuan, Guizhou	Han's Technologies	0.000	0.067
2005	China	Xitang, Zhejiang	Han's Technologies	0.000	0.117
2005	China	Zhuozhou, Hebei	Interchina Holdings	0.000	0.247
2005	China	Shanghai	Interchina Holdings	0.000	5.667
2005	China	Changyi, Shandong	Jinan Shifangyantong	0.000	0.100
2005	China	Yuyao	Ningbo Fuda	0.400	0.000
2005	China	Qianjiang	Qianjiang Water Res	0.300	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, Yunan	Salcon	0.050	0.000
2005	China	Weifang, Shandong	Salcon	0.600	0.000
2005	China	Linyi, Shandong	Salcon	1.000	0.000
2005	China	Wenzhou	Shanghai Industrial	0.000	0.500
2005	China	Xianyang	Shanghai Industrial	0.500	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	2.250	0.000
2005	China	Xintai, Shandong	United Envirotech	0.000	0.267
2005	China	Urumqi, Xinjiang	VE / Beijing Capital	0.000	1.200
2005	China	Handan, Hebei	Veolia Environnement	0.000	0.800
2005	China	Changzhou, Jiangsu	Veolia Environnement	1.200	0.000
2005	China	Kunming, Yunan	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	Colombia	Barranquilla	Consultores Desarrollo	0.604	0.000
2005	Colombia	Sabanagrande	Tecvasa	0.070	0.060
2005	Colombia	San Andres Island	VE (PA)	0.015	0.015
2005	Croatia	Vodice	EVN	0.000	0.010
2005	Czech Rep.	Hodonin	Aquaplast	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	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	0.000	1.000
2005	Peru	Tumbles, Zarumilla & Villar	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	Tuman	Alfa Group	0.511	0.000
2005	Russia	Kaluga Region	Alfa Group	0.710	0.000
2005	Russia	Krasnoyarsk	Renova-KES	0.054	0.000
2005	Russia	Berezniki	Russian Utility Systems	0.174	0.000
2005	Russia	St Petersburg	Veolia Environnement	2.000	0.000
2005	Singapore	Ulu Pandan	Keppel	0.100	0.000
2005	Sudan	Khartoum	Biwater	2.500	0.000
2005	Taiwan	Hsin Chu	Darco	0.000	0.100
2005	Thailand	Borwin	East Water	0.035	0.000
2005	Thailand	Chonburi	Ranhill	0.208	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	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	11.300	5.700
2006	Canada	Brockton	Veolia Environnement	0.010	0.010
2006	China	Changzhou	AEH	0.000	0.025
2006	China	Fengtai, Anhui	AEH	0.100	0.000
2006	China	Yixing, Jiangsu	Asia Environment	0.000	0.033
2006	China	Lu Liang, Shanxi	Asia Water Technology	0.080	0.000

2006	China	Wuhan	Bio Treat Technology	0.000	0.000
2006	China	Beijing	Bio Treat Technology	0.000	0.200
2006	China	Suzhou, Jiangsu	Bio Treat Technology	0.000	2.000
2006	China	Beijing Hao Tai Shi	China Evergreen	0.000	0.050
2006	China	Tianjin	China Evergreen	0.000	0.067
2006	China	Hangdan, Hebei	China Evergreen	0.000	0.450
2006	China	Jingzhou, Hubei	China Water Affairs	0.200	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	0.300	0.000
2006	China	Tongliao, Inner Mongolia	Eguard	0.000	0.333
2006	China	Xiangfan, Hubei	Eguard	0.000	0.333
2006	China	Ganyu, Gansu	Goldis	0.000	0.100
2006	China	Hezhang, Guizhou	Han's Technologies	0.050	0.000
2006	China	Xiangshan, Zhejiang	Han's Technologies	0.200	0.150
2006	China	Liaoyang, Liaoning	Hyflux	0.000	0.100
2006	China	Langfang, Hebei	Hyflux	0.000	0.403
2006	China	Tianchang, Anhui	Long Quan Group	0.200	0.000
2006	China	Haining, Zhejiang	Salcon	0.720	0.000
2006	China	Xiuning, Anhui	Shanghai Fudalefumen	0.000	0.133
2006	China	Zhejiang	Shanghai Industrial	0.600	0.000
2006	China	Dengzhou, Henan	Sinomem	0.000	0.100
2006	China	Ji An City	Sinomem	0.000	0.400
2006	China	Chongqing	Suez	0.000	1.500
2006	China	Changshu, Jiangsu	Suez	1.500	0.000
2006	China	Baoji, Shaanxi	Veolia Environnement	0.000	0.167
2006	China	Weinan, Shaanxi	Veolia Environnement	0.300	0.000
2006	China	Liuzhou, Guangxi	Veolia Environnement	1.000	0.000
2006	China	Wendeng, Shandong	Weihai Dean Water Eng	0.020	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	Ghana	Ghana (urban)	Vitens	6.000	0.000
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	0.500	0.000
2006	Oman	Muscat	Veolia Environnement	0.000	0.700
2006	Philippines	Maynilad Water	DM Consunji	4.500	0.700
2006	Poland	Wozniky	Veolia Environnement	0.010	0.000
2006	Qatar	Lusail	Suez / Marubeni	0.000	0.200
2006	Russia	Orsk	Alfa Group	0.249	0.000
2006	Russia	Rostov on Don	Eurasian W Partnership	1.070	0.000
2006	Russia	Krasnoyarsk	Russian Utility Systems	0.053	0.000
2006	Russia	Petrozavodsk	Russian Utility Systems	0.266	0.000
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	S Africa	Maluti-a-Phofung	Amanz' aBantu Services	0.300	0.000
2006	Thailand	Muang & Baaankai	East Water	0.200	0.000
2006	UAE	Ajman	Veolia Environnement	0.000	0.235
2006	Turkey	Four cities	Remondis	0.000	4.000

2007	China	Tianjin	Veolia Environnement	3.000	0.000
2007	Australia	Sydney	Veolia Environnement	0.500	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	Lanzhou, Gansu	Veolia Environnement	3.200	0.000
2007	Germany	Burghausen	Energie	0.015	0.000
2007	India	Chennai	Suez	4.000	0.000
2007	Mexico	Querétaro	Earth Tech (Tyco)	0.000	0.500
2007	Mexico	Querétaro	FCC	0.700	0.000
2007	Oman	Sur	Veolia Environnement	0.350	0.000
2007	Saudi	Jubail	Suez	3.500	0.000
2007	Turkey	Istanbul	EVN	0.000	2.000

### 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 Aires	Enron	2.500	0.000
1999	2002	Venezuela	Lara	Agval	1.100	0.000
2001	2003	Vietnam	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
1999	2004	Thailand	Pathum Thani	Macquarie	0.800	0.000
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

The ending of La Paz and El Alto was unintentionally hilarious. In early 2006 the new government being ideologically opposed to privatisation, sought to end the concession on the basis that it was performing poorly. Unfortunately, the report commissioned to substantiate this concluded that Aguas de Illimani was the best run utility in Bolivia. It took another year before the concession could be ended and the fate of the city's services will be watched with interest, especially as it will now be administered by the leader of the anti Cochabamba agitation in 2000.

### 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
1998	2003	China	Yueyang, Hunan	Cheung Kong Infra	0.742	0.000
2003	2003	China	Nanchang, Jiangxi	Berlinwasser	1.000	0.000
2000	2004	Argentina	Catamarca	VE (PA)	0.200	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	Atlatic	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
1998	2006	China	Shaoxing, Zhejiang	China Water Company	0.800	0.000
2001	2006	China	Shanghai	SAUR	0.700	0.000
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

The author may be somewhat charitable in saying that all of these were negotiated exits.

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	Stutterheim	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 somewhat excitable 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 for ever, 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.

Bear also in mind that the more contracts there are, the more contracts will at some point have to end and likewise, the longer PSP is in operation, the more contracts will expire in due course.

**Major PSP contract losses, January 1997 to October 2007 (million people)**

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	9.05	0.66	9.05
2003	7.24	0.11	7.35
2004	4.55	2.40	6.65
2005	8.00	6.92	12.75
2006	18.32	10.25	18.57
2007	2.09	1.17	2.26
<b>Total</b>	<b>53.72</b>	<b>27.77</b>	<b>67.50</b>

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.

**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	Listed (Kelda)
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)
Nanghai 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	Listed – to be 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

**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
Suez	81.7	94.7	104.2	102.4	104.5	98.2	100.4
Veolia	74.8	95.2	104.5	108.2	117.5	115.0	133.9
SAUR	27.6	30.4	34.0	33.5	13.7	13.6	13.6
Agbar	31.2	35.3	35.2	35.2	34.9	26.0	22.1
RWE	23.7	56.5	70.1	69.5	67.2	42.7	35.7
<b>Total</b>	<b>239.0</b>	<b>312.1</b>	<b>348.0</b>	<b>348.8</b>	<b>337.8</b>	<b>295.5</b>	<b>305.7</b>
<b>Global</b>	<b>350.0</b>	<b>430.0</b>	<b>490.0</b>	<b>545.0</b>	<b>565.0</b>	<b>632.0</b>	<b>681.0</b>
<b>% by above</b>	<b>68%</b>	<b>73%</b>	<b>71%</b>	<b>64%</b>	<b>60%</b>	<b>47%</b>	<b>45%</b>

While a retreat from the peak of 2002 has been an ongoing process, the divestment of Thames Water and Thames Water International has ramped up these changes and net of American Water (the IPO is due at the end of 2007) will result in these entities accounting for 42% of the world market in terms of people served by the end of 2007.

**A change of perspective**

People served by contract award type (million)

	1999	2000	2001	2002	2003	2004	2005	2006
Local	11.2	29.8	14.7	6.6	22.2	24.2	16.5	14.6
Regional	0.1	0.2	0.2	0.0	0.0	3.6	3.3	0.5
International	30.5	22.4	19.8	16.4	11.0	25.5	24.1	4.8
% awards								
International	73%	43%	57%	71%	33%	48%	55%	24%

While no firm trend can be attached to the above figures, it is reasonable to assume that the role played by international companies has eased, especially since 2002.

**International investment strategies of leading water companies**

Company	Strategy
Suez	Withdraw from Latin America and developing economies save China
Veolia	Concentrating on Europe, USA, China and selected markets
RWE	Withdrawing from all markets except Germany and Central Europe
SAUR	Concentrate on Europe
Agbar	Withdrawal from Latin America, investing in Europe
FCC	Retain some Latin American activities, invest in Europe
ACEA	Maintain international activities but no new projects
AWG	All international activities (except Ireland) being sold
Severn Trent	Maintain asset operation strategy (no capital expenditure)
UU	Maintain a highly selective policy, emphasising Eastern Europe

### 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 Water 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	2008 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 Water	19%	55%	0%	Regulated activities only
UU	60%	52%	35%	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. One broker has predicted there will be no listed companies by the end of 2008. Such a prediction is likely to be driven by the desire for headlines, rather than an understanding of the sector's subtleties.

Changes in the sector 2000-07 and possible changes to 2010

Company	2000-07 status	2007-10 changes
AWG	Listed, taken private (Osprey)	Private-medium term
Dwr Cymru	Went private (Glas)	Private-long term
Kelda	Listed	Possibly remain listed
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 Water	Acquired (RWE then taken private)	Private -medium term
UU	Listed	Remain listed
Wessex	Re-acquired (Azurix to YTL)	Remain with YTL

It was evident that a number of other private equity houses are still attracted to the sector and therefore further bids for the remaining five companies with a market listing are at least a possibility.

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 retaining a market listing, but this carries little weight when the equity model is materially less efficient than 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 a suitable set of operational assumptions are required 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; and
- (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 Las 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 since 2003 have been included in a separate table, as these have become a material factor over the past two 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 Nevas) 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 RWE's AWW both pursue an aggressive tuck-in acquisition strategy, taking up 5,000-15,000 new customers each year this way.
- **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.
- **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, 1987-2006

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 so on. 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 51% by 2007); 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 14million 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	22.8
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
<b>Total</b>		<b>157.0</b>

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

Contract type	Million people
Contract awards	605.2
Contract endings	-67.5
Contract service extension	6.0
Population growth & urbanisation	6.0
Incumbent markets	157.0
Global total	706.7

In 2003, we identified 485million people being served by the private sector, rising to 545million in 2004, 563million in 2005 and 632million in 2006. The current year's increase of 75million is again partly due to identifying other contracts and companies as well as new contract awards.

### Companies and their coverage

The table below outlines the number of people served by each country in their home and international markets. It has not been adapted to take into account the Macquarie acquisitions.

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 is evidently growing apace. 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 even 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
<b>Argentina</b>				
Latin Aguas	2,173,000	0	<b>2,173,000</b>	100%
<b>Australia</b>				
Macquarrie	0	17,700,000	<b>17,700,000</b>	0%
United Group	0	0	<b>0</b>	N/A
Westpac	0	1,720,000	<b>1,720,000</b>	0%
<b>Austria</b>				
Aquaplus	10,000	70,000	<b>80,000</b>	13%
Energie	130,000	517,000	<b>647,000</b>	20%
EVN	488,000	3,249,000	<b>3,747,000</b>	14%
<b>Brazil</b>				
Andrae Gutierrez	8,136,000	0	<b>8,136,000</b>	100%
COPASA	11,300,000	0	<b>11,300,000</b>	100%
Geuppo Equipav	730,000	0	<b>730,000</b>	100%
SABESP	22,600,000	0	<b>22,600,000</b>	100%
<b>Canada</b>				
Aquatech	856,000	0	<b>856,000</b>	100%
Ontario Teachers PP	0	3,500,000	<b>3,500,000</b>	0%
<b>Chile</b>				
Aguas Andinas [1]	5,540,000	0	<b>5,540,000</b>	100%
Aguas Nuevas	1,138,000	0	<b>1,138,000</b>	100%
Antofagasta	461,000	0	<b>461,000</b>	100%
Consortio Financiero	520,000	0	<b>520,000</b>	100%
Southern Cross	600,000	0	<b>600,000</b>	100%
<b>China</b>				
Anhui Water Resources Development	N/A	N/A	<b>N/A</b>	N/A
Anhui Guozhen	1,233,000	0	<b>1,233,000</b>	100%
Beijing Capital	8,750,000	0	<b>8,750,000</b>	100%
Bio-Treat Technology	5,350,000	0	<b>5,350,000</b>	100%
Cathay International Water	3,500,000	0	<b>3,500,000</b>	100%
China Evergreen	1,240,000	0	<b>1,240,000</b>	100%
China Everbright	1,000,000	0	<b>1,000,000</b>	100%
Cheung Kong Infrastructure	0	348,000	<b>348,000</b>	0%
Citic Pacific	600,000	0	<b>600,000</b>	100%
Eguard Resources Development	7,133,000	0	<b>7,133,000</b>	100%
Global Green Tech Group	800,000	0	<b>800,000</b>	100%
Guangdong Investment	6,800,000	0	<b>6,800,000</b>	100%
Guozhen	2,055,000	0	<b>2,055,000</b>	100%
Interchina Holdings	8,170,000	0	<b>8,170,000</b>	100%
Jiangxi Hongcheng Waterworks	1,550,000	0	<b>1,550,000</b>	100%
Nanghai Development Ltd	1,100,000	0	<b>1,100,000</b>	100%
NWS Holdings	16,120,000	0	<b>16,120,000</b>	100%
Ningbo Fuda Company	400,000	0	<b>400,000</b>	100%
Qianjiang Water Resources	300,000	0	<b>300,000</b>	100%
Shanghai Industrial Holdings	17,100,000	0	<b>17,100,000</b>	100%
Shanghai Municipal Raw Water	6,000,000	0	<b>6,000,000</b>	100%
Shanghai Urban Construction Group	2,000,000	0	<b>2,000,000</b>	100%
Shanghai Young Sun	500,000	0	<b>500,000</b>	100%
Shenzhen Kondarl	N/A	N/A	<b>N/A</b>	N/A
Sichuan Guangan AAA Public	100,000	0	<b>100,000</b>	100%
Suzhou New District	100,000	0	<b>100,000</b>	100%
Tianjin Capital Env Protection	11,350,000	0	<b>11,350,000</b>	100%
Towngas	3,030,000	0	<b>3,030,000</b>	100%
Wuhan Sanzheng Industry Holdings	3,500,000	0	<b>3,500,000</b>	N/A
Xinjiang Hui Tong	780,000	0	<b>780,000</b>	100%
<b>Estonia</b>				

Tallinna Vesi	405,000	0	<b>405,000</b>	100%
<b>France</b>				
Alteau	250,000	0	<b>250,000</b>	100%
Bouygues	0	9,160,000	<b>9,160,000</b>	0%
RUAS	130,000	0	<b>130,000</b>	100%
SAUR	5,500,000	8,421,000	<b>13,921,000</b>	41%
Sogedo	50,000	0	<b>50,000</b>	100%
STGS	166,000	0	<b>166,000</b>	100%
Suez	17,000,000	105,502,000	<b>122,502,000</b>	14%
Ternois Eputation	80,000	0	<b>80,000</b>	100%
VE	24,100,000	109,810,000	<b>133,910,000</b>	18%
<b>Germany</b>				
E.ON	N/A	0	<b>N/A</b>	N/A
Gelsenwasser	5,800,000	351,000	<b>6,151,000</b>	94%
Linde	0	500,000	<b>500,000</b>	0%
MVV	990,000	0	<b>990,000</b>	100%
Remondis	200,000	4,101,000	<b>4,210,000</b>	5%
RWE	13,200,000	22,495,000	<b>35,695,000</b>	37%
<b>Greece</b>				
Athens Water	4,000,000	0	<b>4,000,000</b>	100%
Thessaloniki Water	850,000	0	<b>850,000</b>	100%
<b>India</b>				
BHEL	100,000	0	<b>100,000</b>	100%
IVRCL	1,100,000	0	<b>1,100,000</b>	100%
Larssen & Toubro	500,000	0	<b>500,000</b>	100%
<b>Italy</b>				
ACEA	9,110,000	5,845,000	<b>14,955,000</b>	61%
Acegas-APS	669,000	0	<b>669,000</b>	100%
ASCM Como	250,000	0	<b>250,000</b>	100%
ASM Brescia	563,000	0	<b>563,000</b>	100%
Edison	0	2,500,000	<b>2,500,000</b>	0%
Iride	2,925,000	667,000	<b>3,592,000</b>	74%
Hera	2,600,000	0	<b>2,600,000</b>	100%
Meta Modena	432,000	0	<b>432,000</b>	100%
<b>Kuwait</b>				
Utilities Development Company	1,900,000	0	<b>1,900,000</b>	100%
<b>Malaysia</b>				
Eco Water	N/A	0	<b>N/A</b>	N/A
Goldis	0	50,000	<b>50,000</b>	0%
Intan Utilities	600,000	0	<b>600,000</b>	100%
K P Selangor	500,000	0	<b>500,000</b>	100%
PBA Holdings	1,450,000	250,000	<b>1,700,000</b>	85%
PPB	0	250,000	<b>250,000</b>	0%
Puncak Niaga	7,100,000	0	<b>7,100,000</b>	100%
Ranhill Utilities	2,700,000	458,000	<b>3,158,000</b>	86%
Salcon	100,000	3,620,000	<b>3,720,000</b>	3%
Taliworks	2,045,000	0	<b>2,045,000</b>	100%
YTL Holdings	0	2,397,000	<b>2,397,000</b>	0%
<b>Mexico</b>				
Aquasol	500,000	0	<b>500,000</b>	100%
<b>Morocco</b>				
LYDEC	2,800,000	0	<b>2,800,000</b>	100%
<b>Philippines</b>				
Benguet	250,000	0	<b>250,000</b>	100%
Manila Water	5,200,000	0	<b>5,200,000</b>	100%
<b>Poland</b>				
Aquarius	52,000	0	<b>52,000</b>	100%
<b>Portugal</b>				

Mota-Engil	529,000	0	<b>529,000</b>	100%
<b>Russian Federation</b>				
Rosvodokanal	2,010,000	0	<b>2,101,000</b>	100%
RKS	3,745,000	0	<b>3,745,000</b>	100%
Syzran Vodokanal	186,000	0	<b>186,000</b>	100%
<b>Qatar</b>				
QEWCC	500,000	0	<b>500,000</b>	100%
<b>Saudi Arabia</b>				
Amiantit	0	1,727,000	<b>1,727,000</b>	0%
<b>Singapore</b>				
Asia Environment	0	1,468,000	<b>1,468,000</b>	0%
Asia Water Technology	0	3,563,000	<b>3,563,000</b>	0%
Boustead	0	550,000	<b>550,000</b>	0%
Darco	0	850,000	<b>850,000</b>	0%
Dayen	125,000	0	<b>125,000</b>	100%
Hyflux	350,000	650,000	<b>1,000,000</b>	35%
Keppel	100,000	0	<b>100,000</b>	100%
Sembcorp	N/A	N/A	<b>N/A</b>	N/A
<b>Spain</b>				
Acciona	3,500,000	3,300,000	<b>6,800,000</b>	52%
Agbar [2]	13,000,000	9,050,000	<b>22,050,000</b>	59%
Agval [3]	2,040,000	150,000	<b>2,190,000</b>	93%
FCC [4]	13,000,000	9,900,000	<b>22,900,000</b>	57%
Gruppo ACS	2,200,000	2,100,000	<b>4,300,000</b>	51%
Iberdrola	0	760,000	<b>760,000</b>	0%
OHL	750,000	210,000	<b>960,000</b>	78%
Sacyr Vallehermoso	822,000	1,754,000	<b>2,576,000</b>	30%
Tecasva	0	7,204,000	<b>7,204,000</b>	0%
<b>Sweden</b>				
Lackeby Water Group	0	250,000	<b>250,000</b>	0%
<b>Thailand</b>				
CK Karnchung	1,200,000	0	<b>1,200,000</b>	100%
East Water	550,000	0	<b>550,000</b>	100%
<b>UK</b>				
AWG	5,792,000	2,500,000	<b>8,292,000</b>	70%
Biwater	430,000	2,695,000	<b>3,125,000</b>	14%
Costain	N/A	0	<b>N/A</b>	N/A
South Downs	665,000	0	<b>665,000</b>	100%
Dee Valley	258,000	0	<b>258,000</b>	100%
Glas Cymru	3,043,000	0	<b>3,043,000</b>	100%
Sutton & East Surrey	560,000	0	<b>560,000</b>	100%
Kelda Group	5,993,000	0	<b>5,993,000</b>	100%
Nature Technology Solutions	N/A	0	<b>N/A</b>	N/A
Northumbrian Water	6,296,000	246,000	<b>6,542,000</b>	96%
Pennon Group	1,516,000	0	<b>1,516,000</b>	100%
First Aqua	4,400,000	0	<b>4,400,000</b>	100%
Severn Trent	8,280,000	2,895,000	<b>11,175,000</b>	74%
South East Water	1,500,000	0	<b>1,500,000</b>	100%
South Staffordshire	1,233,000	0	<b>1,233,000</b>	100%
Swan Group	563,000	0	<b>563,000</b>	100%
United Utilities	10,328,000	13,505,000	<b>23,828,000</b>	43%
<b>USA</b>				
Alliance Water Resources	315,000	0	<b>315,000</b>	100%
American States	1,225,000	0	<b>1,225,000</b>	100%
Aqua America	3,120,000	0	<b>3,120,000</b>	100%
Artesian	240,000	0	<b>240,000</b>	100%
BIW	38,000	0	<b>38,000</b>	100%

Cadiz	N/A	0	<b>N/A</b>	N/A
California WS	2,000,000	0	<b>2,000,000</b>	100%
CH2M Hill	3,000,000	500,000	<b>3,500,000</b>	86%
Connecticut	271,000	0	<b>271,000</b>	100%
Consolidated Water	0	46,000	<b>46,000</b>	0%
Covanta Holdings	400,000	0	<b>400,000</b>	100%
Middlesex	375,000	0	<b>375,000</b>	100%
Pennichuck	138,000	0	<b>138,000</b>	100%
Pico Holdings	N/A	0	<b>N/A</b>	N/A
Pure Cycle	N/A	0	<b>N/A</b>	N/A
SJW	1,020,000	0	<b>1,020,000</b>	100%
Southwest	1,060,000	0	<b>1,060,000</b>	100%
Tyco	1,500,000	6,233,000	<b>7,733,000</b>	19%
Utilities Inc	905,000	0	<b>905,000</b>	100%
Western Water	N/A	N/A	<b>N/A</b>	N/A
York	161,000	0	<b>161,000</b>	100%

**Companies covered by country**

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

	1999	2000	2001	2002	2003	2004	2005	2006	2007
Argentina	0	0	0	0	0	1	1	1	1
Austria	0	0	1	1	1	2	3	3	3
Australia	0	0	0	0	0	0	1	1	3
Belgium	1	1	1	1	1	1	1	0	0
Brazil	1	1	1	1	1	1	1	4	4
Canada	0	0	0	0	0	1	1	1	1
Chile	1	1	1	1	1	4	4	5	5
China	4	6	7	7	9	16	19	30	30
Czech Republic	1	1	1	0	0	1	1	0	0
Estonia	0	0	0	0	0	0	1	1	1
France	3	3	3	3	3	3	4	4	4
Germany	5	5	5	4	4	4	4	4	6
Greece	0	1	2	2	2	2	2	2	2
India	0	0	0	0	1	2	3	3	3
Italy	5	9	8	8	12	12	7	7	9
Kuwait	0	0	0	0	0	0	0	0	1
Japan	0	0	0	0	0	0	0	1	1
Malaysia	3	3	2	6	10	10	11	11	11
Mexico	0	0	0	0	0	1	1	1	1
Morocco	0	0	0	0	0	0	1	1	1
Netherlands	0	1	1	1	1	1	1	0	0
Philippines	0	0	0	0	2	3	3	3	3
Portugal	0	0	0	0	0	0	1	1	1
Qatar	0	0	0	0	0	0	0	1	1
Saudi Arabia	0	0	0	0	0	1	1	1	1
Singapore	0	0	0	0	4	6	6	6	6
Spain	6	8	8	8	8	7	8	8	9
Sweden	0	0	0	0	0	0	1	1	1
Thailand	2	1	1	1	1	1	1	2	2
United Kingdom	18	16	15	17	18	17	19	18	14
USA	20	24	25	23	23	20	21	21	21

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
Number of countries	13	15	16	15	18	22	28	27	28
Number of companies	70	81	82	84	102	117	128	142	146
- OECD countries	59	69	70	68	73	72	77	74	77
- Advanced developing	2	2	2	2	6	13	13	18	19
- Developing	9	10	10	14	23	32	38	50	50

## COUNTRY MARKET DEVELOPMENT, PROSPECTS AND PROGNOSIS

The addressable population is the percentage of the population (2004 figures) that the author believes have a better than even chance of being served with privatised water and/or sewerage provision by 2015. The year 2015 may appear 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 five 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.

### 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. The Russian Federation has proved to be far in advance of the expectations made five years or so ago, while sub-Saharan Africa and Latin America are emerging as more aggressively challenged markets than would previously have been envisaged.

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.

### Current and forecast extent of private sector participation

Our revised forecast for the extent of PSP in 2015 is 1,148million, an upwards adjustment of 3million on the forecast made in 2006. That in turn was an increase of 60million from the projection of 1,085million people made in 2005. That forecast had represented a fall of 40million from the 1,025million forecast made in 2004 (16% of the global population) on top of a 2004 decrease of 35million from the 2003 forecast of 1,160million people (17% of the 2015 population). Thus the overall forecast is maintained at 16% the population by 2015.

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 three 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.

	Served by the private sector in 2007		Potential for PPP service by 2015	
	Water	Sewerage	Water	Sewerage
Austria	7%	0%	10%	14%
Belgium	3%	10%	3%	11%
Denmark	1%	0%	2%	2%
Finland	0%	1%	0%	2%
France	75%	56%	82%	72%
Germany	17%	15%	26%	29%
Greece	45%	38%	46%	46%
Ireland	1%	37%	21%	43%
Italy	41%	29%	52%	47%
Netherlands	0%	10%	0%	11%
Norway	7%	5%	5%	10%
Portugal	23%	20%	55%	50%
Spain	44%	51%	65%	59%
Sweden	1%	1%	5%	5%
Switzerland	0%	0%	0%	0%
United Kingdom	89%	91%	96%	97%

	Served by the private sector in 2007		Potential for PPP service by 2015	
	Water	Sewerage	Water	Sewerage
Albania	17%	15%	25%	31%
Armenia	82%	33%	87%	37%
Azerbaijan	1%	0%	5%	11%
Bulgaria	16%	16%	42%	49%
Croatia	0%	17%	23%	28%
Czech Republic	67%	63%	84%	79%
Estonia	31%	31%	38%	38%
Hungary	27%	26%	36%	36%
Kosovo	11%	0%	13%	0%
Latvia	0%	0%	23%	23%
Lithuania	0%	0%	15%	0%
Moldova	16%	0%	17%	6%
Montenegro	22%	22%	22%	22%
Poland	3%	3%	11%	13%
Romania	11%	0%	19%	17%
Russian Federation	8%	1%	18%	13%
Slovakia	20%	20%	37%	37%
Slovenia	0%	11%	25%	25%
Ukraine	0%	0%	5%	5%

	Served by the private sector in 2007		Potential for PPP service by 2015	
	Water	Sewerage	Water	Sewerage
Algeria	29%	11%	32%	13%
Bahrain	0%	0%	100%	100%
Egypt	0%	0%	6%	0%
Iran	0%	0%	0%	0%
Iraq	0%	0%	0%	0%
Israel & Palestine	14%	0%	20%	8%
Jordan	45%	0%	45%	30%
Kuwait	0%	76%	100%	100%
Lebanon	0%	0%	13%	13%
Morocco	22%	11%	29%	23%
Oman	33%	27%	38%	47%
Qatar	0%	100%	40%	100%
Saudi Arabia	15%	0%	43%	35%
Tunisia	0%	0%	18%	0%
Turkey	2%	8%	10%	7%
UAE	0%	5%	36%	45%
Yemen	0%	0%	0%	0%

	Served by the private sector in 2007		Potential for PPP service by 2015	
	Water	Sewerage	Water	Sewerage
Burkina Faso	0%	0%	12%	0%
Cameroon	33%	0%	30%	10%
Central African Rep	2%	0%	5%	0%
Chad	8%	0%	24%	0%
Congo	0%	0%	6%	0%
Côte d'Ivoire	29%	8%	37%	14%
Ethiopia	0%	0%	0%	0%
Gabon	44%	0%	44%	0%
Ghana	27%	0%	26%	0%
Guinea	4%	0%	17%	0%
Guinea-Bissau	0%	0%	14%	0%
Kenya	0%	0%	7%	0%
Lesotho	0%	0%	0%	0%
Mali	1%	0%	1%	0%
Mozambique	4%	0%	13%	0%
Namibia	0%	12%	0%	14%
Niger	14%	0%	13%	0%
Nigeria	0%	0%	0%	0%
Senegal	32%	0%	34%	0%
South Africa	2%	1%	4%	2%
Sudan	7%	0%	8%	0%
Tanzania	0%	0%	6%	0%
Uganda	0%	0%	5%	2%
Zambia	0%	0%	4%	0%

	Served by the private sector in 2007		Potential for PPP service by 2015	
	Water	Sewerage	Water	Sewerage
Argentina	11%	5%	24%	18%
Belize	0%	0%	53%	33%
Bolivia	0%	0%	0%	0%
Brazil	27%	18%	36%	24%
Canada	4%	6%	7%	9%
Chile	81%	77%	95%	94%
Colombia	30%	11%	30%	16%
Cuba	5%	0%	13%	0%
Dominican Republic	15%	0%	0%	0%
Ecuador	19%	13%	36%	36%
Honduras	7%	7%	8%	8%
Mexico	13%	11%	22%	17%
Panama	9%	0%	53%	53%
Paraguay	0%	0%	4%	0%
Peru	3%	3%	16%	12%
Trinidad & Tobago	0%	0%	100%	100%
Uruguay	10%	10%	14%	14%
USA	16%	5%	20%	8%
Venezuela	0%	0%	8%	6%

	Served by the private sector in 2007		Potential for PPP service by 2015	
	Water	Sewerage	Water	Sewerage
Australia	42%	8%	49%	16%
China	10%	7%	13%	9%
Hong Kong	70%	0%	92%	26%
Indonesia	5%	0%	8%	1%
Japan	0%	0%	5%	14%
Macao	100%	0%	100%	100%
Malaysia	64%	0%	81%	34%
Maldives	32%	0%	50%	0%
New Zealand	1%	10%	3%	11%
Philippines	13%	2%	25%	10%
Singapore	10%	0%	23%	8%
South Korea	0%	3%	4%	16%
Taiwan	14%	0%	29%	2%
Thailand	3%	0%	65%	36%
Vanuatu	15%	0%	20%	0%
Vietnam	0%	0%	11%	0%

	Served by the private sector in 2007		Potential for PPP service by 2015	
	Water	Sewerage	Water	Sewerage
Bangladesh	0%	0%	0%	0%
India	1%	0%	4%	0%
Kazakhstan	2%	0%	3%	0%
Mongolia	0%	0%	0%	0%
Nepal	0%	0%	3%	0%
Pakistan	0%	0%	0%	0%
Sri Lanka	0%	0%	1%	0%

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

Million people	2007		2015	
	Million people	%	Million people	%
Western Europe	176.8	44%	217.5	54%
C&E Europe	32.8	9%	61.8	18%
ME & Africa	62.4	5%	126.6	9%
South Asia	7.3	1%	51.8	3%
Central Asia	0.3	0%	0.5	0%
South East Asia	249.4	12%	420.6	19%
Oceania	9.6	36%	12.9	45%
North America	66.0	15%	89.8	19%
Latin America	102.1	19%	167.4	27%
<b>World total</b>	<b>706.7</b>	<b>11%</b>	<b>1148.8</b>	<b>16%</b>

### 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. 98 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 pa) 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, 2001–07

This list covers all 19 major deals where a company has either been acquired by a private equity house or sold from one such institution to another. It does not include 2005's acquisition of Utilities Inc from Nuon by AIG as the price for this bid has not been disclosed. The two acquisitions by the Ontario Teacher's Pension Plan (OTPP) this year are also in effect private equity bids.

Company	Holding	Date	Stake	Price
Westby	Mid Kent	03/2001	100.0%	GBP106.0 m
Glas Cymru	Dwr Cymru	05/2001	100.0%	GBP1,850.0 m
South Downs	Portsmouth	10/2001	100.0%	GBP71.0 m
RBS	Southern Water	04/2002	100.0%	GBP1,050.0 m
Macquarie	South East	09/2003	100.0%	GBP426.0 m
Consortio Financiero	ESVAL [1]	10/2003	49.8%	USD92.3 m
Penta Finance	SmVaK (AWG)	11/2003	54.3%	EUR54.5 m
Penta Finance	SmVaK (Ondeo)	04/2004	44.1%	EUR46.5 m
Arcapita Bank	South Staffs	11/2004	100.0%	GBP143.0 m
PAI	SAUR	02/2005	85.0%	EUR1,037.0 m
Hastings	Swan Group	02/2005	100.0%	AUD210.0 m
Terra Firma (UK)	East Surrey	10/2005	100.0%	GBP435.0 m
Deutsche Bank	East Surrey [2]	12/2005	100.0%	GBP189.0 m
Macquarie	Aquarion	02/2006	100.0%	USD860.0 m [3]
Aqualia	SmVaK	04/2006	98.4%	EUR167.0 m
Westpac	South East	01/2006	100.0%	GBP665.0 m [3]
Osprey	AWG	10/2006	100.0%	GBP2,200 m
Macquarie	Thames Water	10/2006	100.0%	GBP8,000.0 m [3]
CIF / JP Morgan	Southern Water	10/2007	100.0%	GBP4,195.0 m [4]

Notes:

[1] 44.8% acquired by Consortio 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%

### 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 (USD m)	Stake bought	USD/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 Water	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 Water	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

The two bids for Thames Water 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 Water's equity, valuing Thames Water's 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 USD7.9billion 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 USD9.5–11.0billion. 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 (USD m)	Stake bought	USD/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	N/A
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 Water & 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 Water	Izmit Su As	21	12%	146	N/A
2000	Suez	Manuas Saneamento	111	90%	51	3.1
2000	Thames Water	ESSEL	73	26%	281	14.8
2001	EVN	Nosiwag	83	100%	184	5.5
2001	Thames Water	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
2006	DM Consunji	Maynilad Water	503	84%	N/A	N/A
2007	Acegas	APGA	N/A	100%	N/A	N/A

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, Biwater Capital 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 subsidiaries and AquaSource), the acquisition of privately-owned companies (Nuon, GH Holdings and Citizens Utilities) and non-core divisions from other water companies (Crea). Marubeni's acquisition of Berlinwasser International in 2006 was subsequently called off.

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

Year	Bidder	Target	Bid price (USD m)	Stake bought	USD/ 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	Macquarrie	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

This is a busy market and will continue to develop. For example, various stakes in Latin America are changing hands as this book goes to press.

### 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, (USDmillion)**

<b>Year</b>	<b>Bidder</b>	<b>Target</b>	<b>Bid price (USD m)</b>	<b>Stake bought</b>	<b>USD/ person</b>	<b>Price / turnover</b>
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

The author has been threatening to write about smaller, more localised companies for some time. The temptation has largely been avoided due to limited information and whenever possible, to be able to present a suitably detailed company entry. A full website and NY Stock Exchange reporting requirements means that BIW merits a full entry despite serving just 38,000 people but other, larger entities have a far more limited profile. While the fifteen hundred people served by The Cholderton and District Water Company will probably continue to enjoy their low profile, many other companies will now be included in the country round-ups and in this section.

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.

### Informal service provision

Two World Bank funded reviews are a useful illumination. The first study (Collignon B & Vézina M (2000) Independent Water and Sanitation Providers in African Cities. Full Report of a Ten-Country Study. IBRD / World Bank, Washington DC, USA, April 2000.) outlines the extent of non service in a number of major African cities and the role played by informal service providers in plugging this gap.

### Water provision in Ten African Cities in 1999

	Population	Household	Standpipe	No service
Cotonou (Benin)	1,100,000	340,000	0	760,000
Ouagadougou (Burkina Faso)	1,000,000	280,000	590,000	130,000
Abidjan (Côte d'Ivoire)	2,800,000	2,130,000	56,000	614,000
Conakry (Guinea)	1,100,000	350,000	33,000	717,000
Nairobi (Kenya)	2,000,000	1,500,000	20,000	480,000
Bamako (Mali)	1,000,000	180,000	200,000	620,000
Nouakchott (Mauritania)	700,000	130,000	210,000	460,000
Kampala (Uganda)	1,100,000	400,000	55,000	645,000
Dakar (Senegal)	2,200,000	1,570,000	308,000	322,000
Dar es Salaam (Tanzania)	2,800,000	880,000	0	1,920,000

Source: Adapted from Collignon B & Vézina M (2000)

The population data is for 1999, and so does not take into account recent population growth, urbanisation and especially the development of informal and peri-urban settlements. Service provision is distinctly varied with 22-100 litres of water provided per person per day and with 13-52 people per connection.

In these cases, a variety of informal private operators provide water services and to a lesser extent sanitation collection services. The infrastructure contributed by these operators takes water from the utility network and provides it to households without these services. Typically, a significant premium is charged, on the basis that the unserved have limited resource to alternative sources.

Points in favour include that some service is better than none (and there is evidently a demand for these services) and that this is a significant source of employment. Against this is the fact that the revenues being generated by these operators are in effect being diverted from capital and operating spending on extending the utility service. That people are willing to pay higher charges for vended water indicates that people are willing to pay for direct access.

### Formal service provision

The second survey (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.

### Cambodia

#### Design-Build-Operate Contracts

These are 15 year contracts, renewable for a further 15 years. The private operator is obliged to connect all those living in the contract area. Project financing is provided by the private operator (40-50%) and a grant from the World Bank's IDA (50-60%) and the O&M costs are funded through tariffs.

**Awarded (2005)**

Contracts	4
Connections	7,875
Population served	39,000

**At selection stage (2005)**

Contracts	2
Connections	5,400
Population served	27,000

**Design-Build-Lease Contracts**

Again, these are 15 year contracts, renewable for a further 15 years, with the private operator being obliged to connect all those living in the contract area. Here, project financing is provided by the private operator (10%) and a credit from the World Bank's IDA (90%) and the tariffs are for full cost recovery, meeting both the O&M costs and repaying the credit facility.

**Awarded and at selection stage (2005)**

Contracts	12
Connections	13,353
Population served	67,000

**Colombia**

Colombia was able to build on a number of large PSP contracts since the mid 1990s which have been operated both by international companies and Latin American operators such as AAA (see Tecvasa in Spain). Infrastructure rehabilitation and expansion was funded by government grants based on World Bank loans. Comprehensive service coverage is expected within the contract area.

**Build-Operate-Invest Contracts**

These are 15-30 year contracts renewable for a similar period where the tariffs cover the O&M costs and a repayment of the investment costs. Approximately 20% of the project finance is provided by the private operator.

**Awarded (2001-04)**

Contracts	17
Connections	N/A
Population served	1,200,000

The contracts included one town with 425,000 people and two with over 100,000 people. The remaining 14 contracts covered an average of 43,000 people.

**Build-Operate Contracts**

This variant was used for smaller and poorer towns. Government and municipal funds were used for the project finance and the private operator collects a tariff designed to cover O&M costs, taxes and a proportion of the investment costs. These are 10-15 year contracts, renewable for a similar period.

**Awarded (2001-05)**

Contracts	3
Connections	N/A
Population served	42,000

In two of the projects, construction had been completed at the time of writing the report. Here, service coverage had increased to 95-99% with water provision rising from one hour a day to 24 hours in one case and from four hours a day to 12 hours in the other.

**Paraguay**

The emphasis has been on rural areas and small towns (less than 2,000 connections per area) where the national connection rate was just 37% in the late 1990s. The government was paying a subsidy of USD300-400 per new connection, which, with limited funds available, was constraining the amount of work it could support. Informal services in these areas had been provided by some 600 informal companies known as 'aguateros'. The principle behind this scheme was to encourage the aguateros to develop formal, legally based contracts with service obligations and access to government funding.

### Build-Operate Contracts

These contracts were based on bidders seeking to provide new connections and to maintain them for ten years (renewable for a further five) on the basis of the lowest government subsidy needed per connection. The private operator's tariff covers the cost of O&M work and for recovering its share of the cost of each connection. The World Bank estimates that this involves the private operators providing 20% of the project financing.

#### Awarded (2002-05)

Contracts	6
Connections	N/A
Population served	28,000

To date, average subsidies needed have fallen to USD100-150/connection and coverage amongst the poorest households has increased to 70%.

### The Philippines

Some 1,000 small towns are managed by Local Government Units (LGUs). These towns have a typical connection rate of 60% with unconnected households using informal water sources or water from vendors at up to 15 times the cost of water provided by the utilities. The Development Bank of the Philippines and the Land Bank of the Philippines are channelling World Bank financing with loans to the LGUs.

#### Design-Build-Lease Contracts

The Development Bank of the Philippines provides 90% of the project finance with the LGU's tax revenues providing the remaining 10%. These are 15 year contracts, renewable for a further 15 years, where the private operator is responsible for covering the operation and maintenance fees and funding the loan fees through a full cost recovery tariff.

#### Awarded (to 2005)

Contracts	6
Connections	6,566
Population served	33,000

#### Operation and Maintenance Contracts

Community water use associations are encouraged to form as formal operating companies through the award of 15 year operation and maintenance contracts renewable for a further 15 years. The Land Bank of the Philippines provides 90% of the project finance with the LGU's tax revenues providing the remaining 10%.

#### Awarded (to 2005)

Contracts	16
Connections	9,934
Population served	50,000

These 16 contracts are for small towns in the vicinity of Palawan city. The tariffs cover the O&M costs, while the tariffs in the city itself include an element for servicing the loans.

### Uganda

These short term contracts cover billing, tariff collection and the O&M activities including routine repairs. More complex repairs are carried out by the local water authority. Being just three years in duration, they do not strictly meet the definition of a PSP contract, although this may change as the contracts are renewed for a further three years.

#### Short term Operation and Maintenance contracts

#### Awarded (2001-03)

Contracts	10
Connections	N/A
Population served	173,000

A number of the original contracts have been re-awarded and as of 2006, 59 contracts had been awarded. Looking at the ten original contracts, a material improvement in water supply has been attained:

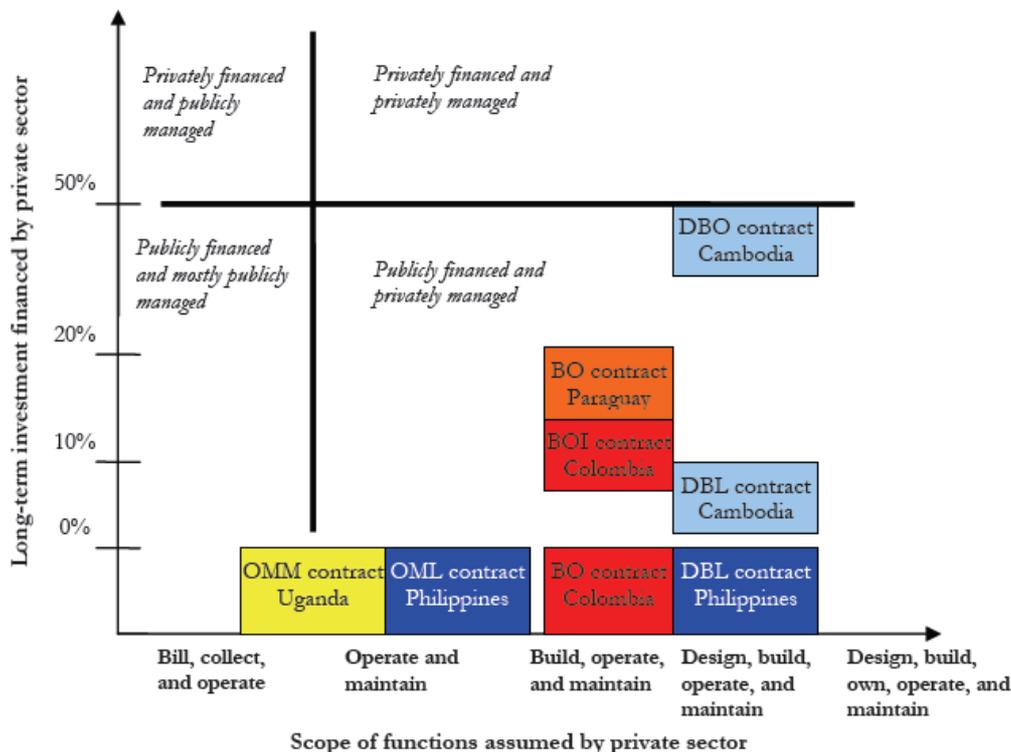
Year	2001	2006
Piped water	5%	70%
Improved point sources	68%	27%
No basic access	27%	3%

24 hour water availability has become the norm and customer surveys found that people were satisfied with their service quality and regarded their water as being of good quality and affordable.

### The discrete charms of low key PSP

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 1.633million people 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/m<sup>3</sup>. 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/m<sup>3</sup> was in fact USD0.48/m<sup>3</sup>, as water used was usually less than the minimum.

### Smaller companies emerge

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).

Further details about companies (population served and so on) will be included in the country entries. In this year's entries, they will be found in France, Poland and Russia. Next year's edition will, by necessity, include a considerable number of such entries in Asia and the Americas.

The number of companies here operating internationally is small. Two were identified operating in China (Han's Technologies and 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.

<b>Project Country</b>	<b>Company</b>	<b>Country</b>
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 Tucuruí	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 Engenharia	Brazil
Brazil	Globalbank Consulting	Brazil
Brazil	Materia Perfuracao de Pocos	Brazil
Brazil	Matonense de Saneamento	Brazil
Brazil	Novacon	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	Han's Technologies	USA
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	Wai Kee Holdings	China
China	Weihai Dean Water Eng	China
China	Yiqi Group	China
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	Consortio 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 Energetic	Colombia
Colombia	Grupo Hydros	Colombia
Colombia	Ingenieria Sala	Colombia
Colombia	Ingenieria Total	Colombia
Colombia	Operadores de Servicios	Colombia
Colombia	Presea	Colombia
Colombia	SIE de Colombia	Colombia
Colombia	Unisaguas	Colombia
Ecuador	Leonardo Armijos Luna	Ecuador
France	Alteau	France
France	Ruas	France
France	Sogedo	France
France	STURNO	France
France	Ternois Eparation	France
Ghana	Vitens	Netherlands
Indonesia	PT Buana & PT Dewata Arta Kharsima	Indonesia
Maldives	NTR / HOH	Denmark
Mexico	Bufete	Mexico
Mexico	Coplata	Mexico
Mexico	Grupo Protexa	Mexico
Mexico	Solaqua / TCS Enterprises	Mexico
Mozambique	Aguas de Portugal / Mazi Mozambique	Portugal
Philippines	DM Consunji	Philippines
Poland	Aquarius	Poland
Russia	CES-Multyenergetika	Russia
Russia	Renova-KES	Russia
Russia	RKI	Russia
Russia	RKS	Russia
Russia	Rosvodokanal	Russia
Russia	Syzranvodokanal	Russia
South Africa	Amanz' aBantu Services / Uzinzo	South Africa
Thailand	EGCO	Thailand
Uruguay	STA / Benencio	Uruguay
Venezuela	SNC Lavalin	Canada

# **PART 2: COUNTRY ANALYSIS**

**ALBANIA**

<b>Economics (2005)</b>	
GDP per capita	USD2,580
GDP per capita (PPP)	USD5,420
GDP in Agriculture	25%
GDP in Industry	20%
GDP in Services	55%

**Water and sewerage infrastructure**

Water and sewerage services are managed by the Ministry of Public Works, Ministry of Territory Adjustment and Tourism and the Committee of Environmental Protection and the National Water Committee. In 2006, the first national survey of water utilities found that 76% of the urban population and 60% of the rural population had access to water supply services. 44% of the population had sewerage services, 77% in urban areas but 1% in rural areas. At present, sewage treatment remains the exception (the first WWTW, serving 125,000 people having opened in Kavaja in 2005) and leakage from sewerage systems is known to be affecting drinking water supplies. Water quality related epidemics such as cholera and poliomyelitis have occurred in recent years. Untreated effluents are also used for irrigation, affecting the soil quality and leading to health problems.

Tirana's population rose from 150,000 in 1991 to an official figure of 586,000 in 2005 (unofficial estimates range from 700,000 to 1million), without a commensurate development in its infrastructure—the city receives drinking water for 4-6 hours per day and has a single wastewater treatment work built in 1962 with a design capacity for 200,000 people. Durres, Albania's second city (160,000) had no wastewater treatment facilities in 2001. Distribution losses are in the region of 43-60% with only 26% of water put into urban networks being billed for in 2006.

<b>Population</b>	
2005 (million)	3.1
2015 (million)	3.2
Urbanisation in 2003	45%
Urbanisation by 2015	52%
In urban agglomerations, 2015	0%

**Privatisation plans**

There are 54 water supply enterprises, of which eight were understood to be covering their costs in 2003. Since 2000, 40 of the entities have been corporatised. The corporatised entities are regulated by the Water Supply and Sanitation Regulatory Commission, with the remaining entities classified as state enterprises managed by the Ministry of Territorial Adjustment and Tourism.

In 1999, the EU's PHARE programme supported the design and construction of a wastewater treatment plant for the cities of Vlora and Pogradec, as well as wastewater treatment plants and drinking water supply for Saranda. Between 1999 and 2001 EUR205million was invested in projects by the international community. The EU's PHARE programme has concentrated on sanitation rehabilitation, with investment more biased towards water provision and treatment from country donors. Legislation transferring responsibility for water supplies to communes and municipalities and allowing private sector participation (PSP) was enacted in July 2000. Additional resources will be required to rehabilitate water supply systems in areas other than Tirana and Durres, and to improve sewerage systems throughout the country. In 2003, the World Bank approved a USD15million Municipal Water and Wastewater Project to support the Government's efforts to implement institutional and financial reforms in the water supply and sanitation sector.

A law on concessions has been under development by the Ministry of Economy, Trade and Energy since late 2006. It is designed to encourage the use of concession contracts for mobilising project finance with contracts of up to 35 years to be implemented.

**Management contracts**

In 2003, Berlinwasser International (60%, VE and RWE) and Aquamundo (40%, Amiantit of Saudi Arabia) gained a five year EUR4m contract to take over management of water supply and wastewater disposal in the Albanian towns of Durres, Fier, Lezhe and Saranda, serving 450,000 people. Aquamundo also operates the drinking water and wastewater disposal services in the town of Kavaja, with 77,000 inhabitants. Berlinwasser has a 30 year water and wastewater concession for the town of Elbasan.

<b>Freshwater</b>	
Annual availability (2003)	23.0km <sup>3</sup>
Per capita	13,056m <sup>3</sup>
Annual withdrawal (2000)	1.7km <sup>3</sup>
Domestic (2000)	27%
Industrial (2000)	11%
Agriculture (2000)	62%

Amga and ACEA both hold 32% of Tirana Acque, an Italian consortium formed to take advantage of bilateral agreements between Italy and Albania. Their long-term aim is to be involved in the privatisation of the Greater Tirana Water Supply and Sewerage Enterprise. In 2001, they gained a EUR10.5million four year management contract for the city, serving 650,000 people.

<b>Groundwater</b>	
Annual availability (2002)	6.2km <sup>3</sup>
Per capita	2,248m <sup>3</sup>
Annual withdrawal (1989)	0.6km <sup>3</sup>
Domestic (1998)	43%
Industrial (1998)	37%
Agriculture (1998)	21%

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Four towns	5 year O&M, water & wastewater	Bwasser/Aquamundo
Elbasan	30 year concession, water & wastewater	Berlinwasser
Kavaja	4 year O&M, water & wastewater	Aquamundo

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
B'wasser/Aqua	Amiantit (Saudi)/RWE (Germany)	100,000	100,000	<b>100,000</b>
Berlinwasser	Veolia (France)/RWE (Germany)	450,000	450,000	<b>450,000</b>
Aquamundo	Saudi Arabian Amiantit (Saudi Arabia)	77,000	25,000	<b>77,000</b>

Source:

UNECE (2002) Environmental Performance Review of Albania, United Nations Economic Commission for Europe, Geneva, Switzerland

World Bank (2004) Albania: Urban and Rural Water and Sanitation Reforms. Paper at the Scaling Up Poverty Reduction conference, Shanghai, China 25-27<sup>th</sup> May 2005

BURIMI, Newsletter of the Water Supply and Sewerage Association of Albania, 7-2 (October 2006), 7-3 (December 2006), 6-3 (December 2005)

## ALGERIA

### Service expansion plans

All water and sewerage services, where provided on an organised basis, are provided by the state. Finance is currently provided by the state, along with World Bank, African Development Bank and the EIB providing project funding. 92% of the urban population receives piped water but supply is intermittent, partly due to the poor condition of the networks, with distribution losses estimated at 40% in 2003. There are 54 wastewater treatment works, with a total PE of 3.7million, but many of these are understood to be out of service. Extending sewage treatment to the rest of the population living in the 13 major cities will cost an estimated USD450million by 2020 and extending water and sewerage services to the 1.1million people living in the 75 secondary towns and cities by 2025 will cost a further USD2billion for water and USD4billion for sewerage and sewage treatment.

Algerienne des Eaux (ADE) is owed DZD25billion (EUR293million) because of irregular payments by customers and illegal connections. ADE announced in July 2003 that it would install 190,000 water meters and that its long-term plans included handing over management to private companies. The National Sanitation Office in 2005 observed that current tariffs only cover 10% of operating costs. The Government is to pay for the outstanding costs and to repair eight WWTWs and build 12 new facilities.

### Privatisation prospects

The Algerian Government's Agence Nationale de l'Eau Potable et Industrielle et de l'Assainissement is seeking to open the water industry to private sector finance and management. By reforming the sector it hopes to attract both domestic and foreign capital to finance improved water supply, wastewater collection. PSP will be introduced in stages, from management contracts towards full concessions as the regulatory climate evolves to be able to manage these contracts. Suez developed a 5+5 year management contract for water and wastewater services for Algiers, worth USD5-6million pa.

Algeria's Parliament, the National Peoples Assembly (APN), is examining a new set of water laws to replace Code 83-17 from 1983. Among the provisions are a new tariff system to cover the actual costs of renovating and expanding potable water, sewer, and irrigation infrastructure. The code would also allow public water and sewer services to take on private partners, encourage water-saving irrigation methods, and give the Government more power to regulate water quality and protect areas with vulnerable ecosystems. It specifies penalties for breaking environmental regulations and creates "water police" to enforce them. From 2006, Agence Nationale des Barrages (dams), Algerienne des Eaux (water provision), Agence Nationale de Realisation et de Gestion des Infrastructures Hydrauliques pour l'Irrigation et le Drainage (drainage) and Office National d'Assainissement (wastewater treatment) will be combined under a single agency.

### Desalination projects and prospects

Facility	Capacity (m <sup>3</sup> /day)	Cost (USD)	Comments
Hamma	200,000	250million	25 year BOO awarded to GE (USA) & AEC (Algeria)
Cap Dijnet	100,000	100-140million	DFBO under consideration
El Tarf	50,000	55-60million	DFBO under consideration
Mostagenem	100,000	100-140million	DFBO under consideration
Jijel	50,000	55-60million	DFBO under consideration

GE Infrastructure Water & Process Technologies holds 70% of the operating company for the Hamma contract, with the Government's AEC holding the remaining 30%. A similar pattern is expected for forthcoming awards.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	Contract	Company
Hamma	Desalination BOO	GE (USA)
Taksebt	Water treatment	Suez
Athmania	Water treatment	Suez
Algiers	Water & wastewater	Suez

Private sector company operations (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
Suez	Suez (France)	6,500,000	3,500,000	<b>6,500,000</b>
Hamma WD	GE (USA) & AEC (Algeria)	1,000,000	0	<b>1,000,000</b>
Geida	Refesa (Spain)	1,500,000	0	<b>1,500,000</b>

Sources:

Global Water Intelligence, May 2005 (6/5) & July 2005 (6/7)  
Water Market Middle East (2005) Global Water Intelligence, Oxford, UK

## ARMENIA

Municipalities are responsible for the water supply and wastewater treatment of communities. The municipal wastewater and water supply investment costs are financed mainly by municipalities themselves, and operation and maintenance costs, including capital costs, covered by the users in compliance with the 1997 Water Code. 1.7million people (60% of the 2002 population) live in 19 towns and cities, including 1.1million in Yerevan.

Public waterworks served 98% of the urban population in 2002. With a 66% unaccounted for water rate in that year, utilities sold just 177million m<sup>3</sup> of the 540million m<sup>3</sup> of water they abstracted. Water supply systems are operated mainly by pumps. Due to the current energy crisis the operation of pumps is essentially inadequate and water supply is often restricted to 2-4 hours in the mornings and evenings. The percentage of tap water samples with bacterial contamination rose from 9.4% in 1990 to 11.6% in 2000. Sewerage services cover 88% of the population in the four cities with more than 50,000 people, but only 52% of the 15 smaller towns. There are 20 wastewater treatment works, all built before 1990 at a time when they did not need to pay for energy. By 2002, five WWTWs were still in operation, all at the primary level only.

Average spending on water services by the Government and industry between 1996 and 2001 has been estimated by the OECD at EUR5million pa. The 46 district branches of the Armenia Water and Sewerage Company (AWSC) will be transformed into legally independent entities that can jointly or alone contract out with the private sector under different forms of private sector participation.

### The Yerevan management contract

The World Bank has made two loans worth USD80million to Yerevan for improving water and sewerage services, especially in poorer areas. In 2000 ACEA (Italy) and Lotti and Associati e WRc (UK) started an operations and management contract for Yerevan. In 2000, just 21% of billed accounts were paid. Billing collection was revived through the introduction of metering from 2002, with an increase in the number of registered customers from 275,500 in 2002 to 311,056 by April 2004; with 245,000 of these being metered and 28,000 are non-active accounts (empty apartments, etc). Instead of charging domestic customers for a nominal per capita consumption of 250L/day, customers are now being billed for actual usage, working out at 100-120 Lc/day.

Yerevan, service indicators	1999	2003	2004
Water provision (hours/day)	6	13	16
Apartment Metering	56%	N/A	95%
Revenue collection	21%	87%	100%

30% of Yerevan's population lives below the poverty line. The introduction of metering has improved service affordability for these people. In 2002, the bottom quintile spent 8.1% of their income on water services. This fell to 5.0% in 2003 and to about 4% in 2005, despite a 50% overall tariff increase in April 2004. In 2005, the contract expired and a 10 year management contract was awarded to Veolia with EUR160million of EBRD support, concentrating on reducing distribution losses and service pension.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	Contract	Company
Yerevan	10 year management	VE

Private sector company operations (Please see the relevant company entry for details)			
Company	Parent company (country)	Population served	
		Water	Sewerage
VE	Veolia Environnement (France)	1,000,000	0
			<b>1,000,000</b>

#### Sources:

OECD (2004) Financing Strategy for Urban Wastewater Collection and Treatment Infrastructure in Armenia, OECD EAP, Paris, France

ACEA (2003) Facing a crisis of confidence in PSP in the water sector: The Yerevan experience, presentation to the World Bank conference, 2-3 July 2003, Vienna, Austria

World Bank (2005) Project appraisal document 30251, Yerevan water and wastewater project, 25<sup>th</sup> January 2005. Europe & Central Asia Region

**AUSTRIA**

<b>Economics (2005)</b>	
GDP per capita	USD36,980
GDP per capita (PPP)	USD33,140
GDP in Agriculture	2%
GDP in Industry	31%
GDP in Services	56%

**Water and sewerage services**

Officially, all urban and rural households have access to safe water provision and sewerage services. In 1990, 28% of the population had no sewage treatment, while 7% had tertiary treatment, 60% secondary treatment and 5% primary treatment. The proportion of the population connected to sewerage services increased from 38% in 1980 to 72% in 1987. The sewerage service coverage has remained at this level. Most industrial plant has secondary treatment for effluents. More than 85% of effluent in terms of its chemical oxygen demand is subject to sewage treatment, which results in a 95% reduction of loads from these sources.

<b>Population</b>	
2005 (million)	8.2
2015 (million)	8.3
Urbanisation in 2005	66%
Urbanisation by 2015	67%
In urban agglomerations, 2000	27%

<b>Inland water quality</b>		
<b>Class</b>	<b>1988</b>	<b>2001</b>
1	9%	6%
1-2	18%	28%
2	39%	53%
2-3	21%	12%
3	10%	1%
3-4	2%	0%
4+	1%	0%

<b>Urban Data</b>	
Served by piped water	100%
Access to sewerage	95%
With sewage treatment	c99%

**Development of sewage treatment**

<b>Sewerage and sewage treatment</b>	<b>1980</b>	<b>1990</b>	<b>2001</b>	<b>2004</b>
Tertiary	3.0%	7.0%	81.0%	83.0%
Secondary	25.0%	60.0%	5.0%	5.0%
Primary	10.0%	5.0%	0.0%	0.0%
Sewerage only	27.0%	0.0%	0.0%	1.0%
Not connected	35.0%	28.0%	14.0%	11.0%

**Compliance work and longer term plans**

The Austrian Government has been using EU legislation since the early 1990s and spending on sewerage and wastewater treatment infrastructure between 1998 and 2003 was at an average of USD655million pa. The cost for the maintenance, modernisation and expansion of existing sewage collection and treatment systems, is expected to be EUR10billion between 2001 and 2012. Austria met its 2010 sewerage objectives in 2001 along with effective compliance with the EU Urban Waste Water Treatment Directive (UWWTD) in 2002.

The Austrian Waters Act of 1959 is regarded as a sound piece of law, with full coverage, but has been let down in the past by the lack of effective implementation. The National Environmental Plan (NUP) was launched in 1997, with a 20 to 25 year period for implementation. The NUP is currently undergoing a revision and assessment programme prior to its formal implementation, along with a comprehensive water resources management plan.

<b>Freshwater</b>	
Annual availability (1998)	55.0km <sup>3</sup>
Per capita	9,569m <sup>3</sup>
Annual withdrawal (2000)	2.1km <sup>3</sup>
Domestic (2000)	35%
Industrial (2000)	64%
Agriculture (2000)	1%

<b>Municipal entity</b>	<b>People served</b>
Wasserwerke Wein	1,540,000
Nösiwag	460,000
Stadtbetriebe Linz	285,000
Grazer Stadtwerke	230,000
Salzberger Stadtwerke	143,000
Innsbrucker Kommunalbetriebe	125,000
Wasserwerke Eisenstadt	119,000
Stadtwerke Klagenfurt	91,000
Wasserwerke St Pölten	49,000
Wasserwerke Bregenz	33,000

Source: EVN, analysts' presentation 2001.

<b>Groundwater</b>	
Annual availability (2000)	22.3km <sup>3</sup>
Per capita	2,716m <sup>3</sup>
Annual withdrawal (1989)	0.6km <sup>3</sup>
Domestic (1987)	52%
Industrial (1987)	43%
Agriculture (1987)	5%

### Privatisation gently emerges

90% of water is directly provided from municipal utilities. A degree of agglomeration is taking place, and there are reasonable expectations of private-public partnerships evolving, rather than outright privatisation in the medium term. The Government's Water Management Fund is used for the financing of water and sewerage infrastructure, and water is seen as being cheap when compared to German water. Wasserwerke Wien has been seen bidding for water and sewerage concessions in central and Eastern Europe, and Stewag, the Styrian electricity utility, is working with Suez on projects and was part of the Maribor consortium in Slovenia.

### Major cities

City	2000	2015	Comments
Vienna	2,065,000	2,069,000	Corporatisation of Vienna Water

In 2003, EVN acquired WTE from Berlinwasser (see RWE company entry). WTE specialises in services for the planning, design and construction of water and wastewater treatment plants in Germany and Central and Eastern Europe. EVN is seeking to develop WTE into a water and wastewater service provision entity. In 2003, Vienna Wasser set up the Aquaplus private sector joint venture for contracts in Austria and Eastern Europe, while Energie AG has made investments in the Czech Republic, acquiring some of AWG stakes there.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
Location	Contract	Company
Lower Austria	Operation of water services	Nösiwag
Waidhofen	WWTW BOT	Ariwa
LWU	Operation of water services	LWU

During 2005, EVN's activities were extended to cover the direct supply of water services to customers and the management of wastewater services.

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
Nösiwag	EVN (Austria)	480,000	0	480,000
Ariwa	Aquaplus (Austria)	0	10,000	10,000
LWU	Energie (Austria)	150,000	0	150,000

Source:

OECD Environmental Performance Review: Austria. OECD, Paris, 2003

## AZERBAIJAN

In Baku and the major cities, 95% of the population is connected to water supplies, compared with 83% in other urban areas and 11% for rural areas. Sewerage services cover 78% of the Greater Baku area and 32% of other urban areas. Some 50% of Baku's sewage effluents are treated, but the facilities only operate to primary level. Service delivery is a severe problem, with water typically available for four hours a day in Baku and considerable indirect evidence of contaminated water supplies, with 30% of samples failing bacteriological standards in 1996. This is due to investment in infrastructure effectively ending in the late 1980s. Unaccounted for water amounts to for at least 50% of urban supplies.

### Access to improved drinking water and sanitation (urban)

	1990	1995	2000	2004
Drinking water	82%	85%	92%	95%
Household connections	66%	68%	74%	76%
Sewerage	N/A	73%	73%	73%

Source: UNDP WSSINFO, June 2006

Baku's water and wastewater services are operated by two independent, corporatised entities, the Apsheron Regional Water Company for water and the Baku Wastewater Department. A further 1.7million people are served by 59 Vodokanals (public water utilities).

Secondary cities and towns	62
With water treatment works	15
With sewerage network	29
With wastewater treatment works	19

In June 2003, the World Bank's Public-Private Infrastructure Advisory Facility started consultations over possible private sector provision of water and waste water services in the Greater Baku metropolitan area. These are still ongoing. In December 2004, the Asian Development Bank approved a USD30million loan, which will be combined with USD9.9million in Government financing to construct and rehabilitate the water supply and sanitation infrastructure in the towns Agdash, Goychay, and Nakhichivan. This will involve the corporatisation of the entities and is part of a general drive towards cost recovery for water services, which was adopted by the central Government in 2005.

Source:

World Bank (2000) Azerbaijan Water Supply and Sanitation Sector Review and Strategy, World Bank,

## BAHRAIN

### Groundwater depletion is the current concern

The Gulf state of Bahrain had a population of 733,000 in 2004, 90% of whom are in urban areas. The leading cities are Manama (140,000 people) and Muharraq (74,000). According to the Ministry of Electricity and Water, there were 148,000 customer accounts in 2004. Indigenous water sources (all using artesian aquifers) generate 0.11million m<sup>3</sup> of water per day, compared with a current water demand that peaks at 0.34million m<sup>3</sup> per day in the summer and 0.27million m<sup>3</sup> per day in the winter. Currently, 82% of water is taken from groundwater sources. Although groundwater abstraction is being replaced by desalination, it will take 1400 years to recharge the country's groundwater sources. Agriculture has already been impacted by groundwater degradation.

Year	Demand (mg/d)	Population
1970	12.62	220,000
1980	26.70	340,000
1990	61.70	490,000
1994	66.75	560,000
1998	101.00	650,000
2004	106.00	733,000

In 2000, 40% of municipal and industrial effluents were treated, 30% of these to tertiary standard, with the recovered water contributing to 4% of water needs. Recycling of other used water resources has been developed, with 60% of these waters going to agriculture. Currently, 81% of the population is been connected to the sewerage network, with the aim of 95% coverage by 2020. Since 2005, treated effluents from the Tubil wastewater treatment facility are being utilised for agricultural and landscape irrigation and replacing groundwater extraction. Once trials have been completed, the facility will provide 70million m<sup>3</sup> pa of treated effluent. By expanding tertiary treatment to cover all effluents, it is hoped to recover 200,000m<sup>3</sup> of water pa by 2010, or some 20% of the total demand.

### Privatisation plans

The Government has been developing a timetable for the privatisation of water and electricity services. In 2003, Bahrain selected Ernst & Young to lead a group of companies to restructure the water and electricity sectors as part of its utilities privatization programme as part of a 15 year water and power plan. At the same time, an Electricity & Water Sector Privatisation Committee was set up. Currently the Government provides some BHD24million (USD65million) in subsidies for water that costs 260fils/m<sup>3</sup> to produce and 65fils/m<sup>3</sup> to sell. Bahrain has reduced its levels of unaccounted-for-water (UFW) from 35% in 1993 to 25% by 2005. This includes an 18% loss through poorly fitted domestic systems.

### Desalination realities

In 2005, peak production for domestic water was 107million gal/day, mainly through five desalination plants:

Al Hidd	30.0million gal
Sitra	25.0million gal
Ras Abu Jarjur/Al Dor	15.0million gal
Alba	7.5million gal
<b>Total for desalination</b>	<b>77.5million gal</b>
Groundwater	29.5million gal

The entire Al Hidd water and power facility (phases 1 & 2) will be placed in private ownership as part of its current expansion plans, which envisage raising its water desalination capacity to by 60million gal/day per day through the USD1billion phase 3. During 2005, the Government has met potential bidders for the project.

**BELGIUM**

<b>Economics (2005)</b>	
GDP per capita	USD35,700
GDP per capita (PPP)	USD32,640
Agriculture	1%
Industry	25%
Services	73%

**Regulation and legislation**

Water policy in Walloon is based on the 1967 law on non-navigable water resources, the 1985 decree for the protection of surface water (modified by the decrees of 1993 and 1996), and the 1990 decree for the protection and use of groundwater and drinking water. The Brussels region is covered by the 1971 law for the protection of groundwater against pollution, the 1983 law concerning water quality objectives and the 1993 regional prescription on environmental permits. Additional legislation concerning integrated permits for the release of wastewater and the taxation of wastewater were passed in 1992 and 1996 respectively. In Flanders water and sewage is integrated into a series of Five Year Environment Policy Plans (MINA). Every two years, a State of the Environment Report (MIRA) is produced. An Environment Programme is issued each year. General Water Treatment Programmes (AWP) are being designed especially for surface water. Nationally, cost recovery for sewerage is about 70%, although it is only 30% in Brussels. Since 1996, a series of levies have been developed for domestic, industrial and agricultural users.

<b>Population</b>	
Total (2005million)	10.5
Total (2015million)	10.5
In urban areas (2005)	97%
In urban areas (2015)	98%
In urban agglomerations (2000)	11%

**Water quality**

According to a UNESCO survey published in March 2003, Belgium has the world's worst water. The survey examined river water quality as well as drinking water. The next EU country was Germany, 56 places above Belgium.

Both ground and surface waters are polluted by nitrates. The river Meuse is polluted by industrial effluents including chlorides, fluorides and phosphates, although it is an important source for drinking water abstraction. The most important aquifers used for drinking water production are to be found in Walloon. Drinking water is generally considered to be of good quality. In East Flanders, the water table has fallen by up to 100 metres because of the over-abstraction of water resources. As a result, the regional Government is now charging a EUR0.050-0.125/m<sup>3</sup> levy for the abstraction of groundwater from private sources.

<b>Inland water quality</b>	<b>1980</b>	<b>1990</b>
I-Good	56%	17%
II-Fair	17%	31%
III-Poor	16%	15%
IV-Bad	11%	37%

The quality of Belgium's rivers appears to have deteriorated notably between 1980 and 1990. This reflects the cumulative legacy of the country's outdated sewage treatment system and a belated acknowledgement as to the challenges the country has to face so as to comply with the UWWTD. In the Meuse Basin (73% of Walloon) water quality is generally grade II and better, except the Sambre River, half of which is grade III/IV. The Yser Basin (Flanders) is mainly grade III/IV. The Escaut Basin (the entire Brussels Region, the majority of Flanders and 22% of Walloon) are all grade III/IV except for the River Dyle in Walloon which is grade II. In consequence, Belgium has the highest concentration of Class IV inland waters in the EU.

<b>Urban Services</b>	
% Water	98%
% Sewerage	71%
% Sewage treated	45%

**Developing the sewerage network**

There were 292 sewage treatment works in 1988, of which 13 served cities with a population in excess of 100,000. Some 4% of the population of Belgium had their sewage treated in 1970. This rose to 23% by 1980. As noted in the company entry for Aquafin (sewerage and sewage services for Flanders), the limited extent of the sewerage network is currently constraining the effectiveness of the sewage treatment infrastructure.

<b>Sewerage and sewage treatment in 1999</b>		
	<b>Sewerage</b>	<b>Treatment</b>
Walloon	60%	38%
Flanders	78%	52%
Brussels	85%	0%

Since 2001, the entire Walloon region has been classified as a sensitive area under the EU's UWWTD, meaning that all wastewater treatment works with a PE of above 10,000 will have to provide tertiary treatment. By 2003, the region had 127 wastewater treatment plants in operation.

<b>Sewerage and sewage treatment in 2003</b>		
	<b>Sewerage</b>	<b>Treatment</b>
Walloon	60%	50%
Flanders	86%	60%
Brussels	90%	33%

According to the Government, the main challenge faced by the Flanders Region is maintaining its investment plans in the face of planning delays. This means that the region is unlikely to achieve universal sewerage coverage by 2015 at the earliest. 80% wastewater treatment is expected to be reached by 2007.

<b>Sewerage and sewage treatment by 2005</b>		
	<b>Sewerage</b>	<b>Treatment</b>
Walloon	80%	80%
Flanders	86%	60%
Brussels	90%	33%

In the Brussels region, the stormwater and domestic sewerage systems need to be separated. The cost implications are driving the need for private sector involvement for the city's third sewage treatment plant. Universal wastewater treatment will be achieved for Brussels by 2006-07, but the rest of the country is set to fail to meet the EU UWWTD's by several decades.

#### The costs of compliance

<b>Regional water budgets 2000 (EURmillion)</b>			
<b>Region</b>	<b>Area</b>	<b>Period</b>	<b>Cost</b>
Brussels	Water opex & capex	10 years	618
Flanders	Drinking water	Annual	620
Flanders	Sewerage	Annual	248
Walloon	Wastewater	2000-04	790

Charges in the Brussels region cover 30% of costs against 70% in Flanders and Wallonia.

<b>Freshwater</b>	
Total (1998, km <sup>3</sup> )	8.4
Per capita (2000, m <sup>3</sup> )	1,770
Withdrawals (1980, km <sup>3</sup> )	9.0
For domestic use (1987)	11%
For industry (1987)	85%
For agriculture (1987)	4%

#### Private sector participation

With the exception of Brussels North and some local water provision contracts, the sector remains in public hands. The distributors are usually responsible for the production of the water, although they sometimes also produce for other regions or buy the water from regional producers. Water distribution and sewerage are organised in regional groupings. In Flanders, water is operated through the VMW, 8 intermunicipal consortiums and 22 municipal or urban organisations. Sewerage is run by Aquafin. 49% of Aquafin's equity was held by the private sector (Severn Trent was the major player with a 20% stake) from its foundation in 1991 to these shares being bought back in 2006. In the Brussels Region, water is operated through Compagnie Intercommunale Bruxelloise des Eaux (CIBE). In the Walloon Region, water management is organised through the SWDE, 22 intermunicipal consortiums, 16 private concessionaires (Régies) and 110 municipal organisations.

<b>Groundwater</b>	
Total recharge (1998, km <sup>3</sup> )	0.9
Per capita (1998, m <sup>3</sup> )	84
Withdrawals (1980, km <sup>3</sup> )	1.0
For domestic use (1980)	68%
For industry (1980)	27%
For agriculture (1980)	5%

### Privatising sewage treatment in Brussels

In Brussels, the private sector operation of new sewage treatment works is currently being developed by corporatising each new facility before putting the operation out to tender. The O&M contract for the first facility in Brussels was in fact won by the municipal water company and thus remains in the public sector. Planning and construction of the Brussels South sewage treatment works started in 1992 and entered service in 2000, serving a PE of 360,000 and costing GBP125million. It is to be operated by Brussels' CIBE. The BOT for the Brussels North sewage treatment works was bid for by VE, Suez, Bouygues and BSUB (Seeghers, Besix, UU and Bechtel) and was awarded to VE. The facility will cost EUR290million and construction started in 2002, and was completed in 2006. Revenues of EUR49.6million pa will be generated over the BOT's 20 year life.

<b>MAJOR CITIES</b>			
<b>Population</b>	<b>2000</b>	<b>2015</b>	<b>Status</b>
Brussels	1,135,000	1,135,000	Brussels North STW privatised

<b>Private Sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Brussels North	Sewage treatment BOT	Aquiris
West Flanders	Water management for IWOV	Aquinter
Flemish Brabant	Water management for IWVB	Aquinter

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Aquinter	Tractabel (Suez, France)	300,000	0	<b>300,000</b>
Aquiris	VE (France)	0	1,135,000	<b>1,135,000</b>

## BULGARIA

<b>Economics (2005)</b>	
GDP per capita	USD3,450
GDP per capita (PPP)	USD8,630
Agriculture	9%
Industry	30%
Services	60%

### Legislation and management

The Ministry of Environment and Waters is responsible for co-ordinating water resource management and development. Co-ordinating bodies are being developed at the river basin level. The Law on Waters was passed in 1998. Integrated water resource management is currently being developed through the strategy for unified management of waters and the strategy for development of the use of water resources and water preservation.

Under these plans, the Government is to develop and implement a permit system for effluent discharges using a phased approach with interim limits and enforceable compliance schedules. In addition, the cost recovery of services is to be improved through focusing on water metering and collection practices, along with the implementation of a water effluent charge. The funding of the completion of unfinished sewage treatment plants is being given priority in areas where maximum benefits will occur, especially in tourist areas.

<b>Population</b>	
Total (2005, million)	7.7
Total (2015, million)	7.1
In urban areas (2005)	70%
In urban areas (2015)	74%
In urban agglomerations (2000)	13%

<b>Inland water quality</b>	
	<b>1993</b>
Ia-II Very Good/Fair	35%
III-IV Poor/Bad	65%

The period after 1989 has seen a significant reduction of discharges into surface water and ground water bodies, resulting in an improvement in their quality. The OECD has also noted a gradual improvement in river water quality between 1990 and 1994. This improvement is probably due more to the restrictions imposed on industrial effluent discharges and the closing down of certain industrial enterprises, than due to industrial water treatment projects.

The Government believes that 100% of the country's groundwater is contaminated with nitrates and in the most intensive farming areas the level exceeds by at least a factor of two the limit of 50mg/gL. In regions with mining and heavy engineering industries, the drinking water also contains metals and arsenic. Approximately 55% of the population in these regions (482,983 people), periodically receive sub-standard water. Of these people, 99.4% drink water with high iron, manganese and zinc levels, while 0.6% drinks water with excessively high lead and arsenic levels. Bacterial contamination has increased in recent years, exceeding EU and WHO standards in 5% of all samples.

<b>Urban services</b>	
% Water	95%
% Sewerage	71%
% Sewage treated	40%

### Infrastructure development

98% of the population (in 238 towns and 4,278 villages) are covered by the mains water supply. 95% of drinking water supplied comes from localised sources serving one hundred to several thousand consumers.

It is understood that most of the sewage treatment capacity is to the primary standard, while no tertiary treatment facilities are currently in operation. Many of the new municipal wastewater treatment plants are currently incomplete because of the problems in obtaining suitable funding. The Government believes that it will take some decades to address the country's water infrastructure shortfalls. The Government has identified the construction of a series of tertiary treatment facilities as one of its main current priorities.

### Development of sewage treatment

Sewerage and sewage treatment	1993	1998	2003	2005
Tertiary	0.0%	0.8%	1.0%	1.0%
Secondary	34.4%	35.0%	37.0%	37.0%
Primary	0.7%	0.9%	2.0%	3.0%
Sewerage only	31.4%	30.0%	28.0%	28.0%
Not connected	33.5%	33.3%	32.0%	31.0%

Bulgaria joined the EU in January 2007. According to the Government, it needs BGL6.8billion (EUR3.6billion) to modernise its water supply and sewerage systems to comply with European Union standards. BGL3.37billion (EUR1.77billion) is needed for the rehabilitation of the water supply network and reduction of water losses. The Ministry plans to construct sewerage systems in cities of more than 30,000 people and to build wastewater treatment plants for BGL3.4billion (EUR1.8billion). The Government hopes to raise at least 40% of the required funds through private investment in the form of concessions, operation and management contracts, and JVs. The remainder would come from grants and loans from the EU ISPA programme and the European Investment Bank (EIB). Implementation of the improvements will be the task of an executive agency for water supply and sewerage to be established by the Ministry for Regional Development and Public Works.

The length of the urban sewerage network in 2001 was 7,718km against 400km in villages. The number of settlements connected to a sewerage system that year was 272: 167 cities and 105 villages. The sewerage system covers 48.5% of the total length of cities' streets, in villages this percent is 0.6%. Sewers are of a mixed type, mainly with concrete and steel-concrete pipes. Over 20% of sewers need to be replaced. Up to now 62 urban wastewater treatment plants (WWTP) have been constructed, from which 11 have only mechanical treatment of the water and 51 have also biological treatment. They service over 53 populated areas and 40% of the population of the country.

Bulgaria's "National Programme for Priority Construction of Urban Wastewater Treatment Plants" for settlements of over 10,000 population equivalent (1999-2014), adopted in 1999 by the Council of Ministers, entails the construction of 81 new wastewater treatment plants and the rehabilitation and upgrading of 23 operating plants. Out of the 104 priority facilities, 36 should have been built and reconstructed up to 2007. Investment needed is about EUR550million. This Programme is currently being updated to include settlements with population equivalent between 2,000 and 10,000. According to the Implementation Programme, until 2014 EUR2,218million is needed for building the sewerage systems and waste water treatment plants for all 430 agglomerations that are within the scope of the UWWTD.

Freshwater	
Total (1998, km <sup>3</sup> )	18.0
Per capita (2000, m <sup>3</sup> )	2,721
Withdrawals (2000, km <sup>3</sup> )	10.5
For domestic use (2000)	3%
For industry (2000)	78%
For agriculture (2000)	19%

### Privatisation and investment

The EBRD is carrying out a number of projects concerned with its Danube River Basin plan (DDEMP-Danube Delta Environmental Management Programme) for the Sofia Municipality and a number of other towns for developing initiatives for the financing of non-sovereign projects for water provision and effluent treatment. Currently the main objective is to develop methods of financing investment into infrastructure. The EU's ISPA has provided grants worth EUR238million for 16 projects with a total value of EUR330million. Structural funding worth EUR2,300million will be made available between 2007 and 2009 as part of the EU Accession process. Since 1998, state controlled water companies have been restructured into corporatised entities with 49% of their equity transferred from the state to the municipalities.

Groundwater	
Total recharge (1998, km <sup>3</sup> )	13.4
Per capita (1998, m <sup>3</sup> )	1,598
Withdrawals (1988, km <sup>3</sup> )	5.0

Two 25 year concessions covering 0.67million people in northern Bulgaria are still under consideration, having originally been set to be privatised in 2002. Five companies have pre-qualified: Suez, VE, Cascal (Bewater/Nuon), UU, VE and RWE (Thames). The Varna (470,000 people) and Shumen (200,000 people) concessions involve capex of USD74million and USD51million respectively.

MAJOR CITIES			
Population	2000	2015	Status
Sofia	1,187,000	1,187,000	Water & sewerage services privatised

### Privatisation of Sofia's water services

Vodosnabdjavane I Kalanizatsia (ViK) was founded in 1884 and is responsible for Sofia's water and sewerage services. 51% of ViK's equity was sold to International Water and United Utilities in 2000, after a privatisation programme was developed with the EBRD in 1996. IW's shares were acquired by UU and the EBRD in December 2003. 1.5million people are served by the utility, including 1.2million in the city, with 800,000 individual metered accounts. BGL 130million was invested between 2000 and 2004 against a planned investment of BGL 125million. By 2015, BGN 300million will have been invested in the service. The city's 1,700km sewerage system has been extended to 2,086km. Distribution losses in Sofia fell from 64% in 1996 to 52% in 1997, with 30% losses by 2004. The proportion of bills collected has increased from 75% to 90%. In March 2005, polling found broad support for shutting supplies to non paying customers, who owe BGL 34million to the utility, 80% being domestic and 20% being commercial and municipal clients.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	Contract	Company
Sofia	25 year water and sewerage concession	UUI

Private sector company operations (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		Total
		Water	Sewerage	
UUI	United Utilities (UK)	1,200,000	1,200,000	<b>1,200,000</b>

## BURKINA FASO

ONEA, the National Office for Water and Sanitation (Office National de l'Eau et de l'Assainissement) is responsible for water and sanitation in the 36 urban areas of Burkina Faso. ONEA has the reputation of being one of the best performing companies in Western Africa.

While the supply of water to Ouagadougou is currently growing by 3% pa, the city's population (1.1million in 2004) was growing at 4% pa. The four dams serving Ouagadougou supply about 70% of the city's demand, currently estimated at 80,000m<sup>3</sup>. During a water shortage in 2003, the price of water purchased from private tankers rose from XOF200 per 200L to XOF1,500-2,000 equivalent to USD17.50 per m<sup>3</sup>.

ONEA has been spending USD30million pa on water projects and services in recent years, much of this on the Ziga dam project. The USD250million dam at Ziga, 40km north of the city will allow 50,000 new customers to be added to the 40,000 who currently receive piped water in Ouagadougou. The actual connection rate in Ouagadougou is approximately one household connection per 36 people.

The Ziga dam will also facilitate 400 more public fountains to the 600 currently in use.

### Water coverage in Burkina Faso

WHO/UNICEF estimates	1900	1995	2000	2002
Urban-Access to improved drinking sources	71%	74%	77%	78%
Urban-Household connections	24%	24%	23%	23%
Rural-Access to improved drinking sources	39%	40%	42%	42%
Rural-Household connections	0%	0%	0%	0%

In June 2001, Veolia and Mazars et Guerard started a five year service contract with ONEA designed to improve the authority's management systems in anticipation of the Ziga dam's opening in 2006. In 2002, Ondeo Degrémont was contracted to construct a EUR19million water treatment plant on the Ziga pipeline, 15km from Ouagadougou, which will provide a daily water output of 60,000m<sup>3</sup>.

The Government of Burkina Faso decided in April 2005 to allowing private investors to re-enter the water and sewerage sectors on a limited basis. An agreement was signed with Denmark to start a pilot development program (PADSEA). DKK10.3million has been contributed by Danida in 2005 for capacity building and related work in this area. This programme aims to improve the quality of the private water and sanitation operators. A commission of NGOs, businesses and research groups has identified that the major challenge lies in the adaptation to the conditions and procedures of free trade.

Sources:

WHO/UNICEF Joint Monitoring Plan: Coverage Estimates, Improved Drinking Water; Burkina Faso, July 2004

International Secretariat for Water (2005) Blue Book, Burkina Faso, ISW, Montréal, Canada

**CAMEROON**

<b>Economics (2005)</b>	
GDP per capita	USD1,010
GDP per capita (PPP)	USD2,150
GDP in Agriculture	41%
GDP in Industry	14%
GDP in Services	45%

**Water provision**

In 2003, 44% of the total population was served with piped water. Water deliveries for domestic usage are running at 200million m<sup>3</sup> pa, with the aim of increasing this to 300million m<sup>3</sup> pa by 2010 and 400million m<sup>3</sup> pa by 2020. 75% of the rural population and 30% of the urban population still lack potable water.

<b>Population</b>	
2005 (million)	16.3
2015 (million)	20.2
Urbanisation in 2005	55%
Urbanisation by 2015	60%
In urban agglomerations, 2000	22%

**Services in Yaoundé**

Yaounde's SNEC has had trouble breaking even on a 2002-03 turnover of XAF20billion (USD40million), down from XAF23billion in 2001-02. Currently, SNEC has 194,000 subscribers, serving 4.0million people and needs XAF11billion in new capital, along with seeking to recover XAF8billion owed by the state. It is 94% owned by the state, with 6% held by private investors. In 1993, 85% of the population of Yaoundé had access to potable water, along with 3% having sewerage. A similar level of service is found in Douala, the second city. In 1999, water was rationed in Yaoundé because of problems at a treatment plant. Yaoundé has been divided into three sectors; each receiving water only three times a week due to a leaking pipeline at a WTW 50km south of Yaoundé, which SNEC does not have the capacity to repair. In 2004, there were 500 cases of cholera and 13 fatalities in Douala due to people drinking from unprotected wells.

<b>Urban data</b>	
Served by piped water	78%
Access to sewerage	64%

<b>Freshwater</b>	
Annual availability (1998)	268.0km <sup>3</sup>
Per capita	17,520m <sup>3</sup>
Annual withdrawal (2000)	1.0km <sup>3</sup>
Domestic	18%
Industrial	8%
Agriculture	74%

**Privatisation of SNEC...for a while**

Suez was awarded the 20 year water supply concession for Société National des Eaux de Cameroon (SNEC) in May 2000. This involves EUR300million capex on network rehabilitation and extension and the fitting of water meters. SNEC supplies water to over 103 towns and cities including Douala & Yaoundé. Implementing privatisation has been slow. As a result, the Government is planning to decentralise the daily management of water from SNEC to local Governments. In September 2004, Suez announced that this concession was being revoked. The Government has subsequently announced that it is seeking a new contract for managing SNEC, probably through a lease.

<b>Major Cities</b>			
City	2000	2015	Comments
Douala	1,642,000	2,607,000	SNEC privatised 2000-04
Yaoundé	1,420,000	2,281,000	SNEC privatised 2000-04

## CENTRAL AFRICAN REPUBLIC

The Central African Republic (CAR) had a population of 3.8million in 2002, 42% living in urban areas. Overall, 59% of people living in urban areas are regarded as having reasonable access to safe drinking water and 83% for sewerage. The former figure is for 1996 and compares with an estimate of 19% by the FAO in 1990.

### **Making water provision viable...**

In 1988, the CAR's Société Nationale des Eaux de Centrafrique (SNE) was virtually bankrupt, with a negative equity equivalent to 50% of sales. At the beginning of 1989, Bouygues' SAUR-Afrique was invited to develop a management plan and a related performance contract. In 1991, SAUR-Afrique was granted a 15 year concession to operate SNE's assets. Société de Distribution d'Eau de Centrafrique (SODECA) was capitalised in December 1991 as a limited liability company in which the State holds a 25% minority stake. SNE continues to exist as an asset-holding company. Under the authority of the ministry responsible for water, SNE and SODECA fix tariffs and modify them according to an agreed formula.

In the Central African Republic, the privatisation of water took place in 1991, with the creation of SODECA as an operating company and SNE as an asset-owning company. 21% of staff left in the first year due to voluntary redundancies and natural wastage, but staff numbers have subsequently stabilised. The new private operating company was given two objectives: to cut water rates and to restore the sector's financial balance securely. In fact, in 1992, SODECA was allowed to increase the water rates for the first time since 1984. The rate for the first segment of consumption was doubled, while for hydrants it was increased by 16%, and for large consumers there was a rise of 65%. As a result, turnover from water sales increased from XAF1.5billion in 1992, to XAFF2.5billion in 1995. This rise was due both to the 1992 tariff increase and to sub-contracted engineering work on behalf of the asset-owning company.

By 1996, the company had moved from near-bankruptcy in 1988 into a viable entity that was providing funds to the Central Government. At the same time, network expansion and upgrading has taken place along agreed lines. The next phase is bringing services from the street level to the household. A survey of 5,815 households in 1994-95 found that 96% did not have running water and 98% lacked internal lavatories. The capital Bangui had a 13% water connection rate and a 1% sewerage rate in 1993 with no sewage treatment facilities.

### **...when there is peace**

The 2002-03 rebellion in the north of the country severely affected drinking water supplies, with no access to safe drinking water for the region, affecting 9% of the CAR's population. SAUR ended its involvement with SODECA at this time and the system has experienced increasing problems since 2003. Following the overthrow of the Government in the CAR in March 2003, in 2004, the ICRC helped SODECA make emergency repairs to water systems serving some 1million people in Bangui and seven towns (Bambari, Berberati, Bossangoa, Bouar, Bozoum, Carnot and Ndele). The priority has been to reduce leakage by repairing or replacing pipes and valves—50% of Bangui's water supply was being lost through leakage—and to extend the distribution network into poorer neighbourhoods. Bouar had lost all water services since December 2003.

**CHAD**

<b>Economics (2005)</b>	
GDP per capita	USD400
GDP per capita (PPP)	USD1,470
GDP in Agriculture	23%
GDP in Industry	51%
GDP in Services	26%

**Lake Chad**

Lake Chad is the only permanent fresh water source in Chad. In a severe drought, such as in 1984, it is possible to walk across the lake. It is the only lake in the Sahel Region, being a freshwater body of water with no outlet to the sea. Surrounded by a large wetland, the lake is rapidly disappearing because of irrigation and heavy usage. Lake Chad has dwindled from 350,000km<sup>2</sup> several hundred years ago, to about 25,000km<sup>2</sup> in the 1960s. Now it is only about 2,000km<sup>2</sup>. What remains of the lake is now threatened by proposed mining and drilling in the area.

<b>Population</b>	
2005 (million)	9.7
2015 (million)	12.5
Urbanisation in 2005	25%
Urbanisation by 2015	31%
In urban agglomerations, 2015	18%

**STEE**

STEE is responsible for water and electricity supplies. In 2001, Veolia started a two year management contract involving XOF20million investment including XOF10million of share capital in a venture with a turnover by the end of the period of XOF180million. STEE was renationalised after Veolia Water pulled out in August 2004 after four months of the second phase of the contract. This was mainly due to profitability problems. STEE is currently owned by the Government (81.2%) and the Agence Française de Developpement(AFD, 18.8%).

In addition to existing in the 11 urban concessionary centres operated by STEE, facilities are spread over 85 of the 175 urban areas of over 2,000 inhabitants. The field enquiries also showed that no more than 40% of the population in each urban area use or have access to water distributed via these systems. On this basis, about 417,000 people were supplied in 2000 by a water system in the concessionary area, while 204,000 people had access to an embryonic network in the non-concessionary area. In 2001, it was estimated that the water supply rate for the entire population of Chad in towns of more than 2,000 people was nearly 35%. However, less than 10% of the urban population is supplied via a household connection.

None of the towns have a functioning wastewater disposal system and fewer than 2% of the urban population have sanitary installations with running water. There is no sewage treatment, and stormwater systems are effectively non-existent.

<b>Urban data</b>	
Served by piped water	31%
Access to sewerage	81%

The basic prices of water and connections differ from one system to another. Generally, the price of water is broken down into three levels. The price of the first, so-called "social" level (15m<sup>3</sup>/month) is fixed at XOF105. The price of the second level (15m<sup>3</sup>/month to 100m<sup>3</sup>/month) varies from one town to another; it is XOF230m<sup>3</sup>/month for towns covered by the STEE and may reach as much as XOF490m<sup>3</sup>/month (at Pala). The price at the stand-pipe is about XOF300m<sup>3</sup> and from water-carriers XOF4,500m<sup>3</sup>. STEE's prices have remained unchanged since 1984. The cost of water provision to STEE is in the region of XOF360/m<sup>3</sup>.

<b>Freshwater</b>	
Annual availability (1998)	10.0km <sup>3</sup>
Per capita	4,857m <sup>3</sup>
Annual withdrawal (2000)	0.2km <sup>3</sup>
Domestic	19%
Industrial	1%
Agriculture	80%

In order to attain the Millennium Development Goals and to move towards universal access to improved water supplies in urban areas by 2025, XOF 59billion needs to be spent during the period 2000-2010 and XOF30billion during the period 2011-2020. Including peri-urban areas, identified spending needs between 2000 and 2020 are some XOF145billion. At present, STEE receives funding of XOF1billion pa and is therefore dependent on external funding. In addition, XOF9-88billion is needed in the twenty year period for basic urban sanitation services, especially rainwater drainage and latrines. This is without any formal sewerage and sewage treatment.

### Privatising STEE

A concession agreement for the private management of STEE was signed on January 28 2001, which includes the Government's take-over of the long-term debts and the transfer to a separate debt-recovery structure of STEE's short-term domestic liabilities. The AFD is funding a EUR8.3million stormwater drainage project in the eastern districts of the town of N'djamena. In addition to EUR10million financing from the World Bank, the AFD also provided EUR5.1million for the privatisation of STEE.

<b>Groundwater</b>	
Annual availability (1998)	11.5km <sup>3</sup>
Per capita	1,669m <sup>3</sup>
Annual withdrawal (1990)	0.1km <sup>3</sup>
Domestic	30%
Industrial	0%
Agriculture	70%

### MAJOR CITIES

<b>City</b>	<b>2000</b>	<b>2015</b>	<b>Status</b>
N'djamena	1,043,000	1,935,000	STEE privatisation ended

Sources:

UN DESA (2003) Integrated plan for Chad's water development and management, United Nations, New York, USA

## REPUBLIC OF CONGO

### Financial problems curtail service provision

The Société Nationale des Eaux (SNDE), the Congo's water management company, was set up in 1967 for the provision of services for urban areas, principally Brazzaville, the capital. It is regulated by the Ministry of Energy and Water, which was set up in 1984 to co-ordinate water provision policy. The Government is currently seeking to find a suitable way of privatising SNDE.

SNDE has not been able to extend its services beyond Brazzaville, Pointe Noire, Dolisie, Nkayi, Mossendjo, Gamboma and the nine main departmental towns. Originally set up in the 1950s, the supply network, which spans some 100,995km or 70% of the Brazzaville area, is now obsolete and can only serve popular districts of the Congolese capital. The 60,279 subscribers in Brazzaville are classified in two groups, 1,749 commercial, Government and industrial customers and 58,523 individual customers.

50% of the urban population had direct access to piped drinking water in 1990, which had increased to 69% by 2005. In contrast, 11% of the rural population had access to piped water in 2005. In 2000, 67% of the urban population had access to safe drinking water against 72% in 1993, while the percentage had declined in rural areas from 24% to 17%. This reflects the impact of population growth even at a time when the networks were being expanded. At least 50% of urban households are still using pit latrines, while at least 30% are using septic systems. 15-20% of urban dwellers have no access to proper infrastructure, while some 70% of people living in rural areas have no sanitation whatsoever.

### Privatisation of SNDE postponed

Despite active interest from the three French water companies (VE, Suez, and SAUR/Bouygues); a management contract to operate SNDE was awarded to Cascal in November 2002. In 2004, Cascal declined to enter into the contract and the privatisation process has since remained on ice.

**CÔTE D'IVOIRE**

<b>Economics (2005)</b>	
GDP per capita	USD840
GDP per capita (PPP)	USD1,490
Agriculture	22%
Industry	21%
Services	57%

**Service provision**

Côte d'Ivoire is regarded as offering the best water and sanitation services for urban areas in Sub-Saharan Africa. Overall, 46% of the urban population receives piped water and 32% are connected to the sewerage services. However, 62% of the population of Abidjan had access to piped water in 1993, with 45% connected to sewerage services. 58% of sewage effluent collected was treated. 0.07km<sup>3</sup> of water was treated in 1994, with approximately 35% of all water provided for domestic and commercial use. Overall water usage rose from 0.7km<sup>3</sup> in 1987 to 1,26km<sup>3</sup> in 1994. In 1998, the Government estimated that it will cost CFAF266billion to provide universal water and sewerage services for all people living in settlements of more than 3,000. Between 1996 and 1998, XAF21billion was spent on such projects.

<b>Population</b>	
Total (2005, million)	18.2
Total (2015, million)	21.6
In urban areas (2005)	45%
In urban areas (2015)	51%
In urban agglomerations (2015)	26%

**SODECI**

Bouygues' SAUR was awarded a lease contract to manage water provision services in Abidjan in 1959. After independence in 1960, the lease was handed over to Société de Distribution d'Eau de la Côte d'Ivoire (SODECI). SAUR in turn became SODECI's major shareholder as it is today. In 1961, the contract was extended to five other municipalities. Shares in the company have been traded on the Bourse Regionale des Valuers Mobilières (BRVM) in Abidjan since 1978. SAUR holds 47% of the company's equity, with 8% being held by the Government and staff, and 45% being held by private investors. The lease contract evolved to cover sewerage services. In 1987, the lease contract was converted into a full concession with an operating life of 20 years. The concession was renewed for three years in 2005.

<b>Urban Services</b>	
Safe drinking water	59%
Average water usage (L/day)	111
Access to sewerage	32%
% Sewage treated	15%

**From lease to concession**

The lease contract appears to have ensured a basic level of service, but has performed poorly in that it did not give SAUR sufficient leverage to manage the company on commercial lines. Thus the first three decades of SODECI's life were marked by the need for Government subsidies. In consequence, the World Bank supported the refinancing of SODECI on the basis that the lease contract was upgraded into a full concession so as to optimise SAUR's management control. This was carried out as an additional part of the World Bank's structural adjustment programme for the country. Throughout the life of the lease and concession contracts, SODECI's scope and customer base has continued to expand. By 1973, SODECI served 40,071 customers in 38 population centres. This has expanded to 345,000 customers in 409 centres by 1997. By 2001, SODECI had 600,000 connections.

<b>Freshwater</b>	
Total (1998, km <sup>3</sup> )	76.7
Per capita (2000, m <sup>3</sup> )	4,794
Withdrawals (2000, km <sup>3</sup> )	0.9
For domestic use (2000)	23%
For industry (2000)	12%
For agriculture (2000)	65%

### A profitable concession

The assets are held by EECI, a Government-held entity, with SODECI being responsible for the management of these assets. While the concession was granted in 1987, the managerial changes needed did not take place until 1990-91. In 1993, SODECI distributed 103million m<sup>3</sup> of water and billed clients for 89million m<sup>3</sup>. SODECI serves approximately 70% of the country's urban population and the number of connections grew by 5-6% pa during the 1990s. SODECI receives no operating subsidies from the state and self-finances all agreed capital expenditure.

Since 1980, unaccounted for water has been kept below 15-17% and payment of bills has exceeded 97% for private customers. However, collecting money from Government departments remains problematic. SODECI was retained by Bouygues when Bouygues sold Saur to PAI in 2004. Bouygues holds 46.06%, of SODECI, Ivorian shareholders 33.46%, SODECI Personnel 6.98%, Ivorian State 3.25% and others 10.25%. SODECI had revenues of EUR74.28million in 2003. While the company's equity remains fairly tightly held, the company's bonds are some of the most heavily traded instruments on the Bourse.

Groundwater	
Total recharge (1998, km <sup>3</sup> )	37.7
Per capita (1998, m <sup>3</sup> )	2,588

MAJOR CITIES			
Population	2000	2015	Status
Abidjan	3,790,000	6,076,000	Privatised

By 2000, SODECI managed more than 300 piped water supply systems across the country, with the number of individual connections increasing by 5 - 6% a year. The company served 70% of the nation's 7million urban residents including 2million in Abidjan, and the rest in settlements ranging from 5,000 to 400,000 people. In order to provide services for poor people, SODECI foregoes direct hook-up charges on three out of four of its domestic connections, a policy that pays the company direct benefits, as it has a 98% percent or better collection rate from its private customers. The cost of SODECI water to consumers is no higher than in neighbouring countries with similar economic conditions, where rates rarely cover costs and service lags far behind.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	Contract	Company
Abidjan	SODECI concession	SAUR Afrique (Bouygues)

Private sector company operations (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
SODECI	Bouygues	5,200,000	3,000,000	<b>5,200,000</b>

## CROATIA

<b>Economics (2005)</b>	
GDP per capita	USD8,060
GDP per capita (PPP)	USD12,750
GDP in Agriculture	8%
GDP in Industry	28%
GDP in Services	64%

### Management

Hrvatske Vode (Croatian Waters) is the principal central Government agency in charge of water resource management. Municipal entities operate on a city level, for example the Split Water and Sewerage Company (SWSC). The Law on Waters and the Law on Water Management Financing were passed in 1995. Croatia aims to bring its environmental standards into line with EU standards with the long term aim of meeting EU accession requirements. At the same time, effluent discharges to bathing waters are being treated as part of reviving the Dalmatian Coast's tourist industry. The Government seeks to raise the public water supply connection rate from 62% in 1991 and 73% by 2000 to 90% by 2005. Distribution losses were 46% in 1998 and 43% in 1999 and rose to 46% in 2003. During the 1991-92 war, 15-20% of the water system was destroyed.

Overall, in 2003 76% of people have piped water, 40% sewerage and 12% sewage treatment. There are 81 sewage treatment works currently in operation:

<b>Sewage treatment</b>	<b>Total</b>
Secondary	4%
Primary	6%
Pre-treatment	2%
Untreated	88%
<b>Total</b>	<b>100%</b>

The development of the sewerage networks is directly related to the size of urban settlements:

<b>Population</b>	<b>None</b>	<b>Partial</b>	<b>Extensive</b>
2,000 – 10,000	85	63	41
10,000 – 50,000	0	4	27
> 50,000	0	0	7
<b>Total</b>	<b>85</b>	<b>67</b>	<b>75</b>

The average water price in Croatia is about EUR0.90 HRK6-7/m<sup>3</sup>. This includes VAT and all contributions to Croatian Water. The internal price used for covering operating costs is probably less than EUR0.5. For full cost recovery, the price should be about 12 HRK, or EUR1.5.

<b>Population</b>	
2005 (million)	4.4
2015 (million)	4.3
Urbanisation (2005)	57%
Urbanisation (2015)	65%
In urban agglomerations, 2015	26%

### Implementation

From 1995, the complete regulation of water resources and water management in Croatia is based on the Water Act, which includes a number of sub legal acts envisaged by the Act. Under the legislative framework, administration and inspection is carried out by the State Water Directorate. The Croatian Waters company is responsible for carrying out water management activities as defined by the Water Act, in collaboration with local enterprises in various catchment areas. Croatian Waters also co-ordinates and finances realisation of the surface water quality monitoring programme which is carried out by the authorised laboratories.

<b>Urban Data</b>	
Served by piped water	90%
Access to sewerage	72%
Wastewater treated	40%

### Water quality and environmental spending

Surface waters (rivers, lakes and artificial lakes), groundwaters and coastal sea areas are classified into four classes, depending on their utilisation and quality. Corresponding new environmental quality standards (of maximum allowable concentrations) are now under preparation. There are no emission standards or guidelines at

the national level. The Directorate for Environment estimated that USD152million was spent on environmental protection in 1995. It can also be assumed that non-environmental expenditures are included in this figure.

<b>Freshwater</b>	
Annual availability (2000)	37.7km <sup>3</sup>
Per capita	23,890m <sup>3</sup>
Annual withdrawal (2000)	0.8km <sup>3</sup>
Domestic (1987)	50%
Industrial (1987)	50%

A sewage treatment works for Rijeka (260,000 people, including eight adjacent municipalities) was built in 1999 for EUR13million, 50% coming from the EBRD. RWE is involved in the DEM400million Zagreb sewage treatment project serving 1.5million people. The financing of this work has involved mobilising DEM150million of project finance and DEM250million from multilateral loans and sponsor finance. Construction started at the end of 1999.

<b>Groundwater</b>	
Annual availability (1998)	11km <sup>3</sup>
Per capita	2,459m <sup>3</sup>

<b>MAJOR CITIES</b>			
City	2000	2015	Comments
Zagreb	1,067,000	1,183,000	Sewage treatment facility project started

KfW, on behalf of the German Government, is to support a project with Aquamundo for upgrading wastewater discharges into the Adriatic Sea. This is designed to help restore tourism. The coast has 150,000 permanent inhabitants and some 250,000 summer visitors. KfW made a grant of EUR37.5million for this project in 2003.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
Location	Contract	Company
Vodice	23 year wastewater DFBOT	WTE
Zagreb	BOT sewage treatment	ZOV

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
WTE	EVN (Austria)	0	10,000	<b>10,000</b>
ZOV	RWE (Germany)/EVN (Austria)	0	750,000	<b>750,000</b>

Source:

MZOPU (2003) State of the Environment Report – Republic of Croatia, MZOPU, Zagreb

## CZECH REPUBLIC

<b>Economics (2005)</b>	
GDP per capita	USD10,710
GDP per capita (PPP)	USD20,140
Agriculture	3%
Industry	39%
Services	50%

### Sewerage development

Connection to the sewage network has increased from 38% to 48% between 1980 and 1992. The number of operational wastewater treatment plants rose from 620 in 1989 to 960 by 1999. 75% of the population was connected to the sewerage network in 2000, with the aim of increasing this to 80% by 2005. Before 1990, sewerage technology in the then Czechoslovakia was well regarded, when given the money to operate to its intended standards. In 1990 a CSK75billion sewage treatment works was completed, one of Europe's largest at the time. Here, the effluent discharges were found to be cleaner than the river water.

<b>Sewerage and treatment</b>	<b>1991</b>	<b>1999</b>	<b>2005</b>
Tertiary treatment	0%	N/A	56%
Secondary treatment	46%	65%	17%
Primary treatment	2%	N/A	0%
Sewerage only	24%	10%	6%
Not connected	28%	25%	21%

In addition, 60% of industrial effluents are inadequately treated. The total amount of effluents discharged in the period 1992-95 decreased by more than 13%, with the amount of treatment taking place increasing by 8%. This in part reflects investments in new and upgraded sewage treatment plants during 1993-1995. The total amount of biochemical oxygen demand (BOD) discharged into rivers decreased by 40% between 1990 and 1996.

In 2002, 9.16million people were supplied with drinking water from the public water mains (89.8%), an increase of 7.4% since 1990. The share of the supplied inhabitants within the administrative regions ranges from 74.8% to 99.6%. 7.89million people had connections to the public sewer system (77.4%) an increase of 12.3% since 1990. The amount of wastewater treated in 2002 was 21% more than in 1990, some 92.6% of the total collected.

<b>Population</b>	
Total (2005,million)	10.2
Total (2015,million)	10.1
In urban areas (2005)	74%
In urban areas (2015)	76%
In urban agglomerations (2015)	12%

### Water quality

In 1990-92, the majority of rivers were understood to be of III/IV class. Across the country, at least 50% of all rivers are in a 'bad' or 'very bad' condition. These rivers can be regarded as biologically dead and a significant proportion of these waters cannot be used for industrial processes even after treatment.

On average, there are 60 cases pa of groundwater pollution from oil and petrol storage leaks, and 50 pa from agricultural effluents. The aquifers along the Rivers Elbe and Moravia have had increasing levels of nitrate contamination from agriculture. Since 1993, an improvement in groundwater quality has been noticed. The quality of drinking water withdrawn from the surface waters has remained poor. As a result, bottled water consumption is widespread, although costly. From 2005, the quality of the water in the public water mains supplying more than 5,000 inhabitants and representing approximately 65% of the overall population will be evaluated in three-year cycles.

Distribution losses of up to 40% have been identified in major towns and cities.

Water lost through leakage accounted for 23.8% of distributed water in 2002, compared to 25.1% in 2001. The Prague water and sewage company cut leakage rates from 44% of distributed water in 1989 to 30% in 2003 and seeks to cut leakage to 19% by the year 2013.

<b>Urban Services</b>	
Safe drinking water	90%
Access to sewerage	77%
% Sewage treated	73%

### The economics of water and sewerage

The Czech Government has been strongly in favour of privatisation since 1993, and with the sale of Prague Water in 2001 the initial privatisation of water and sewerage services is complete.

Since the end of communism in 1989, water consumption has been cut by nearly half, primarily as a result of a 40-fold price rise. Consumption is also down because of the decline of the country's heavy industry. In 1989, average consumption was 300L/person/day, declining to 163L in 2002. The cost of a m<sup>3</sup> of drinking water was CZK19.5 (EUR0.62) in 2002, while the collection of a cubic metre of sewage cost CZK15.9.

All cities and municipalities with over 10,000 people are equipped with a waste water treatment plant. EU compliance related work on the sewerage network and industrial effluent treatment was estimated at EUR2.47billion in 2004, with 600 WWTWs needing to be built or upgraded, so as to provide EU compliant sewage treatment for all cities and towns with more than 2,000 inhabitants by 2100.

Freshwater	
Total (1998, km <sup>3</sup> )	58.21
Per capita (2000, m <sup>3</sup> )	1,286
Withdrawals (2000, km <sup>3</sup> )	2.6
For domestic use (2000)	41%
For industry (2000)	57%
For agriculture (2000)	2%

### Privatising water and sewerage services

Since 1993, 57 water and sewerage companies have been set up, subdivided from the original eight regional entities and Prague Water. With the exception of the latter, shares were offered for all of these entities, although in a number of cases, effective control of the operating companies has remained in municipal hands through the acquisition of shareholdings. With the exception of North Moravia's SMVAK, the asset owning company is held by the relevant municipalities and the Government, which rents the infrastructure and approves water charges to the privatised operating company via a contract, which includes the agreed price formula. Nine of these companies, serving more than 3.85million people, have been fully privatised with foreign investors involved.

The agriculture ministry is seeking to advise municipalities on utility sales, amid concerns that water and sewage works could be sold too cheaply or too quickly. It also intends to use its so-called golden shares in the water utilities yet to be privatised in order to block what it sees as unsuitable sales. The plan is that the commission would monitor the situation and then would oversee sales until the year 2010. Around 40 concerns remaining in local authority hands. The ministry has already used their golden share to so far block the sale of Vodovody and Kanalizace Zlin in south Moravia to foreign investors, while a similar scenario is set to follow for Vodarny Kladno-Melnik in central Bohemia.

MAJOR CITIES			
Population	2000	2015	Status
Prague	1,203,000	1,203,000	Prague Water privatised

### Privatisation of Prague Water

The concession for Prague's water supply companies (Prazske Vodarny) and sewerage service companies (Prazsje Kanalizace a Vodni Toky) was awarded to AWG and VE in early 2001 after the two companies joined forces (a 66% share sale for CZK6.1billion (USD163million), with a 15 year operating contract, with the balance of the shares being held by the city.) The contract supplies 1.16million people in Prague and a further 0.2million in central and eastern Bohemia via the sale of bulk water supplies. Revenues in 2003 were EUR132million, with improved domestic consumption, price increases and reduced system losses accounting for a 7% increase in revenues over 2002.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Prague	Water & sewerage concession	PVK
South Bohemia	Water & sewerage BOT	VAK Jizny Cechy
Kolln	Water & sewerage concession	VODOS Kolln
Chrudim	Water & sewerage concession	VS Chrudim
North Moravia	Water & sewerage concession	Severomoravske VAK (SMVAK)
Kladno-Melnik	Water & sewerage concession	Stredoceské Vodárny
Susice, Stary & Stod	Water & sewerage concession	1.JVS
Pibram	Water & sewerage concession	1.ScV
Slany	Water & sewerage concession	VAK Slany
Prstejov	Water & sewerage concession	VAK Prstejov
Klatovy	Water & sewerage concession	1.JVS
Pilsen	Water & sewerage concession	VAK Pilsen
South Moravia	Water & sewerage concession	Suez
Ceske	Water & sewerage concession	1.JVS
Beroun	Water & sewerage concession	S Berounske Vodovy
Olomouc	Water services	SMV
Brno	Water & sewerage concession	Brnenske VAK
Ostrava	Water & sewerage concession	Ostravske VAK
Karlovy Vary	Water & sewerage concession	VAK Karlovy Vary
Sokolov	Water & sewerage concession	VAK Sokolov (CTSE)
Northern Bohemia	Water & sewerage concession	Severomoravske VAK Ostrava
Nymburk	Water & sewerage concession	VAK Nymburk
Prerov	Water & sewerage concession	VAK Prerov
Vsetin	Water & sewerage concession	VAK Vsetin
Chrudim	Water & sewerage concession	VAK Chrudim
Cheb	Water & sewerage concession	Chevak Cheb
Hradec Kralove	Water & sewerage concession	Kralovehradecka Provozni
Havlickuv Brod	Water & sewerage concession	VAK Havlickuv Brod
Chocen	Water & sewerage concession	VAK Jablonne and Orlici
Breclav	Water & sewerage concession	VAK Breclav
Kromeriz	Water & sewerage concession	VAK Kromeriz
Uherske Hradiste	Water & sewerage concession	Slovacke VAK
Hodonin	Water & sewerage concession	VAK Hodonin
Zlin	Water & sewerage concession	VAK Zlin
Vyskov	Water & sewerage concession	VAK Vyskov
Sumperk	Water & sewerage concession	SPVS

23 corporate entities have been identified. AWG, Suez and VE as outlined below operate 16 of these companies. It is understood that in most of the other cases, the municipalities have retained at least a strategic stake in the operating companies, with the national privatisation fund also being a major investor.

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
PVK	VE (France)	1,400,000	1,400,000	<b>1,400,000</b>
VAK Jizni Cechy	Energie (Austria)	330,000	330,000	<b>330,000</b>
VODOS Kolln	Energie (Austria)	51,000	51,000	<b>51,000</b>
VS Chrudim	Energie (Austria)	80,000	80,000	<b>80,000</b>
S Berounske Vodovy	Energie (Austria)	100,000	100,000	<b>100,000</b>
SMVAK	FCC (Spain)	1,070,000	870,000	<b>1,070,000</b>
Ostravske VAK	Suez (France)	330,000	330,000	<b>330,000</b>
Brenske VAK	Suez (France)	420,000	420,000	<b>420,000</b>
VAK Karlovy Vary	Suez (France)	181,000	181,000	<b>181,000</b>
South Moravia	Suez (France)	350,000	350,000	<b>350,000</b>
Horny Slovak	Suez (France)	9,000	9,000	<b>9,000</b>
SVAK Ostrava	VE (France)	1,238,000	1,238,000	<b>1,238,000</b>
Kralovehradecka Provozni	VE (France)	149,000	149,000	<b>149,000</b>
Stredoceské Vodárny	VE (France)	231,000	231,000	<b>231,000</b>
VAK Slany	VE (France)	21,000	21,000	<b>21,000</b>
VAK Prostejov	VE (France)	70,000	70,000	<b>70,000</b>
1.JVS	VE (France)	276,000	276,000	<b>276,000</b>
SMV	VE (France)	140,000	0	<b>140,000</b>
VAK Zlin	VE (France)	157,000	157,000	<b>157,000</b>
VAK Pilsen	CTSE (VE, France)	230,000	180,000	<b>230,000</b>
VAK Sokolov	CTSE (VE, France)	130,000	130,000	<b>130,000</b>
1.ScV	VE (France)	80,600	80,600	<b>80,600</b>
SVPS	Suez (France)	120,000	120,000	<b>120,000</b>
Benesov	Suez (France)	38,000	38,000	<b>38,000</b>
Dalve	Suez (France)	37,000	37,000	<b>37,000</b>
Chevak Cheb	Gelsenwasser (Germany)	96,800	96,800	<b>96,800</b>

## DENMARK

### Water policy and provision

Water policy is framed by the Water Supply Act of 1978 (amended 1997) and the Environmental Protection Act (amended 1997). Water pricing policy is designed to ensure that the total revenue from water charges does not exceed total costs, including appropriation for future investments. Almost all costs are recovered through water charges. In 1994, an environment tax on drinking water for household use was introduced in order to encourage conservation. A tax on wastewater for discharges of nitrogen, phosphorous and organic substances entered into force in 1997.

All urban and rural households have access to safe water provision and sewerage services, with 90% of the population connected to piped water services. 99% of the Danish drinking water is extracted from underground supplies. National policy emphasises the maintenance of the quality of water resources rather than *post priori* water treatment. Water is obtained via 30 year water extraction permits. There are 540 municipalities, served by 120 water provision entities. 90% of water works are run privately, while the remainder are run by the municipalities. The public water works supply two-thirds of the population. The local private water provision service companies cover 25% of the population, with a further 10% of the population being effectively self served, although they are usually connected to the municipal sewerage network. Notwithstanding the exception below, there appears to be no particular desire to see the privatisation of larger water and sewerage networks in the foreseeable future.

Domestic water prices have increased from DKK13/m<sup>3</sup> in 1993 to DKK35/m<sup>3</sup> in 2002, with water consumption falling from 155L/capita/day to 125L/capita/day during the same period.

Water supplies cost EUR382million in 2000, along with EUR680million for sewerage and sewage treatment.

### Sewerage and sewage treatment

A survey in 1995 identified a spend of DKK100billion (GBP11.6billion) on water provision and sewerage compliance work for 1995-2020. Many of the targets implied by the survey would appear to seek to use EU criteria as bare minima.

### Domestic sewage treatment

In 1975, 45% of domestic sewage was untreated with 27% being subject to secondary treatment. By 1987, 21% of effluents were untreated and the 1987 Action Plan resulted in all effluents being treated, 12% to secondary and 87% to tertiary standard. 59% of sewage sludge was applied to land in 2002, against 12% being landfilled and 29% incinerated. In 1987, 31% of sludges were landfilled, 27% incinerated, with 42% being applied to land.

Inland water quality	1999	2000	2001	2002
1&2 – Bad	4%	3%	3%	3%
3 – Fair	14%	15%	13%	12%
4 – Good	46%	43%	42%	40%
5 – Very Good	24%	26%	27%	30%
6&7 – Excellent	12%	13%	15%	15%

In 1990, the municipality of Farum undertook a sale and lease-back of its wastewater treatment plant. No further PSP has been identified.

Private sector company operations (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
Krüger	VE (France)	0	60,000	<b>60,000</b>
VE	VE (France)	0	23,000	<b>23,000</b>

Source:

Miljøministeriet (2004) Water in Denmark, 2003. Copenhagen, Denmark

**EGYPT**

<b>Economics (2005)</b>	
GDP per capita	USD1,250
GDP per capita (PPP)	USD4,440
Agriculture	14%
Industry	39%
Services	47%

**Water scarcity is endemic**

Egypt is characterised by limited land and water resources. Less than 3% of its area is cultivated because of water shortage. The Nile is already fully utilised, mainly for agricultural and human use. Water quality problems are mainly salinisation and waterlogging as a result of the over-exploitation of the Nile. These problems affect the productivity of cultivated land, while aquifers have rising salt levels and pollution ingress. WHO statistics point to about 90,000 annual recorded deaths linked to water-borne diseases. Quantities of direct or indirect liquid wastes, from industrial sources into the River Nile are estimated at 2.4million m<sup>3</sup> per day. The share of Greater Cairo and Alexandria's pollution load is about 17% and 11% respectively.

Connection to piped water services have increased from 80% in 1995 to 95% in 2004, 90% within households and 5% from standpipes. 28% of the population had improved sanitation in 1997. Nationally, the Government plans to see access to water rise to 100% by 2017, with 60% access to sanitation.

**Irrigation plans and wastewater re-use**

<b>Irrigation area (000 Ha)</b>	<b>Completed By 2004</b>	<b>Developed in 2004</b>	<b>Planned 2004-17</b>	<b>Total by 2017</b>
Surface water & drainage reuse	484	126	502	1,154
Groundwater	44	122	116	239
Treated wastewater	40	0	28	68
<b>Total</b>	<b>567</b>	<b>248</b>	<b>645</b>	<b>1,461</b>

Average consumption in the major cities is 260 l/c/day, compared with 72 l/c/day in the rest of the country. Of those served by public water supply entities, 73% have full coverage, 24% partial coverage and 3% no coverage.

**Drinking water treatment (2000)**

<b>Million m<sup>3</sup> per day</b>	<b>Capacity</b>	<b>Production</b>
Present capacity	18.5	14.4
Current expansion work	0.7	N/A
Planned expansion work	3.3	N/A
New facilities under construction	5.8	N/A
Planned facilities	1.3	N/A
<b>Total</b>	<b>29.7</b>	<b>N/A</b>

By 2003, capacity was 22.9million m<sup>3</sup>. Unaccounted for water losses are estimated at 34%, ranging from 15-65% by region, although the lack of metering means that these figures are estimates. It is believed the real figure is in the region of 50%. Reducing leakage to 25% is seen as feasible. 88% of municipal and 70% of industrial operating costs for water provision is met by Government subsidies. Water rates have been frozen since 1992, although a cost recovery operation has recently been allowed.

**Wastewater discharge (2000)**

<b>Million m<sup>3</sup> per day</b>	
Treated	4.5
Discharged to sewers	1.4
Stored in septic tanks	1.4
Direct discharge	1.6
<b>Total</b>	<b>9.0</b>

**New treatment capacity of 1.4million m<sup>3</sup> per day is planned, 85% from planned new industrial cities.**

Million m <sup>3</sup> per day	Capacity	Used
Current	6.0	4.5
New facilities	9.0	5.5
Total	15.0	10.0
LE/m <sup>3</sup>	Current	Cost recovery
Water	0.20	0.50
Sewerage	0.00	0.60
Total	1.10	0.20

Currently effluents from 18million people (out of an urban total of 26million) are treated and it is planned for this to rise to cover the 40million people forecast to be living in urban areas by 2017. These facilities would require EGP2billion pa for operational costs. It is understood that the performance of these facilities is generally poor. In addition, 80% of industrial waste water from process applications is discharged untreated. 20% of groundwater resources are now non potable due to pollution.

Population	
2005 (million)	74.0
2015 (million)	88.1
Urbanisation in 2005	43%
Urbanisation by 2015	45%
In urban agglomerations, 2015	24%

### Infrastructure development costs

Since 1983, GBP30billion has been invested in service improvement. Potable water reached 90% of the population in 2002. During this time, 1900 water treatment works were built, handling 18million m<sup>3</sup>/day and wastewater treatment capacity was expanded from 1.0million m<sup>3</sup>/day to 8.2million m<sup>3</sup>/day through the construction of 220 WWTWs. Revenues only cover 40% of costs because of subsidies, inefficiency, high levels of leakage, and non-paying state customers.

The Ministry of Public Works and the Ministry of Housing and Public Utilities have allocated GBP3.5billion (along with an EUR90million loan from the EIB) for the Greater Cairo Wastewater programme. This involves an extension of the sewerage network, 20 new water and wastewater treatment works and remedial work to alleviate water source pollution.

Urban Data	
Served by piped water	93%
Access to sewerage	51%
With sewage treatment	10%

### Aid related funding has been the norm

USAID has been the largest single donor in Egypt for urban water pollution treatment equipment projects in Cairo, Alexandria and other medium-sized cities. Since 1975, USAID has invested over USD2billion in urban water and wastewater infrastructure serving about 22million people. More than USD900million of this money has been focussed on sewerage and sewage treatment in Cairo. Projects seek to treat raw sewage and improve water and wastewater systems of several cities. Recent projects have included connecting 700,000 residents in poor Cairo and Embaba to the sewerage network, along with more than 500,000 residents in Suez. In Cairo, three potable water reservoirs serving the city at Darassa entered service providing water to 3million people. This funding programme continues, with USD45m in aid to improve sewage treatment in the southern city of Luxor have been announced in March 1999.

Freshwater	
Annual availability (1998)	2.80km <sup>3</sup>
Per capita	794m <sup>3</sup>
Annual withdrawal (2000)	68.7km <sup>3</sup>
Domestic (2000)	8%
Industrial (2000)	14
Agriculture (2000)	78%

### Environmental legislation

A National Water Policy has set out targets for 2017. These concentrate on improving the efficiency of the irrigation systems and increasing the amount of treated wastewater used for irrigation.

**Plan costs, 2003-17**

LEbillion	Investment	Recurrent costs
Ministries	95.1%	20.5%
Municipalities	0.2%	66.0%
Private sector	4.7%	13.5%
Total	145	44

## Planned spending

LEbillion	2003	2004	2005	2006	2007	07-12	12-17	Total
<b>Capital projects</b>								
Drinking water treatment	2.75	2.75	2.75	2.75	2.75	7.50	7.50	28.25
Wastewater treatment	5.96	5.96	5.96	5.96	5.96	22.50	13.21	65.49
<b>Operating spending</b>								
Drinking water treatment	0.69	0.74	0.80	0.85	0.91	4.99	6.65	15.63
Wastewater treatment	0.49	0.59	0.69	0.79	0.89	5.13	6.50	15.09

**Private sector participation encouraged**

In 2000, a law on the 'grant of concessions for establishment, management and utilisation of water/wastewater utilities' was passed. This allows for the granting of concessions for up to 99 years to private sector companies. An intermunicipal policy co-ordinating committee was established to act as a regulator for the water and wastewater sector, with the specific aim of encouraging management efficiency, cost recovery and private sector participation.

<b>Groundwater</b>	
Annual availability (1998)	1.3km <sup>3</sup>
Per capita	20m <sup>3</sup>
Annual withdrawal (1985)	3.0km <sup>3</sup>

**Privatisation prospects**

The first major private sector operated facility was to be for developing industrial water provision in the Suez Special Economic Zone (SEZ). In 2001, a USD180million 33 year water treatment BOT contract was awarded to Canada's SNC Lavalin. In 2002, the contract was suspended. The BOT plans for water provision for the resort city of Sharm El Sheikh have also been postponed. Bechtel has been asked to develop a series of proposals for Independent Water and Power Projects (IWPPs) in the Sinai. A private sector managed system supplies water to most of the hotels in the city's Naama Bay area, and a private wastewater treatment facility is being built that will also supply treated water for reuse.

In Nuweiba, private companies maintain the city's water and wastewater system. In the longer term, pressures for new investment through PPP are likely to return. Along with SEZ, the Port Said industrial zone is the most likely candidate for a BOT, along with the tourist resorts.

<b>MAJOR CITIES</b>			
City	2000	2015	Status
Alexandria	3,506,000	4,330,000	N/A
Cairo	9,462,000	11,531,000	N/A
Shubra El Khema	937,000	1,234,000	N/A

**Conflict Study: The Nile River Basin**

The 10 countries within the Nile basin contain 40% of Africa's population and make up 10% percent of its land mass. These countries are: Egypt, Sudan, Burundi, the Democratic Republic of the Congo, Eritrea, Ethiopia, Kenya, Rwanda, Tanzania and Uganda. More than 85% of the Nile's water comes from the Blue Nile, which originates in Ethiopia. However, most of the river's flow of 85billion m<sup>3</sup> pa is used by Egypt, the last nation on the Nile's path to the Mediterranean Sea. In 1959, a pact was drawn up dividing most of the Nile's waters between Egypt and Sudan. Earlier agreements include those drawn up on behalf of Nile Basin countries between various European Empires.

The Nile effectively provides Egypt with its fresh water. In recent years, the upstream nations have started to harness the Nile's waters in response to economic development and population growth. In Ethiopia, more than 200 irrigation dams have been built during the 1990s, that will use nearly 500million m<sup>3</sup> of the Nile's flow annually, while further dams are being planned for hydropower. If Ethiopia sought to develop half of its irrigation potential, this would reduce the river's flow to Egypt by 15%. The basin does not produce enough fresh water to satisfy the irrigation plans of both Ethiopia and Egypt. Egypt's New Valley irrigation project is based on relocating 7 million people who will be supplied with 5billion m<sup>3</sup> pa of water from the Lake Nasser reservoir. Sudan plans to build its own dam on the Nile north of Khartoum, where the Blue Nile and the White Nile converge.

After threats by Egypt to go to war over its water resources, diplomacy has been replacing rhetoric. All ten countries have signed the UN's 1997 transboundary waters convention. The U.S. State Department and Environmental Protection Agency have opened field offices to help developing nations negotiate transboundary solutions to regional environmental problems including freshwater scarcity. The Eastern Africa hub, which specialises in Nile Basin water resource issues, opened in Addis Ababa in 1998. With the region's population rising from 140million in 1980 to 340million by 2025, longer term resolutions depend on population stabilisation. In May 1999, water ministers from the ten Nile Basin states agreed to co-operate on the equitable use of the Nile water resources and to strengthen the Nile secretariat head office in Entebbe, Uganda. At a meeting in Khartoum in August 2000, officials agreed to plans for the redistribution of the Nile waters, including power sharing cooperatives, river regulation and water resources management. Egypt is said to have agreed to cancel its monopoly of the waters under the 1959 treaty and has agreed to improve relations with Ethiopia and Sudan. Even so, Kenya's notice of intent to withdraw from the treaty in 2003 has been described by Egypt as "an act of war". In June 2001, the first meeting of the International Consortium for Cooperation on the Nile (ICCON) took place, when the donor community pledged USD140million to support various programmes.

Sources:

GWI (2002). Egypt gripped by wave of pessimism. *Global Water Intelligence*, 3/9, p 5.

Ministry of Water Resources and Irrigation (2005) *Water for the Future: National Water Resources Plan 2017*, Cairo, Egypt

## ESTONIA

<b>Economics (2003)</b>	
GDP per capita	USD5,380
GDP per capita (PPP)	USD12,680
GDP in Agriculture	4%
GDP in Industry	28%
GDP in Services	67%

### Drinking water

Distribution losses are mainly in the region of 30-35%, rising to up to 60% in Northeast Estonia. There are 23 water treatment plants in Estonia, most of which are regarded as outdated and are being upgraded. The Tallinn and Kuressaare water treatment works have been reconstructed since 1991 and are regarded as performing satisfactorily. 20.2% of drinking water samples failed on chemical criteria and 7.4% on bacterial levels in 2000.

<b>Population</b>	
2005 (million)	1.3
2015 (million)	1.3
Urbanisation (2005)	69%
Urbanisation (2015)	71%
In urban agglomerations, 2015	0%

<b>Urban Data</b>	
Served by piped water	95%
Access to sewerage	93%
With sewage treatment	c75%

### Sewerage services

There are some 620 secondary treatment plants, 240 of them requiring extensive overhaul. In addition, there are 10 tertiary sewage treatment works. In the late 1980s, there were 1,080 treatment plants, but many fell into disuse with the break up of communal farming and a population shift towards urban areas. There are 130 direct outlets of wastewater into the sea, 30 into lakes, 1013 into rivers, and seven into groundwater. In 1996, 1% (1.6million m<sup>3</sup> pa) of primary treated wastewater (total 138million m<sup>3</sup> pa) was poorly treated. This is mainly drainage water from the mining industry. 4% (3.4million m<sup>3</sup> pa) of water subject to secondary treatment (85million m<sup>3</sup> pa in total) was just treated by settlement in sewage lagoons, while 27% was regarded as being poorly treated.

<b>Freshwater</b>	
Annual availability (2000)	12.7km <sup>3</sup>
Per capita	9,794m <sup>3</sup>
Annual withdrawal (2000)	0.2km <sup>3</sup>
Domestic (2000)	56%
Industrial (2000)	39%
Agriculture (2000)	5%

### Investments

Between 1990 and 1995, investment was concentrated on wastewater treatment plants situated close to the coast of the Baltic Sea. In the investment programmes for 1996, the emphasis was moved to saving the use of water through efficiency gains and leakage reduction, while concentrating on inland sewage treatment plants. EEK235million was invested in water protection in 1996 from the Estonian Environmental Fund and other sources, which covered more than 50 projects. The Government is using water pricing as a policy to encourage efficient use by domestic and industrial users. This work was supported with a EUR10million loan from the EBRD.

The Ministry of the Environment believes that compliance with the EU's urban wastewater treatment directive will cost EUR350million by 2008, involving 90 individual projects for towns with a PE in excess of 10,000.

<b>Municipal wastewater</b>	<b>1999</b>	<b>2004</b>
Total discharge (million m <sup>3</sup> )	282	N/A
Connected to sewerage	70%	73%
No treatment	1%	1%
Primary	1%	1%
Secondary	28%	25%
Tertiary	40%	46%

**Groundwater**

Annual availability (2000)	4km <sup>3</sup>
Per capita	2,865m <sup>3</sup>

**Privatisation – Tallinna Vesi**

The municipality of Tallinn sold a 50.4% holding in Tallinna Vesi (Tallinn Water) via 28million shares currently held and 30million new shares (for a minimum) to UU and Bechtel in October 2000. International Water and United Utilities bought the stake in Tallinna Vesi for EEK1.3billion (USD78.22million). In 2003, UU bought out Bechtel's stake. In 1994, the EBRD provided EUR23million out of a EUR48million loan package for the construction of a sewage treatment works in Tallinn, which was constructed by Degremont (Suez). The EBRD and DEPFA Investment Bank Ltd syndicated an EUR80million loan to Tallinna Vesi to a group of western European banks in March 2003. The loan will help Tallinna Vesi meet EU standards for water and wastewater services.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Tallinn	30 year water & wastewater concession	AS Tallinna Vesi

**A local issue – Tallinna Vesi**

In June 2005, 30% of AS Tallinna Vesi was floated on the Tallinn Stock Exchange. UU Tallinn continues to hold 35.3% and the City of Tallinn, 34.7%.

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
AS Tallinna Vesi	UU (UK)	405,000	405,000	<b>405,000</b>

## ETHIOPIA

In 2002, the Ethiopian Water Resources Ministry announced that the country will undertake a 15-year water sector development programme with a total investment of some USD8.6billion. Funding is to be secured from the Government and donor organisations and the programme will focus on hydropower generation, safe drinking water provisions, irrigation schemes construction and capacity building. Some 629 safe drinking water schemes and 110 town sewerage systems will be constructed.

A comprehensive National Water Resources Management Policy was established in 1998 and this evolved into the 2002 National Water Sector Development Programme with a Universal Access Plan (UAP) in its Second Plan of Action for Sustainable Development to End Poverty (PASDEP). The national sanitation strategy outlines the need for participatory learning, advocacy, appropriate technology and reliance on local producers.

Access to safe drinking water was 24% in 2000 against 19% in 1990. Sources of safe drinking water were: protected wells 10%, piped networks with standpipes & public taps 11% and piped networks with private taps 3%. In 1990, access to safe water in rural areas was 11% against 80% in urban areas. 83.5% of the urban population had access to safe drinking water in 1998. Access to basic sanitation was 15% in 2000.

Access to improved services	1990	2000
Water – urban	79%	79%
Water – rural	16%	16%
Sanitation – urban	59%	60%
Sanitation – rural	4%	4%

Putting urban water resources in context, in 2006, 82% of the population lives within 1km of an improved water source. Total funding for water and sanitation in 2003 was USD65million pa. This would be adequate to extend basic services for 1.9million people pa, but the population is in fact rising by 2.0million people pa.

In 2001, the Addis Ababa Water and Sewerage Authority (AAWSA) came into operation. The authority's initial aim is to develop a billing system based upon cost recovery and affordability. This is being implemented by CS Holdings of South Africa, who have developed a tariff structure that is being progressively implemented over the next five years. A contract to modernise revenue collection and computerise billing became operational in 2001. By 2002, the contract had paid for itself. The existing tariffs and collection rates were too low to finance operations. To rationalise billing, the bi-monthly billing cycle was replaced by a monthly system, while a new tariff structure is being phased in over a five-year period. Full cost recovery will be introduced for water and sewerage services from 2006. The educational programme, linking water conservation and the importance of paying bills, has assisted this process. It was the first time that the authority had attempted any form of PR.

In 2004, the World Bank approved a USD100million loan to encourage the reform and extension of urban and rural water supply projects. This will mobilise 5,500 local projects designed to bring potable water supplies to 3million people. Current estimates point to ETB10.45billion (USD1,206million) being needed to reach the water Millennium Development Goals (MDGs) alone.

The current programme for the elimination of poverty, PASDEP aims to increase water coverage (now defined as 0.5km from an improved water source) from 80% to 92% in urban areas from 2005/6 to 2009/10. Investments in water and sanitation under the PASDEP are estimated at ETB15.6billion. 77% of this sum will be provided by the Government while the other 23% will be shared amongst the private sector and NGOs. Costs have been reduced by using the local private sector rather than the public sector for the construction of wells, with hand-dug wells costing ETB15,000 instead of Birr 50,000 before.

Sources:

Foxwood, N (2005) Making every drop count. Financing water, sanitation and hygiene in Ethiopia. Tearfund, London, UK.

African Development Bank/OECD (2007) African Economic Outlook

## FINLAND

### Management of water resources

The Finnish Ministry of the Environment is currently preparing long-term goals for the protection of Finnish waters for the year 2005. These will be based on the Water Act (1961, revised in 1996), the Act on Environmental Administration (1995), and the Act on Public Water and Sewage Plants (1977, revised 1994). Annual withdrawals of ground and surface waters as a percentage of available water were 2.3% in 1994. Domestic consumption of water was 257L/capita/per day in 1995.

### Water supplies

Domestic sewage treatment	1990	1999	2002
Tertiary treatment	76.0%	80.0%	81.0%
Secondary treatment	0.1%	0.0%	0.0%
Primary treatment	0.0%	0.0%	0.0%
None	23.9%	20.0%	19.0%

Officially, 99% of urban and 90% of rural households have access to safe water provision and all households have safe sewerage services. In 1983, there were 794 public water supply plants serving 3.79million people. Most industrial plants are served by their own water supplies. Effluent treatment coverage was 93% in 1995, with 600 municipal and 150 industrial wastewater treatment plants in 2002, with an annual operating cost of EUR200million. The quality of Finnish wastewater treatment is regarded as being good. However, there is still need to improve biological and chemical treatment with regards to phosphorus removal from effluents. Industry generated 900million m<sup>3</sup> of wastewater, of which 700million m<sup>3</sup> were generated to in the pulp and paper industry in 1994. 79% of the wastewater of pulp and paper industries is subject secondary treatment, with 11% receiving tertiary treatment and the remaining 12% being treated at primary level.

### Financing water and sewerage services

The municipal wastewater and water supply investment costs are financed mainly by municipalities themselves, and operation and maintenance costs including capital costs are mainly covered by the users in compliance with the polluter pays principle. The current investment costs of public water and sanitation services are about FIM8billion pa (USD340million pa). Finnish industry spent FIM336million on water and wastewater projects in 1997, along with O&M costs of FIM874million.

### Private sector contracts awarded (Please see the relevant company entry for details)

Location	Contract	Company
Haapavesi	Wastewater treatment concession	Kemwater

In 2002, Kemwater Services (51% Kemira OY and 49% YIT Environmental Services, owned by the Helsinki municipality) gained a 12 year concession to operate the second largest wastewater treatment plant in northern Finland. EUR2million will be spent in upgrading the facility.

### Private sector company operations (Please see the relevant company entry for details)

Company	Parent company (country)	Population served		
		Water	Sewerage	Total
Kemwater	Kemira (Finland)	0	60,000	60,000

Lathi City considered a cross-border asset leasing arrangement with the USA for its water and power utilities in order to exploit tax advantages in 2004. This made little progress, principally as it was an exercise in financial engineering. Further PSP in Finland is seen as a possibility over the next two decades, but not as an end in itself.

Source:

Seppälä, O T (2004) PRINWASS Strategic Country Report: Finland D26, Prinwass, Oxford University, UK

## FRANCE

<b>Economics (2005)</b>	
GDP per capita	EUR34.810
GDP per capita (PPP)	USD30,540
Agriculture	2%
Industry	22%
Services	76%

<b>Population</b>	
Total 2005, million	60.9
Total 2015, million	62.4
Urban areas (2005)	77%
Urban areas (2015)	79%
In urban agglomerations 2015	20%

**Sewerage and sewage treatment**

Year	1993-1995	2000	2001
Tertiary	5%	13%	27%
Secondary	44%	61%	51%
Primary	5%	13%	2%
Sewerage only	14%	6%	N/A
Not connected	32%	7%	N/A

The connection rate for sewerage services has increased from 55% in 1970 to 61% in 1980 and 93% by 2000. The percentage of the population having their sewage effluents treated has increased from 19% in 1970 to 41% in 1980 and 87.5% by 2000.

Lead pipes were still being installed in Paris as late as 1992. Lead piping was banned in 1995 and lead solder in 1996. In consequence, replacement of up to 70% of piping in some areas in 1996 was estimated to cost a total of FRF20billion. A survey carried out in 1999 found that in France, 10% of water samples were over the current lead standard, let alone the standard being proposed by the WHO and the EU. According to a 2004 report of the Institut Française de l'Environnement, 21% of groundwater and 45% of surface water has excessive pesticide levels and 30% of inland water is of poor or bad quality.

**Water usage and availability**

Demand for water has risen by 4-5% pa since 1950, and had stabilised by 1990. Since 1991, domestic water consumption has been decreasing by 1% pa. Since 1994, water bills are calculated according to the volume of water used, while metering has been compulsory since the 1930s. The shift towards demand-led pricing has been a key factor in constraining domestic water use. 14.42million people live in areas with a water shortfall, mainly in Côte d'Azur and the Ile de France.

<b>Urban services</b>	
% Water	99%
L/capita/day	156
% Sewerage	95%
% Sewage treated	80%

**Compliance costs**

According to Suez, compliance with the proposed Drinking Water Directive will cost France EUR15-18billion, with affected households paying EUR1,500-7,500 to replace their lead piping. The company stopped using lead piping for connecting households with the mains in 1981 and even then, it was the exception. The Paris region plans spending USD6-7billion on wastewater treatment from 1997 to 2015.

<b>Water billings in 2001 were EUR10billion:</b>	
Local authority collection	46%
Private sector collection	25%
Water agencies	12%
Government	7%

One of the problems is that the 'polluter pays' principle applies more to domestic customers than to other categories. In 1998, agriculture generated a BOD load of 254million PE while financing 2% of sewerage expenditure and accounted for 80% of water demand while paying 1% of the national supply bill. The Agences des Basins are failing to levy appropriate charges to agriculture and industry. As a result, they have been steadily increasing their fees to domestic customers (up 22.7% pa on average between 1988 and 1994) to make up for this shortfall.

## Market structure

Companies have a portfolio of local contracts, traditionally managed on a regional basis. Privatisation has been taking place alongside the evolution and expansion of water and wastewater services. Since the late 1930s, privatisation has generally expanded by 1% pa. There are three leading private sector companies with 13,000 contracts, and the public sector, which addresses some 23,000 municipal contracts. The private sector accounts for 78% of the population, including the great majority of the urban population with an average population served of 3,600 people per contract. The public sector serves the remaining 22% of the population, mainly in rural areas, with an average population served of 565 people per contract.

<b>Freshwater</b>	
Total (1998, km <sup>3</sup> )	180.0
Per capita (2000, m <sup>3</sup> )	3,371
Withdrawals (2000, km <sup>3</sup> )	40.0
For domestic use (2000)	16%
For industry (2000)	74%
For agriculture (2000)	10%

## Privatisation

Private sector involvement started in 1853 with the founding of Cie. Generale des Eaux (VE), followed by Eaux de Banlieue in 1867 and Lyonnaise des Eaux (Suez) in 1880. By 1933, there were eight major private sector players in France, along with a number of smaller regional concerns serving 17% of the population. PSP rose to 31% in 1954, 44% in 1968 and 69% by 1986. In 1980, there were 50 private sector companies, many of them under the wings of VE and Suez. By 1990, five significant private sector entities remained. One new competitor (Ruas) has recently emerged, but this remains a local company. With the acquisition of SDEI by Suez in 1991 and CISE by Bouygues (SAUR's then parent company) in 1997, there were only three major private sector players left, serving some 78% of the population.

## Population served by management regime

Million	Municipally run		Delegated		Overall	
	1998	2001	1998	2001	1998	2001
<b>Drinking water supply</b>						
Single municipality	8.6	7.6	16.5	15.4	25.0	23.0
Group of municipalities	10.0	10.0	25.0	27.1	35.0	37.1
<b>Overall</b>	<b>18.6</b>	<b>17.6</b>	<b>41.5</b>	<b>42.5</b>	<b>60.0</b>	<b>60.0</b>
<b>Waste water treatment</b>						
Single municipality	11.3	9.8	11.8	10.4	23.1	20.2
Group of municipalities	14.6	16.3	18.3	19.9	32.9	36.1
<b>Overall</b>	<b>25.8</b>	<b>26.1</b>	<b>30.1</b>	<b>30.3</b>	<b>55.9</b>	<b>56.4</b>

Source: Institut Française de l'Environnement, in collaboration with the statisticians of the Service Centrale des Enquetes et Etudes Statistiques, 2004.

Since 1990, privatisation of sewerage services has grown appreciably faster than for water since new sewerage schemes are usually only initiated when the contract is given to the private sector. Private sector market share is being gained more rapidly for sewerage contracts than for water. For example, VE served 19.8million people for water and 6.9million for sewerage in 1980, while Suez provided water for 14million and sewerage services for 6million in 1994.

<b>Groundwater</b>	
Total recharge (1998, km <sup>3</sup> )	100.0
Per capita (1998, m <sup>3</sup> )	1,703
Withdrawals (1990, km <sup>3</sup> )	6.2
For domestic use (<1990)	53%
For industry (<1990)	30%
For agriculture (<1990)	17%

<b>MAJOR CITIES</b>			
Population	2000	2015	Status
Paris	9,630,000	9,858,000	Private sector
Lyon	1,353,000	1,446,000	Private sector
Marseilles	1,290,000	1,358,000	Private sector
Lille	991,000	1,036,000	Private sector
Toulouse	761,000	871,000	Private sector

### Regulatory study: Reforming France's water services

The chief domestic challenge facing both VE and Suez is the perceived lack of a competitive market, which is best demonstrated by the fact that until the Nantes sewerage concession award to VE in 1997, VE and Suez have never gained a contract from each other. The piecemeal nature of contracts in France has constrained the scope for economies of scale. VE has 2,300 contracts in France, with an average population served of 11,304, Suez has 3,000 (average 4,667), while SAUR has 6,000 contracts, each serving on average 1,083 people.

Average water prices in France (EURper m<sup>3</sup>)

	1995	1996	1997	1998	1999	2000	1995 – 00
Water	1.01	1.04	1.07	1.08	1.10	1.11	10.6%
Sanitation	0.71	0.78	0.78	0.80	0.82	0.83	17.5%
Taxes	0.57	0.66	0.66	0.68	0.70	0.71	23.2%
Total	2.29	2.48	2.51	2.56	2.62	2.65	15.9%

While revising prices during the life of a contract remains common practice, the traditional reason for such revisions has been to facilitate price rises. Indeed, until 1997, 80% of contract reviews resulted in upward price revisions. There has been a subsequent shift from increases to cost cutting exercises. There has also been concern about the effect of a number of corruption scandals over contract awards, which have taken place in recent years. The Government has threatened to take-over water contracts or their awarding process so as to penalise these companies. This may result in genuine competition for water and sewerage contracts.

Since 1997, the private sector has been providing the local authorities and national and regional audit offices with externally audited annual reports and results statements. The 1995 Loi Barnier also obliges local water authorities and municipalities to publish an annual report on water prices and quality, which will create an unprecedented degree of transparency in the market. Water prices now need to be renegotiated every five years as opposed to the previous limit of once every 15 years. In 2002 Nice negotiated a 15% cut in bills with Veolia, who had serviced the town since 1864. The city of Avignon negotiated a similar reduction earlier in the year, while Dijon gained a 10% cut from Suez. In 2004, Castres cancelled its contract with Suez after a dispute about proposed spending and price rises. There has been a significant move towards a centralised and activist regulatory regime as pioneered by Ofwat in England and Wales. VE and Suez regard the French market as being the most competitive in Europe despite controlling 85% of the private sector between them, while jointly operating some of the largest contracts. In a typical year, 12-15% of contracts in France are renewed. Suez had a contract retention rate of 84% in 2001 and VE retained 80% in 2003.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	Contract	Company
National	2,300 water and sewerage contracts	Generale des Eaux
National	3,000 water and sewerage contracts	Lyonnaise des Eaux
National	6,000 water and sewerage contracts	SAUR
Gard & Herault	3 water contracts	Ruas de St. Jean de Gard

### Competition remains at an early stage

The Syndicat Professionnel des Exploitants Indépendants des Réseaux d'Eau et d'Assainissement (SPEIREA) was founded as a grouping of water and wastewater service companies outside the three major companies. Since competition effectively started in 1995-96, 2% of the market has been gained by perhaps 15 independent companies. In the region of 600 municipalities are served by the five companies identified below.

- RUAS (SA Michel Ruas) provides water to 130,000 people and wastewater services for 120,000 people in 100 communes in the South of France. The first noted contract gain was in 1996.
- SOGEDO (Société de Gérance de Distribution d'Eau) is based in Bordeaux and serves 66 of the 1,457 communes in the Rhone/Mediterranean/Corsica region. Revenues in 2002 were EUR7million.
- La Société de Travaux Gestion et Services (STGS) provides water and wastewater services to 305 communes in eight departments in north West France, including water services for 245 communes, serving 132,000 people and sewerage and sewage treatment for 34,000 people. The company was founded in 1991 and is part of STURNO, a French company involved in telephone, waste management and water equipment and services based in Avranches in North West France. STGS had revenues of EUR5.2million in 2003.
- Alteau was founded in 1992. The company has 82,000 domestic customers (all for water provision), 55,000 served by concessions and 32,000 through affermage contracts. The two concessions cover 88 communes and generate revenues of EUR1.5million pa. Revenues for 2007 are anticipated to be EUR17.1million against EUR14.8million in 2003, with a total of 250,000 people being served.

Locality (region)	Contract	People served
Basse-Limagne (Puy-de-Dôme)	Concession	78,250
Plaine de Riom (Puy-de-Dôme)	Concession	25,500
Ville de Belley (Ain)	Affermage	10,000
Velye-Reyssouze-Vieux Jonc (Ain)	Affermage	30,000
Saint-Just Saint-Rambert (Loire)	Affermage	11,000
Savigneux (Loire)	Affermage	8,500

Ternois Epuraton was founded by Ternois Developpement France's fourth largest manufacturer of wastewater treatment works founded in 1970. Ternois provides wastewater treatment for 150,000PE, or approximately 80,000 people in a number of municipalities in the Eure, Loire and Var regions. Revenues were EUR8.9million in 2002-03 with group revenues of EUR32million in 2005-06 against EUR20million in 2002-03.

Private sector company operations (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
Generale des Eaux	VE (France)	24,100,000	16,200,000	<b>24,100,000</b>
Lyonnaisse des Eaux	Suez (France)	17,000,000	9,000,000	<b>17,000,000</b>
SAUR	PAI (France)	6,000,000	6,500,000	<b>6,500,000</b>
Alteau	Alteau	250,000	0	<b>250,000</b>
Ruas	Ruas	130,000	120,000	<b>130,000</b>
Ternois Epuration	Ternois Developpement	0	80,000	<b>80,000</b>
STGS	STURNO	132,000	34,000	<b>166,000</b>
Sogedo	Sogedo	50,000	0	<b>50,000</b>

A number of contracts are held jointly (e.g. Paris, Marseille, Lille & Versailles) so the country numbers include a significant element of double counting. In 2000, approximately 10% of the private sector share was accounted for by joint ventures, 12 between VE and Suez and 2 between Suez and SAUR. These arrangements are increasingly seen as being anti-competitive and by 2003, 5 of the VE/Suez joint ventures had been broken up.

**GABON**

<b>Economics (2005)</b>	
GDP per capita	USD3,340
GDP per capita (PPP)	USD5,500
Agriculture	8%
Industry	62%
Services	30%

The country's water resources are managed and developed by the Ministry of Mines, Energy, Oil and Water Resources and the Gabonese energy and water company (Veolia's Société des Eaux et de l'Electricité du Gabon (SEEG)).

**Water provision**

40% of the population of Libreville has access to piped water but there are no sewerage or sewage treatment facilities serving the city. Nationally, 90% of the urban population is regarded as having access to safe water. Connections to piped water in Libreville have increased from 49% to 62% after the privatisation of SEEG.

<b>Population</b>	
Total 2005, million	1.4
Total 2015, million	1.6
In urban areas 2005	84%
In urban areas 2015	89%
In urban agglomerations 2015	0%

Gabon is one of the 10 best-endowed countries in the world as far as water resources are concerned. The 2005 national poverty survey (Enquête gabonaise pour l'évaluation et le suivi de la pauvreté-EGEP) showed that although access to drinking water had significantly improved since 2000, but the country had far to go as regards sanitation, with just 40% of the population having access to improved sanitation. Water is sold at the same price wherever the customer lives, but at least 25% of the 46% of directly-connected households get their water from a connected neighbour, who re-sells it to them at a profit. The houses that sell on the water are usually better off and therefore are doubly benefiting from a subsidised official supply.

**Sewerage services**

Sewerage services are being developed under a delegated management contract with SOCAGI, a group comprising Suez (43%), Hydro Quebec (34%) and EDF (23%). SOCAGI was virtually bankrupt in 1994, having made a loss of XAF14billion in that year. The company is understood to be at least breaking even, although the scope for cost-cutting is difficult, due to some hostility towards further privatisation by the workforce.

<b>Urban Services</b>	
Safe drinking water	90%
Per capita consumption (L/day)	66
Sewerage	55%
% Sewage treated	0%

**Privatising SEEG**

SEEG has been earmarked for privatisation since 1993. The Government was, however, reluctant to proceed, even though it has recognised that the private operator would contribute a significant amount of capital to the company, in return for a concession. In March 1997, VE gained a 20 year concession to operate SEEG's services. SEEG generated revenues of FRF500million from its electricity services and FRF200million from water provision in 1996. VE initially acquired 100% of SEEG's equity, 49% of which was in turn sold in a public tender with the equity being listed on the Libreville stock exchange. The concession serves Gabon's three principal cities: Libreville, Port-Gentil and Franceville.

<b>Freshwater</b>	
<b>Total (1998, km<sup>3</sup>)</b>	<b>164.0</b>
Per capita (2000, m <sup>3</sup> )	1121,392
Withdrawals (2000, km <sup>3</sup> )	0.1
For domestic use (2000)	48%
For industry (2000)	11%
For agriculture (2000)	40%

<b>Groundwater</b>	
<b>Total recharge (1998, km<sup>3</sup>)</b>	<b>62.0</b>
Per capita (1998, m <sup>3</sup> )	52,991
Withdrawals (1989, km <sup>3</sup> )	0.0
For domestic use (1989)	100%

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
Main urban areas	20 year water provision concession	SEEG
Urban areas	Lease contract, sewerage development	SOCAGI

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
SEEG	VE (France)	450,000	N/A	<b>450,000</b>
SOCAGI	Suez (France)	0	N/A	<b>N/A</b>

Source:

African Development Bank/OECD (2007) African Economic Outlook

## GERMANY

<b>Economics (2005)</b>	
GDP per capita	USD34,580
GDP per capita (PPP)	USD29,210
Agriculture	1%
Industry	29%
Services	70%

### Regulations and charging mechanisms

EUR7.15billion is invested annually in wastewater disposal in Germany, approx. 70% for the construction and maintenance of sewage systems, and 30% for the construction and operation of wastewater treatment plants. Despite the high connection percentage, an average annual investment of EUR6.64 billion to EUR7.66billion will be needed in future. The focal point of this investment will be in rural areas and in upgrading wastewater treatment plants and sewage systems in the new federal states.

The Federal Ministry for the Environment, Nature Protection and Nuclear Safety is responsible for the enactment of the Federal Water Act, the Wastewater Charges Act, the Washing and Cleansing Agents Act and the Federal Nature Conservation Act. The Federal Ministry of Food, Agriculture and Forestry deal with water resources management projects in the rural economy. The Federal Ministry of Health is responsible for drinking water supply and quality.

Effluents are charged for under the Wastewater Charges Act of 1976 (amended 1990). These charges are based on Schadeinheit (SE), or unit harm. One SE unit is the equivalent discharge of a human pa. The charges started at DEM12 per SE in 1981 and were last revised at DEM70 per SE in 1994. In addition, most of the Länder have regulations on the payment of a water abstraction charge of up to DEM0.6 m<sup>3</sup>. The revenue is used to support special environmental measures like the economical use of water, to subsidise innovative techniques or to protect catchment areas, e.g. by payments to farmers for changing land use patterns. The municipalities also have to pay this tax.

<b>Population</b>	
Total (2005,million)	82.5
Total (2015,million)	81.8
Urban areas (2005)	75%
Urban areas (2015)	90%
In urban agglomerations (2015)	43%

### Development of sewerage infrastructure

	1975	1990	1995	1999	2001	2004
Tertiary	5.0%	29.9%	72.3%	83.1%	88%	90%
Secondary	64.7%	49.8%	12.2%	6.3%	5%	3%
Primary	10.2%	5.9%	4.1%	1.1%	0%	0%
Untreated	N/A	3.8%	3.5%	4.8%	3%	3%
Unconnected	N/A	10.4%	7.9%	4.7%	5%	4%

The sewerage network is basic in the former GDR, with 62.4% of the population receiving treatment compared with 91.3% in Western Germany. Primary treatment accounts for 24.7% and 1.1% respectively, secondary treatment 27.1% and 5.6% and tertiary treatment reaches 10.6% and 37.4% respectively. Overall, 98 out of the former Eastern Germany's 243 sewage treatment works comply with COD/BOD standards.

<b>Urban Services, Western Länder only</b>	
% Water	100%
% Sewerage	100%
% Sewage treated	99%

### Inland water quality

<b>Western Länder</b>	<b>1985</b>
I-Very Good	6.5%
II-Good	38.0%
II-Fair	40.0%
III-Poor	14.0%
IV-Bad	1.5%

The rivers Ruhr and Rhine are considered problem areas. In addition, the Elbe, Weser and Main are Class III/IV in their lower reaches. The Rhine Action Plan (1987) sought to improve the Rhine to Class I or II quality by 2000. The systematic examination of groundwater quality started in 1984. There are rising nitrate and phosphate levels,

while a number of sources have been closed as a result of excess PAH concentrations (see table above for definition). Systematic data on the eastern Länder is currently being collected. It is fair to say that water quality and infrastructure are appreciably below those in the western Länder. For example, in Brandenburg, 34% of rivers have water quality of I-II, 45% of II/III and 18% of III/IV. The water in the former GDR is of a poor quality as only 20% of surface water can be used for drinking water abstraction within reasonable efforts of purification.

<b>Freshwater</b>	
<b>Total (1998, km<sup>3</sup>)</b>	<b>96.0</b>
Per capita (2000, m <sup>3</sup> )	1,866
Withdrawals (2000, km <sup>3</sup> )	47.1
For domestic use (2000)	12
For industry (2000)	68
For agriculture (2000)	20

### Compliance and upgrading forecasts

In 2003, the German association of towns and parishes, the DStGB, stated that it believed the upgrading of Germany's water and wastewater system will require investment of about EUR75billion over the next 10 years. This is in contrast to figures of EUR150-300billion for sewerage and wastewater alone that have been the accepted norm since the 1990s. This perhaps reflects the work carried out to date as well as the savings that can be made when examining costs more closely.

It has been found that private sector operators can significantly undercut assumed costs. The VpA was established in 1992 as an association of private sewerage operating companies. They have studied 200 projects across Germany and concluded that costs for developing facilities could fall by 15-40% when submitted to private tender. VpA found that conversion work for extant facilities can be carried out for DEM250/capita against previous assumptions of DEM450-600/capita.

### Investment in infrastructure

<b>EURbillion</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>
Water	2.36	2.44	2.28	2.56
Wastewater	6.84	6.85	N/A	6.00
<b>Total</b>	<b>9.20</b>	<b>9.29</b>	<b>N/A</b>	<b>8.56</b>

### The cost for the customer

Water production has fallen by 28% 1990-2002, with an average water fee of EUR1.77 per m<sup>3</sup>. Water utilisation was 130L/day in 2003. In 2003, wastewater charges were EUR2.28/m<sup>3</sup> against 2.18/m<sup>3</sup> in 2000.

	<b>1990</b>	<b>2001</b>
Water sales (million m <sup>3</sup> )	5,985	4,785
Price EUR/m <sup>3</sup>	1.18	1.70

Source: *Ministerium für Verbraucherschutz*

In western Germany, there have been legal moves to force water charges down in North Rhine-Westphalia, Bavaria and Baden-Wurtemberg. There is considerable resistance to further EU laws, because of the current high cost of water provision and sewerage services. In 1999, the State of Hess lowered water fees charged by Sudheissische Gas und Water AG, the municipally held water provider. The average household will pay EUR380 as a result, some DEM46 less than in 1998.

<b>Groundwater</b>	
Total recharge (1998, km <sup>3</sup> )	45.7
Per capita (1998, m <sup>3</sup> )	555
Withdrawals (1990, km <sup>3</sup> )	8.0
For domestic use (1975)	49%
For industry (1975)	48%
For agriculture (1975)	44%

Since unification in 1990, household water consumption in western Germany has fallen by 20%, with usage in eastern Germany falling by 50%. In Berlin, for example, per capita usage has dropped another 10L to just 117L/day. As seen in Nordhauser, conserving water brings its own costs. Water consumption in the former Eastern German town has fallen by 50% to 80L/capita/day since reunification. As a result, their bills are rising. This paradox has arisen because the water distribution system is designed to operate by providing 220L/capita/day, thereby getting water through its pipes in an optimal time. The excess remaining in the system means that extra spending is needed in order to keep bacterial levels down.

<b>Major Urban Agglomerations</b>			
<b>Population</b>	<b>2000</b>	<b>2015</b>	<b>Status</b>
Aachen	1,060,000	1,070,000	N/A
Berlin	3,319,000	3,320,000	BWB privatised in 1999
Bielefeld	1,294,000	1,310,000	N/A
Bremen	880,000	886,000	Sewerage privatised
Rhein-Rhur South	3,054,000	3,089,000	N/A
Rhein-Rhur Middle	3,233,000	3,335,000	N/A
Rhein-Rhur North	6,531,000	6,554,000	N/A
Rhein-Main	3,681,000	3,718,000	Privatisation under consideration
Hamburg	2,664,000	2,683,000	HWW corporatised
Hannover	1,283,000	1,291,000	N/A
Karlsruhe	977,000	988,000	N/A
Rhein-Neckar	1,605,000	1,621,000	MVV part privatised in 1998
Munich	2,291,000	2,317,000	N/A
Nuremberg	1,189,000	1,204,000	N/A
Saarland	891,000	892,000	N/A
Stuttgart	2,673,000	2,703,000	N/A

#### Principal cities in the five regional agglomerations:

Rhein-Main	Darmstadt and Frankfurt am Main
Rhein-Neckar	Mannheim
Rhein-Rhur Middle	Düsseldorf and Mönchengladbach
Rhein-Rhur North	Duisburg and Essen
Rhein-Rhur South	Bonn and Cologne

#### The municipalities and the private sector

##### Water provision in 2002

<b>Entity</b>	<b>Status</b>	<b>Million m<sup>3</sup> pa</b>
Gelsenwasser-Group	Private	364
Berlinwasser	Private	217
Gelsenwasser-AG	Private	140
Lake Constance Water	Municipal	133
Hamburg Water	Municipal (considering PPP)	128
Westphalian Water	PPP	117
Munich Water	Municipal	116
Stuttgart Water	Municipal	89
Hildersheim Water	Municipal	80
Eastern Harz Water	Municipal	76
Rhenish-Westphalian Water	Municipal	70
Essen Water	Public-Private	70

The market remains broadly in the hands of municipalities and by quasi-private companies directly owned and controlled by municipalities. The best opportunities for private sector investment continue to be seen in the eastern Länder. In the east, water and sewerage are integrated at the municipal level. They are separate in the west.

The EIB has been a major investor with municipal water projects in Germany, with EUR3,183million of loans disbursed 1998-2002. In addition, the German Bank for Reconstruction has made a number of major loans, including EUR900million for water provision and sewerage. The EU is providing EUR1,300million in funding for water and environmental projects in the eastern Länder between 2000 and 2006.

The western Länder has 1,429 water supply companies and some 6,000 water and sewerage entities in total. The desire to privatise sewerage in the eastern Länder is stronger, with formal structures put into place by the privatisation agency to encourage the setting up of JVs and the award of concessions. Legal complications remain a problem, with the Rostock contract having been held back for two years because of these.

Since 2002, there has been an increase in the pace and scope of privatisation proposals. The city of Dresden in Saxony has sold a 49% stake in Dresdner Stadtentwässerung (DS) to Gelsenwasser in 2004. DS treats 130,000m<sup>3</sup> of waste and surface water daily for 475,000 households and 1,100 industrial customers. Gelsenwasser is also taking over Emmerich in North Rhine Westfalia's Abwasser Emmerich. Abwasser Emmerich provides wastewater disposal services for the town's 30,000 inhabitants. Gelsenwasser and EAM-Wasserversorgung (E.ON) have signed a 25 year contract with Bad Karlshafen to take over operational management of the town's water and wastewater activities. E.ON's Avacon (49%) and Vienenburg (51%) have formed a JV, a water and wastewater company named WAGV Wasser-und Abwassergesellschaft Vienenburg. From 2003, Avacon will also take over commercial operations and billing. Annual water sales in Vienenburg are about 0.52million m<sup>3</sup>. Baden-Württemberg's Emmingen-Liptingen will set up a new water supply company from its

public works water department, to start operations at the beginning of January 2004 and in Hesse, the town of Fränkisch-Crumbach is considering PSP. Energieversorgung Offenbach (EVO) has a 25-year co-operation contract to operate water and wastewater operations for the parish of Mainhausen. EVO traditionally supplies the towns of Offenbach and Dietzenbach with drinking water and operates their wastewater services. The commune of Schwerin has become the first commune in Mecklenburg-Vorpommern to enter into a wastewater PPP. Operational management has been taken over by Wasser-Abwasser-Gesellschaft Schwerin, owned 51% by the municipal utility Stadtwerke Schwerin and 49% by Eurawasser. Hamburg is also considering a partial privatisation of Hamburger Wasserwerke (HWW). The state of Saxony Anhalt is seeking to sell its water supply company Fernwasser Sachsen-Anhalt (FSA).

Consolidation in the public and private sectors continues. E.ON has consolidated its northern German operations, which supply 22,000 customers with water. These are Schleswig (Rendsburg), Hein Gas (Hamburg) and the Hein Gas' eastern German subsidiary, HGW (Schwerin). Likewise, the state of Thüringia is encouraging water associations to merge. The Abwasserzweckverband Wipper-Ohne and Wasserzweckverband Eichsfelder Kessel are setting up the jointly-owned Wasser-und Abwasserzweckverband Eichsfelder Kessel.

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
AWS	Gelsenwasser (Germany)	20,000	55,000	<b>55,000</b>
Berlin Wasser	VE/RWE (France/Germany)	3,900,000	3,900,000	<b>3,900,000</b>
Energie	Energie (Austria)	15,000	0	<b>15,000</b>
Eurawasser	Suez (France)	550,000	600,000	<b>600,000</b>
Gelsenwasser	Gelsenwasser (Germany)	4,650,000	1,150,000	<b>5,800,000</b>
Hansewasser	Gelsenwasser (Germany)	0	550,000	<b>550,000</b>
MVV	Mannheim Municipality	990,000	400,000	<b>900,000</b>
Oewa	VE (France)/VKR (Germany)	730,000	710,000	<b>730,000</b>
RWE Aqua	RWE (Germany)	2,100,000	4,400,000	<b>6,300,000</b>
S'werke Göttingen	Gelsenwasser (Germany)	50,000	0	<b>50,000</b>
Severn Trent	Severn Trent (UK)	0	45,000	<b>45,000</b>
Stadtwerke Görlitz	VE (France)	80,000	80,000	<b>80,000</b>
Stadtwerke Gera	VE (France)	165,000	0	<b>165,000</b>
WTE	EVN (Austria)	21,000	105,000	<b>105,000</b>
Remondis Aqua	Remondis (Germany)	0	315,000	<b>315,000</b>

### Politics and the private sector

Bad Schwalbach in Hesse has let its contract with Süwag Wasser (RWE) expire at the end of 2002, after becoming coalition partners in the local Government. This is despite Süwag's good record in the four years since it took over these services in 1999.

<b>EURmillion</b>	<b>1996-98</b>	<b>1999-02</b>
Investment	2.20	6.20
Profits	-0.62	0.73
Price per m <sup>3</sup>	5.14	4.93

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Altenburg	20 year sewerage BOOT	WTE
Bremerhaven	Sewage treatment and sewerage PPP	Remondis Aqua
Burghausen	Water provision	Energie
Berlin	30 year water and sewerage concession	VE / RWE
Bremen	Sewerage and sewage treatment	Hansewasser
Döbeln/Oschatz	4 year water and sewerage management	Oewa
Gelsenkirchen	30 year water concession	Gelsenwasser
Gera	O&M, water provision	Stadwerke Gera
Genthin	PPP, sewage treatment	Remondis Aqua
Görlitz	Municipal services	Stadwerke Görlitz
Goslar	25 year sewerage concession	Eurawasser
Gotha	Water and sewerage operations PPP	Remondis Aqua
Göttingen	Municipal services	Stadwerke Göttingen
Hecklingen	30 year sewerage treatment BOOT	WTE
Kiel	Water and sewerage concession	MVV
Leipzig	25 year water and sewerage concession	Oewa
M-Pomerania	Two 25 year concessions	Eurawasser
Nohra	10 year sewerage treatment management	Severn Trent
Rostock	25 year sewerage concession	Eurawasser
Saxony	Two 25 year water concessions	Eurawasser
Saxony Anhalt	Water and sewerage contracts	Oewa
Wessendorf	Sewage treatment PPP	Remondis Aqua
Windeck	25 year water and sewerage BOOT	WTE

## GHANA

In 2006 Ghana agreed a five year lease contract for the Ghana Water Company Limited (GWCL), with Vitens (Netherlands) and Rand Water (South Africa) supported by a USD103million grant from the World Bank. The Urban Water Supply Project aims to provide a more reliable water supply for 7 million people in Ghana's main towns. The total project cost is USD120million. The Nordic Development Fund will provide USD5million and the Government of Ghana is providing the remaining USD12million. This strategy has developed through a series of consultations held since 1996. The original plans drawn up by the World Bank in 1995-96 anticipated a concessional contract for GWCL. By 2000-01, these were for a lease. In 2003-04, it became evident that a management contract of no more than five years duration was the most appropriate way forward.

GWCL had 320,000 customer connections in 2003 and 350,000 in 2006. Typically, people in urban areas without water connections pay ten times the GWCL rate for their water. Some 15% of Accra is covered by the sewerage network, mainly in the business district. While 20 satellite systems have been developed in Accra, most of these have broken down.

Aqua Vitens Rand Water Ltd's contract has been designed so that the international operators cease to have a management role after five years, by which time the local management will be able to take over all aspects of the company's operations. Currently, the 350,000 connections supply 7 million people, typically with standpipes or tankers. 40% of the urban population have access to adequate drinking water within a reasonable distance of their homes, along with non revenue water of at least 50%.

GWCL has been able to invest some USD1.50/capita pa since the mid 1990s. Ghana established a multi utility regulator in 1997 as part of its overall utility reform package. Further regulatory bodies have since been put into place: the Public Utility Regulatory Commission (PURC, regulates tariffs and water supply operational performance); the Water Resource Commission (WRC, responsible for the regulation and management of water resources); the Ghana Standard Board (development of drinking water standards); the Environmental Protection Agency (environmental regulation of water supply operations) and the Community Water and Sanitation Agency (community water and sanitation services through District Assemblies).

<b>Water in 2003</b>	<b>Total Population</b>	<b>Improved Water</b>	<b>Percentage Served</b>
Urban areas	8.4	5.1	61%
Rural areas	11.8	5.2	44%
Total	20.2	10.3	51%

Nationally, USD1.3billion is needed for an adequate water and sewerage system, with one third of water systems in the country currently classified as non-functioning.

Sources:

World bank (2004) Project appraisal document on a proposed credit to the Republic of Ghana. Report Number 28557-GH, World Bank, Washington DC, USA

African Development Bank/OECD (2007) African Economic Outlook

**GREECE**

<b>Economics (2005)</b>	
GDP per capita	USD19,670
GDP per capita (PPP)	USD23,620
GDP in Agriculture	7%
GDP in Industry	23%
GDP in Services	70%

**Water resources and management**

There has been a substantial increase in water usage since the 1970s. A slight decrease in consumption since 1992 has not been enough to alleviate the continual water shortages being encountered. The proportion of the population connected to sewerage services increased from 0.5% in 1980 to 10% in 1990 and to 58% by 1994. There were 26 sewage treatment works in 1988, of which 2 serve cities with a population in excess of 100,000. The proportion of the population served by sewage treatment has remained constant at 11% in recent years.

<b>Population</b>	
2005 (million)	11.1
2015 (million)	11.2
Urbanisation, (2005)	59%
Urbanisation, (2015)	65%
In urban agglomerations, 2015	41%

**Water services**

The only water treatment takes place in Athens. Other municipalities carry out chlorination only. Water consumption varies from 150L/day in small cities to 250-350L/day in larger cities. There was EU funding (70%) and Government funding (30%) of EUR3.75billion of water and sewerage upgrading work between 1994 and 1999.

<b>Urban data</b>	
Served by piped water	86%
Access to sewerage	60%
With sewage treatment	30%

**Development of sewage treatment**

	<b>1993</b>	<b>1994</b>	<b>1997</b>
Tertiary	3.8%	0%	9.6%
Secondary	12.7%	9%	14.2%
Primary	32.8%	1%	32.4
Sewerage only	18.2%	48%	11.6
Not connected	31.5%	42%	32.2%

56 new wastewater treatment plants are currently under construction. These units are designed to serve a population equivalent of 1.53million people. Another 22 are planned to serve a population of 400,000 inhabitants. By 2006, 75% of the Greek population is expected to be connected to wastewater treatment systems. In 1998, the percentage of urban settlements served by sewerage systems was 45%, and in 2000 increased to 64%. For settlements with PE >15,000 that discharge into normal areas, the percentage has increased from 27% to 43% in 2000. This percentage has further increased in 2001, with the total number of municipal wastewater treatment plants amounting to 290, whereas projections show that in 2005 the number will reach 475, covering 94.8% of the population.

<b>Freshwater</b>	
Annual availability (2000)	45.2km <sup>3</sup>
Per capita	6,764m <sup>3</sup>
Annual withdrawal (2000)	7.8km <sup>3</sup>
Domestic	16%
Industrial	3%
Agriculture	81%

**Water issues**

Groundwater depletion and salination is widespread, especially at Patras, Iraklia, Alexanpolis and Preveza. Groundwater depletion is also taking place in Thessaloniki (1million inhabitants). Athens is fed by canals and tunnels from a network of rivers and dams (3.5million inhabitants). 4.141million people in central Greece face regular water shortages.

**Inland water quality (1986, estimate)**

Ia-Very Good	20%
Ib-Good	40%
II-Fair	20%
III-Poor	15%
IV-Bad	5%

In 1993, the Government started moves to restrict water usage. The first 60m<sup>3</sup> pa per household is charged at a basic rate. Any water used above 400m<sup>3</sup> pa per household is charged at 20 times that rate. The law No 1665/80 of 1980 established state funded water and sewerage corporations. These are either self standing entities for large cities or municipally run entities. These corporations are now being grouped, so as to encourage EU and private sector funding. It is likely that private partners will be encouraged to enter the sector in the short to medium term.

<b>Groundwater</b>	
Annual availability (1998)	2.5km <sup>3</sup>
Per capita	237m <sup>3</sup>
Annual withdrawal (1980)	1.9km <sup>3</sup>
Domestic	13%
Industrial	3%
Agriculture	85%

<b>MAJOR CITIES</b>			
City	2000	2015	Comments
Athens	3,116,000	3,138,000	EYDAP partially floated in 2000
Thessaloniki	789,000	825,000	EYATH partially floated in 2001

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
Location	Contract	Company
Athens	20 year water and sewerage concession	EYDAP
Thessaloniki	25 year water and sewerage concession	EYATH

**Flotation of EYDAP and EYATH**

In April 2000, 28% of EYDAP was listed on the Athens Stock Exchange in a nine times oversubscribed issue. The issue raised EUR233million for the company and allowed its activities to be run on a commercial basis. The Government will retain control of its water production facilities in the medium term and will be responsible for its investment programme until 2008. This was followed in 2001 by the flotation of a similar stake in Thessaloniki's EYATH.

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
EYDAP	Athens Municipality	4,000,000	3,300,000	<b>4,000,000</b>
EYATH	Thessaloniki Municipality	850,000	850,000	<b>850,000</b>

## GUINEA

<b>Economics (2005)</b>	
GDP per capita	USD370
GDP per capita (PPP)	USD2,240
GDP in Agriculture	26%
GDP in Industry	38%
GDP in Services	37%

### From DEG to SONEG

The Entreprise Nationale de Distribution des Eaux de Guinee (DEG) was responsible for all technical and commercial operations up to the end of the 1980s. From 1976 to 1985, the World Bank provided a restructuring loan, the results of which were extremely disappointing in spite of extensive technical assistance from abroad. Indeed, by 1985, the urban water supply system in Guinea was one of the least developed in West Africa. The utility had no management autonomy from the ministry and was not able to finance maintenance work. In 1986 the Guinean authorities decided to liberalise the water management regime and in 1987 established Société d'Exploitation des Eaux de Guinee (SONEG) as an independent water services provision company wholly owned by the state. SONEG was responsible for implementing and managing water supply, acting as owner of the facilities to serve Conakry, the capital, and 16 other towns. The Minister of Natural Resources and Energy remains responsible for approving and monitoring any capital investment.

<b>Population</b>	
2005 (million)	9.4
2015 (million)	11.8
Urbanisation in 2005	33%
Urbanisation by 2015	44%
In urban agglomerations, 2015	32%

### Commercialising water provision

In 1987, the World Bank recommended that radical institutional reform be carried out, with financial support from the IDA, transferring management and risk to the private sector. The legal separation between asset-management activities (SONEG) and operating activities (SEEG) took place in 1989 with the two companies formally established. One, the newly created Société Nationale des Eaux de Guinée (SONEG), was to be responsible for conserving and enhancing the public assets, but also for servicing the debt by levying a fee on the managing entity. SONEG in turn awarded a ten year leasing contract for operations to SEEG (Société d'Exploitation des Eaux de Guinée), which has the task of supplying water in Conakry and a number of smaller cities for a period of 10 years. The contract can be renewed at the end of this period. SEEG was then privatised, with the Government maintaining a 49% stake in the entity.

<b>Urban Data</b>	
Served by piped water	61%
Access to sewerage	54%
With sewage treatment	0%

### Accountability and affordability

All of SEEG's activities are defined in its terms and conditions and in a three-year performance contract. SONEG derives its income from a fee paid by SEEG. The latter, for its part, operates the water supply facilities. It also carries out maintenance of the facilities and replaces smaller items of equipment. Lastly, it takes care of all aspects of consumer relations.

At the outset, tariff reforms would have created problems because water had never been regarded as an economic good. The Guinean authorities therefore decided upon a six-year transition period during which the rate actually paid by the consumer would be lower than the full rate, thanks to subsidies from the state and from external sources. The World Bank paid a subsidy for the six years (having required the introduction of a realistic price) which gradually decreased after the first four years. This was to ensure that the sudden increase in price did not appear to be excessive for the users.

<b>Freshwater</b>	
Annual availability (1998)	226.0km <sup>3</sup>
Per capita	26,218m <sup>3</sup>
Annual withdrawal (1987)	1.5km <sup>3</sup>
Domestic	8%
Industrial	2%
Agriculture	90%

### Operations and actualities

Fees collected by SEEG go towards paying service providers, covering distribution costs and for operations and investments carried out on behalf of the facilities owner (SONEG). SEEG began operations against a backdrop of severe water shortage and a network in a poor state of repair, along with some cultural difficulties. For example, a profit-oriented company needed to be developed, and customers had to be educated about the qualities of drinking water, how to avoid wasting water and why water had to be paid for.

The performance of the contract to date has been mixed. Between 1989 and 1995, the cost of water rose first from USD0.12/m<sup>3</sup> to USD0.25/m<sup>3</sup> at the start of the contract and progressively to USD0.90/m<sup>3</sup> then falling back to USD0.66/m<sup>3</sup> by 2000. In 1989, 15% of urban dwellers had access to piped water. This had increased to 52% by 1996. Meanwhile, water connections increased from 8,500 in 1975 to 12,000 in 1989 and to 30,500 by 1995. Metering also increased from about 5% to 98% of all connections by 2000. The bill collection ratio improved from below 50% in the years 1986-88 to 75% in 1995, before falling back to 60%.

Groundwater	
Annual availability (1998)	38.0km <sup>3</sup>
Per capita	4,952m <sup>3</sup>

### The scope for conflict

The Guinean Government's 49% share gives it some control over management decisions and it has the right to approve all changes of a legal nature. There is one potential problem with this relationship, which is that there is no independent regulator. The balance of stakeholder concerns may be affected in the future by the Government seeking (or seen as seeking) to optimise the return on its shareholding at the expense of customer concerns. The current challenge for the contract is to see how the customers' willingness and their capacity to pay in a period of economic difficulties will be affected by the ending of all subsidies. It is understood that some tensions exist between SONEG and SEEG with regard to the operational interpretation of the contract. SONEG sticks to the contract rigidly, while SEEG is seeking to have a greater degree of operational freedom. This perceived need for further operational flexibility is to be one of the main elements of the current contract renewal negotiations. The term of the lease contract is currently expiring and the system is now capable of attracting a concession contract. For the latter to succeed, affordability needs to be addressed, along with the relationship between SONEG and SEEG.

In 2001, the lease contract between SEEG and SAUR and Veolia ended, having formally expired in 1999 and no replacement contract being implemented. It is understood that a replacement contract is still being sought.

Major Cities			
City	2000	2015	Status
Conakry	1,232,000	2,073,000	Formerly privatised (SEEG)

## GUINEA-BISSAU

In Guinea-Bissau, Suez has provided management support for water services since 1991 in order to improve the technical and financial performance of EAGB, the public water and electricity utility. This contract is based on Suez receiving 75% of its income on a fixed fee basis, with the remaining 25% being performance-linked. The lack of a clear management role and the inability to take action over identifiable areas of under-performance has meant that this has been a difficult compromise for both the state and the private sector. The state has continued to fail to make its payments to Suez on time, while funds earmarked for investments in the network's infrastructure have not emerged. At the same time, tariffs have not been revised so as to allow billings to meet operating costs.

Nationally, Guinea-Bissau suffers from poor water availability and catchment degradation where water sources occur. 32% of the urban population had access to potable water in 1996, compared with 19% in 1991. 24% of the urban population had access to adequate sanitation in 1996. One of the problems evident in a contract such as the one with Suez is the size of the market in relation to the costs required to fully reform the cost recovery process. In a contract of this size, it may well be cheaper for a company such as Suez to let matters rest rather than to address any underlying problems. In the longer term, countries such as Guinea-Bissau are likely to demonstrate the limits of private sector involvement.

<b>Access to improved services</b>	<b>1980</b>	<b>2000</b>
Urban water	18%	29%
Rural water	8%	55%
Total water	10%	49%
Urban sanitation	21%	88%
Rural sanitation	13%	34%
Total sanitation	14%	47%

In 2003, EAGB's staff went on strike over unpaid wages, in some cases with arrears extending to more than one year. The interim Government has announced that it is looking again at PSP solutions in order to pay staff.

## HUNGARY

<b>Economics (2005)</b>	
GDP per capita	USD10,030
GDP per capita (PPP)	USD16,940
Agriculture	4%
Industry	31%
Services	65%

### Water pollution concerns

Industrial pollution of surface and groundwater is a major problem. Groundwater quality is decreasing. 35% of groundwater resources are regarded as failing acceptable standards, with nitrate levels being a particular problem. In total, 60% of groundwater needs treatment prior to use. Waters from the Danube are regarded as an unreliable source to depend upon, because of the pollution load. In the south and central areas, there are extensive seasonal water shortages.

<b>Population</b>	
Total (2005,million)	10.1
Total (2015,million)	9.8
Urban areas, (2005)	66%
Urban areas, (2015)	70%
In urban agglomerations (2015)	19%

### Development of sewerage infrastructure

<b>Population served</b>	<b>1970</b>	<b>1980</b>	<b>1990</b>	<b>1992</b>	<b>1996</b>	<b>2000</b>	<b>2002</b>
Tertiary	0%	0%	0%	1%	8%	31%	20%
Secondary	4%	12%	22%	11%	25%	N/A	37%
Primary	2%	7%	9%	4%	N/A	15%	4%
Preliminary	19%	19%	10%	27%	10%	5%	0%
None	75%	62%	59%	57%	48%	49%	39%

The proportion of population with sewerage services increased from 19% in 1980 to 49% in 2000. In 1995, 96% of the population was connected to mains water supplies. The country plans to spend USD4.8billion on sewerage service extension work between 1996 and 2010. A further USD1.5billion is to be spent on water provision during this period. Some USD0.75billion was spent on sewerage work between 1990 and 1995.

### Connection to mains water and sewerage

	<b>% Water</b>	<b>% Sewerage</b>
1980	75%	40%
1990	92%	52%
1992	94%	54%
1993	95%	55%
1994	96%	56%
1995	96%	58%
2002	98%	58%

The quality of more than 42% of the drinking water supplies in 2002 did not fully satisfy EU and Hungarian standards. Between 1994 and 2000, the length of the sewerage network increased by 7,500km to 22,300km. 90% of households in Budapest were served with sewerage in 2002, against 72-44% in other towns.

<b>Urban Services</b>	
% Water	98%
% Sewerage	85%
% Sewage treated	70%

### Privatisation

There are now more than 400 different water or wastewater service providers in Hungary, although 80% of the market is accounted for by the 25 largest firms. Municipalities regard water provision and sewerage as being a non-profit activity, with water supply obligatory, even to non payers. Prices have to be confirmed with the municipality concerned before the concession is formally granted.

In 2004, the Hungarian National Water Directorate is expected to submit a draft law to Parliament regulating private sector involvement in the water and wastewater sector. Present legislation prevents private companies from gaining a majority stake in water and wastewater utilities. This is directly related to the need to raise funds for the EU accession programme and is likely to be used to encourage concession contracts.

<b>Freshwater</b>	
<b>Total (1998, km<sup>3</sup>)</b>	<b>6.0</b>
Per capita (2000, m <sup>3</sup> )	10,579
Withdrawals (2000, km <sup>3</sup> )	7.6
For domestic use (2000)	9%
For industry (2000)	59%
For agriculture (2000)	32%

### Privatisation of Budapest

Fovarosí Csatonazasi, Budapest's sewerage services, was privatised in 1997. A 25% stake was sold to a joint bid by Berliner Wasser-Betriebe and Veolia. Financing of the project is via 25% equity and 75% debt. The concession involves the construction of 150km of sewerage piping and expanding the South Pest STW by 40,000m<sup>3</sup> per day. The operational contract for Favorsi Vizmurek Rt., Budapest's water provision utility, was awarded to Eurawasser AG. The concession award was delayed when the municipality blocked proposals to raise water fees. Water provision for the city was 285million m<sup>3</sup> (drinking) in 1996, along with 8million m<sup>3</sup> for industry. 98% of the city is connected to mains water.

Water fees were HUF1.2 per m<sup>3</sup> in 1990 and HUF45 per m<sup>3</sup> in 1996. In January 1999, water fees rose by 13% and sewerage charges by 16.7%. In total, utility fees rose by HUF230 for the average household.

<b>Groundwater</b>	
<b>Total recharge (1998, km<sup>3</sup>)</b>	<b>6.8</b>
Per capita (1998, m <sup>3</sup> )	685
Withdrawals (1990, km <sup>3</sup> )	1.0
For domestic use (1990)	35%
For industry (1990)	48%
For agriculture (1990)	18%

<b>MAJOR CITIES</b>			
<b>Population</b>	<b>2000</b>	<b>2015</b>	<b>Status</b>
Budapest	1,819,000	1,819,000	Water and sewerage privatised separately

### City study: Upgrading Budapest's sewage treatment

53% of the population of Budapest is connected to the sewerage network, 54% of which is treated: 33% to secondary standard and 67% to primary standard. The two extant STWs are being upgraded and four wastewater treatment works are to be built for Budapest by 2015. The Dunaújváros and Veszprem STWs are currently under preparation. Csepel has been completed (600,000m<sup>3</sup>/day) and South Budapest for 2005+ (60,000m<sup>3</sup>/day). After the two STW upgrades, 40-45% of effluents in Budapest will be treated to at least secondary standard. The trunk main will be connected to a further 19,000 people currently using septic tanks.

Organisational and planning delays may mean that HUF80billion (EUR319million) from the EU will be withdrawn. Construction work is meant to be started by the end of 2005, so the installation could be ready for use by 2010. The HUF12billion facility is designed to treat some 40% of the sewage in the area, 65% of its funding coming from the EU, 15% from the budget of Budapest City Council and 20% from the state budget.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Budapest	25 year sewerage concession	BWI
Budapest	25 year water provision concession	Eurawasser
Debreen	20 year water and sewerage concession	Eurawasser
Kapsovar	15 + 7.5 year water and sewerage concession	Suez
Pecs	25 + 5 year water and sewerage concession	Suez
Borsodviz	20 year water and sewerage concession	Borsodviz Rt.
Erd	25 year water & sewerage concession	Veolia
Hodmészövásárhely	25 year sewerage concession	BWI

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Eurawasser	Suez (France)/RWE (Germany)	2,217,000	217,000	<b>2,217,000</b>
Kapsovar	Suez (France)	70,000	70,000	<b>70,000</b>
Pesci Vizmu	Suez (France)	180,000	180,000	<b>180,000</b>
BWI	VE (Germany)/RWE (Germany)	0	1,950,000	<b>1,950,000</b>
Veolia	VE (France)	100,000	100,000	<b>100,000</b>
Borsodviz Rt.	Gelsenwasser (Germany)	150,000	150,000	<b>150,000</b>

## IRAN

Most of Iran is arid or semi-arid, with annual rainfall averaging about 24cm, one-third the world average. The average rainfall in 96% of Iran's land area does not exceed 20cm pa. The rate of evaporation is correspondingly high. In Tehran, where the mean annual precipitation is 22cm, the potential evaporation is about 300cm, 13 times the rate of precipitation.

Until recently, agriculture depended on the qanat system. This is an underground channel that conveys water from a highland aquifer to the surface at lower levels by gravity. Currently there are some 50,000 qanats in use, with a total output roughly equal to that of the Euphrates River. Since the 1960s there has been a long term programme of dam building and well construction.

The former Shah of Iran nationalised water resources in 1967, as the tenth point of the Revolution. Two National Plans running from 1969 to 1978 emphasised the importance of reservoir construction, with 27billion m<sup>3</sup> of water held by dams by the end of 1978. Desalination was increased from 3million m<sup>3</sup> pa to 23million m<sup>3</sup> pa between 1974 and 1978.

The Ministry of Energy of the Islamic Republic of Iran co-ordinates the country's water policies. The Regional Water and Wastewater Company carries out regional management. Drinking water quality standards are set by the Department of the Environment (DE). The DE also sets acceptable limits for all hazardous effluents discharged from sources. The main items of legislation include the Fair Water Distribution Act (1983), the Act of the Establishment of Water and Wastewater Companies (1984), the Environmental Protection and Enhancement Act (1974) and the Prevention of Water Pollution Regulation (1994).

Major water and sewerage infrastructure projects have made relatively little headway since the 1979 Revolution. Political sensitivities have played a major role in this. For example, some USD200million of World Bank loans for sewerage and healthcare projects were postponed in June 1999 after a crackdown on Jewish Iranians. These loans were originally drawn up in 1993 and were only reactivated in 2002. Iran has been seeking to normalise its relations with most Western economies and water and wastewater infrastructure projects are of a non-contentious nature with regard to the mobilisation of international investment and management.

Domestic consumption of water in large cities is approximately two 200L/capita/day; in small cities, the quantity is 180L. There are fifteen sewage treatment plants operating in the country, along with about thirty units for recycling wastewater. In total, some 5% of urban sewerage is treated.

The Tehran Sewerage Company (TSC) is developing a larger scheme to install a comprehensive sewerage network in Tehran. TSC is currently considering proposals for the laying of the USD44million eastern main trunk line.

TSC is implementing a city-wide sewerage and sewage treatment scheme. The first phase will cost USD340million (USD145million via the World Bank, USD195million from TSC), which includes a 450,000m<sup>3</sup>/day treatment plant to serve a population of 2.1million by 2006. Capacity will be doubled in phase 2, for implementation between 2006 and 2011. In phases 3 to 5, the network will be expanded and an additional treatment plant will be built in south west Tehran to serve a population of 10.5 million by 2029.

## IRAQ

### Water and sanitation projects have been shelved...

Iraq's water and sewerage infrastructure has been one of the principal casualties of the Iraq war and continues to suffer from the resultant social and political fall-out. Access to potable piped water decreased between surveys carried out in 1996 and 2003 and 2004. According to the United Nations in 2004, water and sewerage systems repair and enhancement costs will be USD7billion, including providing 'universal' (in other words, for those living in urban areas) access to potable water and sewerage. In June 2005, Latif Rashid, the Water Resources Minister stated that he believed that Iraq needs up to USD15billion to repair its water and wastewater systems.

To date, three major contracts have been signed, along with a series of smaller projects worth a total of up to USD3.1billion. This work was estimated to take two to three years after the Iraqi Ministry of Water Resources was handed over to local control in May 2004. The Ministry's 2004 budget is USD150million (EUR126million) compared with USD1million under Saddam. The first contract was awarded to Bechtel (USA) and Parsons (USA) and was financed by USAID in 2003. As part of the Iraq Infrastructure Reconstruction-Phase II, Bechtel's USD1,030million contract covers Baghdad and eight other cities. Bechtel will repair or upgrade a total of 19 water treatment facilities and restore 85% of Iraq's total sewage treatment capacity. The project started this January and runs to December 2005. CH2M Hill (USA) & Parsons Water Infrastructure, Inc. also have a contract to provide support to the Public Works and Water Sector Program Management Office.

In March 2004, a series of water and sanitation contracts were announced, financed by the USD18.6billion appropriated by Congress to rebuild Iraq's infrastructure. A joint venture between Washington International Inc (USA, 90%) and Black & Veatch (USA, 10%) was awarded a contract with a ceiling of USD600million to rebuild the water sector. Later that month, FluorAmec (Fluor of the USA, 51% and Amec of the UK, 49%) gained a USD1.1billion contract to rehabilitate existing water systems and build new treatment and distribution plants. The contract also involves sewerage rehabilitation and constructing solid waste management systems in the north and south of Iraq. Secondary contracts worth up to a further USD400million were also signed.

According to USAID, by February 2005 11.8million people had been accessed by USD600million in investments in water and sanitation projects through the Iraq Infrastructure Reconstruction Program. This includes the expansion of Baghdad's main water treatment plant, which when complete will recover 250million gallons of drinking water per day, along with a wastewater treatment plant in Baghdad which resumed operations in June 2004 having been out of service since 1992. However, by April 2005, it emerged that all but USD1.07billion of the USD3.65billion pledged by the United States toward new water infrastructure, has been diverted to security. In consequence, no new water projects were started in 2005 and the programme has effectively been frozen since.

USAID currently states that ten sewage treatment plants were refurbished (serving 5.1million people) along with 19 water treatment plants (serving 3.1million people). 500,000 people in villages have had water supplies provided by a further 70 projects.

In January 2006, the special inspector general for Iraq reconstruction reported that 60% of planned water and sanitation projects had not been carried out and that 49 of planned 136 water and sanitation projects will in fact be completed. The report noted that 'administrative expenses' meant that USD2.185billion (50.4%) of the funds allocated to works in the sector were subsequently withdrawn.

### ... as services and infrastructure suffer as a result

77% of Iraqis lived in urban areas in 2000 and the latest data points to 22.5million people in Iraq in 2002. An official assessment of the water and sewerage infrastructure was carried out by the Ministry of Housing and Development Co-Operation in 2004:

#### Water and wastewater services in Iraq:

	Piped Water services	Safe Water Systems	Improved Sanitation	Connected to Sewerage	WWTW
Urban	88%	60%	66%	47%	27%
Rural	43%	33%	56%	3%	N/A

Sources: MHDC, WHO, USAID. WWTW data is for 2003

Overall, 54% of households have access to safe and stable drinking water supplies, 29% have safe drinking water with an erratic supply and 17% have poor supplies of unsafe water. According to the UNDP's 2003 assessment (primarily based on 1996 data), 90% of households used to have access to safe drinking water, so there has been a significant deterioration in water services. Likewise, a decline from 93% access to improved sanitation to 66% was recorded, although caution is needed when comparing such surveys.

When surveyed about their water services by the Ministry, 38% of urban households regarded their water supplies as being too expensive, with 54% reporting problems in obtaining an adequate supply. 40% of urban households examined had sewage present in nearby streets.

There are 13 major sewage treatment works in Iraq, capable in theory of serving 5million people including three facilities that serve 3.8million people in Baghdad. In practice, a shortage of parts, chemicals and power means they are operating well at below capacity.

While USAID guarantees dollar payments for its work, the rest of the programme is likely to be financed through hard currency grants and loans. It is already evident that attacks on foreign nationals means that carrying out the work will be at best challenging. USAID completed the rehabilitation of the Sweet Water Canal reservoir and distribution system in Basrah in June 2004 for USD38million (EUR31.8million). A USD11million pilot project to restore parts of Iraq's southern marshlands has been launched by the UN Environment Programme. It aims to provide potable water and effective sanitation for 80,000 of the Marsh Arabs.

Privatising some of Iraq's water services within a year was considered by the authorities in 2003, but this will be subject to political sensitivities and has not been subsequently developed.

Source:

Iraq living conditions survey 2004, Volume II: Analytical Report, Ministry of Housing and Development Co-Operation/UNEP, Baghdad, Iraq, 2005

**IRELAND**

<b>Economics (2005)</b>	
GDP per capita	USD40,150
GDP per capita (PPP)	USD34,720
Agriculture	3%
Industry	41%
Services	56%

**Service provision and management**

In urban areas, water supply systems are public utilities, owned, operated and maintained by city and town councils. Rural water supplies are also organised into Group Schemes, which are relatively small-scale co-operative water systems, developed, operated and maintained by user groups. There are also very many individual supplies to single dwellings and industrial enterprises in rural areas. The water supply pipe network and reservoir system are owned, operated and maintained by the local authorities, except for the small-scale group schemes, which are in private ownership. The public water supply system reached 91.9% of the population in 2003 at present while public group schemes supply 2.5% and private group schemes 5.6%. Distribution losses in 2000 were 47%.

In June 2001, changes were announced to the Urban Waste Water Treatment Regulations to require a higher level of treatment for discharges into the 30 water bodies. The designation of 12 stretches of river, 3 lakes and 15 estuaries as sensitive areas makes the provision of nutrient reduction facilities, or tertiary treatment, compulsory for discharges from large sewage treatment plants. Nutrient reduction facilities have been installed in the appropriate waste water treatment plants in the 10 sensitive areas designated in 1994 and are already in place in a number of the areas now being designated.

<b>Drinking water compliance</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>
Public water schemes	97%	97%	98%
Group water schemes	89%	91%	92%
Overall	95%	96%	96%

<b>Population</b>	
<b>Total 2005, million</b>	<b>4.2</b>
<b>Total 2015, million</b>	<b>4.7</b>
In urban areas 2005	61%
In urban areas 2015	64%
In urban agglomerations 2015	26%

**Water quality****Inland water quality**

<b>Class</b>	<b>1995-97</b>	<b>1998-00</b>	<b>2001-03</b>
A – Unpolluted	66.9%	69.8%	69.2%
B – Slight pollution	18.2%	17.0%	17.9%
C – Moderate pollution	14.0%	12.4%	12.3%
D – Serious pollution	0.9%	0.8%	0.6%

The relatively low level of industrialisation means that the influence of intensive agriculture is higher than usual. In 1989 after research to identify the impact of agriculture on water quality, it was found that 20% of noted water pollution incidents resulted from agriculture. Nitrate levels for surface waters and aquifers are within EU standards. Irish surface waters contain a relative low level of nitrate; there is also little contamination with metals and pesticides. 75% of public water supply stems from surface water. While groundwater resources are generally unpolluted, the fissured nature of the limestone aquifers means that pollutants can move through them relatively rapidly. This, combined with the shallowness, could cause problems in the future.

<b>Urban Services</b>	
% Water	98%
% Sewerage	95%
% Sewage treated	40%

### Development of sewerage infrastructure

The effect of EU cohesion funding on Ireland's sewage treatment facilities can be seen from the development of broadly based secondary/tertiary treatment by 2002-03. The data in the table below is for people living in groups of at least 500, which accounts for most of the population. 35% of sewage sludges went to landfill in 2002-03, with the rest being used for agricultural application.

Population served	1994-95	1998-99	2000-01	2002-03
Tertiary	2%	35%	8%	9%
Secondary	18%	21%	21%	58%
Primary	33%	38%	41%	2%
None	41%	29%	23%	18%

Compliance with discharge consents remains a significant problem. For smaller facilities, only 22-29% of plants met their consents in 2002-03, against 52-57% for larger and more advanced facilities.

### Spending needs

EUR533million is being spent on rural water between 2000–06. 665 sewage schemes are also being implemented: 50 have been completed; 186 between 2002-04; 129 from 2005; and 240 rural schemes. Spending on sewage and water between 2002-04 will be EUR726million. In total, some EUR4.4billion is being spent by the end of 2005. Ireland 88 has sanitary authorities, with 12 planning to charge for industrial effluent discharges. The main STW, Ringsend in Dublin, will have a 1.57million PE.

The Irish Government spent EUR100million on bringing rural water supplies up to an appropriate standard in 2004, a 50% increase on funds was planned for 2003. County councils were to receive EUR78million; EUR5million went to the single house well grant; EUR7million was for subsidies for group water schemes; EUR4million for pilots of new wastewater treatment systems for small villages.

In September 2007, the Irish Government unveiled a EUR5.8billion package of 950 individual water and sewerage infrastructure schemes. This is a EUR4.7billion increase on the levels set out in the National Development Plan, a blueprint for the country's growth from 2007-2013. The spending has been linked to a more stringent enforcement of water resource protection, which will establish licences for large waste water treatment plants.

Freshwater	
Total (1998, km <sup>3</sup> )	47.0
Per capita (2000, m <sup>3</sup> )	13,003
Withdrawals (2000 km <sup>3</sup> )	1.1
For domestic use (2000)	23%
For industry (2000)	77%
For agriculture (1987)	0%

### Paying for water services

Ireland is the only country in the EU that does not charge for domestic water on a universal basis. This has traditionally been left to the discretion of local authorities. This has meant that poorer (usually rural) municipalities imposed charges, while cities such as Dublin and Limerick did not. In the mid 1990s, an attempt to impose uniform charges backfired and as a result, the Local Government Act of 1997 abolished domestic water charges.

The EU has responded by cutting Cohesion finance for water projects since 2000: the EU allocated EUR1.1billion under the Cohesion Fund for the environment in Ireland for 1993-02. The EU maintains that the polluter pays principle, along with the need for cost recovery for compliance work up to 2010, and has warned that future aid allocations may be cut if Ireland continues to block domestic charges for water. In addition, the EU wants water metering to be introduced for domestic customers.

Groundwater	
Total recharge (1998, km <sup>3</sup> )	3.5
Per capita (1998, m <sup>3</sup> )	971
Withdrawals (1980, km <sup>3</sup> )	0.2
For domestic use (1980)	35%
For industry (1980)	37%
For agriculture (1980)	29%

MAJOR CITIES			
Population	2000	2015	Status
Dublin	985,000	1,149,000	Sewage treatment privatised in 2000

The UK Government's Treasury Taskforce for PFI is being used as a model by the Government of the Republic of Ireland to develop public private partnerships for major infrastructure projects. A central unit is being created in

Ireland's department of finance to launch a number of pilot projects for roads and other schemes. It will involve private-sector expertise in design and operation, and may bring in private money. After 2000-03, Ireland is set to lose large amounts of European Union Cohesion and Structural funds.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Cork	22 year sewage treatment BOT	Northumbrian
Dublin	20 year sewage treatment BOT	AWI consortium
Sligo	10 year water O&M	AWI consortium
Fringal County	20 year sewage treatment BOT	Earth Tech

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Northumbrian	NWG (UK)	0	220,000	<b>220,000</b>
AWI	AWG (UK)	50,000	1,200,000	<b>1,250,000</b>
Earth Tech	Tyco International (USA)	0	30,000	<b>30,000</b>

Sources:

EPA Office of Environmental Enforcement (2004) Urban Waste Water Discharges in Ireland: A Report for the Years 2002 and 2003. EPA, Wexford, Ireland.

EPA Office of Environmental Enforcement (2004) The Quality of Drinking Water in Ireland: A Report for the Year 2003. EPA, Wexford, Ireland.

EPA Office of Environmental Enforcement (2004) Water Quality in Ireland 2001-2003. EPA, Wexford, Ireland.

**ISRAEL-PALESTINE**

<b>Economics (2005)</b>	
GDP per capita	USD18,620.00
GDP per capita (PPP)	USD25,280.00
GDP per capita (Palestine)	USD1,051.00

**Water in Israel**

Israel is one of the leaders in recycling wastewater. At the beginning of the 1990s, 90% of domestic and industrial users were connected to the sewerage network and 70% of the water collected was reused, accounting for 195million m<sup>3</sup> pa of water, or about 10% of total supply. From 1992 to 2003, the quantity of treated wastewater grew from 126million to 332million m<sup>3</sup> pa. As 450million m<sup>3</sup> pa of wastewater is currently produced, treatment will be extended for all of these effluents. National policy calls for the gradual replacement of freshwater allocations to agriculture by reclaimed effluents. Presently reclaimed municipal wastewater accounts for 30% of the total water supplied to agriculture. It is estimated that by 2020 effluent use will constitute 50%.

**Water provision and use in Israel (1992-93)**

Domestic use (L/day)	275
Agriculture	63%
Industry	6%
Domestic	31%
Total (million m <sup>3</sup> )	1,754

Fresh water in all areas of Israel will be restricted to domestic use by 2014. The increased cost of land and labour is driving the profitability of irrigation agriculture down. This is creating considerable potential for mutual aid between the two states with Palestine taking over the commodity side of food production and Israel concentrating on higher value activities such as seeds and support services.

USD1.7billion will be invested in desalination and related water projects between 2003 and 2007. USD360million will be invested in small desalination facilities to be built by private companies, along with USD620million for larger facilities at Ashkelon, Hadera and Ashdod. USD180million is to be invested in wastewater reclamation facilities, along with USD240million from private companies.

<b>Israel: Population</b>	
2005 (million)	6.9
2015 (million)	8.1
Urbanisation in 2005	92%
Urbanisation by 2015	92%
In urban agglomerations, 2015	35%

<b>Palestine: Population</b>	
200 (million)	3.4
2015 (million)	5.3
Urbanisation in 2002	71%
Urbanisation by 2015	76%
In urban agglomerations, 2015	0%

**The West Bank and the Gaza Strip**

Water development and management projects in the West Bank and the Gaza strip to date have been related to aid spending or World Bank supported schemes. USD75million in aid was granted in 2003 to alleviate water supply shortages on the southern West Bank, via the World Bank, the United States Agency for International Development (USAID) and the French Development Agency (AFD). USIAD work has been frozen due to the intensification of the conflict.

Gaza II, an eight-year contract to supervise, manage and maintain the water and wastewater system in the Gaza Strip is to be awarded in the near term having been postponed from 2001 by the Palestinian Intifada. Gaza I, the USD28million, four-year water and wastewater management contract won in July 1996 by Suez saw revenue collection double and leakage fall from 50% to 31%. Suez's management replaced 8,000 meters and repaired a further 7,000 meters. The Palestinian Water Authority's National Water Plan highlights investment needs of USD1.5billion in the Gaza strip and USD3.5billion in the West Bank over the next 20 years.

**Water provision and use in the West Bank/Gaza (1990-92)**

Domestic use (L/day)	57
Agriculture	62%
Industry/Domestic	38%
<b>Total (million m<sup>3</sup>)</b>	<b>210</b>

In 1999, the European Investment Bank loaned EUR30million in a EUR65million package for developing water resources for the cities of Hebron and Bethlehem in the West Bank. 250,000 people will be served by the work, aimed at improving service and cutting distribution losses, with the work meant to be completed by 2002. In relation to this, a four year management contract for the two cities has been awarded to VE and will have a turnover of EUR6.4million over the contract life.

Urban Data	
Served by piped water	90%
Access to sewerage	80%
With sewage treatment	70%

### Conflict study: Israel, Jordan and Syria

Israel, Jordan and Syria occupy one of the three most arid, permanently settled areas in the world. They are unique in that their relatively poor groundwater resources and petrochemical deposits mean that surface water resources have to form the backbone of the water supply. The increase in water demands placed on these resources have been exacerbated by population growth, immigration, refugee flows and the insistence by various parties on using irrigated agriculture. The Lebanon is also a party to these regional concerns, but has enough rainfall to be self sufficient in water resources. The estimated total renewable water supply for the region is approximately 2,400million m<sup>3</sup> pa, while water use averages 3,000million m<sup>3</sup> pa, according to a 1998 study compiled by the U.S. Geological Survey. The resulting deficit is met by extracting water, without recharge, from groundwater sources and underground aquifers.

Freshwater	
Annual availability (1998)	1.70km <sup>3</sup>
Per capita	255m <sup>3</sup>
Annual withdrawal (2000)	2.0km <sup>3</sup>
Domestic	31%
Industrial	7%
Agriculture	63%

### Water resources, their use and abuse

The Jordan River basin drains an area of 18,300km<sup>2</sup> and is some 230km long. The total natural discharge of the basin averages around 1,500million m<sup>3</sup> pa. The Upper Jordan, which forms the axis of the northern part of the system, has three sources, the Dan (250million m<sup>3</sup> pa), Hasbani (125million m<sup>3</sup> pa), and Baniyas (125million m<sup>3</sup> pa). The Dan is within Israel, the Hasbani rises in Southern Lebanon, and the Baniyas rises on the Golan Heights, which belonged to Syria until 1967 and are now under Israeli control. The Yarmouk (400-550million m<sup>3</sup> pa) rises in Syria, then the river flows along the Syrian-Jordanian border, and into Israel before converging into the Jordan River. The Lower Jordan forms the border between Jordan and Israel and then between Jordan and the West Bank. Some 400-500million m<sup>3</sup> pa is discharged into the river through a number of smaller tributaries in Jordan.

### Water usage in the two main rivers (1990s, million m<sup>3</sup> pa)

	Upper Jordan	Yarmouk River
Israel	550	70-100
Jordan	0	120-130
Syria	0	150-240
Lebanon	0	N/A
West Bank	0	0

Israel and Syria have extensively exploited these rivers in recent years. Israel's National Water Carrier was conveying 420-450million m<sup>3</sup> pa in the 1980s, which, along with direct water extractions in the Upper Jordan Valley and on the shores of Lake Tiberias, accounts for effectively the whole discharge of the river in its northern section. Financial and political pressures have restricted Jordan's exploitation to 120-130million m<sup>3</sup> pa from the Yarmouk. Israel in turn pumps some 70million m<sup>3</sup> pa from the Yarmouk while Syria takes between 200-250million m<sup>3</sup> pa from this river.

The natural discharge of the river was 1,300million m<sup>3</sup> pa. Israel allows a flow downstream from Lake Tiberias of 60million m<sup>3</sup> pa (about 10% of the natural discharge in this section), along with the remaining Yarmouk waters, and some irrigation return flows, and winter runoff, a total of 200-300million m<sup>3</sup> pa. This water is unsuitable for irrigation because of its high salinity and other pollution. The West Bank aquifer (also called the Mountain Aquifer) delivers 600-900million m<sup>3</sup> pa of water with a safe yield of 632million m<sup>3</sup> pa. Most of the aquifers and the rain recharge arise in the West Bank and are transboundary in nature. Historically, use of the western aquifer by the local Palestinian population was limited to part of the flow of springs as well as some 20million m<sup>3</sup> from traditional dug wells in the coastal area.

20% of the current downstream river flow consists of untreated effluents, along with brackish water discharge. Estimates for a minimum sustainable river flow in the Lower Jordan range from 141-192million m<sup>3</sup> pa. Despite the rehabilitation of the river forming part of the 1994 Israel-Jordan peace treaty, no progress has been made to date.

#### Water usage in the West Bank (million m<sup>3</sup> pa)

Israel	413
Settlers	110
Palestinians	50
Unallocated	58

<b>Groundwater</b>	
Annual availability (1998)	1.10km <sup>3</sup>
Per capita	187m <sup>3</sup>
Annual withdrawal (1986)	1.20km <sup>3</sup>

#### Politics and practicalities

All water disputes in the region revolve round perceptions of water and power. Any projects that are seen as possibly strengthening one side have traditionally been opposed by the others or their allies. United Nations vetoes have been used to block World Bank funding for water provision schemes in Jordan while, in the 1960s and 1970s, military raids were carried out on dams. The 1955 Johnson Plan for water allocation is often invoked by Jordan and Syria, but it does not recognise the realities after the 1967 war. Water allocation has been one of the core areas for debate during the current peace process.

The Via Maris Desalination and Carmel Desalination groups have won BOT contracts to build two desalination plants for USD140million. Each group will construct a desalination plant capable of purifying 30million m<sup>3</sup> of water pa. The plants will be built under a BOT basis, at a cost of USD70million each. At USD0.54/m<sup>3</sup>, Via Maris offered the lowest price per cubic metre. The Via Maris group is made up of Tahal Consulting Engineers, Granite Hacarmel, Middle East Tubes and Ocean Advanced Industries. Carmel, which is composed of Ionics (USA), Baran and Dor Chemicals, plans to build its plant in Haifa Bay. A USD120million, 100million m<sup>3</sup> pa desalination facility to be located in Caesarea is under consideration.

MAJOR CITIES			
City	2000	2015	Status
Tel Aviv	2,001,000	2,392,000	No privatisation plans at present

#### Private sector developments

Israel's water industry was liberalised in 2003. The Water Commission issued regulations that require the state-owned Mekorot Water Company to purchase brackish water desalinated by private producers. Mekorot has agreed to purchase 8.5million m<sup>3</sup> of water annually from a JV between kibbutz Maagan Michael on the Mediterranean coast and Ionics at USD0.35 per m<sup>3</sup>, 30% below the cost of water from Veolia's Ashkelon plant, reflecting the lower of desalinating brackish water. The potential for brackish water development is estimated at 180million m<sup>3</sup> pa.

Licenses for setting up independent water and sewage companies were first awarded in 2003, the first two being to Rishon Le Zion and Metullah. The intention is to allow these entities to be privatised at a later date. Jerusalem, Haifa, Ashdod and Petah Tikva are also setting up municipal water and sewage companies.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	Contract	Company
Ashkelon	25 year, water desalination BOT	VE

Israel has been developing a series of desalination projects but it became evident in 2004 that these were facing various difficulties. The original target was for 315million m<sup>3</sup> of desalinated water by 2006 but this level is now unlikely to be reached before 2009. Production in 2006 is likely to be in the region of 160million m<sup>3</sup>. The only project performing to expectations is VE's.

Private sector company operations (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
VE	VE (France)	700,000	0	700,000

#### Export of water from Turkey to Israel

Negotiations have been underway between Turkey and Israel since 2003 concerning the export of water from Turkey's Manavgat River dam to Israel. It is understood that the contract covers 50million m<sup>3</sup> of water pa and will last 20 years. The water will either be transferred by tanker or via a pipeline. It is understood that Turkey will take

sole responsibility for the marketing and sale of Manavgat water in Israel, with Israel taking responsibility for transportation. The Manavgat Estuary is 325 nautical miles from Ashkelon, the nearest Israeli port.

The dam cost Turkey USD160million to construct and is capable of supplying potable water at 5.8m<sup>3</sup>/s. A USD150million pumping station and treatment plant entered service in 1999. Turkey is seeking to export water from the dam to a number of markets including Greek Islands in the Aegean, Cyprus and other (as yet unnamed) Middle Eastern countries and hopes to eventually sell 0.5million m<sup>3</sup>/day of water, or 182.5million m<sup>3</sup> of water pa. No negotiations between Turkey and countries other than Israel have been disclosed to date.

According to the Israeli Government (GWR, October 2003), the cost of water exported to Turkey would break down as follows:

Cost of water in Turkey	USD0.20/m <sup>3</sup>
Cost of piping water to Israel	USD0.70/m <sup>3</sup>
Cost of transfer to local network	USD0.10/m <sup>3</sup>
<b>Total cost</b>	<b>USD1.00/m<sup>3</sup></b>

Source:

Friends of the Earth Middle East (2005) Crossing the Jordan: Concept Document to Rehabilitate, Promote Prosperity and help Bring Peace to the Lower Jordan River Valley. Aman, Jordan & Bethlehem & Tel Aviv, Israel

## ITALY

<b>Economics (2005)</b>	
GDP per capita	USD30,010
GDP per capita (PPP)	USD28,840
Agriculture (2005)	3%
Industry (2005)	28%
Services (2005)	70%

### Water quality

According to the 1991-93 survey of the 13 main rivers from a total of 156 survey sites taken from the national network of the National Information System on the Environment (SINA), river quality in Italy is as follows:

I-II: Good – Fair	50%
III: Polluted	32%
IV: Very Polluted	9%
V: Heavily Polluted	9%

The Rivers Po, Tiber, Adige and Arno account for 40% of Italy's fresh water resources, with their basins covering 35% of the surface area and 45% of the population. These four rivers are all of poor or bad quality. The water quality in natural and man-made lakes is generally poor. This phenomenon is particularly evident in Sardinia, where 40% of the capacity is subject to frequent algal blooms, and Sicily, where 51% of the waters are considered to be suffering from some degree of eutrophication. The population equivalent generated by residents, commercial and industrial users and tourists is of 99million people. 70% of the overall pollution load is subject to treatment. 80% of the industrial effluent generation is concentrated in the Paduan basin.

Groundwater problems are mainly caused by the intensive use of herbicides and fertilisers. Problems remain in different areas of the country with regards to the presence of nitrates in drinking water, saline intrusions into underground coastal aquifers and the problem of the presence of organic synthetic compounds such as organic chlorinates. Excess levels of nitrates in drinking water are a particular problem in Tuscany, the Marches and Campania, significantly affecting water supplies for 0.67million people. Saline intrusion into coastal aquifers in Romagna, Puglia and Sicily is also of concern. Organic compounds are at a high level in the Po Valley, Brescia, Vicenza, Padua and La Spezia.

Algal blooms continue to be a problem in the Upper Adriatic Sea due to the discharge of untreated effluents mainly into the river Po. According to official returns, most of the beaches meet guideline as well as mandatory standards.

<b>Population</b>	
Total (2005,million)	58.6
Total (2015,million)	58.0
In urban areas (2005)	68%
In urban areas (2015)	69%
In urban agglomerations (2015)	21%

### Infrastructure and service provision

National gross water supply

	<b>Billion m<sup>3</sup></b>	<b>Per capita</b>
1961	5.2	297 L/day
1975	5.8	324 L/day
1998	6.8	352 L/day
2015	10.6	548 L/day

There was an average abstraction of 324L/day in 1975, with an average water supply of 174L/day to domestic users. Urban areas have a higher than average usage: Rome; 243L/day, Milan; 300L/day and Turin; 310L/day. Access to sewerage rose from 30% in 1980 to 62% in 1987 and 80% by 1995. The proportion of domestic sewage subject to treatment was 14% in 1971, rising to 30% in 1980, 45% in 1987 and 62% by 1995. According to Veolia Environnement (VE) in 1995, some 35% of sewage treatment works were working below par or were in fact not in operation.

### Sewage treatment development

<b>Year</b>	<b>1995</b>	<b>1999</b>
Tertiary	5%	24%
Secondary	34%	36%
Primary	17%	3%

% of population connected to wastewater treatment plants, 1999

Rome	78%
Milan	0%
Naples	38%
Turin	96%
Palermo	19%
Genoa	56%
Bologna	99%
Florence	12%
Brescia	80%
Modena	85%
Parma	69%

1998-08 spending is forecast at EUR31-51billion although the Public Works Ministry's slower programme is for EUR41-51billion for 15-20 years.

A survey by Itstat in 2004 found that 1,165 of Italy's 7,988 Comuni still have no sewage treatment works, with 112 of these lacking a sewerage system. Only one of the six cities with a population over 0.5million has an effective sewage treatment while nearly half of Comuni with a population of 10-80,000 have inadequate sewage treatment or sewerage.

### Regional water scarcity

25% of the overall population has inadequate water resources. While in the north of Italy 8.5% of the population does not have sufficient amounts of water, this rises to 18% in central Italy, 55% on the islands, and 78% in the south. These areas are considered to be under the threat of supply disruptions in drought years. Therefore, the Italian Parliament is currently examining a law proposing the reorganisation of the National Water Network with special emphasis on supplying the southern parts of Italy. In total, 9.161million people are in areas of regular water stress. In 1995, 55% of people in Sardinia faced occasional water shortages.

Urban Services	
% Water	98%
L/cap/day	300
% Sewerage	90%
% Sewage treated	85%

### Structure of the water market

Water supply in Italy is managed by a total of 8,075 municipal administrations, which work either individually or in association with other municipalities. Exceptions are three public utilities (Apulian, Sicilian and Sardinian), which operate large facilities for the abstraction and distribution of water. According to the figures of the association of Italian public water and gas utilities, 55% of the water is supplied by 184 municipal or co-operative waterworks and the remaining 45% is in the hands of 5,896 different public bodies.

### Water and sewerage entities, 2002

Water supply	5,500
Water distribution	6,200
Sewerage	7,000
Sewage treatment	2,000

Italy's 300 state held municipal service entities have an estimated total value of ITL50,000billion. These assets are mainly in water, sewerage, gas and energy services. A quasi market for these activities has been developing in recent years because of the need for credit ratings to raise new debt issues. At the same time, for water and wastewater services, there has been increased political pressure to keep prices down in recent years.

Freshwater	
Total (1998, km <sup>3</sup> )	159.4
Per capita (2000, m <sup>3</sup> )	3,336
Withdrawals (2000, km <sup>3</sup> )	44.4
For domestic use (2000)	18%
For industry (2000)	37%
For agriculture (2000)	45%

### The 1994 Galli Law

The Galli Law is designed to address the inadequacies of the current operational structure in Italy when faced with a EUR25billion ten year bill for basic EU compliance work. The Law seeks to rationalise various water entities into 91 more manageable entities, with the aim of these then combining water provision and sewerage.

One of the central elements for attaining this is to allow the former municipal water utilities to expand their services into other regions of Italy. The Galli Law started to make an impact in 1999, when the first direct concession award (Arezzo by Suez and Amga) took place. A secondary driver has been the opening up of gas and electricity markets to competition, eliminating the scope for cross-subsidies between these activities and water and sewerage services.

Market structure	1995	2000	2003
Private sector	3%	8%	11%
ENI	4%	11%	10%
Municipal stake sales	0%	6%	18%
Moving towards privatisation	1%	9%	8%
Municipal entities	92%	66%	53%

Progress in the development and establishment of ATOs, 2005-06		ATOs	Concession started	% started
ATO not established		4	0	N/A
ATO procedure not decided		30	0	N/A
Procedure decided	Public	13	12	92%
	PPP	33	25	76%
	Private	11	1	9%
	<b>Total</b>	<b>57</b>	<b>38</b>	<b>67%</b>
<b>Grand Total</b>		<b>91</b>	<b>38</b>	<b>42%</b>

Source: Giulio Citroni (2007) Public-private partnerships in the Italian reform of water supply and sanitation services. CIRES, Italian Research Centre for European Studies, Working Paper 1, Florence, Italy.

The table below provides a snapshot of ATO development in 2005-07

Company		Public share
Abruzzo 1-Aquilano	Gran Sasso Acqua	100%
Abruzzo 3-Peligno Alto Sangro	Saca Spa	100%
Abruzzo 6-Chietino	SASI Spa	100%
Basilicata UNICO	Acquedotto Lucano	100%
Calabria 1-Cosenza	Cosenza Acque	100%
Campania S-Sele	SIIS scarl	100%
Lombardia Milano (Provincia)	AEMME; Brianzacqua; Miacqua	100%
Lombardia Bergamo	AKUA	100%
Marche 3-Marche Centro-Macerata	Unidra; S.I.Marche; C.M.A.; Astea	100% (Amga)*
Marche 5-Marche Sud-Ascoli Piceno	Cicli Integrati Impianti Primari	100%
Umbria 3-Foligno	Valle Umbra Servizi	100%
Veneto VC-Valle del Chiampo	Acque del Chiampo	100%
Umbria 2-Terni	SII S.p.A.	75%
Campania SV-Sarnese vesuviano	G.O.R.I. S.p.A.	73% Acea
Umbria 1-Perugia	Umbra acque	72%

Toscana 3-Medio Valdarno	Publiacqua Spa	60% Acea
Toscana 5-Toscana Costa	ASA	60% Amga
Toscana 6-Ombrore	Acquedotto del Fiora	60% Acea
Em. Romagna 9-Rimini	HERA	56%
Piemonte 5-Astigiano, Monferrato	ASP SpA	55% Amga
Toscana 2-Basso Valdarno	Acque Spa	55% Acea
Toscana 4-Alto Valdarno	Nuove Acque	54% Amga
Lazio 2-Lazio Centrale-Roma	Acea Ato 2	51%
Lazio 4-Lazio Meridionale-Latina	Acqualatina	51%
Liguria GE-Genova	AMGA	51% Comune di Roma
Lazio 5-Lazio Meridionale-Frosinone	A.T.O. 5 Frosinone	0% Acea

Source: Giulio Citroni (2007) Public-private partnerships in the Italian reform of water supply and sanitation services. CIRES, Italian Research Centre for European Studies, Working Paper 1, Florence, Italy.

Given that in 1995 the municipal share of the market was more than 87%, the Galli Law has clearly assisted the development of private sector participation on a broader basis. The Finance Bill of 2002 has thrown some aspects of the ATO system into confusion and will probably need to be amended. Under the Law, municipally owned water and wastewater companies are only to be allowed to develop their activities outside their ATOs between 2003 and 2007.

<b>Groundwater</b>	
<b>Total recharge (1998, km<sup>3</sup>)</b>	<b>30.0</b>
Per capita (1998, m <sup>3</sup> )	524
Withdrawals (1985, km <sup>3</sup> )	12.0
For Domestic use (1985)	53%
For Industry (1985)	13%
For Agriculture (1985)	34%

### Market size and development

In 2001, total billings generated EUR3.0billion. This is expected to rise to EUR5.0billion by 2010 due to a programme of tariff increases since 1994. Average tariffs of EUR0.85/m<sup>3</sup> in 2002 will rise to EUR1.19/m<sup>3</sup> by 2010.

### Spending plans amongst some ATOs

Plans for 41 of the ATOs submitted by 2004, covering 42% of Italy's population, give an idea of various regional trends and capital spending commitments. Capex here refers to all water related projects, which break down as EUR9.64billion for water projects and a further EUR6.92billion for sewerage and EUR3.98billion for sewage treatment projects. These figures are not exhaustive. Water delivery refers to the anticipated increase in the volume of water sold over a 20 year period.

Region	ATO	Name	Capex (EUR000)	Water Delivery	Number of Communi	People Served
Piedmont	ATO 2	Biellese, Vercel., Casal.	343,000	19.8%	185	446,477
Piedmont	ATO 3	Turin	1,212,500	0.0%	306	2,226,084
Piedmont	ATO 5	Astigiano	266,553	30.2%	154	256,070
Piedmont	ATO 6	Alessandrino	247,900	30.2%	147	325,000
Veneto	ATO	Valle del Chiampo	53,393	10.9%	10	53,350
Veneto	ATO	Alto Veneto-Belluno	172,675	13.1%	66	305,536
Tuscany	ATO 1	North Tuscany	252,073	0.0%	51	522,967
Tuscany	ATO 2	Basso Valdarno-Pisa	662,676	8.3%	62	771,701
Tuscany	ATO 3	Medio Valdarno-Florence	765,806	8.9%	50	1,207,359
Tuscany	ATO 4	Alto Valdarno-Arezzo	216,538	20.8%	37	296,226
Tuscany	ATO 5	Tuscany coast-Livorno	355,067	32.4%	34	371,691
Tuscany	ATO 6	Ombrore	444,834	43.5%	56	352,700
Umbria	ATO 1	Perugia	262,120	7.6%	38	456,423
Umbria	ATO 2	Terni	173,345	19.4%	32	221,043
Umbria	ATO 3	Foligno	79,668	10.5%	22	146,348
Lazio	ATO 2	Central Lazio-Rome	2,065,824	0.0%	111	3,696,097
Lazio	ATO 4	South Lazio-Latina	317,817	31.9%	38	563,739
Lazio	ATO 5	South Lazio-Frosinone	340,741	26.7%	86	477,408
Abruzzo	ATO 3	Peligno Alto Sangro	55,859	6.3%	37	76,682
Abruzzo	ATO 4	Pescara	392,840	33.4%	64	426,154
Abruzzo	ATO 5	Teramo	333,772	56.7%	40	246,664
Abruzzo	ATO 6	Chieti	281,065	32.0%	92	272,836
Campania	ATO 1	Calore Irpino	853,826	20.1%	195	710,603
Campania	ATO 3	Sarnese Vesuviano	1,895,414	44.0%	76	1,462,613
Campania	ATO 4	Sele	687,831	13.0%	144	777,865
Basilicata	-	Basilicata	791,051	54.8%	131	607,853
Calabria	ATO 1	Cosenza	937,823	8.0%	155	727,267
Calabria	ATO 2	Catanzaro	321,465	8.9%	80	378,780
Calabria	ATO 3	Crotone	161,026	21.3%	27	163,058
Calabria	ATO 4	Vibo Valentia	182,234	30.0%	50	175,487
Calabria	ATO 5	Reggio Calabria	484,698	20.1%	97	570,065
Sicily	ATO 1	Palermo	1,261,289	69.1%	82	1,198,644
Sicily	ATO 2	Catania	1,192,581	3.8%	58	1,040,547
Sicily	ATO 3	Messina	814,196	31.1%	108	643,543
Sicily	ATO 4	Ragusa	378,153	31.9%	12	292,000
Sicily	ATO 5	Siracusa	484,863	9.0%	21	375,499
Sicily	ATO 6	Enna	290,537	71.0%	20	177,291
Sicily	ATO 7	Agrigento	502,309	66.8%	43	441,669
Sicily	ATO 8	Caltanissetta	318,893	82.0%	22	272,402
Sicily	ATO 9	Trapani	512,643	65.5%	24	410,381
Sardinia	-	Sardinia	1,620,700	22.2%	377	1,661,429
<b>Total</b>			<b>22,988,893</b>	<b>17.8%</b>	<b>3,440</b>	<b>25,805,551</b>

Source: Banca Intesta, Local Public Services Monitor, June 2004, Based on the 2004 Supervisory Committee on Water Resources report.

### Privatisation developments

Genoa SpA (Amga) was partially floated in 1996, along with Rome's ACEA and Como's ASCM, Trieste's Acegas and Brescia's ASM. These municipalities have been lowering their stakes over time. ACEA's Acqua Italia has started rationalising water services in Genoa after acquiring the smaller companies serving the city. A second wave of ATO IPOs and mergers has been taking place since 2005.

Preparations for the privatisation of Acquedotto Pugliese (AP) are underway after four years of delays. The Apulia region holds 87.2% of AP's capital, while 12.8% belongs to Basilicata. AP serves more than fourmillion people. Enel has been seeking to acquire AP since 2000.

Major Cities			
Population	2000	2015	Status
Milan	4,251,000	4,251,000	Corporatised, preparing for a partial float
Naples	3,012,000	3,012,000	Stake in Arin SpA sold to Italgas in 2000
Rome	2,649,000	2,649,000	49% of ACEA floated
Turin	1,294,000	1,294,000	Corporatised, preparing for a partial float
Genoa	890,000	890,000	49% of AMGA floated
Florence	778,000	778,000	Partly privatised

Entity	2001 revenues (EURmillion)	Supply (million m <sup>3</sup> pa)	Population Served	Municipalities Served
AQP, Puglia & Basilicata (public)	346	244	4,345,000	338
ACEA, Rome (semi private)	248	385	3,000,000	66
Italgas/ENI	119	342	2,020,000	283
CAP, Milan, Lodi & Pavia (public)	85	220	1,650,000	194
AAM, Turin (public)	52	161	1,243,000	38
Hera, Bologna (semi-private)	52	74	764,000	47
AMGA, Genoa (semi-private)	45	41	760,000	90

**Private sector contracts awarded** (Please see the relevant company entry for details)

Location	Contract	Company
Arezzo	25 year concession award	Suez/Amga
Asti	30 year water and wastewater concession	Amga
Bologna	44% sale of Hera Spa in 2003	Hera
Brescia	25% stake sale of ASM Brescia in 2002	ASM Brescia
Calabria	30 year water and sewerage concession	So Ri Cal
Caltanissetta	30 year water and sewerage concession	FCC
Como	49% stake sale of ASCM in 2000	ASCM Como
Florence	35 year concession award	ACEA/Suez
Frosinone	30 year water and wastewater concession	Acea
Genoa	49% stake sale of Amga in 1996	Amga Spa
Latina	30 year water and wastewater concession	VE
Massa	Water and sewerage concession	Camuzzi
Modena	22% sale of Meta Modena Spa in 2003	Meta Modena
Naples	JV for water services	Italgas
Perugia	30 year concession award	SAUR
Pisa	30 year concession award	ACEA/Suez
Pavoda & Vicenza	ATO merger	Acegas
Rome	49% stake sale of ACEA in 1999	ACEA Spa
Siena/Grosetto	25 year concession award	ACEA/Suez
Terni	30 year water and wastewater concession	Severn Trent
Trieste	49% stake sale of Acegas, 2001	Acegas
Vercelli	Acquisition of Atena ATO	Amga

### ATO development

A total of 91 ATOs have been set up, mostly since 2000-02. The Italian Government is currently considering if the tender processes for the granting of ATO licenses was properly carried out. The Environment Ministry is considering revoking various ATO concessions, most notably ACEA's. In the meantime, nine ATOs have been floated, seven of which continue as independent entities and have in turn merged with 21 other ATOs, with further mergers under consideration.

### Mergers and acquisitions amongst the ATOs

This is list of M&A within the ATOs themselves that has been noted by the author. It does not include traditional (pre Galli Law) water companies and concessions. It is of interest to note the central role being played by Iride (via Amga), ACEA and Hera.

Date	Target		Bidder
2003	ATO Frostinone	Frostinone	ACEA
2003	A de Fiora	Siena-Grosetto	ACEA
2002	Acque	Pisa	ACEA
2003	Publiacqua	Firenze	ACEA
2005	Campania-Gori	Sarnese Vesuviano	ACEA
2003	APS	Bacchiglione	Acegas
2007	APGA	Bacchiglione	Acegas
2003	Atena	Vercellese	Iride (AMGA)
2003	AMAG	Alessandrino	Iride (AMGA)
2003	Asp	Astigiano	Iride (AMGA)
2003	ATENA	Vercellese	Iride (AMGA)
2003	Mondaccque	Cuneese	Iride (AMGA)
2004	Acqu di Savona	Savonese	Iride (AMGA)
2004	AMAT	Imperiese	Iride (AMGA)
2004	Nuove Acque	Alto Valdarno	Iride (AMGA)
2003	ASA	Toscana Costa	Iride (AMGA)
2006	Amga	Genova	Iride
2004	BAS	Bergamo	ASM Brescia

Date	Target		Bidder
2007	ASM	Brescia	AEM
2004	Agea	Ferrera	Hera
2006	Aspes Multiservizi	Pesaro	Hera
2006	SAT	Sassuolo	Hera
2006	Meta	Modena	Hera

Source: Envisager

Four proposed new ATO concessions were noted during 2005. The Palermo ATO process (320,000 people) was suspended in April 2005, but was awarded to Acque Potabili in 2007. There has been a lack of interest in the Trapani (Trapani ATO 7) project but the process was revived in 2006-07. Naples (ATO 2 Napoli-Volturno, 250,000 people) is being developed and Siracusa was awarded to Iride in 2006. Projects in Agrigento and Messina have been delayed by legal issues, while progress is slowly being made in Catania and Catanzaro.

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
ACEA	Rome Municipality (Italy)	6,770,000	6,170,000	<b>6,770,000</b>
Acegas	Trieste Municipality (Italy)	470,000	450,000	<b>470,000</b>
Acque Genova	Amga/Iride (Italy)	0	878,000	<b>878,000</b>
ASCM Como	Como municipality (Italy)	250,000	0	<b>250,000</b>
Acquedotto Ferrari	Gruppo Iride (Italy)	350,000	0	<b>350,000</b>
Acquedotto Nicolay	Amga/Iride (Italy)	330,000	0	<b>330,000</b>
Acque Potabili	Gruppo Iride (Italy)	2,150,000	0	<b>2,150,000</b>
Iride Acqua	Gruppo Iride (Italy)	2,044,000	2,044,000	<b>2,044,000</b>
Mediterranea delle Acque	Gruppo Iride (Italy)	950,000	0	<b>950,000</b>
Pridesa	Acciona (Spain)	1,169,000	396,000	<b>1,169,000</b>
ASM	Brescia municipality (Italy)	610,000	530,000	<b>610,000</b>
FCC	FCC (Spain)	275,000	275,000	<b>275,000</b>
Hera	Bologna (Italy)	2,600,000	2,200,000	<b>2,600,000</b>
Camuzzi	VE (France)	44,000	30,000	<b>44,000</b>
Meta	Modena municipality (Italy)	315,000	327,000	<b>327,000</b>
Siemec	VE (France)	0	700,000	<b>700,000</b>
Sigesa	ACEA (Italy)	1,200,000	2,450,000	<b>2,800,000</b>
Crea	Suez (France)	700,000	700,000	<b>700,000</b>
SAP	VE (France)	50,000	0	<b>50,000</b>
Acque Toscane	Suez (France)	40,000	40,000	<b>40,000</b>
CGA	VE (France)	345,000	0	<b>345,000</b>
Severn Trent	Severn Trent (UK)	600,000	600,000	<b>600,000</b>
Latina	VE (France)	600,000	600,000	<b>600,000</b>
Enel Hydro-So Ri Cal	VE (France)	6,100,000	752,000	<b>6,852,000</b>
Nuove Aqua	Suez (France)/Amga (Italy)	296,000	105,000	<b>296,000</b>

Source:

Giulio Citroni (2007) Public-private partnerships in the Italian reform of water supply and sanitation services. CIRES, Italian Research Centre for European Studies, Working Paper 1, Florence, Italy.

OECD (2002) Environmental Performance Reviews: Italy. OECD, Paris, France

## JORDAN

### Water Resources

In the Amman-Zarqa area where some 60% of the national population lives, the daily availability of drinking water is the lowest for an urbanised area in the world. In Jordan, water supplied for domestic usage is about 115L/day. This figure does not take into account distribution losses and other municipal uses. In consequence, the actual daily delivery of water is 85L/day. Municipal water demand has surpassed the available supply since the mid-1980s and summer rationing was introduced systematically in most provinces since 1988. In Amman, running water is only available for a few hours of the week. In Amman during the 1998 drought, municipally supplied water was only available for two days a week. Water from the Bassel Dam in southern Syria has started to flow to Jordan. This is the result of an accord with Syria to pump 3.5million m<sup>3</sup> of drinking water to Amman in August 2000.

### Water provision and use in Jordan (1992)

Domestic use (L/day)	115
Agriculture	74%
Industry	5%
Domestic	21%
<b>Total (million m<sup>3</sup>)</b>	<b>875</b>

Sewerage systems and treatment plants have been built or are under construction in most towns, but sewage treatment remains at an early stage of development, with less than 20% of effluents subject to treatment.

### Water Management

Jordan's revised EUR2.29billion 2002-2011 water sector policy plan's 53 projects include 10 projects worth EUR998million earmarked for PPP. The original 1997-2011 plan was to cover 61 facilities at a total cost of USD5billion. Capital spending in 1997/98 was running at USD98million pa. In the longer term, the building of the Red-Dead Canal, aimed at channeling water from the Red Sea to the Dead Sea, using a desalination facility remains under consideration, despite its estimated cost of USD3billion.

In September 2002 a USD800million plan for piping water to the Dead Sea was unveiled. The 186 mile pipeline is designed to prevent the continuing shrinkage of the sea, which has caused problems for both Jordan and Israel. The World Bank is assisting Jordan with a plan that aims to pump 2billion m<sup>3</sup> of water pa from the Red Sea to raise the level of the Dead Sea back to its historic levels of about 395m below sea level as opposed to its present level of 410m. Without this, the Dead Sea is expected to dry up by 2050

### Privatisation of Amman's water and sewerage management

Jordan has adopted a draft law on privatisation that came into effect at the end of 1999. Although initiated in the mid-1980s, privatisation has only now been taken seriously because it is a prerequisite to Jordan's entry into the World Trade Organisation (WTO). The draft law is said to include safeguards for employee rights and a clause giving the Government the right to maintain a golden share in any privatised institution.

The Greater Amman water management project was awarded to Suez in 1999 (Ondeo 75% and Montgomery Watson-Arabtech Jardaneh, 25%) and has been supported by a USD55million World Bank loan in March 1999. The overall project cost is USD136million, the Government of Jordan contributing USD17million, the European Investment Bank USD44million, and Italy USD20million. The 51 month contract aims to improve the efficiency, management, operation, and delivery of water and wastewater services for the Amman Service Area, covering about 1.6million people. The Greater Amman area accounts for 45% of the country's total drinking water consumption. The project seeks to improve the efficiency of the water distribution system through leakage management, network rehabilitation, and a program of meter repair and replacement, reducing unaccounted-for water by at least 25% as well as increasing sales revenues. Water and sewerage facilities are to be upgraded and the sewerage network extended. The contract has enjoyed limited success, due to institutional conservatism.

Jordan's estimated USD120-140million Wadi Main, Zahra and Mujib DBO water treatment scheme was won by a JV between ABB SUSA and Earth Tech (Tyco). The 55million m<sup>3</sup>/day spring water treatment plant is being funded by USAID.

A 25 year concession to pump and distribute 100million m<sup>3</sup>/day of water 325km from the Disi aquifer has been under consideration since 1998. Capital spending of USD625million will be required. Five groups have pre-qualified to bid for the project, with USD200million provided by the Jordanian Government and the Social Security Corporation. In July 2005, it was announced that the bidding process would be resumed.

A five plus five year management contract for water services in the Northern Governates (Irbid, Jerash, Ajloun and Mafraq) is currently at the bidding stage.

<b>MAJOR CITIES</b>			
<b>City</b>	<b>2000</b>	<b>2015</b>	<b>Status</b>
Amman	1,148,000	1,654,000	Water management project for Suez

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Northern Jordan	25 year water treatment BOT	Ondeo

#### **A water treatment BOT for Northern Jordan**

Suez's Ondeo Degrémont, Ondeo and Morganti of the USA have been awarded a 25 year BOT for a 530,000m<sup>3</sup>/day water treatment plant in northern Jordan. USAID, the US Agency for International Development is providing 60% of the project's USD169million cost, with the rest coming from local sources. The As-Samra facility will replace an existing waste stabilisation pond treatment system and will provide drinking water to about 2million residents in the Jordanian capital Amman and surrounding towns. Construction started in May 2004, with the consortium running the plant from 2006-28.

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Ondeo	Suez (France)	2,000,000	0	<b>2,000,000</b>

**KENYA**

<b>Economics (2005)</b>	
GDP per capita	USD530
GDP per capita (PPP)	USD1,170
GDP in Agriculture	27%
GDP in Industry	18%
GDP in Services	55%

The Water Act of 2002 created the Ministry of Water and Irrigation (MWI) in 2002 to protect, harness and develop the country's water resources. In addition, there are the Water Services and Regulation Board (WRSB), the Water Resources Management Authority (WRMA) and the Water Services Trust Fund (WSTF). Water operators are private/commercial enterprises, which provide water services in small towns and peri-urban areas. A National Water Resources Management Strategy (NWRMS) was adopted in 2003.

**Water and sewerage services**

93% of Nairobi receives potable water and 35% some form of sewerage. 51% of the overall population have access to safe water – 76% of the urban and 40% of the rural population. There are 742,000 water connections and 680 piped systems in the country, along with 350 community water schemes. 145,000 connections to 35 sewerage systems serve 2million people. In 2003, 7.6% of the population had piped water within their dwellings, 19.2% for urban areas and 33.2% for Nairobi.

Total water demand was approximately 3,150million m<sup>3</sup> in 2000 and is forecast to rise to 4,343million m<sup>3</sup> in 2010 and to 5,552million m<sup>3</sup> in 2020. The Kenyan Aftercare Study of 1998 forecast total spending of USD2.6billion being needed to upgrade and extend the water and sewerage networks. Studies carried out in 2001-03 point to an immediate need for USD1.0–1.4billion for the water system. This does not include the need for more water storage capacity, which is becoming a critical issue due to periodic droughts in recent years. In reality, investment has been falling, with capital spending in 2001-02 42% of its 1994-95 level. This has in part been due to the economic consequences of drought and flooding between 1997 and 2001.

**Water is a wealth issue**

Access to safe water supplies by household income, 2003

Poorest 20%	28.0%
Second 20%	37.7%
Middle 20%	50.6%
Fourth 20%	63.8%
Richest 20%	93.7%

**And a waste of time**

In 2004, it was estimated that 53.2% per cent of households in Kenya walk for less than 15 minutes each day to fetch water. Even in urban areas, 16.2% of the population have to spend more than this time carrying water.

<b>Population</b>	
2005 (million)	34.3
2015 (million)	44.1
Urbanisation in 2005	21%
Urbanisation by 2015	52%
In urban agglomerations, 2015	10%

**Vendors being brought into the mainstream**

Water vending is widespread in larger cities. Under a scheme developed in 2005, they are collaborating with official agencies in Kibera (Nairobi) and Kisumu to improve water supply service for underserved consumers. Maji Bora Kibera, an association of 500 small-scale water vendors serving approximately 500,000 Kibera inhabitants, have a partnership with the Nairobi Water and Sewerage Company. Between 40-60% of the population of Nairobi's informal settlements lack access to safe drinking water and pay almost 20 times more than well-to-do city residents. In Kisumu 200 of the total 1000 small-scale private water providers receive bulk water at concessional rates of USD0.40 (EUR0.31) /m<sup>3</sup> from the Kisumu Water and Sewerage Company (Kiwasco). The vendors will also manage secondary water distribution branches installed by Kiwasco, serving poor settlements. In Kisumu the total population now unserved is 200,000.

<b>Urban data</b>	
Served by piped water	67%
Access to sewerage	69%

## Reforms

Investigations were started in 2004 into losses caused by council officials allowing illegal water connections and tenders. 50% of Nairobi's was unaccounted for, adding up to more than KES1.1billion (EUR10.4million) a month.

The responsibility for water services provision is to be transferred to the Water Services Boards (WSB) in 2005. Responsibility for water services provision will be decentralised to the regional level. This will see the separating of the management of water and sanitation from the management of water resources. The WSBs will appoint water services providers, with a minimum of 20,000 connections. These providers will take various forms including companies established by local authorities in the urban areas and community schemes for the rural areas.

### A partial privatisation

VE and its local partner Saureca Space gained a management contract in 1999 for water services in Nairobi, involving improving basic services and reducing distribution losses from their current 50% level for some 2million people and may be developed into a concession contract in the future. The contract started as a 10 year outsourcing contract for Nairobi's water services for a flat fee, involving installing 40,000 meters in the first four years and a total of 130,000 meters by 2009.

The 2002 Water Act allows for concession contracts to be awarded. It also authorises the setting up of a national regulator and appeals systems. At the local level, political opposition to the presence of foreign companies has even resulted in aid funding being withdrawn. The Government's failure to provide universal water access by 2000 has been a major boost for PSP at the national level. A new plan seeks universal water access by 2010.

A PSP contract for the 2.1million people living in Mombassa would include the whole of Mombassa and the coastal region, which has a number of separate urban areas. Access to piped water in the region is 29%, along with 10% for sewerage.

The World Bank's Public-Private Infrastructure Advisory Facility carried out a series of studies and seminars between 2000 and 2003 for preparing for PSP for water and sanitation in Nairobi, Kisumu and Mombassa and for training the Water Services Regulatory Board. The WB considered that a lease contract would be the appropriate form of a contract for Nairobi and this is currently under consideration. Likewise, a USD10.4million 15 year lease was recommended for Kisumu, which will be considered in 2006.

<b>Freshwater</b>	
Annual availability (1998)	7.4km <sup>3</sup>
Per capita	932m <sup>3</sup>
Annual withdrawal (2000)	1.6km <sup>3</sup>
Domestic	30%
Industrial	6%
Agriculture	64%

The National Water Conservation and Pipelines Company (NWPC) were set up in 1988 to operate systems that could be run on a cost recovery basis. However, the NWPC has since accumulated debts of KES1billion and is unable to service its interest charges.

<b>Operator</b>	<b>Systems</b>	<b>Connections</b>
Ministry of Water	630	280,000
NWPC	40	230,000
Nine municipalities	N/A	70,000
Nairobi municipality	N/A	160,000

Financial performance of water service, 2001

<b>(KShmillion)</b>	<b>Revenues</b>	<b>Expenses</b>
Nairobi	1,980	1,500
NWPC	1,200	1,250

Three water boards were set up in 2004: the Water Resource Management (WRM) Authority, the Water Services Regulatory (WSR) Board and the Water Services Trust (WST) Fund. The WRM Authority will see to the restoration of degraded water catchment and depleted aquifers to guarantee availability of the resource for development. The WSR Board will licence, regulate and supervise water services boards and ensure access and expansion, whereas the WST Fund is charged with the responsibility of a financing instrument for expansion of water services particularly to the poor.

<b>Groundwater</b>	
Annual availability (1998)	1.1 km <sup>3</sup>
Per capita	35m <sup>3</sup>
Annual withdrawal (1992)	0.18m <sup>3</sup>

**Sources:**

Odhiambo, W. (2004). Pulling apart: facts and figures on inequality in Kenya, Nairobi, Kenya, Society for International Development, Eastern Africa

PriceWaterhouseCoopers (2003): Building Kenya Together. Conference on Private Sector Participation in Kenya's Infrastructure, 15<sup>th</sup> May 2003

World Bank (2004). Kenya: towards a water-secure Kenya: water resources sector memorandum, Vol. 1 of 1. Washington D.C., USA, World Bank

African Development Bank/OECD (2007) African Economic Outlook

**KUWAIT**

<b>Economics (2005)</b>	
GDP per capita	USD24,040
GDP per capita (PPP)	USD24,010

<b>Population</b>	
2005 (million)	2.5
2015 (million)	3.4
Urbanisation in 2005	98%
Urbanisation by 2015	97%
In urban agglomerations, 2015	53%

**Population and water**

Kuwait has a population of 1.9million people, all of whom effectively live in five urban areas. Virtually all of Kuwait's water comes from Government constructed seawater desalination plants. The Iraqi occupation of 1990-91 caused considerable damage to these plants but most of them are once again fully operational. One of these was the largest in the world with a production of approximately 200million gal/day of drinking water.

**Drinking water**

The Government is upgrading and expanding its desalination facilities. The Az-Zour facility (80million m<sup>3</sup> pa) was extended to provide a further 50million m<sup>3</sup> pa in 2002 at a cost of USD250million. The original plant was built in the 1980s for USD230million. New desalination plants providing a total of 40million m<sup>3</sup> pa were put into operation during 1997-98.

In 1999, Kuwait's Ministry of Electricity and Water awarded the construction contract for a USD500million desalination plant for the proposed Sabiya New City development. Construction of the facility will start in 2004 and it will enter service in 2007, supplying 83million m<sup>3</sup> pa of potable water to the industrial area and existing water distribution complexes.

A plan for the sale of 300million m<sup>3</sup> pa of water by Iran to Kuwait via a USD2billion dedicated pipeline from northern Iran has been under development since 2002.

<b>Freshwater</b>	
Annual availability (2000)	0.0km <sup>3</sup>
Per capita	8m <sup>3</sup>
Annual withdrawal (2000)	0.4km <sup>3</sup>
Domestic (2000)	45%
Industrial (2000)	3%
Agriculture (2000)	52%

**Privatisation**

The Employment Law for the privatisation of various non-oil state enterprises and utilities was enacted in 1994. By 1998, the Government had sold shares in 25 local companies worth about USD3billion. Kuwait has adopted the World Bank's proposals for privatising the Ministry of Electricity and Water, with the share sales to be handled by the Kuwait Investment Authority. Water services are currently earmarked for privatisation in the medium term. Water is sold at USD2.40 per 1,000 US gallons to residents, (or USD1.00 to tanker companies who sell it on at USD3.30 per 1,000 gallons) and USD0.80 per 1,000 US gallons to industry.

<b>Groundwater</b>	
Annual withdrawal (1994)	126.5
Domestic (1987)	0%
Industrial (1987)	0%
Agriculture (1987)	100%

<b>MAJOR CITIES</b>			
City	2000	2015	Comments
Kuwait City	879,000	1,136,000	Wastewater privatised

**Private sector participation**

In 1999, Kuwait's Ministry of Electricity and Water awarded the construction contract for a USD500million desalination plant for the proposed Subiya New City development. The facility is designed to be operational by the end of 2002, and will supply up to 122million gal/day of potable water to the industrial area and existing water distribution complexes.

A USD390million BOT wastewater treatment plant contract at Sulaibaya was awarded to the UU and Bechtel led consortium in 2001, following delays over assessing the three shortlisted bids. The facility will treat 375,000m<sup>3</sup>/day of wastewater from 2005, with projected revenues of USD2billion over the contract's life. This will be the world's largest membrane-based water reclamation facility. With a tariff of USD0.47/m<sup>3</sup>, it is anticipated that the facility will save the country USD3billion during the life of the concession. There is an option to extend the facility to handle 600,000m<sup>3</sup>/day of wastewater in the future if needed.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Sulaibaya	30 year sewage treatment BOT	Utilities Development Co

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Utilities D. Co	UU (UK)	0	1,900,000	<b>1,900,000</b>

Source:

Sulaibaya achieves financial close. Global Water Intelligence (2002), 3/8 p9.

## LATVIA

### Water resources and distribution

More than 90% of the population in Riga, 54% in Liepaja and more than 80% in other cities and towns are served by mains water. In smaller towns, the figure is typically 50%. In 1995, the daily water supply per capita in the cities of Latvia was as follows: 339L in Riga, 331L in Ventspils, 223L in Daugavpils, and 139L in Liepaja. Total losses in water supply systems were estimated at 12% of water abstraction in 2000, half of the level seen in the mid 1990s. 60% of losses are in Riga. While there continue to be problems with drinking water quality in smaller towns, there has been a significant improvement in Riga.

% samples failing standards	Chemical		Bacterial	
	1999	2000	1999	2000
Latvia	54%	58%	9%	7%
Riga	2%	5%	0%	0%

### Sewerage and sewage treatment

The '800+' programme began in Latvia in 1995, aiming to improve water supply and wastewater treatment in small towns and rural areas, through the refurbishment and construction of 800 sewage treatment works by 2010. By 2003, 70% of urban wastewater was treated: 33% to tertiary, 35% to secondary and 2% to primary standard. In 2005, 38% of urban wastewater was treated to tertiary standard, 26% to secondary and 2% to primary, some 66% in total. Current capital spending is coming through the following sources:

EUR million	2004	2005	2006	2007	2008
European Union funding	16.674	21.090	103.437	85.379	59.228
State budget	0.749	11.343	7.391	N/A	2.870
Own funds	9.231	12.294	10.646	15.225	11.057
<b>Total</b>	<b>26.654</b>	<b>44.726</b>	<b>121.474</b>	<b>100.604</b>	<b>73.155</b>

### Inland water quality

Latvian rivers have moderate levels of organic pollution and nutrients, quite high concentrations of oxygen, and rich flora and fauna. Water quality is considered to be quite good in 80% of Latvian rivers. The proportion of wastewater that is treated to EU compliant standards has increased from 44-46% in 1991 & 1992, to 81% by 2000, with a significant improvement noted since 1998. Surveys have been carried out in smaller rivers, showing an improved biological water quality:

	1993-96	1998-00
Good (1-3)	45%	88%
Quite good (4)	48%	9%
Not good (5-6)	8%	3%

### Privatisation prospects

In 1996, the EBRD provided EUR18million out of a EUR97million loan package for the upgrading and expansion of water and sewage treatment works serving Riga. As with Estonia and Lithuania, the EBRD's financing was arranged as a USD90million loan portfolio for supporting projects to be carried out by Suez's Degrémont. There are no current plans for the privatisation of Riga's water and sewerage services, but this may change in the medium term.

MAJOR CITIES			
Population	2000	2015	Status
Riga	761,000	761,000	PSP under consideration

Source:

Latvian Environment Agency (2002) Environmental Indicators in Latvia 2002, Riga, Latvia

## THE LEBANON

### The civil war's legacy lingers on

The civil war effectively obliterated the Lebanon's water and sewerage treatment facilities. By 1996, all sewage effluents were discharged untreated, while in 2001, it was estimated that 60-70% of the country's water distribution capacity needed to be rehabilitated. Prior to the civil war, 95% of the country was covered by basic water services. The Lebanon has a nominal water treatment capacity of 385,000m<sup>3</sup>/day, equivalent to 70% of the minimum daily requirement, but in 1998, 80% of drinking water was not subject to treatment. Distribution losses are in the region of 50%. A number of primary treatment facilities with sea outfalls are being developed for the coastal zone with the short term aim of all wastewater to be subject to primary treatment. Secondary treatment plants are planned for inland areas where the effluent from these plants will be used for specific agricultural uses.

Domestic consumption of water in the country as a whole was 60L/capita/day in 1997, compared with 150L/capita/day in Beirut. Much of the water supply is only chlorinated or not treated at all where it is withdrawn from the ground water. In 1998, 70% of Lebanon's fresh water sources were found to be subject to bacteriological pollution, mainly due to household effluents and industrial pollution. Water demand was 1.48billion m<sup>3</sup> in 1998 and is forecast to rise to 2.84billion m<sup>3</sup> in 2015, although internal resources are only 2.2billion m<sup>3</sup> pa.

The UN Economic and Social Commission for Western Asia believe that Lebanon could see serious water shortages by 2025 unless losses are curbed. Lebanon has 2.85billion m<sup>3</sup> of water pa, 25% in underground reserves. In 2000, the country used 1.14billion m<sup>3</sup>, mostly on agriculture, and demand is expected to rise to 4billion m<sup>3</sup> by 2025. Much of the water is wasted or contaminated through pesticide use and industrial pollution. Only 40% of Lebanese domestic customers pay for their water, and the income is not enough to cover operation and maintenance costs. Water tariffs have been increased by 40% in Beirut since 1994, but these only cover 70% of operating costs.

Some industrial facilities (and hospitals) have water meters installed. For household use, the current pricing policies have one unified price per m<sup>3</sup>/day for all household connections within a given water authority's jurisdiction. The regional authorities are to install water meters to house connections and to develop pricing policies that reflect individual household usage rather than fixed per day water supply. In addition, pricing policy is to reflect investment costs.

### Capital spending plans

Since 1996, the Lebanon has received USD600million in donor funding for rehabilitating water services. Longer term, USD750million needs to be spent on coastal sewage treatment plants, USD1.0billion on inland facilities and USD1.152billion on sewerage networks. A further USD1,000million for water treatment and distribution has been identified. The Government is proposing financing the construction of a USD200-220million 260,000m<sup>3</sup>/day water treatment plant and pipeline for Beirut through a 28 year concession have been delayed due to political concerns. The World Bank has supported this project and seven consortia had pre-qualified at the time of the postponement in 2002.

### A reformed water management system

The 22 water authorities have been rationalised into four and USAID is supporting capacity building measures in a four year programme running from 2002. All of these authorities will in turn be expected to develop regional integrated land and water management. USAID aims to encourage private sector investment in its programme.

Suez Ondeo has been appointed to manage water and wastewater systems in the city of Tripoli for four years from 2003. The contract, which is being financed by a USD21million soft loan from France's Agence Française de Développement, provides for Ondeo to repair and expand WWTPs and water supply networks.

In 2004, the Government announced plans to "transfer the full cost of providing water supply and sewage disposal services from the state to consumers through an equitable tariff and collection system" but only Sidon Water Authority has domestic water meters that charge on a volumetric basis.

## LESOTHO

### The Lesotho Highland Water Project

Lesotho is a small country of some 2million people, surrounded by the Republic of South Africa. The Highland Water Project described below is the world's largest water catchment and transportation infrastructure project to date. While there is no water service element per se, water exports from the project have become Lesotho's largest export earner. The project therefore merits attention because it demonstrates the economic power of water.

#### Water rich and water poor

Water is arguably the only abundant natural resource in Lesotho. South Africa's need for reliable long term water supplies resulted in two water export feasibility studies in Lesotho's Highlands in the 1950s and 60s. Both failed because agreement could not be reached between the two Governments on payment for water exports. However, a new feasibility study was launched in the 1970s, which in 1979 and 1983 recommended a 70m<sup>3</sup>/sec water transfer scheme, along with hydropower generation to enable Lesotho to replace electricity imports with locally produced energy. The dams trap water that normally runs into Lesotho's Orange River which is discharged into the Atlantic Ocean, and turns it north towards Johannesburg and Gauteng Province.

On October 24, 1986, an agreement was signed between Lesotho and South Africa to proceed with the Lesotho Highlands Water Project ('LHWP') for the transfer of water from Lesotho. About 115m<sup>3</sup>/sec of water flows out of Lesotho via the Sengu River. The LHWP exploits this by arresting the southern flow, storing the water and redirecting it northwards to the Vaal River, to supply the state of Gauteng, which has a population of more than 10million. The cost of phase 1A amounted to EUR1.5billion and attracted external funding from European export credit agencies (USD380million), the World Bank (USD69million), the EU Commission (EUR50million) and the European Investment Bank (EUR23.5million). In 2002, the cost of Phase 1B was estimated at EUR1.1billion and has a similar funding pattern with EUR99million being made available by the European Investment Bank.

Phase 1A and 1B of the LHWP has resulted in savings to South African water users estimated at USD30million pa. The aggregate benefits (savings) to both South Africa and Lesotho amassed from the LHWP have a net value of about USD1billion for Phases 1A and 1 B. Of this sum, 56% of the cost savings will go to Lesotho in terms of a royalty payable for the sale of water to South Africa. In addition to the royalty payable to Lesotho, there is a levy paid by water customers in Gauteng to finance the project. On 1st October 1990, the levy was set at ZAR0.07/m<sup>3</sup> of water and was increased to ZAR0.10/m<sup>3</sup> from 1 October 1991. From 1 October 1996, the levy was ZAR0.3808/m<sup>3</sup>. The levy is to remain at this level for fifteen years.

#### LHWP – Phases 1A and 1B

m <sup>3</sup> /second	Year Commissioned	Phase	Supply Type	Incremental Water supply	Total Water supply
Katse	1998	1A	Dam & tunnels	18.2	18.2
Mohale	2003	1B	Dam & tunnels	9.5	27.7
Matsoku	2003	1B	Weir & runnels	1.9	29.6

When Phase 1B was completed in March 2004, the full yield of the system was 933.5million m<sup>3</sup> pa, compared with a yield of 574million m<sup>3</sup> pa at the end of phase 1A. Water transferred increased from 574.1million m<sup>3</sup> in the year to 31<sup>st</sup> March 2001 to 593.2million m<sup>3</sup> in 2002. By the end of 2002, the total volume of water delivered was 2,278million m<sup>3</sup>, generating royalties of ZAR863million. The water royalty in 2002-03 contributed 6.4% of the Government of Lesotho's budget.

#### The fluid politics of water

Times and politics change. At the project's inception, it was regarded as a mechanism for ensuring resource stability in the region. After the democratic transition in 1994, the project was seen as a means of getting water to the arid townships of the region. This area accounts for more than 40% of South Africa's urban population by the year 2000 and over half of its industry.

The project period runs from 1990 to 2017. The water transfer project is based upon a series of reservoirs, transfer tunnels, delivery tunnels and pumping stations. In 1998, 18m<sup>3</sup>/sec of water was being delivered to South Africa from the Katse Dam. By 2020, four further dams will be linked to the scheme, delivering a total of 82m<sup>3</sup>/sec.

#### Some problems

There are a number of costs associated with the project. Total environmental, compensation and rural development costs were estimated in 1989 by the authorities linked with the project at USD39million, or 4% of the total project's cost. Sources external to the project have pointed out that the project involves the loss of 11,000 hectares of grazing or arable land, affecting 20,000 Basotho people, who are mostly subsistence farmers. This in turn will exacerbate the country's dependence on food imports.

In May 2002, Masupha Sole, the former chief executive of the Lesotho Highlands Development Authority was sentenced to a total of 18 years in prison. He had been convicted on 13 counts of bribery and fraud for taking bribes of about USD2million over a period of nine years from international consultants and contractors. In September 2002, the Lesotho High Court found Canadian engineering firm Acres International (Acres) guilty of paying bribes for contracts on the project. The company had paid USD278,000 to Masupha Sole, through its local agent. Acres maintain that it was unaware that some of its money that was being used on the project was being secretly paid to Sole's Swiss bank accounts. Acres was fined EUR22.8million in 2003. If the judgment is upheld, the firm faces being disbarred by the World Bank, which is financing the project. This will also affect Acres involvement with the Bujugali Dam in Uganda and the Nam Theun 2 dam in Laos. An internal investigation by the World Bank in 2003 found that there was insufficient evidence to punish Acres.

#### **Longer term considerations**

Some authorities on water conservation now believe that South Africa ought to concentrate on conservation as a means of postponing the further development of the project. For example, projections by Rand Water indicate that the second phase (the Mohale Dam) could be delayed by some years with a 10% decrease in water consumption, or up to 17 years with a 40% decrease in water consumption. It is unclear if the aspirations of people living in these townships have been fully factored in for those assumptions.

#### **Utility privatisation is under consideration**

The UK's Adam Smith Institute has been working for the Lesotho Government since 1997 with the aim of developing an effective legislative and regulatory framework for the water sector, and devising and implementing a programme for private sector participation in the delivery of water and sewerage services. The latter involves specifying the best form of management contract, developing the acceptance criteria, initiating the bidding process and assisting the Government in awarding the short term management.

## LITHUANIA

<b>Economics (2005)</b>	
GDP per capita	USD7,050
GDP per capita (PPP)	USD14,220
GDP in Agriculture	6%
GDP in Industry	31%
GDP in Services	63%

**Laws**

Lithuania is undergoing a radical programme of revising environmental legislation and standards in preparation for compliance with EU environmental standards. A draft Standard on Drinking Water, Hygiene Requirements and Monitoring is under preparation. Other legislation includes the Law on Environmental Protection (1992), Lithuanian Environmental Strategy Action Programme (1996), the Water Law (1997), the Law on Environment Pollution Taxes (1991), and the Draft Law on Drinking Water (2002). By 2002, all applicable EU directives had been transposed into national law.

<b>Population</b>	
2005 (million)	3.4
2015 (million)	3.3
Urbanisation in 2005	67%
Urbanisation by 2015	69%
In urban agglomerations, 2015	0%

**Water usage**

In 2001, surface water extraction was 4,053million m<sup>3</sup> compared with 4,510million m<sup>3</sup> in 1991. In 2001, 157million m<sup>3</sup> came from groundwater resources, against 340million m<sup>3</sup> in 1991. The decline in consumption during recent years is related to the decline of industry, economic restructuring, and the introduction of taxes for water and effluent discharges. In addition, water distribution losses are being targeted, as they accounted for 23% of groundwater abstractions in 2001; 6million m<sup>3</sup> pa of distribution losses were eliminated between 1999 and 2001.

**Water pollution taxes**

<b>Litas per tonne</b>	<b>1997</b>	<b>2000</b>	<b>2003</b>
BOD	417	485	714
Nitrogen (N)	417	435	550
Phosphorus (P)	1,418	1,480	2,000

In 2004, plans were prepared to rationalise the country's 50 larger and 200-300 smaller water entities into 5-10 regional companies.

<b>Urban Data</b>	
Served by piped water	86%
Access to sewerage	80%
With sewage treatment	80%

**Sewerage and river water quality**

There are more than 700 sewage treatment works in Lithuania with a total capacity of about 1.2million m<sup>3</sup>/day, 90% being for rural areas, with an average capacity of about 100m<sup>3</sup>/day. The recycling of wastewater has only been used in the town of Akmenė, where all the treated wastewater (10,000m<sup>3</sup>/day) is utilised in the cement factory. 60.4% of the population was connected to the sewerage system in 2002. Wastewater discharge has fallen from 252million m<sup>3</sup> in 1997 to 168million m<sup>3</sup> by 2002. Further upgrading is still needed as 82% of effluent discharges in 2001 failed the EU Urban wastewater treatment directive's standards against 86% in 2000.

	<b>1997</b>	<b>2002</b>	<b>2005</b>
Untreated	17%	2%	1%
Primary	15%	18%	11%
Secondary	67%	61%	22%
Tertiary	1%	19%	36%

With the reduction of pollution loads as a consequence of the taxation regime and upgrades to some sewage treatment facilities, water quality in rivers and lakes has somewhat improved.

<b>River water quality (1995) %</b>	
Good	43%
Fair-Poor	48%
Bad	9%

With the exception of the Urban Wastewater Treatment Directive (to be met by 2010), Lithuania believes that it has complied with the applicable EU water related directives as part of its accession programme. Tertiary waste water treatment plants will be built in forty-seven Lithuanian cities and towns, on top of the tertiary treatment plants already serving eighteen cities and towns. On completion, 209million m<sup>3</sup> pa, or about 83% of wastewater generated will be treated to secondary or tertiary standard, as appropriate. A total of USD250million has been spent on wastewater treatment projects between 1992 and 2002.

Tertiary treatment is being used in current construction and upgrading projects with a total capacity of about 110million m<sup>3</sup> pa, or 53% of effluent generation. Funding constraints are severe, and it is currently uncertain how all of these projects will be completed.

<b>Freshwater</b>	
Annual availability (1998)	15.56km <sup>3</sup>
Per capita	7,276m <sup>3</sup>
Annual withdrawal (2000)	0.3km <sup>3</sup>
Domestic (2000)	78%
Industrial (2000)	15%
Agriculture (2000)	7%

### **Water resources**

87% of Lithuania's water resources have levels of iron and manganese that exceed permissible rates. This iron is purified from 28% of the supplied water, but the percentage is expected to increase with the building of new purification stations in Vilnius, Kedainiai, Anyksciai, and the Pagiriai water fields. Some LTL315million (USD80million) is needed for the construction of water purification facilities in Lithuania.

<b>Groundwater</b>	
Annual availability (1998)	1.20km <sup>3</sup>
Per capita	332m

### **Privatisation prospects**

In 1995, the EBRD provided EUR11million out of a loan package of EUR67million for the construction of a water treatment plant at Kaunas, serving Vilnius. The plant provides water for 700,000 people and was constructed by Degrémont (Suez). The water provision services for Vilnius are under consideration for developing a concession contract. The World Bank's Public-Private Infrastructure Advisory Facility has been providing technical assistance for PSP development and its recommendations were submitted to the Government at the end of 2004.

Source:

Ministry of Environment (2002) State of Environment 2001, MoE, Vilnius, Lithuania

## MALAWI

Access to clean water improved from 48% in 1994 to 56% in 1999, and 66% in 2005, although water Aid believes that improved water services only reach 43% of the population. Under a national water supply programme some 3,000 boreholes have been drilled. A 1998 survey showed that 23,000 boreholes would need to be drilled to cover 100% of the population at a cost of MWK360million (EUR8.4million).

### Water and sanitation coverage

2005	Urban	Rural	National
Water supply	85%	64%	66%
Household water supply	13%	1%	2%
Sanitation	78%	60%	62%
Flush lavatories	14%	1%	3%

Attempts to commercialise its water utility have been hampered by the debt burden the company carries, along with outstanding client accounts and weak debt collection systems. The Water Supply Authority is one of the 100 state enterprises that Malawi has identified for privatisation. Malawi's four-year old privatisation programme is being carried out under the terms of the World Bank and the International Monetary Fund (IMF). An official admitted that there was some resistance to the privatisation of the water utility because of fears of price rises and job losses. To compensate for the latter, the Government has set up "training projects for retrenched workers".

The World Bank's Public-Private Infrastructure Advisory Facility funded a study on options for private involvement in the water sector in 2000 and recommended that lease contracts should be considered. Water and sewerage services are provided by five Government-owned, parastatal water boards for Blantyre, Lilongwe and the Northern, Central and Southern regions. All five water boards are loss making and have been generally characterised by weak governance and political interference.

In April 2004 Malawi launched a strategic water plan for 2003/04, focusing on technical operations and information management, policy planning and drawing up a legal framework. In December 2004, it was announced that Malawi would be allocated USD336.2million to finance water projects under the African, Caribbean and Pacific countries-European Union (ACP-EU) Water Facility. The Government aims for all households to be within 500 metres of an improved water supply by 20011.

Source:

African Development Bank/OECD (2007) African Economic Outlook

## MALI

The water code adopted in 2002 sets out the procedures for managing and protecting resources by defining the rights and obligations of the state, local authorities and users. It recommends the establishment of public water-service development funds and sets up a national council, regional and local councils, and water-basin councils. The water sector is placed under the responsibility of the Ministry of Mines, Energy and Water (MMEE), while responsibility for sanitation, is shared amongst the DNH, the Ministry of the Environment and the Ministry of Health.

In 1987, 25% of Mali's 283,000 urban housing units had direct access to piped water, 17% with water piped to the inside of the unit and 8% with water available outside. Nationally, access to household connections increased from 6.4% in 2001 to 8.6% in 2005. In the capital Bamako, 26% of households were connected to piped water in 1993, while 2% had direct access to sewerage. The city had no sewage treatment. Overall, 46% of the urban population was considered as having suitable access to potable water in 1996 (against 41% in 1991) and 58% as having access to adequate sanitation. In 1987, 1.3% of all households were connected to flush lavatories. By 2000, 27 of the 34 towns with more than 10,000 people had formal water systems, covering 52% of the population.

An assessment drawn up in 2004 paints a more pessimistic picture:

Water and sanitation coverage (million people)

	Population	Coverage	Water % covered	Coverage	Sanitation % covered
<b>1990</b>					
Rural	6.7	3.5	52%	4.2	62%
Urban	2.1	1.4	65%	2.0	95%
Total	8.8	4.9	55%	6.2	70%
<b>2004</b>					
Rural	8.8	5.3	60%	2.6	30%
Urban	2.2	1.4	65%	1.8	80%
Total	11.0	6.7	61%	4.4	40%

In 2005, urban coverage was estimated to be 70%. Data for sanitation is meagre, and the EDS III survey in 2001 identified just 10% of households as having improved sanitation facilities, or a 30% coverage in urban areas and a 2% coverage in rural areas.

Traditionally, as sanitation is informal, it is family funded. Government funds for mini-sewerage systems through the Office Malien de l'Habitat have provided XAF139million for mini-sewerage systems serving Bankoni and Baco Djicoroni. Other projects include mini-sewerage systems in Djenné and Timbuktu. However, cost recovery remains a problem, which stands at just 20%.

According to France's Hydroconseil, USD180million is needed for water supplies and USD70million for sanitation services for Mali to meet the urban Millennium Development Goals. A further USD260million will be needed for rural water and sanitation services.

In 2003, the Plan National d'Accès à l'Eau (PNAE, National Plan for Access to Water) was launched, along with a Water access initiative, with the support of the African Development Bank. The Government is currently developing a water and sewerage project management agency, the Agence Malienne pour l'Eau Potable et l'Assainissement (AMEPA-Mali Agency for Water Supply and Sanitation) for overseeing local and municipal projects.

Average water consumption in 2000:

Less than 2,000 people	20L/day
2,000 – 5,000 people	31L/day
5,000 – 10,000 people	31L/day
10,000 + people	45L/day

In the 16 certain largest towns water is provided by Energie du Mali (EDM). The water activities of EDM were awarded to SAUR under a concession contract in 2000. Although the original concession projected a period of price stability, the Government has unilaterally passed two price cuts since then. This contract has restricted itself to addressing those areas where private sector advice could make the most dramatic impact to service efficiency. At the same time, the Commission de Régulation de l'Eau et l'Electricité (CREE) was established as the sector's regulator.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	Contract	Company
Urban areas	20 year concession, water provision	SAUR

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
SAUR	Bouygues (France)	115,000	0	115,000

Sources:

International Secretariat for Water (2005) Blue Book, Mali, ISW, Montréal, Canada

African Development Bank/OECD (2007) African Economic Outlook

## MOROCCO

<b>Economics (2005)</b>	
GDP per capita	USD1,730
GDP per capita (PPP)	USD4,360
GDP in Agriculture	13%
GDP in Industry	31%
GDP in Services	56%

### Management

A national plan for water and water resource management was adopted in 1995. This has been augmented with regional and city based plans for the larger urban areas. The emphasis remains on irrigation issues, but there is an increasing concern about the need for sewerage and sewage treatment infrastructure.

<b>Population</b>	
2005 (million)	30.2
2015 (million)	34.2
Urbanisation in 2005	59%
Urbanisation by 2015	65%
In urban agglomerations, 2015	21%

### Service coverage

In 1985, 63% of urban households had piped water, compared with 2% of rural households. Rural water coverage increased to 14% by 1994 and 55% in 2003, with the aim of 90% coverage by 2007. 90% of urban households had lavatories of some description, compared with 19% of rural households. In 1983 87% of households in Rabat had access to potable water and 95% had access to adequate sanitation, but none of the sewerage effluents were treated.

The Moroccan Government is seeking to mobilise an additional 6.2billion m<sup>3</sup> of water pa on top of the current withdrawal of 13.9billion m<sup>3</sup> pa by 2020. Connection to piped water in urban areas was planned to rise to 90% in 2000 and to 98% by 2020. 80% of the rural population is to be connected to piped water by 2005. In 1997 PAGER, a rural water provision programme was launched. It is seeking to serve 11million people in 31,000 localities through the rehabilitation of 30,000 water storage units, installing or renovating 20,000 water pumps and developing 1,300 local water sources. The rate of sewerage connections in urban areas is to be improved to 90% in 2005 and 95% by 2015. All major urban centres are to be provided with primary treatment by 2005, with these facilities being upgraded to secondary or tertiary standard between 2005 and 2015.

<b>Urban Data</b>	
Served by piped water	85%
Access to sewerage	69%
With sewage treatment	5%

### Pricing policies

Domestic water is provided for MAD30 pa where usage is below 24m<sup>3</sup> pa, except in Casablanca and Rabat, where it costs MAD84 and MAD74 respectively. Since 1996, measures have been taken to discourage excessive domestic usage by bringing in additional charges for usage above the basic quantity. These are MAD2.47/m<sup>3</sup> in Méknès and MAD7.15m<sup>3</sup> in Casablanca for 24-60m<sup>3</sup> pa and MAD9.87/m<sup>3</sup> in Casablanca for more than 60m<sup>3</sup> pa. Industrial tariffs in 1996 ranged from MAD1.59/m<sup>3</sup> in Méknès to MAD6.01/m<sup>3</sup> in Safi.

<b>Freshwater</b>	
Annual availability (1998)	30.0km <sup>3</sup>
Per capita	9341m <sup>3</sup>
Annual withdrawal (2000)	12.8km <sup>3</sup>
Domestic (2000)	8%
Industrial (2000)	2%
Agriculture (2000)	90%

### Privatisation proposals and progress

Since the enactment of the 1995 National Water Plan, Morocco has sought to privatise most of its major urban utility services and has been notably keen to attract international management and finance. To date, 35% of the urban water and sewerage sector has been privatised, with the privatisation of a further 25-30% under way.

<b>Groundwater</b>	
Annual availability (1998)	7.5km <sup>3</sup>
Per capita	268m <sup>3</sup>
Annual withdrawal (1985)	3.0km <sup>3</sup>

### Casablanca and Rabat

In 1997, Lyonnaise des Eaux de Casablanca (Lydec) was awarded the 30 year Urban Community of Casablanca (UCC) concession contract. This was part of the overall privatisation of Casablanca's urban services, which is described in the Suez entry. The water contract is worth MAD5billion (USD517million), for the expansion and upgrading of water distribution and treatment. 75% of the population is currently connected, which will increase to 85% in 5 years, 95% in 10 and 100% in 25 years, price rises were seen in years 2 to 5. The wastewater contract is worth MAD16billion (USD1.6billion). 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 7% of the population is connected to the sewerage network. In 1998, Lydec water and sewerage accounted for USD100million in turnover (30% of the total) and 60% of investment, reflecting the need to upgrade and extend the city's water and sewerage services. By 2004, 25million m<sup>3</sup> pa of water losses had been addressed, equivalent to 800,000 people's need.

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

### Application of cross subsidies

Block tariffs, 2005	Consumption per month	Tariff Mdh/m <sup>3</sup>
1 <sup>st</sup> section	0–8m <sup>3</sup>	2.92
2 <sup>nd</sup> section	9–20m <sup>3</sup>	9.69
3 <sup>rd</sup> section	21–40m <sup>3</sup>	13.20
4 <sup>th</sup> section	> 40m <sup>3</sup>	13.25

Most of the water (649million m<sup>3</sup> out of 814million m<sup>3</sup> in 1999) is bought from ONEP, the National Drinking Water Administration, for 3.95MAD/m<sup>3</sup> meaning that water for essential use is directly subsidised by LYDEC. As a result, 50% of customers pay less than USD3/month. LYDEC is obliged to make 45,000 low income connections every five years and in addition is training staff to extend services to 10,600 households in informal peri-urban settlements outside its operational remit in 2004.

14% of LYDEC's equity was sold on the Casablanca Bourse on 18<sup>th</sup> 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.

The privatisation of Rabat utility services was awarded to Electricidade de Portugal and Pleiade (Portugal), Alborada (Morocco) and Urbaser (Dragados), with a 30 year concession. Rabat's utilities serve 1.7million people, with a EUR138million (USD130million) turnover for water, sewerage and electricity services in 1998. In 2002, Dragados sold its stake to Veolia Environnement.

MAJOR CITIES			
City	2000	2015	Status
Casablanca	3,541,000	4,862,000	Water and sewerage services privatised
Rabat	1,496,000	2,105,000	Water and sewerage services privatised
Fes	907,000	1,300,000	PSP plans postponed
Marrakech	822,000	1,210,000	No plans announced

### Further privatisations under way

Water and electricity services to Fez and Méknès were due to be privatised in 2001. Fez (1.3million people) had an approximate turnover of EUR108million pa in 2001 and Méknès (0.6million people) will have a turnover of perhaps half of this. This privatisation has been delayed.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	Contract	Company
Casablanca	Water and sewerage services	Lydec
Casablanca	Bulk water provision concession	Lydec
Rabat	Water and sewerage services	VE
Tetouan & Tangier	25 year water and sewerage concession	VE

Private sector company operations (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
Lydec	Suez (France)	3,800,000	1,300,000	3,800,000
VE	VE (France)	2,900,000	450,000	2,900,000

## Sources:

Djerrari, F (2003) Best practice in urban water resource management: Contribution of LYDEC in Casablanca, World Bank Water Week, Washington DC, USA, 4-6<sup>th</sup> 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

## MOZAMBIQUE

<b>Economics (2005)</b>	
GDP per capita	USD310
GDP per capita (PPP)	USD1,270
GDP in Agriculture	23%
GDP in Industry	40%
GDP in Services	47%

### The National Water Plan

Mozambique unveiled a National Water Development Plan in 1995. The Plan is based on reviving Mozambique's water provision infrastructure in the wake of the country's civil war – access to improved water supplies having decreased from 48% in 1980 to 35% by 1995. The Plan states that to permit services to be financially viable, the price of water has to reflect its economic value, eventually covering the cost of supply; water resources management will be decentralised to autonomous catchment authorities and water supply and sanitation services are to be decentralised to autonomous and financially self-sufficient local agencies. The Government's role will therefore be restricted to setting priorities, defining minimum service levels, and the regulation of the activities of the service providers, including overseeing any planned privatisation processes.

<b>Population</b>	
2005 (million)	19.8
2015 (million)	23.5
Urbanisation in 2005	35%
Urbanisation by 2015	46%
In urban agglomerations, 2015	20%

### The role of the state

The Water Law of 1991 defines the institutional and legal framework for licensing and allocation of water concessions. Under this law, the National Water Council (CAN) provides inter-sector co-ordination and strategic decision making. Infrastructure development for the extension of coverage service and the corresponding investments will remain the responsibility of the state for the foreseeable future. On the other hand, management or operation of the water supply systems will, in principle, be carried out in a financially viable way and will be independent of the civil service.

<b>Urban Data</b>	
Served by piped water	17%
Access to sewerage	15%
With sewage treatment	0%

### Urban water and sanitation

According to the Public Works and Housing Ministry in 2003, Mozambique needs more than USD1billion to meet the millennium target of reducing by half the people deprived of clean drinking water and basic sanitation by 2015.

The National Statistics Institute found in 2001 that 37% of the population has access to piped water or a protected well and 50% had access to basic sanitation facilities. Of the total urban population, 35% have access to safe water supplies. In 1980 the coverage was estimated to be about 48%. The 1995 Plan's objective was to increase the coverage so that 50-80% of the population is supplied with safe drinking water by 2002. In 1999, 81% of the urban population had access to safe drinking water and 68% to improved sanitation. All water companies had a target to supply at least 50% of the population by then. The target for Maputo, the capital city, is 60%, and higher targets have been set for Xai and Chokwe (70%), Inhambane (75%), Pemba and Tete (80%). If these targets are achieved an extra 1million people will be served. Most of the expansion will be in the peripheral areas, where the proposed quality of service is one standpost with two taps per 500 people. The target coverage for the various levels of service is 30% by standpipes, 25% with yard connections and 20% with house connections. To achieve these targets water losses will have to be reduced from about 40% to less than 25%.

Capital spending for these targets is estimated at USD30 to 35million pa, against USD20 to 25million pa in recent years. Tariffs were adjusted in 2000 to cover operation, maintenance costs and 50% of depreciation costs. Full cost recovery was attained by 2004.

For sewerage in urban areas, short term investment will concentrate on the rehabilitation of the existing sanitation infrastructure, especially in cities with poor sanitary conditions such as Tete, Quelimane, Beira and Maputo at a cost of USD5-10million pa. By the year 2000, urban sanitation taxes should be introduced in all the major cities to cover operation and maintenance costs. In 1995 approximately 100,000 urban families had latrines. The official target was to increase this number to 200,000 families by 2000.

<b>Freshwater</b>	
Annual Availability (1998)	100.0km <sup>3</sup>
Per capita	11,266m <sup>3</sup>
Annual withdrawal (2000)	0.6km <sup>3</sup>
Domestic (2000)	11%
Industrial (2000)	2%
Agriculture (2000)	87%

### Rural water provision

Sufficient water sources were constructed to increase the coverage of supply to the rural population from 6% in 1980 to 30% by 1993. A 1999 survey pointed to 26% coverage that year against a Government target of 40% by 2000. The level of service is where a shallow well or borehole equipped with an operational hand-pump will serve 500 people in a radius of not more than 500 meters. These targets imply the construction of around 6,000 new water sources to serve an additional 3million people. To carry out these activities an investment of about USD15 to 20million pa will be required between 1995 and 2000, compared with the previous level of USD4-9million pa.

<b>Groundwater</b>	
Annual availability (1998)	17.0km <sup>3</sup>
Per capita	910m <sup>3</sup>

### Privatisation and players

In 1998, Halcrow carried out an assessment of the water systems in Maputo, Beira, Quelimane, Nampula and Pemba. This study was designed to formulate the basis for including the private sector in the operation of these water systems. Halcrow found that tariff increases would not be affordable outside Maputo in the medium term and that finance needs to be raised through improving the efficiency of the services, allied with leakage reduction and increasing the number of people paying for these services.

In 1998, the Government announced that water provision services for Maputo, Beira, Quelimane, Nampula and Pemba would be privatised on a lease (BOT) basis for Maputo along with management contracts for the other four cities. The contract also involves the commercialisation of water services for Maputo's neighbouring industrial city of Matola and Beira's neighbouring city of Dondo. USD120million is to be invested over the first five years of the contract on upgrading facilities. The contract is linked to USD117million in donor funding, USD92million of the initial donor grant is for the service expansion programme, with the remaining USD25million for operating the services. The World Bank, African Development Bank, Dutch Government and the European Union funded the grant.

The contract was awarded in September 1999 to Aguas de Mocambique (ADM), a consortium consisting of SAUR (38.5%), IPE-Aguas de Portugal (31.5%) and the Mazi-Mozambique consortium (30%). Mazi-Mozambique is led by the Mozambique Community Development Foundation, an NGO and includes local private companies Norte Investimentos, FLOTUR and MG-Mozambique Gestores. The consortium forecast a USD50million turnover over the first 5 years. The contract grants ADM a full commercial concession in Maputo and Matola for 15 years and similar concessions in the other five cities for five years.

In 2007, the OECD concluded that overall, ADM operates reasonably well and will have to concentrate efforts to reduce non-revenue water and improve customer services.

In 2004, as a result of the improvements in water management brought about by ADM the Government decided to expand the delegated management framework to southern cities. The water-supply systems of Inhambane, Maxixe, XaiXai, and Chokwe were integrated and delegated to Vitens. In 2006 a further expansion of delegated management contracts took place in the central region.

Increased investment has led to a significant improvement in the coverage, reliability of supply, and water quality in the five cities monitored. Daily water availability has risen from about 10 hours in 2000 to 16.5 hours in 2006. In 2007, connections are forecast to increase to about 122 000 in the five cities (34% above the 2000 figure), or 645,000 people directly covered. Despite improvements, water losses remain a major problem, and are rising, with 50% losses in the five cities.

<b>MAJOR CITIES</b>			
City	2000	2015	Status
Maputo	1,092,000	1,899,000	BOT lease contract for water provision

### International finance

The first World Bank water project to take place in Mozambique was given the go-ahead in February 1998. This involved a USD36million credit to assist the Government to improve water supply and sanitation in rural and urban areas. This project will lay the groundwork for an increase in the quality, coverage, and sustainability of water supply and sanitation services through new systems and encouraging privatisation policies. The Mozambique National Water Development Project's total cost of USD56.9million will be financed by a USD36.0million IDA credit and co-financed by the Government of Mozambique and various bilateral institutions.

The World Bank's Second National Water Development Project entered into service in 2005, having been approved in 1999. It focuses investment in the of Maputo, Beira, Quelimane, Nampula, and Pemba and seeks to promote greater private sector participation in providing. The project is backed by a USD115million grant from the International Development Association of the World Bank.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Maputo/Matola	15 year water provision BOT	Aguas de Mocambique
Beira/Dondo	5 year water provision BOT	Aguas de Mocambique
Quelimane	5 year water provision BOT	Aguas de Mocambique
Nampula	5 year water provision BOT	Aguas de Mocambique
Pemba	5 year water provision BOT	Aguas de Mocambique

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Aguas de Mocambique	Bouygues (France)	2,500,000	0	2,500,000

Source:

African Development Bank/OECD (2007) African Economic Outlook

## NAMIBIA

The Water Resources Management Bill was introduced in 2004, placing an obligation on the Ministry of Agriculture, Water and Rural Development to ensure that safe water is available for basic human needs. With the exception of abstracting water for domestic use, the new law will introduce a comprehensive licensing system for the extraction and use of water, as well as the discharge of waste water. A Water Regulatory Board will control water abstraction and effluent discharge pricing.

Water and wastewater assets and services are relatively advanced due to the German colonial legacy and the need for active water management in an extremely arid country. Of the 533,000 people living in urban areas, 341,000 have household water connections and 75,000 are served via standpumps. 96% of the urban population has some form of sanitation, with 349,000 having access to the sewerage network. Namibia aims to have 97% urban sewerage coverage by 2010. Groundwater accounts for 73% of water resources. Only 3% of the country's rainfall is used, due to the high rate of evapotranspiration.

While Nam Water has been commercialised, privatisation has been restricted to new facilities and service extension. Nam Water has a turnover of NAD250million and an asset base of NAD1,400million, with an annual capital spending of NAD150-200million. An AA credit rating allied with cost recovery means that the entity is able to fund its current activities.

The commercialisation of water supply in Namibia's Windhoek Municipality has been based on cost recovery for those who can and developing a system of cross subsidies for the poor via a rising block tariff system. This was challenged in 2004 by a lobby who argued that water and sanitation ought to be free. Nam Water adopted South Africa's free minimum water policy, which by 2007 had resulted in serious funding problems for 240 of the country's 273 municipalities.

The capital Windhoek is having its main drinking water treatment facility built and operated by Berlin Wasser International and VE. The consortium will operate the water reclamation plant for 20 years. This facility is being financed by Germany's KfW (construction) together with the European Investment Bank (EIB). The contract generates a turnover of EUR2million pa. The capacity of the plant will be 21,000m<sup>3</sup>/day. This is nearly 50% of the city's total water consumption. The water supplies from the current central Namibian reservoir system and from wells has run too low. The city's long experience in the reprocessing of wastewater into industrial and drinking water could not be of any further help. 226,000 out of the city's 271,000 people are served by household water and sewerage. All of Windhoek's wastewater that is collected by the sewerage system is treated. Unaccounted for water in 2006 was 10.3%, a notably good figure.

In December 2002, the NAD100million (EUR11.4million) water reclamation plant for Windhoek entered service. This is the first multiple-barrier facility in which domestic sewerage is treated to produce potable water. Raw sewerage is initially pumped into the Gammams Plant before the semi-purified water is piped to the new plant for further treatment and chlorination.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Windhoek	Wastewater treatment	BW/VE

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
BW/VE	Veolia (France)/RWE	0	135,000	135,000

### **Aqua Utilities, a local water company**

Aqua Utilities was established in Namibia in 2001 to pursue opportunities for water and wastewater treatment and recovery services in Namibia and southern Africa. Its first project is for providing treated seawater for Deep Ocean Processors in Walvis Bay; with an NAD3million treatment plant for cleaning the fish processing unit entered service in 2005.

Source:

African Development Bank/OECD (2007) African Economic Outlook

## THE NETHERLANDS

<b>Economics (2005)</b>	
GDP per capita	USD36,620
GDP per capita (PPP)	USD32,480
GDP in Agriculture	2%
GDP in Industry	26%
GDP in Services	72%

### Water management

The Dutch have been developing integrated water management systems since 1798, when the Directorate-General for Public Works and Water Management (Rijkswaterstaat) was founded. Two thirds of the country is truly man made and lies within two metres of the mean sea level. As their saying goes, 'God created the world, but the Dutch created the Netherlands'. Almost all industrial wastewater is subject to secondary or tertiary treatment.

<b>Population</b>	
2003 (million)	16.3
2015 (million)	16.8
Urbanisation in 2005	80%
Urbanisation by 2015	91%
In urban agglomerations, 2015	14%

### Water infrastructure and usage

(million m <sup>3</sup> )	1970	1980	1990	2001
Groundwater	1,157	1,008	1,049	943
Surface water	10,787	8,190	6,751	7,918
<b>Total</b>	<b>11,944</b>	<b>9,198</b>	<b>7,800</b>	<b>8,861</b>

Between 1975 and 1990, a national network of sewage treatment works was constructed, along with the connection of 97% of the population to the sewerage system by 1994. The proportion of the population connected to sewerage services increased from 73% in 1980 to 93% in 1990. There were 485 sewage treatment works in 1988, of which 64 serve cities with a population in excess of 100,000.

<b>Sewage treatment</b>	1980	1990	1995	2000	2003
Tertiary	3%	4%	8%	79%	85%
Secondary	62%	74%	84%	19%	14%
Primary	8%	8%	1%	0%	0%
Sewerage only	15%	7%	2%	0%	0%
Not connected	14%	7%	5%	2%	1%

<b>Urban data</b>	
Served by piped water	100%
Access to sewerage	99%
With sewage treatment	99%

With 98% of BOD removal by 2000 (against 92% in 1990), the Netherlands has already exceeded the requirements of the Urban Wastewater Treatment Directive. The country had a treatment capacity of 26million PE by 2003, but was actually using 16-17million PE at the time due to lower inputs from industry.

<b>Inland water quality (1986)</b>	
Ia-Very Good	12%
Ib-Good	65%
II – Fair	18%
III – Poor	4%
IV –Bad	1%

In contrast, the 1990 survey quoted in 'The Dobris Assessment' (1995) has 5% of river waters as 'Good', 50% 'Fair', 40% 'Poor' and 5% as 'Bad'. The figures are so different that it is to be assumed that they are not strictly comparable. The Netherlands continues to face pollution problems in the coastal areas due to the high effluent concentrations in the rivers Rhine, Meuse and Scheldt from Belgium and Germany. For example, the river Meuse is highly polluted and is a major source of nutrient pollution. The river Scheldt is the most polluted river flowing into the North Sea.

<b>Freshwater</b>	
Annual availability (1998)	10.0km <sup>3</sup>
Per capita	5,608m <sup>3</sup>
Annual withdrawal (2000)	7.8km <sup>3</sup>
Domestic	6%
Industrial	60%
Agriculture	34%

### Costs and financing

Since 1995 there has been a ground water tax of EUR0.168 and a domestic usage tax of EUR0.136/m<sup>3</sup>. A water supply tax of EUR0.29/m<sup>3</sup> is also levied on water companies, who can pass it on to customers. In addition, there are discharge related taxes. In all, these taxes raise some EUR320million pa for water projects. Total annual spending on water and wastewater in 2001 was EUR5.4billion, including EUR1billion pa by the central Government for flood protection, EUR1.6billion by water boards on water and wastewater treatment (70%), water distribution (25%) and flood control (5%), and EUR0.7billion by municipalities on storm water and waste water management. Approximately 90% of costs are met through direct charging, with, for example, sewage charges for municipal customers rising from EUR313million in 1991 to EUR1,435million by 2001 with wastewater treatment charges rising from EUR386million to EUR987million.

<b>Groundwater</b>	
Annual availability (1998)	4.5km <sup>3</sup>
Per capita	286m <sup>3</sup>
Annual withdrawal (1985)	1.1km <sup>3</sup>
Domestic	32%
Industrial	45%
Agriculture	23%

### Privatisation prospects become confused

The 80 public water companies are currently being rationalised into 30 larger entities. In 1945, there were 208 companies, so this is part of an ongoing programme. In addition, there are a number of private permits granted to individuals, farms and industrial customers. The public sector is responsible for at least 95% of all water provision, with all private permits being on a localised basis. Nearly 100% of the population is connected to the public water distribution system, which is the highest share of all European countries. The construction of new water purification plants has become very important in recent years, due to the increasing problem of contaminated ground water (e.g. from agricultural and industrial activity), the main source for drinking water. In September 2000 a Bill was passed which outlawed public water companies in the Netherlands from handing over shares or control to non-public bodies. Public water companies will retain exclusive rights to the production and distribution of drinking water in their distribution area. In consequence, if Noun is privatised, its Dutch water activities would have to be sold back to the state.

In October 2002, the EUR1.5billion Delftland wastewater treatment concession for the Hague was awarded to the Delfluent Consortium, led by Veolia Environnement (VE) (40%); two Dutch publicly owned water distribution companies, Delta Water (20%) and Waterbedrijf Europoort (20%); Rabobank (10%), Heijmans Betonen Waterbouw (5%) and Strukton (5%). The contract started in 2003 and involves operating the existing plant at Houtrust and developing the new EUR258million plant at Harnaspolder. VE (50%) will lead 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. This will treat sewerage for 1.7million people. The 30 year contract involves EUR600million of capital spending in total, designed to bring the region into line with EU standards to comply with the UWWTD by 2005.

<b>Major Cities</b>			
Population	2000	2015	Status
Amsterdam	1,105	1,115	PSP for water services illegal
Rotterdam	1,078	1,082	PSP for water services illegal

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
Delfluent	VE (France)	0	1,700,000	1,700,000

Source:

OECD Environmental Performance Review: The Netherlands. OECD, Paris, 2003

## NIGER

In 2001, the World Bank lent Niger USD18.6million as part of its Poverty Reduction and Growth Facility (PRGF) to commercialise various utility activities. This included the privatisation of the national water company, SNE into SPEN a state held asset owning company and SEEN, the leasing company. There are approximately 60,000 household connections in urban areas. SEEN covers 50 towns and Niamey, the capital. Water rates have risen since 1999 from XOF196/m<sup>3</sup> to XOF244 in 2005, with a 10% increase in standpipe rates to XOF127. These price increases aim to reduce the XOF5billion financial deficit of the national water enterprise, the Société Nationale des Eaux (SNE) and to enable new investments.

Currently, 57% of the population has access to safe water, with formal water and sewerage provision in urban areas officially covering 70% and 79% of the population respectively. However, there is no formal urban sewerage network and most water provision is at the street pump level, with concerns about its potability.

Water and sanitation coverage (million people)

		Population	Coverage	Water % covered	Coverage	Sanitation % covered
<b>1990</b>						
Rural		6.5	3.3	51%	0.3	62%
Urban		1.2	0.8	65%	0.9	95%
Total		7.7	4.1	53%	1.1	70%
<b>2004</b>						
Rural		9.7	4.6	50%	0.4	5%
Urban		2.1	1.5	70%	1.7	79%
<b>Total</b>		<b>11.8</b>	<b>6.1</b>	<b>57%</b>	<b>2.2</b>	<b>20%</b>

Approximately 5% of wastewater is collected and treated.

From 2004, 50 small town water supply schemes are to be rehabilitated and local private operators will take over their maintenance by 2005. Twenty-eight private operators and 50 Water Users Associations have been trained so far.

In January 2001 Veolia Environnement (VE) was awarded a 10 year renewable lease contract for water services to Niger. VE has 51% of the equity and will spend EUR5.5million in service extension and installing water fountains while the World Bank is leading a group of backers for a EUR35million infrastructure rehabilitation programme. The first aim is to increase the number of connections from 58,000 over the next five years. Niamey (0.6million people) is the initial target area, with other addressable markets to be covered later.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
Location	Contract	Company
Major Cities	10 year renewable lease	VE

In Niamey, 189,000 people are served through household water connections, 162,000 through public standpipes and 202,000 via water vendors. There is no piped sewerage, 28,000 being served via septic tanks and 482,000 via latrines. The average charge for household water connections is USD1.4 per month. Water vending and sanitation are carried out on an informal basis.

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
VE	VE (France)	600,000	0	600,000

Sources:

International Secretariat for Water (2005) Blue Book, Niger, ISW, Montréal, Canada

African Development Bank/OECD (2007) African Economic Outlook

## NIGERIA

<b>Economics (2005)</b>	
GDP per capita	USD560
GDP per capita (PPP)	USD1,040
GDP in Agriculture	24%
GDP in Industry	56%
GDP in Services	20%

Public spending on water supply increased from NGN7.3billion in 1999 to NGN80billion in 2006, with a focus on the completion of the Gurara Water Project for Abuja, along with constructing the dams Owiwi Dam, Shagari Dam, Ile-Ife Dam, Jada Multipurpose Dam, Kashimbila Dam Project, and the Galma Multipurpose Dam.

### Service coverage and delivery

In 1993, 68% of households had access to piped water in Lagos (10.29million people in 1995), using an average 70L/capita/day of water. 2% of the city's population is connected to sewerage, all of which nominally receives treatment. There is no sewerage or sewage treatment in Ibadan (population 1.48million in 1995), where 68% of households are connected to piped water, using an average 70L/capita/day of water. Officially 84% of the country's urban population in 1996 had both access to safe water supplies and adequate sanitation. In reality, 50% of urban Nigerians (20% in unofficial urban areas) and 35% of rural Nigerians had access to potable water in 2003 and the urban figure may be 30% overall due to poor maintenance. The Government seeks to improve this to 60% by 2010. The World Bank approved a USD120million loan in 2004 to encourage the reform of urban water management. Between 1999 and 2004, Federal Government spending of over NGN80billion on water supplies brought about an official increase in water supply coverage from about 35% in 1999 to almost 65% at the end of 2004. The National Urban Water Sector Reform Project (NUWSRP) aims to see 80% water supply coverage at the end of 2007.

<b>Population</b>	
2005 (million)	131.5
2015 (million)	160.8
Urbanisation in 2005	48%
Urbanisation by 2015	56%
In urban agglomerations, 2015	15%

### Water provision is being commercialised

Until recently, water was provided free of charge, with direct finance from the Government. Since the mid 1990s there has been a gradual move towards partial commercialisation, with marginal rates for water in order to allow the corporations to break even, although until recently profits were not allowed. Akwa Ibom Corporation (Akwa Ibom state) has been turned into a limited liability company as part of a USD73million loan from the African Development Bank designed to encourage the commercialisation and reform of utility services in Nigeria. Of that state's population, 30% is connected to mains water, while in the state capital, 30,000 out of 50,000 customers are connected. The Akwa Ibom Corporation's remit is limited to supplying water to urban areas with a population in excess of 5,000.

The Ministry of Water Resources intends to increase water supply coverage from the current 40% to 60% by the end of 2003. In urban areas 180 water schemes have now been completed, increasing water supply capacity by 1.2million m<sup>3</sup>/day and restoring access to 10million people. A Government/World Bank pilot project on small towns water schemes had started in the states of Kogi, Akwa Ibom, and Bauchi, while three more schemes are planned in Ebonyi, Katsina and Niger states. The Government aims to bear 50% of rural water supply and 30% of all urban water supply projects initiated by states from 2004.

A survey in 1999 found bacterial levels in 90% of tap water samples taken in Lagos to be above WHO limits. This was taken as evidence for the readiness of people to buy bottled 'pure' water and thus to pay for potable water supplies.

<b>Urban Data</b>	
Served by piped water	84%
Access to sewerage	84%
With sewage treatment	2%

### Good water resources, sewerage problems

85% of Nigeria is regarded as having good water resources and storage capacity because of the six month rainy season. The country's problem areas are in the north, close to the Sahara. Sanitation systems for Nigerian cities are inadequate. Despite the fact that water sanitation is a high priority for health and quality reasons, the Government has been unable to allocate funds in this area. Some 90% of industry in Nigeria does not have pollution control equipment of any sort. Most industries thus discharge untreated effluent into adjacent water

courses either directly or through sewers. Where waste treatment plants exist, the capacities are usually inadequate or the plants have broken down due to poor maintenance or lack of spare parts.

<b>Freshwater</b>	
Annual availability (1998)	221.0km <sup>3</sup>
Per capita	2,252m <sup>3</sup>
Annual withdrawal (2000)	8.0km <sup>3</sup>
Domestic (2000)	21%
Industrial (2000)	10%
Agriculture (2000)	69%

### **Industrial effluent problems**

A central WWTP for industrial effluent exists in the oldest industrial estate in the country at Ikeja in Lagos. Established since the early 1970s, this plant has been inoperative since the mid 1980s. Industrial effluents pass through the facility untreated and discharge into the surface water. Lack of financial resources has stalled the rehabilitation and expansion of the plant. Although the guidelines and standards for industrial pollution control specify the establishment of central waste treatment facilities, in reality these facilities do not exist. Currently, the only sewerage system is in the new Federal capital Abuja. Other cities such as Lagos use latrines and cesspits. In the past, sewerage and sewage treatment was not a part of the water corporations' remit.

<b>Groundwater</b>	
Annual availability (1998)	87.0km <sup>3</sup>
Per capita	714 m

### **Privatisation in prospect**

Until recently, it has been the standard in Nigeria to wait for a capital infusion through foreign aid or a federal government to rehabilitate or replace water and sewerage systems instead of maintaining the infrastructure. The shortfall of this approach led to the National Water Rehabilitation Project. In 1991, it was found that Nigeria's water systems were working at 40% of their installed capacity. A USD256million loan financed rehabilitation project ran from 1991 to 1998, working on over 250 individual water systems. However, declining financial resources are making this less feasible, and the rate and extent of deterioration is accelerating.

The delegation of responsibilities between the state and federal Governments remains a problem, with the Federal Government expecting state Governments to implement their own development plans, even though budget allocations are controlled at the central level. According to the World Bank, seven states are currently suitable for PSP: Ogun, Enugu, Rivers, Plateau, Gombe, Kano and Kaduna. The World Bank has allocated USD245million in funding for capacity building in these states. In each case, this will consist of USD5million in emergency funding, followed by USD30million in infrastructure development funding linked to a formal PPP process.

In March 1999, the Nigerian Government indicated that water utilities were going to be included in the country's privatisation plans. During 1999-2000, the IFC examined privatisation options for the Lagos state Government. The main area of concern is how sewerage services can be commercialised. The aim is to attract investment of up to USD1.5billion for the state's water systems through PSP with Lagos and the Nigerian Environmental Protection Agency (NEPA) and then the six state water boards. VE, Suez, Thames (RWE) and Severn Trent have prequalified for the Lagos State Water Corporation privatisation process, which will generate USD2billion in revenues over 25 years. Before this can go ahead, the legal framework to permit concession awards needs to be put into place.

Challenges include the difficulty of knowing how many people in fact live within the city, along with the profiling of spending and the relationship between Lagos and the Lagos State Water Corporation (LSWC). Capital spending requirements point to USD1.2billion being needed during the first 15 years of a contract and USD2.5billion over 25 years. During 2002-03, LSWC has undertaken the construction of 10 micro-waterworks costing NGN2.2billion (EUR15.9million) in various parts of the state. Private sector participation is being considered if there are no increases in tariffs. A water policy bill was under development in mid 2005 to allow the private sector to operate in water provision projects nationally. This follows on from a bill passed in December 2004 for the legal framework for the privatisation of the water sector in Lagos.

Guinness Nigeria has awarded a EUR3.8million contract to Biwater (Pty) Ltd for the design, supply, installation, and commissioning of an effluent treatment plant at the Ogba Brewery in Lagos. Work started in October 2003 and was completed in December 2004.

In October 2005, Delta State announced that the Delta State Urban Water Board will be one of nine State Owned Enterprises to be fully commercialised with the aim of introducing private sector operators in the medium term.

**Major Cities**

City	2000	2015	Status
Ibadan	1,549,000	2,542,000	Privatisation under consideration
Lagos	8,665,000	15,966,000	Privatisation under consideration
Ogbomosho	809,000	1,356,000	Privatisation under consideration

**Case study: Kaduna State Water Board**

The state of Kaduna has a population of 2.7million with the cities of Kaduna (1.5million) and Zaria (800,000). Currently the Kaduna State Water Board (KSWB) is a Parastatal, under the State Ministry of Water Resources, responsible for urban water supply. Assets have been vested in KSWB but the Ministry of Water Resources acts as a custodian to these. In 2002, households accounted for 76% of consumption and 21% of revenues, with a system coverage of 46% and unaccounted water at 38%. KSWB charges USD4.6/month for households and 50% of bills are collected. In the regional context, the KSWB has a good record, but there remains much room for progress. The state is experiencing 3% pa population growth, and has a target for 100% service coverage by 2025. Capital expenditure of USD257million is needed-USD38million for rehabilitation, the rest for expansion. As a result, PSP was planned for 2002-03; the first for a state water board but little progress has been made.

There are many challenges: low income levels, with many below the poverty line (USD1/day), while service levels are bad and thus the willingness to pay is low. In addition, resistance to PSP is expected due to the threat of tariff increases and lay offs. The Government aims to use a lease contract as a stepping stone towards concessions in the longer term.

Sources:

Adelegan O.J. & Adelegan J.A. (2001). Investment appraisal of the privatisation of water supply in Nigeria. 27<sup>th</sup> Wedc Conference. Wedc, Loughborough, UK.

African Development Bank/OECD (2007) African Economic Outlook

**NORWAY**

<b>Economics (2005)</b>	
GDP per capita	USD59,590
GDP per capita (PPP)	USD40,420
GDP in Agriculture	2%
GDP in Industry	39%
GDP in Services	59%

**Water and sewerage services**

Norway has an abundance of water and supply is adequate for domestic, agricultural and industrial uses. 87% of supplies are drawn from surface water. In 1994, withdrawals of ground and surface waters were 0.3% of available water. Domestic consumption was 260L/capita/day. Water is generally regarded as a free resource. There is no effective pricing for water abstraction by agriculture and industry. The water and sewerage sector has traditionally been seen as parts of the municipalities. Political change is starting to alter this picture. It now appears that privatisation opportunities will appear on a one-off basis, usually in relation to the construction of a new facility. The average household paid USD200 pa for water and USD300 pa for sewerage services in 2002.

<b>Population</b>	
2005 (million)	4.6
2015 (million)	4.8
Urbanisation in 2005	77%
Urbanisation by 2015	86%
In urban agglomerations, 2015	0%

**Water provision**

A national programme for improving water supply was launched in 1995 with the goal of securing satisfactory and safe water from all waterworks supplying more than 100 people, some 85% of the population. For water purification, 500 new drinking water disinfection plants and 500 additional plants for colour removal are needed. At present, 65% of water is treated before being used as drinking water. The target is to increase this percentage to 100%.

<b>Urban data</b>	
Served by piped water	85%
Access to sewerage	80%
With sewage treatment	74%

**Sewerage and sewage treatment**

Long term spending plans for upgrading Norway's sewerage network are as follows: NOK10.0billion for sewerage, NOK0.5billion for sludge handling and NOK2.0billion for treating industrial discharges. The proportion of Norway's population connected to sewerage services increased from 34% in 1980 to 77% in 1990 and to its current 80% level by 1995.

**Sewerage and sewage treatment**

	1980	1990	1995	1999	2002	2005
Tertiary treatment	26%	43%	51%	51%	54%	56%
Secondary treatment	1%	1%	1%	1%	2%	1%
Primary treatment	7%	13%	15%	21%	18%	19%
Sewerage only	46%	20%	13%	7%	6%	6%
Not connected	20%	23%	20%	20%	20%	18%

Norway has built a number of sewage treatment plants with secondary treatment in recent years, and secondary treatment is planned for all plants serving more than 2,000 people. The capacity for wastewater treatment is about 5.4million PE. Currently, 67% of urban sewerage is treated. In 1997, Norway's sewage treatment facilities removed 1,576 tonnes of phosphorus, some 64% of the estimated total intake at municipal sewage treatment plants and separate treatment facilities in sparsely populated areas. Around 80% of the population of Norway lives in areas with municipal sewage systems. In 1996, municipal sewage treatment plants released an estimated total of 563 tonnes of phosphorus. The average purification efficiency of municipal treatment plants was 72% and the rate for the entire country has been around 70-72% since the 1990s.

<b>Freshwater</b>	
Annual availability (1998)	384.0km <sup>3</sup>
Per capita	83,919m <sup>3</sup>
Annual withdrawal (date)	2.2km <sup>3</sup>
Domestic	23%
Industrial	67%
Agriculture	10%

<b>Groundwater</b>	
Annual availability (1998)	96.0km <sup>3</sup>
Per capita	21,923m <sup>3</sup>
Annual withdrawal (1985)	0.1km <sup>3</sup>
Domestic	27%
Industrial	73%
Agriculture	0%

### Private sector players

In 1995, the municipality of Bærum (located to the west of Oslo) turned its water and sewerage company into a limited company. The municipality is seeking to abolish metering and bring in fixed charges, along with selling a 49% stake to an outside investor. The original plan, to sell this stake to a JV between Suez and Kværner (Norway) fell through due to political resistance to the JV. In 1999, a concession was awarded to a consortium headed by Northumbrian Lyonnaise International as a JV with the municipality.

Anglian Water International (AWI) was granted an option for an operations concession for a sewage treatment works serving 250,000 people in Oslo in 1999, with a PE of 350,000. The facility entered service in September 2000. A GBP40million construction contract has been followed by a GBP40million 13 year operations contract. The concession was sold to Läckeryby Water Group (Sweden) in 2005.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
Location	Contract	Company
Baerum	JV water provision contract	Baerum Vann
Oslo	Sewage treatment concession	Bekkelaget

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
Bekkelaget	Läckeryby Water Group (Sweden)	0	250,000	250,000
Baerum Vann	Suez (France)	50,000	0	50,000

<b>MAJOR CITIES</b>			
Population	2000	2015	Status
Oslo	779,000	836,000	Sewage treatment concession

**OMAN**

<b>Economics (2005)</b>	
GDP per capita	USD9,070
GDP per capita (PPP)	USD14,680
GDP in Agriculture (2005)	2%
GDP in Industry (2005)	46%
GDP in Services (2005)	42%

Some 84% of Oman's population live in urban areas, with 91% of the urban population officially receiving safe water supplies and 75% having adequate sewerage services in 1991. However, just 14% of Muscat's sewage was treated in 2003. Oman has been the pioneer in utility privatisation in the Gulf since 1994. The Ministry of Electricity and Water was corporatised by 2001, along with the implementation of an independent regulator.

<b>Population</b>	
2005 (million)	2.6
2015 (million)	3.2
Urbanisation in 2005	72%
Urbanisation by 2015	83%
In urban agglomerations, 2015	0%

Water BOOT projects are intended to sell water to the Government, which will in turn sell this water on to customers, with its preferred level of subsidies. Five projects were outlined by the Ministry of Development in 1994, which have started to emerge as fully fledged BOOT concepts. The Government has ruled that BOOT contracts will operate via a locally based joint stock company. It is proposed that 40% of each BOOT's equity is to be floated on the Oman Stock Exchange in Muscat: (1) Salalah WWTW BOOT (2) Al Massarat groundwater distribution BOOT, (3) Al Ashkara desalination BOOT, (4) Muscat WWTW BOOT and (5) Barqa power and desalination BOOT.

<b>Urban Data</b>	
Served by piped water	96%
Access to sewerage	98%
With sewage treatment	0%

To date, the implementation of these plans has not been a smooth one. The Muscat wastewater treatment plant project has resulted in a 30 year BOOT concession being awarded to Cascal after SECTO withdrew in 2001. Cascal in turn pulled out and the process was then restarted.

<b>Freshwater</b>	
Annual availability (2000)	0.9km <sup>3</sup>
Per capita	337m <sup>3</sup>
Annual withdrawal (2000)	1.4km <sup>3</sup>
Domestic (2000)	7%
Industrial (2000)	2%
Agriculture (2000)	91%

A new attempt at privatising the Muscat WWTE finally emerged during 2005. This time, it will be a five to eight year O&M contract for the Oman Wastewater Services Company, covering 630,000 people. A wide range of companies have expressed interest in the process, including Cascal. This forms part of Oman's plans to raise sewage treatment to 80% of the population by 2013 and to 90% by 2017. The Government is also currently seeking to award a two year O&M contract for the Salalah wastewater treatment facility, leading to a 20 year operations contract. The plant will serve 134,000 people. It is intended that the Salalkah Sanitary Drainage and Services Company will be listed on the Muscat Stock Exchange. This in time is designed to open the way for privatising Muscat's sewerage services.

<b>Groundwater</b>	
Annual availability (2000)	1.0km <sup>3</sup>
Per capita	376m <sup>3</sup>
Annual withdrawal (1990)	0.4km <sup>3</sup>

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Barka	Water & power IWPP	Suez
Muscat	5 + 3 year wastewater management	VE
Sur	22 year water DBO	VE

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Suez	Suez (France)	500,000	0	500,000
VE	VE (France)	350,000	700,000	1,050,000

**POLAND**

<b>Economics (2005)</b>	
GDP per capita	USD7,110
GDP per capita (PPP)	USD13,490
Agriculture	5%
Industry	31%
Services	65%

**Laws and spending**

Polish water law has been revised to bring water and sewerage laws in line with EU standards by 2002. A second National Environment Plan, launched in 2000, drew up longer term targets. These call for suitable levels of service, provision of increasing treatment standards with time, financial incentives for the private sector and protection of consumer interests. Tariffs are to be established by water companies and approved by the local community with yearly revisions and the prospect of differential charging.

There are 700 water utilities, 300 of which serve urban areas. In 2000, the average water price was USD0.84/m<sup>3</sup>. Environmental spending was USD2.1billion in 1998, up from USD0.8billion in 1990, with 40% of this going to water (equivalent to 0.6% of GNP). In 2000, estimates by the Government point to USD700million pa being spent on water related work in Poland. Some 5% of this is currently coming from foreign investment. The compliance costs for water and wastewater upgrading and extending for EU accession has been variously estimated as between EUR18 and EUR40billion in 1998, with USD2.6billion required for sewage treatment works and USD4billion for sewerage. Poland was granted derogation until 2015 for complying with the UWWTD because of the estimated cost of compliance. For example, in 2000, 11% of the rural population was served by wastewater treatment plants.

Investment on wastewater treatment and water management, 1992-2000

PLNmillion	1992	1994	1996	1998	2000
Wastewater	663	1,002	2,161	3,426	N/A
N/A Treatment plants	N/A	N/A	969	1,326	1,902
N/A Sewerage systems	N/A	N/A	963	1,567	1,902
Water	633	766	1,415	1,748	1,653
N/A Supply systems	N/A	N/A	881	936	852
N/A Treatment plants	N/A	N/A	207	214	197

In 2003 the Government cut the levies that water suppliers pay for using water resources. From April 2003, the levy per m<sup>3</sup> of surface water taken to produce drinking water, or water for domestic purposes, will be PLN0.03 (USD0.7), down from PLN0.042. This is intended to water suppliers to reduce their prices.

<b>Population</b>	
Total (2005, million)	38.2
Total (2015, million)	37.6
In urban areas (2005)	62%
In urban areas (2015)	64%
In urban agglomerations (2015)	18%

**Pollution and problems**

Polish data is on the harsh side because the worst performing parameters are used as definitive. Surveys using biological criteria point to up to 88% of rivers being of class 4 quality in 1990 and 96% in 1995. In 2000, this had fallen to 61% of rivers, but class 1&2 rivers still only accounted for 3% of the total. Class 4 rivers are those which are biologically dead and whose water cannot be used for agriculture or industry.

**River water quality (biochemical criteria)**

Class	1985	1990	1995	2000
1	4.8%	6.0%	2.9%	5%
2	30.3%	27.9%	20.3%	35%
3	27.8%	30.3%	33.8%	40%
4	37.1%	35.8%	43.0%	20%

<b>Urban Services</b>	
% Water	94%
L per capita per day	124
% Sewerage	83%
% Sewage treated	79%

### Development of urban water and sewerage infrastructure

Treatment level	1995	1998	2000	2002	2003	2005
Tertiary	4%	13%	20%	27%	31%	37%
Secondary	30%	30%	30%	27%	25%	21%
Primary	8%	6%	3%	3%	3%	2%
None	58%	51%	47%	43%	41%	40%

### Municipal effluent treatment and generation

Billion m <sup>3</sup> pa	1990	1995	1998	2001
Effluent generated	2.31	1.85	1.65	1.49
Effluent treated	1.39	1.25	1.31	N/A

In 1992, 48% of the largest industrial sites had no effluent treatment facilities. 17% of all industrial discharges were untreated, with 66% of industrial effluents subject to primary treatment only, and 17% to secondary treatment. 5% of factories had plants with an inadequate treatment capacity.

### An urban/rural divide

2004 household connections	'000	%
Overall – Water connections	32,640	85.4%
Overall – Sewerage connections	22,253	58.3%
Urban – Water connections	22,157	94.4%
Urban – Sewerage connections	19,714	84.0%
Rural – Water connections	10,484	71.3%
Rural – Sewerage connections	2,538	17.3%

Between 1990 and 1996, over 900,000 rural households were connected to water supply systems and sewerage coverage grew from 5% in 1995 to 12% by 2000, with a similar improvement in the proportion connected to wastewater treatment plants. Indeed, during 1992-00, 300 new wastewater treatment works were built each year, one third being secondary or tertiary treatment works. The Government aims to have 100% water supply and sewerage coverage by 2010. 25% of effluent generation is from rural areas and its lack of treatment means that it has a disproportionate impact.

Freshwater	
Total (1998, km <sup>3</sup> )	49.4
Per capita (1998, m <sup>3</sup> )	1,598
Withdrawals (2000, km <sup>3</sup> )	16.2
For domestic use (2000)	13%
For industry (2000)	79%
For agriculture (2000)	8%

### Privatisation prospects

The pace of privatisation is stepping up after a slow start. The main development to date has been the planned flotation of Warsaw's water and sewerage services since 2000. Urban water and sewerage services such as the second Warsaw STW have been reconstructed as limited companies, but remain directly under the control of the municipalities and the Government's Environmental Council. Effectively all aspects of the operation of water and sewerage services are in the hands of the local authorities. It is up to each authority to decide if privatisation will take place. The major French water companies have been helping to frame the privatisation process. While the Government remains committed to privatising water and sewerage services, there is some reluctance at municipal level. SAUR's experience in Gdansk may alleviate this.

The city of Stettin was expected to start a prequalification process for the award of a water and sewerage concession by the end of 2000. The privatisation of Poznan's PwiK was abandoned, when the municipality decided that it could develop its services for 650,000 people unilaterally, by using the EU's EUR75million Instrument for Structural Policies Pre-Accession (IPSA) grant, even though it was linked to a concession.

### Water companies noted

SAUR is involved in the management of Gdansk's water and sewerage facilities. SAUR Neptun Gdansk has increased the proportion of water that meets the Government's water quality criteria from 8% in 1992 to 25% in 1997. In November 1999 SAUR gained a EUR40million 25 year water and wastewater management and renewal contract for Ruda Slaska, which has a population of 170,000.

In Krakow, CH2M Hill (USA) has developed a plan for water provision for the city which it hopes to turn into a BOOT contract. RWE Aqua, Gelsenwasser, VE, UU, SAUR and Suez are bidding for the Poznan concession. In 2003, Atkins Water was commissioned by the Krakow Municipal Water and Sewerage Company (MPWiK) to undertake a range of efficiency studies with the potential of privatisation to mind.

<b>Groundwater resources</b>	
Total recharge (1998, km <sup>3</sup> )	36.0
Per capita (1998, m <sup>3</sup> )	931
Withdrawals (1990, km <sup>3</sup> )	2.0
For domestic use (1990)	70%
For industry (1990)	30%
For agriculture (1990)	0%

<b>MAJOR CITIES</b>			
Population	2000	2015	Status
Katowice	3,494,000	3,547,000	N/A
Warsaw	2,274,000	2,325,000	Privatisation plans being drawn up
Lodz	1,053,000	1,061,000	N/A
Gdansk	893,000	913,000	Management contract since 1995
Krakow	859,000	892,000	BOT plans under consideration

### City Study: Warsaw

Central Warsaw has 1.64million inhabitants, 98% receiving potable water and 95% connected to the sewerage network. One sewage treatment work treats the effluents of 500,000-600,000 people. The rest of the effluent is directly discharged into the Vistula River. Approximately 25% of the population is subject to water shortages, partly due to a 113% increase in distribution losses between 1975 and 1991, at a time when consumption rose by 39% (reasons include, customer affluence, e.g. washing machines and power showers).

The EBRD is encouraging Warsaw to float Miejskie Przedsiębiorstwo Wodociągów i Kanałizacji (MPWiK) in the shorter term, ideally through an IPO. The city's first STW has a treatment capacity of 240,000m<sup>3</sup>/day. Degrémont was involved in the design and construction of the second Warsaw STW and the upgrading of the original STW in a project which is being partially funded by the EBRD. The second STW has a capacity of 112,000m<sup>3</sup>/day, serving 300,000 people at a cost of USD128.5million. VE's OTV is involved in the design of a third STW for northern Warsaw, for treating a population equivalent to 850,000 with a treatment capacity of 260,000m<sup>3</sup>/day. This project is at the study phase, and more direct methods of private sector finance and involvement are under consideration. The construction of this USD150million facility is expected to be integrated into the Warsaw Water flotation procedure.

### A local private sector contract – Aquarius & Co

Aquarius & Co, a Warsaw based company was granted a service contract for Piaseczno, a suburb of Warsaw in 1993. In 2003, this was upgraded to a lease contract, serving 52,000 people. The granting of the lease contract reflects on the company's performance over its first ten years:

- billings and billing collection increased by 400%;
- water tariffs increased by 200%;
- wastewater tariffs increased by 300%; and
- population served rose by 25%.

The relationship between the company and the municipality has evolved from a very simple contract in 1993, into one with increasing responsibility transferred to Aquarius as the company was able to demonstrate its capabilities and the municipality was able to identify areas where Aquarius was best positioned to assist in its operations.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
Location	Contract	Company
Silesia (two towns)	25 year water and sewerage BOT	VE
Wozniky	10 year water management	VE
Dabrowa	25 year water and sewerage BOT	RWE
Biesko Biala	Strategic partnership with municipality	UUI
Miskloc	20 year water and sewerage concession	Pwik w Glogowie
Piaseczno	10 year water & wastewater lease	Aquarius
Drobin	Water management PPP	Remondis Aqua

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
RWE	RWE (Germany)	135,000	135,000	135,000
VE	Veolia Environnement (France)	80,000	70,000	80,000
UUI	United Utilities (UK)	300,000	300,000	300,000
Glogowie	Gelsenwasser (Germany)	150,000	150,000	150,000
Aquarius	Aquarius	52,000	52,000	52,000
Remondis Aqua	Remondis (Germany)	10,000	0	10,000

## Sources:

Warner, J. (1999). Poland: The Environment in Transition. *The Geographical Journal*, 165, 209-221.

OECD Environmental Performance Review: Poland. OECD, Paris, 2003

**PORTUGAL**

<b>Economics (2005)</b>	
GDP per capita	USD16,170
GDP per capita (PPP)	USD19,730
Agriculture	4%
Industry	27%
Services	70%

**Regulation**

The 2000-06 Strategic Plan for Public Water and Waste Water Collection and Treatment seeks to develop the integrated management of coastal areas and water resources. This strategy includes an inventory of water use and sources of water pollution. A wastewater discharge licensing system has been established, along with the Water Resources Planning Process covering the River Basin Plans and the National Water Resources Plan.

**Water quality and requirements**

Portugal remains an essentially rural economy and this is reflected by the country's water and sewerage infrastructure.

<b>River water quality</b>	<b>1990</b>	<b>1993</b>	<b>1996</b>	<b>1999</b>
Unpolluted	0%	0%	0%	0%
Moderate pollution	20%	23%	22%	35%
Critical pollution	26%	29%	42%	38%
Severe pollution	44%	40%	33%	25%
Excessive pollution	10%	8%	3%	2%

There are groundwater problems in the Ave Basin and Aveiro/Estarreja (industrial wastes), North of Lisbon (agricultural run-offs) and Algarve (salt water intrusion). 3.8million people live in areas with water shortfalls, mainly in the Algarve, Lisbon, and Madeira.

**Access to piped water**

<b>Region</b>	<b>1990</b>	<b>1995</b>	<b>1997</b>	<b>1999</b>
North	65%	70%	71%	78%
Centre	68%	84%	89%	95%
Lisbon & Vale do Tejo	92%	97%	98%	99%
Alentejo	83%	89%	92%	94%
Algarve	82%	82%	88%	91%
Total	77%	84%	86%	90%

**Access to sewerage**

<b>Region</b>	<b>1990</b>	<b>1995</b>	<b>1997</b>	<b>1999</b>
North	36%	44%	51%	59%
Centre	39%	52%	54%	71%
Lisbon & Vale do Tejo	79%	86%	86%	89%
Alentejo	69%	83%	84%	85%
Algarve	76%	68%	81%	84%
Total	55%	63%	68%	75%

The aim was to have 95% access to piped water by 2006, along with 90% sewerage and wastewater treatment. Data for 2006 is not yet available, but by 1999, 93% of the population had piped water, but it is clear that much needs to be done on sewerage and sewage treatment.

<b>Sewerage and sewage treatment</b>				
<b>Year</b>	<b>1980</b>	<b>1990</b>	<b>1998</b>	<b>2004</b>
Tertiary	0%	0%	2%	7%
Secondary	2%	11%	26%	25%
Primary	0%	9%	14%	12%
Sewerage only	33%	34%	23%	30%
Not connected	65%	46%	35%	26%

<b>Population</b>	
Total (2005, million)	10.5
Total (2015, million)	10.9
In urban areas (2005)	58%
In urban areas (2015)	78%
In urban agglomerations (2015)	68%

### Spending needs

Portugal has enjoyed EUR1.45billion in Cohesion funding for environmental projects between 1993 and 2002, albeit with a dramatic tailing off in 2002. Compliance work from 2000 to 2006 will cost EUR4billion and even with a maintained level of Cohesion funding, private sector capital of EUR1.5billion is needed. Overall, EUR1.4billion is needed for expanding piped water provision to at least 95% of the population, while EUR2.6billion is required for sewerage and sewage treatment.

<b>Urban services</b>	
% Water	97%
% Sewerage	95%
% Sewage treated	85%

### Private sector participation legalised

Private sector involvement was specifically outlawed in 1977. The 1993 water policy reforms created conditions for the quasi-privatisation of the water market. Municipalities are allowed to privatise their services at their own pace, while retaining ownership of the assets. Privatisation has been erratic to date because of the public and political expectations of lower prices. Political pressure for some effective form of privatisation will be maintained because of Portugal's relative dependence on EU funding for water and sewerage compliance work. Until 1998, public control of water operations was retained via a 49% private sector holding cap.

<b>Freshwater</b>	
Total (1998, km <sup>3</sup> )	38.0
Per capita (2000, m <sup>3</sup> )	6,821
Withdrawals (2000, km <sup>3</sup> )	11.3
For domestic use (2000)	10%
For industry (2000)	12%
For agriculture (2000)	78%

### Privatisation prospects

80% of the population is covered directly and 91% indirectly by two groupings accounting for 268 municipalities, IPE Aguas de Portugal and EPAL. EPAL (Empressa Portuguesa das Aguas Livres) serves water to 0.31million people in Lisbon along with a number of small contracts in other areas. EPAL has been in existence since 1867. The Government has invited foreign companies to consider taking a stake in EPAL to finance part of its compliance programme. ADP serves 70% of the country's population through 14 water supply and 14 wastewater treatment companies and has been valued at EUR2-3billion.

<b>Groundwater</b>	
Total recharge (1998, km <sup>3</sup> )	5.1
Per capita (1998, m <sup>3</sup> )	521
Withdrawals (1990, km <sup>3</sup> )	3.0
For domestic use (1987)	39%
For industry (1987)	23%
For agriculture (1987)	39%

### Companies noted

Agbar's Lusagua JV was the dominant private player company in Portugal, serving 1.06million people through six contracts: four for direct service and two for bulk water provision. Lusagua was sold to Aguas de Portugal for EUR23.5million in 2001. Lusagua had a 2000 turnover of EUR10million. Sacyr Vallehermoso's Somague – AGS has bought major stakes in these contracts and a number of other contracts, to make it the leading private sector player in Portugal. Motal-Engil, the second player, is also a local company, having bought out Severn Trent's interests and gained further concessions. FCC and VE have gained a number of contracts.

<b>MAJOR CITIES</b>			
Population	2000	2015	Status
Lisbon	3,861,000	4,544,000	Piecemeal privatisation underway
Porto	1,940,000	2,400,000	N/A

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Fafe	25 year water provision concession	IIG de Aguas
Frielas	25 year water and sewerage concession	Aqualias
Lezíria del Tajo	40 year water and sewerage concession	FCC
Mafra	25 year sewerage concession	Aqualias
Matosinhos	25 year water concession	FCC
Ourem	25 year sewerage concession	Aqualias
Paredes	35 year sewerage concession	Aqualias
Santo Tirso	25 year water provision concession	IIG de Aguas
Santo Maria de Feira	35 year water provision concession	IIG de Aguas
Valongo	30 year sewerage concession	Aqualias
Vila de Conde	40 year water and sewerage concession	IIG de Aguas
Matosinhos	25 year water and sewerage concession	IIG de Aguas
Setubal	25 year water and sewerage concession	AGS
Vale do Ave	25 year water and sewerage concession	AGS
Figueira da Foz	25 year water and sewerage concession	AGS
Cascais	25 year water and sewerage concession	AGS
Carrazeda de Ansiaes	25 year water and sewerage concession	AGS
Gondomar	30 year water and sewerage concession	AGS
Alenquer	30 year water and sewerage concession	AGS
Pacos de Ferreira	35 year water and sewerage concession	AGS
Barcelos	25 year water and sewerage concession	AGS
Marco de Canaveses	Water & sewerage concession	AGS
Taviraverde	Water & sewerage concession	AGS
Covilha	Water & sewerage concession	AGS
Faro	35 year water and sewerage concession	AGS

In 2005, approximately 2.1million people were served by various forms of PPP contract. Approximately 0.1million were served by small contractors with local companies.

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Aqualias	VE (France)	184,000	250,000	<b>255,000</b>
FCC	FCC (Spain)	464,000	220,000	<b>464,000</b>
IIG de Aguas	Mota-Engil (Portugal)	536,000	0	<b>536,000</b>
AGS	Sacyr (Spain)	1,342,000	1,342,000	<b>1,342,000</b>

Source:

OECD Environmental Performance Review: Portugal. OECD, Paris, 2001

## QATAR

### All supplies from groundwater or desalination

With 75 mm of rainfall pa, Qatar has no surface water resources. Agriculture (which grew from a cultivated area of 2,256 Ha in 1980 to 8,312 Ha in 1994) is therefore almost entirely dependent on irrigation from pumped groundwater. With a groundwater withdrawal rate of 188million m<sup>3</sup> pa in 1994 against a recharge of 50million m<sup>3</sup> pa, it is estimated that Qatar aquifers will be depleted in 20 years. Renewable water resources are now totally depleted. The accumulated groundwater deficit during the period 1972-1995 was 994million m<sup>3</sup>, more than one third of the 1977 estimate of total groundwater reserves in the country of 2,500million m<sup>3</sup>. As a result, groundwater levels are falling by 0.5-1.1m pa and the quality of water is being compromised by sea water ingress and the intrusion of saline water from deeper aquifers. The estimated safe yield of the aquifer, based on the calculated average natural recharge over the last 20 years is some 35million m<sup>3</sup> pa.

The annual production capacity for desalinated water in 2004 was 180million m<sup>3</sup> pa. Desalination plants account for 96% of municipal potable water production. The total available potable water storage in the country, in buffer reservoirs, ground tanks, elevated tanks, and water towers, totals approximately 1.1million m<sup>3</sup>. This represents approximately three days' supply based on an average national consumption rate.

### Privatisation is steadily evolving

The sector was restructured to allow private sector involvement in the 1990s. Distribution and transmission were taken over by a new public sector body, the Qatar General Electricity and Water Corporation (QGEWC, now called Kahramaa). Generation and desalination were put under the Qatar Electricity and Water Company (QEWC). Shares in QEWC were sold via an IPO on the Doha Securities Market in 1993. While the Government retained 42.74% of the company, 16.86% was taken by private investors and 40.4% was sold to major companies, including Qatar Petroleum and the Qatar National Bank, which hold around 10% each.

The Government's current pricing policy of supplying potable water free of charge to the prime residence of all Qatari nationals may need to be reconsidered depending on the nature of private sector involvement required. In 2000, QEWC was granted the power to charge for services and to operate on a commercial basis. In 2003-04, QEWC commissioned a feasibility study for the privatisation of water distribution services. Kahramaa seeks to spend QAR1.57billion for 25 projects to extend water services between 2005 and 2009, including QAR1.15billion for projects already under construction.

### Groundwater and water imports

In order for the Government to maintain irrigated agriculture, and in the absence of any other source of water supply, Qatar is looking to import water from Iran. This would be used to increase the remaining groundwater reserves through artificial recharge to combat and minimise the environmental impact on the deteriorating water quality caused by salt water intrusion and soil degradation. Imported water from Iran is being negotiated and the Government has commissioned a study to test the feasibility of using this water for direct irrigation purposes. It is expected that 5m<sup>3</sup>/sec (160million m<sup>3</sup> pa) of water would be delivered from Iran's Karun River.

Following a decree in 2001, the Ras Laffan Power Company was formed as a joint venture between AES Corporation (USA, 55%), QEWC (25%), Qatar Petroleum (10%), and the Gulf Investment Corporation (Kuwait, 10%). Construction of the Ras Laffan B Power and Water Plant started at Ras Laffan in June 2005. The facility will meet short term water needs, but further projects are anticipated in the medium term. Ras Laffan B is being built by Q-Power (Qatar Electricity and Water Company (QEWC, 55%), International Power (UK, 40%), and Chubu Electric Power (Japan, 5%). Ras Laffan B will deliver a further 150million m<sup>3</sup> pa of water when it is fully commissioned in 2008. Power and water from Ras Laffan B will be sold to Kahramaa under a 25 year purchase agreement after the project is completed. Further plans to meet demand are also in preparation. An expansion of the Ras Abu Fontas B (RAFB1) co-generation plant and a new IPP known as Facility B are both part of a strategy to meet Qatar's domestic power needs until 2015. The proposed capacity for the RAFB1 project is 33 – 45million m<sup>3</sup> pa of water. The project will be executed by QEWC. The hope is that the expansion will be completed within 15 months of the project's signing by the end of 2005.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	Contract	Company
Lusail	10 year DBO	Degremont
Various	12-25 year, desalination BOT	QEWC

Private sector company operations (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
Degremont	Suez (France)	0	200,000	200,000
QEWC	QEWC (Qatar)	1,000,000	0	1,000,000

**ROMANIA**

<b>Economics (2005)</b>	
GDP per capita	USD3,830
GDP per capita (PPP)	USD8,940
Agriculture	10%
Industry	35%
Services	55%

**Water pricing and plans**

Charges for domestic wastewater vary from USD0.20/m<sup>3</sup> to 0.35/m<sup>3</sup>, with charges for water provision in 1997 typically varying from between USD0.60/m<sup>3</sup> and USD0.75/m<sup>3</sup>, representing 2.5 – 3.0% of household incomes.

Current water pricing covers all provision costs. The formulae used are under review for the more efficient allocation of water. In order to take into account the special needs of the poor the taxes and prices for household and agricultural use of water is one third less than those for use by industry. The estimated cost for achieving universal coverage of water and sanitation in Romania is about USD500million in the short term (3-5 years) and about USD700million in the medium term (5-10 years).

<b>Population</b>	
Total (2005, million)	21.6
Total (2015, million)	20.7
In urban areas (2005)	54%
In urban areas (2015)	56%
In urban agglomerations (2015)	10%

**Sewerage and sewage treatment**

The Siret River basin has a total population (including some people in the Ukraine) of 4 million. The city of Galati (330,000 people) has no sewage treatment. 42% of the area's population lives in urban areas. 77% of these are connected to sewerage networks, 50% of which gets its sewage treated. This implies that 17% of people in the area have access to STWs. Including industrial effluents; the EBRD has identified a basic level of EUR250million needed for investments in municipal and industrial effluent treatment.

<b>Sewage treatment</b>	<b>1992</b>	<b>2005</b>
Tertiary treatment	0%	0%
Secondary treatment	29%	17%
Primary treatment	8%	27%
None	63%	56%

By 1997, 50% of urban sewerage was treated. In 2000, 83% of urban and 11% of rural households was connected to a sewerage system. Recycling of wastewater is undertaken in only a few local industrial installations. Some 50% of industrial discharges are untreated. Lower industrial wastewater discharges and the impact of more municipal wastewater treatment have been seen in the improvement of inland waters:

<b>River water quality</b>	<b>1985</b>	<b>1994</b>	<b>2002</b>
Good	35%	54%	66%
Fair/Poor	N/A	34%	27%
Bad	N/A	12%	7%

The Romanian Water Association (ARA) stated in 2003 that it believes that EUR18.64billion needs to be invested by 2023 to upgrade Romania's water and wastewater infrastructure to meet EU requirements. This includes EUR14.4billion for urban areas, an average of EUR1,220million pa. After taking into account possible EU grants and Government financing, there will still be a shortfall of around EUR1,100million pa which would need to be made up by the private sector. In 2006, it was estimated that EUR18billion will be needed for municipal water, sewerage and sewage treatment by 2018.

The EU's IPSA is supporting the development of wastewater treatment facilities through a series of grants running to 2007. Eleven wastewater treatment plants projects have been approved to date by the ISPA management committee and will be co-financed by ISPA. Grants totalling EUR521.9million will be provided to; Constanta, Iasi, Craiova, the Jiu Valley, Arad, Braila, Cluj Napoca, Oradea, Focsani, Timisoara and Targu Mures.

<b>Urban Services</b>	
% Water	90%
Domestic consumption L/day	254
% Sewerage	83%
% Sewage treated	50%

## Water provision

In 2000, 14.7million people (65% of the total population) were connected to a public water supply, including 11.3million in urban areas (90% coverage) and 3.4million in rural areas (33% coverage). Tests on public water supplies in 2000 found that faecal biological parameters (total coliforms and faecal coliforms) exceeded the limits for 3% and 1% of samples respectively, with 3-5% of samples failing on chemical levels. There is no metering for domestic customers and overall, 50% of supplies are metered. Distribution losses are currently in the region of 35% and there are plans to reduce this to 15% by 2020.

<b>Freshwater</b>	
Total (1998, km <sup>3</sup> )	37.0
Per capita (2000, m <sup>3</sup> )	9,512
Withdrawals (2000, km <sup>3</sup> )	23.2
For domestic use (2000)	9%
For industry (2000)	34%
For agriculture (2000)	57%

## Privatisation and the EBRD

The EBRD has developed a Municipal Utilities Development Programme (MUDP), starting with a USD28million loan in December 1994, covering water and effluent treatment in Brasov, Craiova, Iasi, Timiosara and Tirgu Mures, cities with a population range of 164,000-360,000. The MUDP is designed to encourage private sector involvement in the water companies in these cities. Prior to MUDP, all finance has been through Central Government grant transfers. In 2001, Timisoara's Aquatim funded EUR438million in wastewater upgrades, through a EUR34million ISPA loan allied with local loans.

<b>Groundwater Resources</b>	
Total recharge (1998, km <sup>3</sup> )	8.3
Per capita (1998, m <sup>3</sup> )	368
Withdrawals (1975, km <sup>3</sup> )	1.0
For domestic use (1975)	61%
For industry (1975)	38%
For agriculture (1975)	1%

<b>MAJOR CITIES</b>			
Population	2000	2015	Status
Bucharest	2,001,000	2,001,000	Privatised

## Privatisation of Bucharest's services

Bucharest's water company, the Regia Generale de Apa Bucuresti (RGAB) was privatised under the IFC's auspices. Water supply for the city is through taps (92%) and standpipes (8%), averaging 800L/capita/day at USD0.17/m<sup>3</sup>. RGAB supplies sewerage for 85% of the city. Capital spending of USD1,000million is needed for water and sewerage over the life of the concession. Six bidders pre-qualified, three submitting compliant bids (UU/Bechtel, Suez and VE) with Azurix presenting a letter. VE's Apa Nova Bucuresti SA won with a tariff of USD0.11/m<sup>3</sup>, with a strict set of performance criteria and future tariff increase limits. VE have acquired 70% of RGAB's equity for EUR35million in 2001. Suez has a 25 year BOT for bulk water provision to 920,000 people in the city via the construction of a FRF350million water treatment works. Suez holds 51% of the consortium and its Degremont subsidiary will hold the remaining 49% of the equity.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
Location	Contract	Company
Bucharest	25 year water concession	Veolia
Ploiesti	15 year water concession	Apa Nova SRL
Zetea	Water DBOT	Amiantit

## Constanta

Regia Automoma Judeteana De Apa Constanta (RAJAC), which serves the county of Constanta (600,000 people, plus up to 400,000 tourists) is seeking to award a 20 year concession. RAJAC has a turnover of EUR23million and this project is linked to EBRD aid. Six international companies have pre-qualified for the bid, but little progress has been identified since 2004-05.

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
Apa Nova SRL	VE (France)	250,000	0	250,000
VE	VE (France)	2,000,000	0	2,000,000
Amiantit	Amiantit (Saudi Arabia)	200,000	0	200,000

## THE RUSSIAN FEDERATION

<b>Economics (2005)</b>	
GDP per capita	USD4,460
GDP per capita (PPP)	USD10,640
GDP in Agriculture	6%
GDP in Industry	38%
GDP in Services	56%

### Legislation and its enforcement

The fundamental law on the Protection of the Natural Environment was enacted in 1991. The law was intended as setting a foundation for more specialised environmental acts, but the post 1993 constitution has limited its worth. Preparation of the Law on the Protection of the Environment in the Russian Federation is currently being considered, along with the concept of the transition of Russia to the model of sustainable development. The complexity of the system of environmental responsibilities of the various state agencies is a further problem. The Plan of Action of the Government of the Russian Federation for Environmental Protection and Resource Management for 1996-1997 has been approved, and interested ministries and agencies and local Government bodies are taking part in its implementation.

<b>Population</b>	
2005 (million)	143.1
2015 (million)	136.0
Urbanisation in 2005	73%
Urbanisation by 2015	74%
In urban agglomerations, 2015	21%

### Water usage

Towns and villages with some form of water or sewerage system, 2002

	<b>Water network</b>		<b>Sewerage</b>	
Towns	1,085	99%	1,041	96%
Villages	1,727	92%	1,290	73%

The total water intake from renewable water resources throughout the Russian Federation was 90km<sup>3</sup> in 2002 as compared to 96km<sup>3</sup> in 1995. The average water supply for drinking water and domestic needs was 248L/inhabitant/day. Owing to the poor quality of water from these sources (and a number of other reasons), the country's existing system of drinking water supply is in a critical situation. About 10% of groundwater intakes have reported exhaustion of water supplies. More than 30% of piped water from surface sources is not treated, despite significant resource contamination, affecting 68% of urban and 10% of rural consumers. 25% of water withdrawal facilities are not surrounded by protection zones, while the other facilities are typically non-compliant. In 2001, 40% of drinking water was of potable quality and 30% of domestic effluents were treated.

<b>Urban Data</b>	
Served by piped water	81%
Access to sewerage	87%
With sewage treatment	20%

### Sewerage and sewage treatment

In 2002, the capacity of the wastewater treatment plants was 56.1million m<sup>3</sup>/day, which is 3% above the 1995 level. 14,000million m<sup>3</sup> of municipal wastewater was collected by the urban sewerage system in 2002, 86.4% of the total. Of this, 28% was treated. That year, 60% of wastewater treatment works were operating above capacity and 38% needed rehabilitation.

<b>Freshwater</b>	
Annual availability (1998)	4,312.7km <sup>3</sup>
Per capita	31,653m <sup>3</sup>
Annual withdrawal (2000)	76.7km <sup>3</sup>
Domestic	19%
Industrial	63%
Agriculture	18%

### Financing

In 1995, revenues received from the abstraction of water were USD7.8million/km<sup>3</sup> of freshwater collected, compared with expenditure on the maintenance, repair and use of networks of USD19.5million/km<sup>3</sup>. This is equivalent to a cost recovery of 40%, and points to total spending of USD1.88billion in 1995. Financing of measures concerning the use and protection of fresh water sources is provided by the federal budget (18%), the

budgets of member states of the Federation (16%), local budgets (18%), resources of enterprises (53%), environmental funds and other sources (5%).

<b>Groundwater</b>	
Annual availability (1998)	788.0km <sup>3</sup>
Per capita	5,320m <sup>3</sup>

### Privatisation prospects

Three contracts have been awarded to WTE, part of Austria's EVN, one involving Suez. VE is involved in the construction of a sludge treatment plant for St Petersburg worth EUR70million. Veolia has set up a joint venture with a management group from RKI, the Eurasian Water Partnership.

At the same time, a number of Russian water utilities have been emerging. The following companies were noted by Global Water Intelligence (August 2004, P15): JSC Russian Utility Systems (RKS) was formally registered in May 2003 and has some 50 short-term contracts for communal services with municipalities and regions. JSC Russian Communal Investments (RKI), a subsidiary of Bazovyi Element, operating in Nizhnii, Novgorod Oblast and some cities of Irkutsk Oblast, Krasnoyarsk Krai and Buriatia. Alfa Eco (Alpha) is present in Orenburg, Krasnoyarsk and Voronezh. Novogor (Russia New Municipal Systems, part of Interros) took over the water utility of Perm.

### A new private sector emerges

Million people	>2003	2003	2004	2005	2006	2007E
New contracts	0.7	3.5	3.0	3.0	2.0	2.8
Contracts lost	0.0	0.0	0.7	1.1	0.9	0.5
Number of contracts	3	11	15	20	22	N/A
Total served	0.7	4.2	6.5	8.4	9.5	11.8

Sources: Presentation by Eurasian Water Partnership to the World Bank, March 2007

A survey carried in June 2004 by the OECD found that private water supply and sanitation enterprises were operating in 38 municipalities in Russia, meaning that they potentially address 17.7million people or 16.6% of the urban population. At least 15 contracts for the delegated management of major WSS assets have already been concluded, serving 8.7million people, or 8.2% of the urban population. Other information (save for a report in Global Water Intelligence in 2004 and entries recorded by the World Bank) on these activities is somewhat incomplete at present.

Company	Water & sewerage activities
RKS	52 contracts in 16 regions
RKI	10 municipalities in Krasnodarskij Krai (region)
CES-Multyenergetika	45 municipalities in Perm and Sverdlovsk, and Syktyvkar (Komi Republic).
Novogor-Prikamye	Perm, Berezniki
Rosvodokanal	Orenburg
Syzranvodokanal	Syzran Municipality and Syzran district

RKS, Russian Communal Utility Systems was set up by RAO, UES and Gazprom in 2003. In the spring of 2004, Gazprom sold its shares to an undisclosed buyer and in June 2005, CJSC Integrated Energy Systems (IES, Russia) acquired 75% of RUS. IES is primarily interested in power generation and energy services and has no other water interests. RUS has 52 short term lease type contracts in 16 regions for water, communal heating, gas and electricity supply, serving 4.5million people. Revenues for the year ending 31<sup>st</sup> June 2004 were RUB14billion (USD480million). The main water contracts to date have been: Blagoveshchensk (Amur Utility Systems, 214,000 people); Volgograd (Volgograd Utility Systems, 780,000 people); Kirov (Kirov Utility Systems, 15 year lease, USD20million capex, 475,000 people); Kachkanar (Sverdlovsk Utility Systems); Tambov (Tambov Utility Systems, 294,00 people) and; Tomsk (Tomsk Utility Systems, 488,000 people).

To date RKS has gained eight short term leases (Blagoveshensk, Kirov, Orel, Tambov, Tomsk, Vladivostok, Volgograd & Petrozavodsk), along with two long term leases (Kirov and Tambov), with four of the short term leases having not been renewed (Orel, Tomsk, Vladivostok & Volgograd). In addition, three contracts were acquired with Novogor-Prikamye in 2006.

Novogor-Prikamye (New Urban Infrastructure of Prikamye) was set up by Interros in December 2003. It took over the water utility of Perm (1,096,100 people) and now implements the programme that was originally developed for an EBRD project in the city. The lease runs to 2020 and contains 2,420 separate water supply and drainage agreements: 9 with communal services of the City of Perm; with private houses owners, 556 with residential co-ops; 153 with state-owned federal enterprises and organisations; 564 with state-owned municipal enterprises and organisations; 1,094 with commercial companies and 37 with other types of consumers. In 2005, NP took over Perm's wastewater treatment works (secondary standard), which covers 95% of the city, and gained a 49 year lease for operating Perm's water channel, linked with RUB750million to be invested in refurbishing the channel and the city's water and sewerage infrastructure by 2010. Novogor-Prikamye gained the tender for wastewater systems engineering in Berezniki (population 201,800) in 2004 and the contract started in 2005. This is the first

time in Russia that the entire sewerage system of a big municipal unit will be leased to a private company. Novogor-Prikamye was sold to RKS for USD58million in 2006.

JSC Russian Communal Investments (RKI) is a subsidiary of Bazovyi Element, a Russian manufacturing conglomerate. RKI operates in Nizhnii Novgorod Oblast and some cities of Irkutsk Oblast, Krasnoyarsk Krai and Buriatia.

CES – MULTYENERGETIKA has 45 contracts: Sverdlovsk Region, 7 municipal districts, plus 22 cities and towns, including Kachkanar, Verkhnij Tagil and Nizhnij Tagil, Kamens-Uralskij and Pervouralsk; Komi Republic. (Syktyvkar) and, Perm Region. (Solikamsk, Berezniki, Tchaikovsky, Krasnokamsk, Kungur, Kizel, Vereshchagino, Chusovoi, Ocher, Gornozavodsk, Gremiachinsk and Suksun).

Alfa Eco's Rosvodokanal is a subsidiary of Alpha, a private equity company. Rosvodokanal seeks to operate in cities where Alpha has industrial activities (oil and metal). Orenburg Vodokanal Ltd has a lease serving 487,000 people in Orenburg for water and sewerage. Since 2003, revenues have increased by 16% with the collection rate increasing from 85% to 97%, while water losses distribution fell from 27% to 21%. Short term lease contracts were gained for Orenbourg, Barnaul, Krasnodar, Kaluga region, Tver and Tyumen and in then cases of Orenburg, Krasnodar, Kaluga region, and Tyumen, these have been renewed as long term lease contracts, while Tver was not renewed.

Syzran Vodokanal gained a five year management contract in 2001 for the Syzran Municipality and Syzran district, serving 162,668 people for water and 120,986 for sewerage. Since 2001, bill collection has increased from 80% to 93% while 24 hour water availability has become the norm. In this case, it appears that the municipal utility has been privatised on its own.

<b>MAJOR CITIES</b>			
<b>City</b>	<b>2000</b>	<b>2015</b>	<b>Status</b>
Moscow	8,367,000	8,141,000	Three wastewater contracts
St Petersburg	4,635,000	4,488,000	Contracts under consideration
Omsk	1,174,000	1,187,000	N/A
Novosibirsk	1,321,000	1,276,000	N/A
Ekateringburg	1,218,000	1,162,000	N/A
Samara	1,132,000	1,083,000	N/A
Perm	991,000	952,000	Novogor-Prikamye
Chelyabinsk	1,045,000	1,088,000	N/A
Ufa	1,102,000	1,110,000	N/A
Kazan	1,137,000	1,140,000	N/A
Rostov-On-Don	1,012,000	1,009,000	N/A
Volgograd	1,000,000	1,000,000	RKS
Krasnoyarsk	840,000	811,000	RKI
Saratov	881,000	871,000	N/A
Tolyatti	771,000	899,000	N/A
Ulyanovsk	864,000	1,144,000	N/A
Voronezh	918,000	934,000	Alfa Eco

### City Study: Moscow

Water and sewerage services are provided by Mosvodokanal. Water usage by domestic customers rose from 3.68million m<sup>3</sup> pa in 1992 to 3.88million m<sup>3</sup> in 1995, while usage by industry fell from 1.05million m<sup>3</sup> pa to 0.61million m<sup>3</sup> pa over the same period of time. Likewise, water discharge by domestic customers rose from 2.29million m<sup>3</sup> pa to 2.38million m<sup>3</sup> pa, while falling from 0.70million m<sup>3</sup> pa to 0.43million m<sup>3</sup> pa for industrial and power customers. It appears likely that the monitoring of the discharge of industrial effluents eased during this period. The quality of drinking water has been affected by drives to develop land surrounding water abstraction areas to the point where these sources are being materially contaminated. In consequence, while 1.2% of drinking water samples failed bacterial contamination tests in 1991, this rose to 3.4% by 1995. The failure rate on chemical criteria for recreational water bodies rose from 48% in 1991 to 72% in 1995 and from 53% to 65% for bacterial contamination over the same period. Meanwhile, a collapse in living standards for the majority of the population has taken place to the point where environmental concerns are overshadowed by apparently more immediate concerns. In 2002, Mosvodokanal claimed that it was owed RUB30million (EUR965,000) in unpaid bills by regional administrations and municipal institutions. At the beginning of 2002 Mosvodokanal cut the supply of drinking water to several towns in the Moscow region. Mosvodokanal in turn owes RUB70million (EUR2.25million) to energy supplier Mosenergo. In the meantime Mosvodokanal has filed a counterclaim against Mosenergo for RUB16.9million (EUR540,000).

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Moscow	11 year, wastewater build, O&M	WTE
Moscow	12.5 year, wastewater build, O&M	WTE
Moscow	13 year, water BOOT	Suez/WTE

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
WTE	EVN (Austria)	1,000,000	650,000	1,650,000
Suez	Suez (France)	1,000,000	0	1,000,000
EWP	Veolia (France)	1,234,000	N/A	1,234,000
RKS	IES (Russia)	3,745,000	N/A	2,221,000
Amiantit	Amiantit (Saudi)	450,000	0	450,000
Rosvodokanal	Alpha (Russia)	2,010,000	2,010,000	2,010,000
Syzran Vodocanal	Syzran Vodocanal (Russia)	186,000	121,000	186,000

Sources:

Oldfield, J (1999). The Environmental Impact of Transition – a case study of Moscow city. *Geographical Journal*, 165, 222-231.

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OECD (2004) Overview of Domestic and International Private Companies Operating in the Utilities Sector in Russian Federation, OECD, Paris

## SAUDI ARABIA

<b>Economics (2005)</b>	
GDP per capita	USD11,770
GDP per capita (PPP)	USD14,740
Agriculture	4%
Industry	59%
Services	37%

### Water resources and applications

The Ministry of Water Affairs was formed in 2003. It deals with private sector participation and foreign investments in water, desalination and wastewater reuse projects. The new Ministry will also be involved in setting new water tariffs.

The country is seeking to reduce over-abstraction through a reduction in water from 16.2million m<sup>3</sup> pa to 14.9million m<sup>3</sup> pa, mainly via a fall in agricultural use from 14.5million m<sup>3</sup> pa to 12.6million m<sup>3</sup> pa. Even so, this compares with a total surface water availability and annual groundwater recharge of 4.60million m<sup>3</sup> pa. In consequence, groundwater supplies have a 15-20 year life, with 85-90% of water currently used for agriculture. Currently water costs USD0.03/m<sup>3</sup> for domestic customers and USD1.60/m<sup>3</sup> for large industrial customers.

In 2006, Saudi Arabia supplied 5.72million m<sup>3</sup>/day of potable water, of which 1.84million m<sup>3</sup> was collected and treated as wastewater with 0.34million m<sup>3</sup>/day of this being reused.

The Water and Electricity Ministry allocated SAR300million (USD75million) pa in 2005 for reducing distribution losses and has launched a nationwide water saving campaign targeting households across the country. So far 1.8million water saving kits have been delivered to houses and more have been sent to schools, mosques and other public institutions.

In 2005, SAR15billion (USD3.75billion) was allocated to address water shortage and sewage problems in Jeddah over the next five years. This covers the construction of a water treatment works in Shoiba and one in northern Jeddah (250,000m<sup>3</sup>/day capacity) and sewerage networks northern and southern Jeddah.

<b>Population</b>	
Total (2005,million)	23.1
Total (2015,million)	28.9
In urban areas (2005)	81%
In urban areas (2015)	91%
In urban agglomerations (2015)	24%

### Desalination extension plans

The sixth Plan (1995-99) sought to have all drinking water obtained via desalination plants. Due to a number of delays and continuing problems with extant plant, the SWCC was given a revised set of targets in 1999. Currently, Saudi Arabia has 24 desalination plants in operation with a 600million gal/day capacity, or 700,000m<sup>3</sup>/day. SWCC now plans to construct 17 desalination plants (with a total capacity of 2.3million m<sup>3</sup>) so as to provide a total capacity of 3.0million m<sup>3</sup>/day.

In 2003 the National Commercial Bank noted that the SWCC projects a 20-year investment requirement of SAR11.5billion (USD3billion) pa on water supply and sanitation projects from 2003 to 2022. Saudi Arabia currently utilises 185million m<sup>3</sup> pa of treated wastewater effluent. Current production costs for desalinated water in Saudi Arabia are estimated at SAR2.7 (USD0.72)/m<sup>3</sup>, with a full cost of water and wastewater services of some SAR4.67 (USD1.33/m<sup>3</sup>).

<b>Urban Services</b>	
Safe drinking water	100%
Access to sewerage	60%
% Sewage treated	25%

### Maintaining extant assets

Lack of maintenance has held back the operation of these facilities and their use. For example, the Jeddah 1-4 desalination plants are meant to generate 95million gal/day, but operational problems means the real figure is some 65-70million gal/day. In addition, the water network suffers from distribution losses in the region of 40%. This in turn has been causing water table problems, and buildings in the area have not been designed to cope with this. Another example is the Shuaiba facility, which serves the Holy City of al Makkah (Mecca). This plant has a capacity of 50million gal/day, but had been allocated a maintenance budget of USD0.41million pa against an operating cost of USD90million pa (USD1.1/m<sup>3</sup>).

Sewerage coverage is less than 60% and the population is growing by 3% pa. Some 8% of wastewater is fully treated. USD14billion is needed for basic services over the next 20 years in Riyadh. This includes USD9billion in water treatment and distribution and USD4.9billion for sewerage and sewerage treatment.

<b>Freshwater</b>	
Total (1998, km <sup>3</sup> )	2.4
Per capita (2000, m <sup>3</sup> )	96
Withdrawals (2000, km <sup>3</sup> )	17.3
For domestic use (2000)	10
For industry (2000)	1%
For agriculture (2000)	89%

### **Involving the private sector**

Short term investment needs of USD17billion have been identified by the Government, along with USD81billion needed by 2022 to increase desalination capacity by 6% pa and water treatment by 11% along with developing a suitable wastewater management infrastructure. The private sector is needed to finance this and to bring the eventual cost down. The Agriculture and Water Ministry and regional seven water boards are being rationalised into a new Water Ministry to centralise the management of resources and manage the privatisation process. This involves charging for services on a cost recovery basis before PSP begins. A law was passed in 2000 allowing foreign companies to hold 100% of their businesses in Saudi Arabia as opposed to having to use locally based joint ventures. PSPs are to be carried out under the auspices of the Water & Electricity Company (WEC).

Utilities in Saudi Arabia are being taken over by the Utilities Company (UCO) as part of a move towards the full or partial privatisation in the future. The cities of Jubail and Yanbu are being used as pilot projects for private sector involvement with the UCO. The company will be partially privatised via a share sale to the public with 75% being retained by the state through three holding companies. No date has been fixed as yet. UCO is to concentrate on water and power for Jubail and Yanbu as outlined below.

The Jeddah Water and Sanitary Drainage Authority are seeking to develop a series of BOT projects for Jeddah and Makkah. The private sector is being involved in a series of mooted desalination projects. Sumitomo of Japan is considering constructing a USD2.2billion co-generation facility for Jubail while VE's Veolia Water and Suez's Ondeo Services are looking at other projects, along with Korea's Doosan.

In 2003, Saudi Arabia's state-owned Saline Water Conversion Corporation (SWCC) and Saudi Electricity Company (SEC) invited international developers to submit expressions of interest for the country's first independent water and power project, at Shouaiba, 120km south of Jeddah. The first phase will have a water capacity of 176million gal/day and up to 700mw in power generation, with the second phase being for 700mw and 24million gal/day. SWCC which supplies desalinated water is offering private firms a 60% stake in new water and power plants and says it is also moving towards privatisation. SWCC has also teamed up with the Saudi Electricity Company to devise several independent water and power projects. The Shouaiba Project calls for a power and desalination plant capable of producing 900 megawatts and 174million gal/day, with the bidder being granted a share of 60%. The similar Jubail Project is designed to produce 2400mw and 79million gal/day. Crown Prince Abdullah Bin Abdul Aziz declared that privatisation was a strategic choice for the Saudi economy in 2000.

In May 2005, two contracts were agreed which are intended to lay the foundations for PSP in Riyadh. Veolia has a USD5million contract to audit water distribution, metering and collection in the capital. Similar works are also planned for other Saudi cities. The intention is for the contract to evolve into a more formal private-public partnership. Booz Allen Hamilton (USA) is to develop plans to implement a management lease programme, which will lead to "a fully-fledged privatisation" by 2013-15.

<b>Groundwater resources</b>	
Total recharge (1998, km <sup>3</sup> )	2.20
Per capita (1998, m <sup>3</sup> )	109
Withdrawals (1985, km <sup>3</sup> )	7.34
For domestic use (1985)	5%
For industry (1985)	8%
For agriculture (1985)	87%

### **Pilot privatisation at Jubail and Yanbu**

The first development was a JV between the Royal Commission for Jubail and Yanbu (RCJ and Y) and Bechtel and Parsons Corporation (both of the USA), for a USD1,600-2,000million general upgrade of the water and wastewater facilities which began 1997. These are the two leading industrial cities in Saudi Arabia. There remains scope for optimising water reclamation through the treatment of domestic and industrial effluent and the recovery and beneficial reuse of treatment effluents.

**Water Management in Jubail and Yanbu**

	Population		Desalination (m <sup>3</sup> /day)		Reclaimed (m <sup>3</sup> /day)	
	1996	2003	1996	2003	1996	2003
Jubail	107,000	127,000	433	700	33	66
Yanbu	57,000	87,000	193	353	15	25

MAJOR CITIES			
Population	2000	2015	Status
Jeddah	3,192,000	5,183,000	O&M outsourcing under development
Mecca	1,335,000	2,063,000	O&M outsourcing under development
Medinah	891,000	1,429,000	O&M outsourcing under development
Riyadh	4,549,000	7,536,000	O&M outsourcing under development

**Proposals for Jeddah and al Makkah**

In 2002, Suez was awarded a contract to oversee an investment programme for al Makkah of more than EUR10billion over the next 10 years. The province has 7.5million inhabitants and three major urban areas: the Holy City, Jeddah and Taif. The water situation is especially critical in Jeddah, the second largest city in the country with 2.6million inhabitants. Less than 20% of the city is equipped with a sewer system.

**A revitalised PPP process**

In 2006, a new PPP plan was unveiled, based on setting up NWC, a National Water Company. This involves separate PPP awards for Riyadh, Jeddah, Damman/Khobar and Madinah, along with a separate set of eight contracts for wastewater treatment plants serving Riyadh and a further eight contracts for Jeddah. The water management PPPs will be based on management contracts lasting up to six years which in turn will evolve into lease or concession contracts.

Riyadh – current and planned performance

	2006	2007-11	2012-26
Water supply	7 hours a day	40% to get 24 hour	100% to get 24 hour
UFW (%)	31%	15%	5%

The Riyadh plans involve a 6-7 year management contract which will be superseded by a lease or concession contract. Various areas have been highlighted for these contracts, especially leakage, which currently accounts for some 1.1million m<sup>3</sup>/day of water, equivalent to the production of nine of Saudi Arabia's leading desalination facilities. It is assumed that USD0.4billion on network repairs in Riyadh will generate savings of USD2.1billion by 2026 in avoiding extra desalination capacity. During the 2007-2026 period, the following spending is anticipated in the four cities:

USDbillion	Capex	Opex
Water distribution	14.0	6.9
Sewerage	20.8	4.8
Sewage treatment	1.9	5.6

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	Contract	Company
Jubail	23 year BOOT	Suez

Private sector company operations (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
Suez	Suez (France)	3,500,000	0	3,500,000

Source:

Urban Water Sector Restructuring in Saudi Arabia. Presentation by Loay Bin Ahmed Al-Musallam (MOWE), at the GWI Conference, Barcelona, April 2007

## SENEGAL

<b>Economics (2005)</b>	
GDP per capita	USD710
GDP per capita (PPP)	USD1,770
GDP in agriculture	4%
GDP in Industry	59%
GDP in Services	37%

### Urban water and sewerage services

Between 1996 and 2000, access to potable water increased from 67% to 72%. Overall, 51% of the urban population received potable water supplies in 1992, with 85% having access to water by 1996. 20% of water provided to the urban population received treatment in 1992. Nationally, water provision was 28L/person/day in 2000. 33% of the population are seen as not having adequate water availability. Senegal is currently seeking to install a sewerage and stormwater drainage system in every secondary city through Société nationale d'exploitation des eaux du Sénégal (Sonees), which is now managed by a public independent body, the Office national de l'assainissement du Sénégal (Onas). Since the institution of the Onas, 63,000 individual connections have been set up in the peri-urban zones. The proportion of water fees devoted to financing Onas covers 65% of its needs.

<b>Population</b>	
2005 (million)	11.7
2015 (million)	114.5
Urbanisation in 2005	42%
Urbanisation by 2015	58%
In urban agglomerations, 2015	26%

### Privatisation proposals

Water and electricity services in Senegal have suffered through the inability of the utilities to deal with unauthorised connections and unpaid bills, particularly those of local authorities. These problems were to blame for the financial problems faced by the country's Régie Autonome de Distribution (RAD). In order to ease the burden of enforcing payments, the Government of Senegal decided to divest its water and electricity services in 1995.

<b>Urban Data</b>	
Served by piped water	82%
Access to sewerage	83%
With sewage treatment	0%

### SONES and Sénégalaise des Eaux

The SONES enterprise was broken up into an asset-owning company, which retained the former utility's name (SONES) and which owns the water assets, and a private operating company, Sénégalaise des Eaux (SDE). The Government awarded a ten year lease for operating Senegal's water services in 1996 to a SAUR led consortium. SAUR International and GTHE, a group of local civil engineering firms hold 51% of SDE's share capital, with Senegalese investors holding 35%, the state 5% and the employees hold the remaining 9%. The contract was renewed for a further five years in 2006.

<b>Freshwater</b>	
Annual availability (1998)	26.4km <sup>3</sup>
Per capita	3,811m <sup>3</sup>
Annual withdrawal (2000)	1.6km <sup>3</sup>
Domestic	6%
Industrial	4%
Agriculture	90%

SDE is bound to the State Government of Senegal through a performance contract that sets targets for improvement of the service. These criteria relate to facility maintenance, water quality and commercial management, which are monitored by SONES and the Office National de l'Eau Potable (ONEP). The contract also specifies quality, timing, and supply and payment arrangements.

<b>Groundwater</b>	
Annual availability (1998)	7.60km <sup>3</sup>
Per capita	844m <sup>3</sup>
Annual withdrawal (1985)	0km <sup>3</sup>
Domestic (1987)	25.0%
Industrial (1987)	0.0%
Agriculture (1987)	75.0%

### The contract in reality

Since 1999, it has become evident that the contract has been providing material benefits, even within its financial and operational constraints. Water delivery has increased from 96.3million m<sup>3</sup> in 1997 to 114.6million m<sup>3</sup> in 2002, while revenues rose by 47% between 1996 and 2001 at a time when tariffs rose by 20%. There has been an increase in the number of clients from 241,671 in 1996 to 408,000 in 2005. In the Dakar region (75% of the total service area), the number of private water connections increased from 135,414 in 1995 to 216,000 in 2003. Tariff rises were originally kept at below 3% pa with a low tariff for the first 20m<sup>3</sup>/month used, a cross subsidy system is in operation. Tariffs were frozen in 2003 and will be reviewed in 2008. Low income households also receive free connections and this meant that 85% of new connections in 2003 were to low income households. Average water usage in Dakar is 69L/capita/day. Non revenue water was 19.5% in 2007 and 98% of invoices were paid, meaning that the contract has been profitable since 2003.

Over the same period, the number of public standpipes in Dakar rose by 5%, from 940 in 1995 to 1,424 in 2002. Coverage figures for the Dakar region show that the proportion of the population served increased from 80.3% (1.63million) in 1995 to 89.5% as of the end of 2002 (2.25million people).

The financing of new infrastructure was covered by development partners, under the water-sector project (1995-2001) and the long-term water-sector project (2002-07). In 2005, a new sector policy and a XOF241.5billion new investment programme were set out under the Programme national d'eau potable et d'assainissement du millénaire (Pepam) to address sanitation needs and the expansion of Dakar.

<b>MAJOR CITIES</b>			
City	2000	2015	Status
Dakar	2,078,000	3,481,000	Water services leased to SDE

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
Location	Contract	Company
Dakar/urban	10+5 year lease contract	SDE

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
SDE	SAUR/Bouygues (France)	3,800,000	0	3,800,000

Source:

Brocklehurst, C. & Janssens, J. (2004) Innovative Contracts, Sound Relationships: Urban Water Sector Reform in Senegal. WSSSB Discussion Paper Series, 1. World Bank, Washington DC, USA.

African Development Bank/OECD (2007) African Economic Outlook

## SLOVAK REPUBLIC

### Water and wastewater management

In 2001, 83.6% of the population was supplied with water from public piping, compared with 75.2% in 1990. Coverage in Bratislava was 94% in 1997. Distribution losses in 1996 were approximately 22%, one of the better figures from central and Eastern Europe. 4.75% of drinking water samples failed on bacterial standards, against 1.32% on chemical criteria.

Connections to sewerage had increased from 37.1% in 1996 to 55.3% by 2002. The Government seeks to increase sewerage connections to 66% by 2010. Only 635million m<sup>3</sup>, or about 42% of wastewater released in 1991 was treated. The table below outlines the development of sewage treatment since 1990.

### Wastewater treatment

(1,000 m <sup>3</sup> )	1990	1995	1996	1997	2000
Mechanical (primary)	18,015	48,312	47,847	47,553	53,027
Chemical (secondary)	107	24	801	801	5
Biological (secondary)	6,251	2,110	1,535	1,543	643
Combined (tertiary)	25,238	28,816	37,738	38,721	36,183
<b>Total</b>	<b>49,611</b>	<b>79,262</b>	<b>87,921</b>	<b>88,618</b>	<b>89,858</b>

### Water and wastewater plans

In 1995, the Government set a series of mid to long term objectives for bringing water management into line with EU norms as well as taking sustainability into account when planning. These include: a 50% reduction in the amount of pollutants discharged in effluents via a 60% increase in the volume of wastewater subjected to treatment, while increasing the proportion of all wastewater subject to secondary and tertiary treatment by at least 20%, reducing the overabstraction of groundwater resources by cutting the agricultural use of groundwater to 30% of current levels, encouraging the recycling of wastewaters so as to bridge the gap between the volume of water extracted and discharged, using water meters to obtain a 30% decrease in the consumption of drinking water, and reducing distribution losses in the water distribution system to 10-15% of total volume.

### Making water and sewerage pay

Water and sewerage fees and service costs (SKK/m<sup>3</sup>)

Client	Service	1996	1997	1998	1999
Household	Water	4.71	4.99	5.66	7.26
	Sewerage & treatment	2.83	3.14	3.77	3.77
Industry	Water	7.09	8.65	9.40	10.44
	Sewerage & treatment	6.07	6.85	7.46	7.85
Cost of service	Water	7.77	9.76	10.45	10.80
	Sewerage & treatment	5.21	5.84	6.44	7.49

Since 1998, average water and sewerage charges have been increased to fully cover the costs of services provided. This is both to generate funds for bringing the water and sewerage infrastructure in line with the EU accession process and to use pricing as an economic instrument to discourage excessive water consumption and the discharge of effluents. The former is illustrated by changes in abstraction patterns:

Water abstraction, by use

	Million m <sup>3</sup>	1990 %	Million m <sup>3</sup>	1999 %
Municipal use	635	30%	455	39%
Agriculture	275	13%	21	2%
Industry	1,206	57%	688	59%
<b>Total</b>	<b>2,116</b>	<b>100%</b>	<b>1,164</b>	<b>100%</b>

**Private sector contracts awarded** (Please see the relevant company entry for details)

Location	Contract	Company
Banska Bystrica	30 year concession	StVS
Poprad	30 year concession	PVS
Trencin	20 year water & sewerage concession	TVS

The Slovak Republic has six regional water organisations and 47 local water supply establishments. By 2002, three of the latter (Trencin district, Komarno district and Hlohovec city) had their shares transferred to local authorities. Of these three, only Trencin has to date decided to sell shares to the private sector.

Bratislavskej vodarenskej spoločnosti (BVS), which serves Bratislava is 59% held by the city council. BVS aims to invest SKK700m (EUR17million) in 2004 on capital projects and serves 750,000 people in Bratislava and the west

of Slovakia. While PSP for BVS has not been ruled out, the city does not anticipate developments in the near term.

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
PVS	Veolia Environnement (France)	290,000	290,000	290,000
StVS	Veolia Environnement (France)	660,000	660,000	660,000
TVS	Suez (France)	150,000	150,000	150,000

Source:

OECD (2002) Environmental Performance Review: Slovak Republic. OECD, Paris

## REPUBLIC OF SLOVENIA

### Management and financial strategy

A new Water Act was adopted in 1998, along with ordinances on the water quality standards of surface fresh water and groundwater, the monitoring requirements concerning the quality of surface water and the ecological quality standards of water. Approximately 30% of water costs are recovered through pricing at present. Water and sewerage services are to become self financing in the medium term (2005-2010), through the adoption of a pricing policy for cost-recovery and equitable allocation of water in the Water Act. Domestic and commercial water users are taxed in proportion to the pollution load of the wastewater discharged. Exemptions from the tax can be granted if the revenues are used to fund projects aimed at reducing water pollution.

### Environmental spending and sources of finance

Budgeted spending on water and wastewater was USD391.1million for 2001-03 and USD519.4million for 2004-2006.

### Inland water quality

The quality of watercourses has improved gradually since 1989 due to a decrease in industrial sewage, along with the municipal wastewater treatment investment coming into effect.

Class	1992	1995	2000	2002
1	0%	2%	1%	3%
1-2	3%	4%	1%	6%
2	32%	41%	54%	45%
2-3	30%	24%	14%	19%
3	23%	21%	23%	20%
3-4	4%	4%	1%	2%
4	9%	5%	6%	5%

Pollution of the majority of surface waters exceeds the allowed limit (3rd and 4th grades, equivalent to poor and bad) and has been spreading towards river headwaters. The quality of groundwater has been declining recently. The most polluted groundwater with nitrates is found in the areas with intensive agricultural use, improperly maintained sewerage systems and thin cover layers. However, point sources of pollution of water have been improved.

### Water provision

Drinking water supply for 77% of the population is organised through public networks (treated), 14% from private wells, 5% from rainwater reservoirs and 4% from other sources. Approximately 47% of the total amount of piped drinking water is used by households, 39% by industry and the manufacturing sector, while 8% are supplied to livestock farms, 5% to the tourist industry and 1% to all other purposes. In 2000 almost 155,000 (7.8%) people had no drinking water from the public water supply.

### Sewerage and sewage treatment

53% of the population lives in areas covered by the sewerage system. The capacity for treating wastewater is 190million m<sup>3</sup>/year (45%) with 30% of the population connected to the sewerage system and sewerage treatment. There remains a pressing need for the adoption of secondary and tertiary treatment on a broad basis.

Sewerage treatment	1998	1999	2000	2001	2002	2005
Preliminary	45%	45%	45%	45%	48%	48%
Primary	11%	8%	9%	9%	7%	4%
Secondary	6%	8%	5%	7%	11%	16%
Tertiary	3%	3%	5%	5%	3%	11%

Wastewater treatment plans in the Adriatic Sea basin are concentrating on six plants and their sewerage systems: Koper (50,000 PE, tertiary), Izola (30,000 PE, tertiary) and Piran (30,000 PE, tertiary) Ilirska Bistrica (9,500 PE, secondary), Sežana (6,000 PE, secondary) and Pivka (3,250 PE, secondary).

### Privatisation progress

A 25 year concession contract was awarded to Suez and Aquaplus for a sewage treatment works serving the city of Maribor (190,000 people), Slovenia's second largest city. This was the first BOT wastewater treatment contract to be awarded in central or Eastern Europe.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Kranjska Gora	15 year wastewater concession	WTE
Bled	25 year BOT	WTE
Laško	25 year BOT	WTE
Maribor	25 year wastewater concession	Aquasystems

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Aquasystems	Suez (France)/Aquaplus (Austria)	0	190,000	190,000
WTE	EVN (Austria)	0	24,500	24,500

## SOUTH AFRICA

<b>Economics (2005)</b>	
GDP per capita	USD4,960
GDP per capita (PPP)	USD12,120
GDP in Agriculture	25%
GDP in Industry	20%
GDP in Services	55%

### Devolution of power and funding seen

The Government aims to transfer its water supply and sanitation activities to municipalities by 2006. This involves local governments taking over operating and capital costs when the schemes still operated by the department are transferred to municipalities by the end of 2006. The Water Affairs and Forestry Department's water services budget will fall to ZAR400million in 2007/8 from ZAR2.3billion in 2003/4. ZAR21billion (EUR2.63billion) National Water Resource Strategy was adopted in 2004, to allow for a more efficient management of the country's water resources, and address water shortages. The Strategy will ensure that about 6million South Africans have access to clean water, while the backlog of about 18million people without sanitation is cleared by 2008

### Targets for universal coverage slip away

South Africa has set the target of ensuring access by everybody to water services by 2008, and sanitation services by 2010. Basic water services are defined as 25L potable water within 200 meters on a sustainable basis. Sanitation services are defined as being safe and hygienic. The ongoing programme has completely changed the water supply and sanitation profile of the South African population, namely in 1994 access to basic water supply was 59% and in 2003 it is now 76%. By contrast sanitation was 47% in 1994 and in 2003 it was 61%.

In 2004 there were 3.6million people with no access to safe water; a further 5.4million had a source of safe water but at more than 200 metres from the households. 16million people do not have access to any hygienic sanitation.

### State coverage targets:

	<b>2003</b>	<b>2004</b>	<b>2008</b>
Free basic water	70%	80%	85%
Free basic sanitation	0%	20%	40%

A policy on basic household sanitation was developed and adopted by Cabinet in 2001. Following up on this a comprehensive strategy is being developed which will be completed by March 2004 and include aspects such as basic and higher levels of sanitation in informal settlements, urban and rural areas, as well as an implementation plan and financial models for sustainability.

### Water resources and distribution

South Africa is presently the 26<sup>th</sup> most stressed country in terms of water availability per person. It is a semi-arid country with unevenly distributed rainfall (43% of the rains fall on 13% of the land) and with high annual variability and unpredictability. The industrial heartland of the country, surrounding Johannesburg, is situated in an arid zone. As a consequence, some of the largest inter-basin transfer schemes in the world have been developed. See the country entry for Lesotho for the Highlands Water Project, the largest example of this kind.

<b>Population</b>	
2005 (million)	23.1
2015 (million)	28.9
Urbanisation in 2005	81%
Urbanisation by 2015	63%
In urban agglomerations, 2015	32%

### Water as white gold?

The 1956 Water Act is regarded as having applied the rules of the well-watered countries of Europe to the arid and variable climate of South Africa. The policy and functions of the Department of Water Affairs and Forestry prior to the 1994 elections were constrained exclusively to water resource management. The Department did not regard itself as responsible for ensuring that citizens had a water supply and indeed had no political mandate for such responsibility. The previous regime was characterised by a marked reluctance to ascribe a value to water resources. An estimated ZAR20billion of water resource infrastructure has been built by the Government, for users who do not pay for their operational, management or capital costs. Investment by the Government was related entirely to political patronage. In consequence, those who were not allowed to vote were effectively excluded from Central Government capital spending.

<b>Urban Data</b>	
Served by piped water	99%
Access to sewerage	79%
With sewage treatment	10%

### Reforming water provision

The Water Services Act (1997) and National Waters Act (1998) have been designed to provide for the equitable distribution of water resources upon the principles of sustainability and economic prudence. While water rights remain in Central Government hands, they are now to be ascribed with an economic worth and can be operated by the private sector.

The National Water Resources Strategy (NWRS) was published in 2002. This envisages resource reviews every five years and catchment management. The role of PSP has been left to state governments: it remains too politically contentious to be dealt with. The Department of Water Affairs and Forestry (DWAF) manages water resources and seeks to ensure that all people have an adequate water supply and sanitation service. Responsibility for water supply lies with local governments, in terms of the norms and standards described in the Government's policy. Where local government fails to perform its function, the DWAF is empowered to take direct action to strengthen local government and temporarily perform the functions of local government.

Between 1994-2001, the post Apartheid Government spent ZAR4.5 bn (EUR471million) in cutting the number of people without access to safe water supplies from 14million to 7million. Progress on the 20.8million without adequate sanitation has only been made since 1999. The Government aims to provide universal services by 2010. This works out as 25l/person/day of safe treated water at a maximum distance of 200m from the dwelling. Household connections will not be considered as part of the basic infrastructure because conventional sewerage is not regarded as a viable, thus one well-constructed Ventilated Improved Pit (VIP) per household is the minimum requirement. The 2001 Free Water Policy, guaranteeing 6m<sup>3</sup>/person/month of free water may be populist, but it is preventing rural investment since cost recovery is unfeasible.

From 1994 to 2001, the Government spent ZAR5,268million (EUR573million) on service extension, providing water to an additional 7.2million people. In 2004, the Government approved a ZAR21billion (EUR2.63billion) National Water Resource Strategy to allow for a more efficient management of the country's water resources and address water shortages including building about 20 dams. The Strategy will also ensure that about 6million South Africans have access to clean water, while the backlog of about 18million people without sanitation is to be cleared by 2008. At the same time, water budgets at the Ministry for Water Affairs and Forestry (DWAF) are being devolved to local Government, with the Ministry's budget falling from ZAR2,608million (EUR349million) in 2003 to ZAR1,334million (EUR178.5million) in 2004.

<b>Freshwater</b>	
Annual availability (1998)	44.8km <sup>3</sup>
Per capita	96m <sup>3</sup>
Annual withdrawal (2000)	17.3km <sup>3</sup>
Domestic (2000)	10%
Industrial (2000)	1%
Agriculture (2000)	89%

### Water and sewerage services (2000)

Inadequate sanitation	51%
No potable water	29-34%
Inside lavatories	48%
Outside lavatories	17%
Pit latrines	28%
Bucket system	4%
Informal	1%

Tariffs need to remain affordable and at the same time, capital spending is needed to reduce wastage and to deliver a perceived improvement in water quality and service. The free basic water policy currently extends to 26million people (66% of those served) and is being expanded to 29million (77%) in the medium term. Larger water users are now being managed on an economic basis. The Government estimates that 46,000 users account for 90% of national water demand. These users will in future be granted water abstraction licences.

Suez developed a national partnership to support local workers in building rural water supply systems through training provided by Suez. The aim is to bring clean water to 1million people by 2005. Water tariffs in Johannesburg have risen by 40% between 2001 and 2004 since the start of the Johannesburg Water (JW) contract with Suez. Meters have been installed to dispense 6,000L/household/month of free water.

5 million South Africans still require access to a basic supply of water in 2003. A Water Affairs and Forestry survey in Kwa Zulu-Natal found that 56.5% of the schemes were operating below the standards of the

reconstruction and development programme. Johannesburg was unable to account for 42% of the water it paid for in 2001.

<b>Groundwater</b>	
Annual availability (1998)	4.80km <sup>3</sup>
Per capita	108m <sup>3</sup>
Annual withdrawal (1980)	2km <sup>3</sup>
Domestic	10.6%
Industrial	5.6%
Agriculture	83.8%

### The economics of equitable provision and privatisation

The South African Municipal Workers' Union (SAMWU) and the Communist Party, part of the ANC-led Government are ideologically opposed to privatisation per se. To date, four relatively small and local privatisations have taken place, reflecting a gradualist stance by various parties. One has been for a tourist area (SAUR and Dolphin Coast), one for a municipality (Biwater and Nelspruit) and two are for BOTTs (build, operate, train and transfer) for rural areas (WSSA in the Eastern Cape and Northern Province). WSSA (Suez) serves a total of 2.5million people through a variety of management and technical assistance contracts.

The five year Johannesburg Greater Metropolitan Council management contract was awarded to Suez and is tied to USD300million in financing, equivalent to ten years of capital spending. Perhaps the greatest challenge lies in managing growth projections and usage. It appears the longer term demographic effect of Aids has not been factored into many water demand management models. In consequence, price changes and capital expenditure deferrals are being discussed.

Plans for a concession for Cape Town have been postponed. The overriding concern for the city is to provide basic water services to the 92,000 informal households that are currently without such services.

<b>MAJOR CITIES</b>			
<b>City</b>	<b>2000</b>	<b>2015</b>	<b>Status</b>
Cape Town	2,930,000	3,458,000	Some O&M outsourcing
Johannesburg	2,950,000	3,811,000	Private sector involvement under consideration
East Rand	1,552,000	1,703,000	N/A
Pretoria	1,590,000	2,152,000	N/A
Durban	2,391,000	3,020,000	Corporatisation of water provision in progress
West Rand	1,255,000	1,541,000	N/A
Satolburg	1,219,000	1,554,000	N/A
Port Elizabeth	1,006,000	1,150,000	N/A

### A full privatisation-Nelspruit

The privatisation of Nelspruit water services was agreed in early 1999 after 28 months of negotiations. The concession is worth ZAR350million for the running of the council's water and sanitation services, covering all of Greater Nelspruit's 260,000 residents. This is the first municipal deal for privatised water and sanitation in South Africa. Two former townships and six peripheral urban areas have been incorporated into Greater Nelspruit. Most of the people have not yet enjoyed regular running water, or acceptable sanitation services. The JV is run by Biwater International (40%) and Sivukile Investments (60%). The consortium will pay the council ZAR1.25million pa for monitoring the process. The consortium will invest ZAR150million in the next five years to improve water and sanitation in the town. Progress on the deal will be reviewed by the council in five years. In addition, billing arrears of more than ZAR20million needs to be dealt with. This concession is seen as a battleground by the anti privatisation lobby and thus it remains contentious irrespective of its actual performance.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Dolphin Coast	30 year water and sewerage concession	Siza Water Co.
Nelspruit	30 year water and sewerage concession	Biwater
Queenstown	10 year BOTT concession	WSSA
Fort Beaufort	10 year BOTT concession	WSSA

### Siza Water: A tourist resort concession

In 1999, the borough of Dolphin Coast (56,000 people) awarded a 30 year concession to SAUR's Siza Water. USD172million of investments are to be made during the life of the concession. Siza Water forecast a 40-50% increase in service demand after the contract award, but has subsequently seen demand rise by just 5% in 2002. Since the concession award, operation and maintenance targets are on track, it has increased the number of employees, uses 3% of salary bill for staff training and has encouraged staff share ownership. Distribution losses have fallen from 30% to 16%, with an increase in tariff collection from 75% to 97%. Customers choose from four levels of service: (1) community has own service (no service from Siza Water); (2) standpipe with VIP, per household; (3) 200 litre water tank and septic tank, per household and (4) full water connection and flush toilet.

Residents may start at level 2 and upgrade to 3 or 4 as affordability levels improve. Future challenges include further enlargement of the municipal area and a pricing policy, which is based on cost reduction and cost recovery rather than a pro-poor policy.

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Metsi a Sechaba	Biwater (UK)	270,000	270,000	270,000
Siza Water Company	SAUR/Bouygues (France)	56,000	56,000	56,000
WSSA	Ondeo (France)	300,000	260,000	300,000

Source:

M Pillay & G Moloi (2002). Bridging the gap: greater understanding between public and private sectors will extract the best from both – what could this mean for Africa's water sector? Water 21, Africa Energy Forum, London, July 2002.

## SPAIN

<b>Economics (2005)</b>	
GDP per capita	USD25,360
GDP per capita (PPP)	USD25,820
Agriculture	3%
Industry	29%
Services	67%

### Water quality and resources

Survey information is relatively poor at present. The first national survey was carried out in 1990 and was based on informal data. It found 40% of rivers to be of Class I – II/III (good to fair) and 60% to be of Class III – IV (fair to bad) quality. A 1999 survey of rivers, using 489 data points found 222 to be of good to excellent quality (45%), 207 of fair to poor quality (42%) and 60 to be of bad quality (13%).

Water shortages are a widespread concern. These occur in the eastern Pyrenees, Guadalquivir, Segura, southern Spain, the Balearic and Canary Islands. In Andalusia and Extremadura there are regular supply limitations during the summer. Water is both unevenly distributed and rainfall is markedly seasonal. Overall, there is an 'excess' of 27billion m<sup>3</sup> of water pa, 92% of which is found in northern Spain in the Duero, Tagus and Ebro basins. This means that more than 50% of current water resources are not being exploited. However, other areas have a minimum shortfall of 2.6billion m<sup>3</sup> pa. Overall, 18.5million people live in areas of water stress.

Distribution losses have exacerbated these regional problems. Supply efficiency for irrigation projects is in the region of 40%, while the urban water network has distribution losses of 25% in 2000, against losses of 32% in 1990.

### Management and politics

The main problem for those seeking to modernise the management of Spain's water resources is that the great disparities in water availability and need means that regional interests will continue to block plans to integrate its water management. What are known as the nine hydrographic confederations (river basin agencies) are seen as impotent, especially when it comes to monitoring water quality.

There have been plans for an overall increase in water availability of 20.0billion m<sup>3</sup> pa by 2010, of which 3.2billion m<sup>3</sup> pa (16%) would come via groundwater. The shortfall for the Balearic and Canary Islands is to be tackled via new desalination plants. Demand for urban and industrial water by 2010 is expected to be 15billion m<sup>3</sup> pa, or 850L/capita/day. But the long term problem areas, with a projected deficit of 6.7billion m<sup>3</sup> pa will remain, especially along the Mediterranean coast, Andalusia, Eastern Pyrenees, Guadalquivir, Segura and Jucar.

The National Hydrological Plan proposed in 2000 was abandoned following the Socialist Party winning the 2004 elections. Plans for 17 desalination plants at a cost of EUR3.8billion as an alternative water source for the southern areas of Spain are under consideration.

<b>Population</b>	
Total (2005,million)	43.4
Total (2015,million)	44.4
In urban areas (2003)	77%
In urban areas (2015)	81%
In urban agglomerations (2015)	18%

### Development of sewerage infrastructure

In comparison to most of the major western economies, Spain's sewerage and sewage treatment infrastructure remains at an undeveloped stage. The table below highlights that, given the undeveloped state of the system prior to the end of the Franco regime in 1976; the country has in fact made appreciable strides towards modernisation.

#### Urban sewage treatment

<b>Population served</b>	<b>1975</b>	<b>1980</b>	<b>1990</b>	<b>2000</b>	<b>2002</b>	<b>2005</b>
Tertiary treatment	0%	0%	4%	15%	26%	27%
Secondary treatment	7%	16%	38%	65%	62%	65%
Primary treatment	7%	13%	11%	8%	1%	1%
None	86%	71%	47%	12%	11%	7%

The proportion of Spain's population connected to sewerage services increased from 18% in 1980 to 86% in 2000. The National Sewerage and Wastewater Plan, 1995-05 budgeted EUR11.4billion in spending, 25% coming from EU grants. The effect of this work can be seen in the improvement of inland waters (physico-chemical quality):

<b>River water quality</b>	<b>1995</b>	<b>2002</b>
Good quality	52%	62%
Intermediate quality	40%	32%
Poor quality	8%	6%

In terms of ecological water quality, perhaps 30% of rivers were clean in 2002, and a further 30% showed mild contamination. 20% was contaminated and the remaining 20% severely contaminated, indicating that much will be needed in order to comply with the EU water framework directive.

<b>Urban services</b>	
% Water	97%
Consumption (L/day)	265
% Sewerage	95%
% Sewage treated	70%

### **Making a market for water**

In 1997, Spain considered developing a water market to encourage external investment and open the market up for more privatisation while restricting the role of the state. At the time, this was in response to the drought of 1995 and 1996, thus the temporary respite offered in 1997 and 1998 eased political pressure for reform. A further drought in 1999 has concentrated minds again. In September 1999, Spain's parliamentary environment committee used fast-track procedures to approve new legislation designed to improve water conservation. The reform creates a market in water with the aim of rationalising the use of resources by allowing water rights to be bought and sold. In addition, the legislation allows for the establishment of water banks, as seen in California, which will allow the Spanish Government to redirect water resources to priority sectors of need. The law will also make obligatory the metering of water used for irrigation and creates a regulatory framework for new water-conservation schemes such as desalination and the use of grey water on parks and golf courses. At the same time, the implementation of a national hydrological plan to provide a long-term solution to the problem of Spain's scarce and unequally-distributed water remains as contentious as at any point over the past decade.

Generally speaking, there is an inverse relationship between water scarcity and price. Many municipally held entities in the water short regions of southern Spain continue to provide water at a loss. In Barcelona, the price of drinking water is EUR1.27/m<sup>3</sup> for water, compared with EUR0.90/m<sup>3</sup> for the rest of Catalonia and a Spanish norm averaged at EUR0.30/m<sup>3</sup>.

<b>Freshwater</b>	
Total (1998, km <sup>3</sup> )	110.3
Per capita (2000, m <sup>3</sup> )	2,711
Withdrawals (2000, km <sup>3</sup> )	35.6
For domestic use (2000)	13%
For industry (2000)	19%
For agriculture (2000)	68%

### **Privatisation and the private sector**

The private sector is making steady progress in Spain. This has been compounded by the generally held belief amongst the municipally held sewerage companies that until EU laws are impending, they need not be considered. The EUR18.8billion 2001-08 Plan Hidrológico Nacional Capex included EUR2.82billion for urban water supply, EUR2.72billion for water transport, EUR2.61billion for wastewater treatment and EUR1.26billion for water quality improvements.

### **Structure of market – contracts in 2000**

<b>Population</b>	<b>Private</b>	<b>Public</b>
Up to 10,000	2,510	5,224
10,000-50,000	288	208
50,000+	59	56

Private sector involvement dates back to Aguas de Barcelona's original water provision contract in 1911. Private sector progress was limited during the Franco era, but since 1976 it has made steady inroads. FCC and Aguas de Barcelona (part of Suez Lyonnaise via direct and indirect stakes) were the only private sector players until 1985. Effective competition has only emerged since 1991, after which Aguas de Barcelona has gained some 50% of all contracts. Aguas de Valencia (30% held by Bouygues) has been gaining a number of small contracts in recent years. Dragados entered the water and sewerage market in 1991, having been responsible for approximately 30% of Spain's water and sewerage construction work since 1951. Ferrovial and Iberdrola are also building up portfolios of contracts, the latter having acquired Obrascom's water activities in order to gain economies of scale.

The private sector is gaining contracts for serving 650,000–900,000 people pa. By 2010, it is expected that 75% of the Spanish water provision and sewerage market will be privately held, including the anticipated award for

Madrid's Canal Isabella II's sewerage services. Many water and sewerage services are currently being run at a loss by municipalities. Agbar believes that it has 55% of the private sector.

<b>Groundwater</b>	
Total recharge (1998, km <sup>3</sup> )	20.7
Per capita (1998, m <sup>3</sup> )	521
Withdrawals (1990km <sup>3</sup> )	6.0
For domestic/industry (<1990)	22%
For agriculture (<1990)	78%

### Corporatised entities

Canal de Isabel II (CI II) was founded in 1851 to provide Madrid with water. It has consistently been under the direct ownership of the municipality and operates as a corporatised entity. CI II serves 4.6million people for water and 3.1 people for sewerage and is financed through internal cash generation and syndicated loans for longer term capital spending work. CI II may be broken into two or three parts if and when it is privatised.

After a decade of indecision, it was announced in September 2005 that Madrid city council is to cede the management and infrastructure ownership of CI II's 4,000 kilometres of sewers and drainage systems and its seven treatment plants for the next 25 years to a private company which will pay the council EUR750million. Currently, some O&M work is carried out by eleven private companies through a series of four year contracts.

Comphana de Aguas de Grande Bilbao is a consortium of 48 Basque town councils. The consortium is looking at contracts in Uruguay, Argentina and Morocco and had a budget of EUR104.5million for 1999. The company gained the final Province of Buenos Aries regional concessions in Argentina in 1999. The municipalities of Bilbao, Tarragona, Pamplona and Santander have formed their water provision and sewerage companies into separate entities, which are distinct from their municipalities, even if held by them.

<b>MAJOR CITIES</b>			
Population	2000	2015	Status
Barcelona	2,729,000	2,729,000	Aguas de Barcelona
Madrid	3,976,000	3,976,000	Corporatised, PSP for sewerage planned

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
Location	Contract	Company
Albacte	Water and sewerage concession	Aguas de Barcelona
Cadiz	Water treatment	Canal de Isabell II
L'Ampolla	Water and sewerage concession	Aguas de Valencia
Masalfassar	Water and sewerage concession	Aguas de Valencia
Oviedo	Water and sewerage concession	FCC
Sabadell	50 year water provision concession	Aguas de Sabadell
Salamanca	Water and sewerage concession	FCC
Valladod	Water and sewerage concession	Aguas de Barcelona

Only selected recent contract gains above are included. Aguas de Sabadell is a semi private company formed for water provision services to the municipality of Sabadell.

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
FCC	FCC (Spain)	7,200,000	9,500,000	<b>9,500,000</b>
Aguas de Barcelona	Agbar (Spain)	12,347,000	13,380,000	<b>16,000,000</b>
Aguas de Valencia	AgVal/PAI (France)	2,040,000	700,000	<b>2,040,000</b>
Sacyr	Sacyr (Spain)	823,000	220,000	<b>823,000</b>
Urbaser	Grupo ACS (Spain)	2,900,000	3,300,000	<b>3,300,000</b>
Ferrosar	Ferrovial (Spain)	350,000	100,000	<b>350,000</b>
Iberner	RWE (Germany)	270,000	270,000	<b>270,000</b>
Pridesa-Ondagua	Acciona (Spain)	677,000	6,862,000	<b>6,862,000</b>
OHL	OHL (Spain)	300,000	350,000	<b>350,000</b>

Source:

OECD Environmental Performance Review: Spain. OECD, Paris, 2004

## SWEDEN

<b>Economics (2005)</b>	
GDP per capita	USD41,060
GDP per capita (PPP)	USD31,420
GDP in Agriculture	2%
GDP in Industry	29%
GDP in Services	69%

### A purist approach

Given that the water flowing from Stockholm into the sea is regarded as fit to drink, it is evident that environmental compliance in Sweden follows the country's singularly purist agenda rather than allowing itself to be held back by the ambitions of other nations. The country remains understandably content to plough its own furrow and is set to remain committed to municipal water ownership and management for the short term. This approach has been a twin edged sword commercially, with entities such as Stockholm Water being forbidden from seeking international privatisation contracts despite their service delivery record at home and the high regard in which their consulting work abroad is held.

<b>Population</b>	
2005 (million)	9.0
2015 (million)	9.3
Urbanisation in 2005	84%
Urbanisation by 2015	84%
In urban agglomerations, 2015	20%

### Water provision

There is no shortage of fresh water in Sweden. The total volume of fresh water used is 3.3billion m<sup>3</sup> pa. The use of fresh water in households in 1994 was as follows: personal hygiene; 30%, cooking; 5%, cleaning and car washing; 10%, sanitation; 20%, laundry; 15% and dish washing 20%. Nearly 100% of the drinking water from the urban municipality water plants is more or less treated. In contrast, in Sweden official water distribution losses are seen as being in the region of 20-22%.

<b>Urban Data</b>	
Served by piped water	100%
Access to sewerage	100%
With sewage treatment	100%

### Structure of ownership

The 300 water suppliers in Sweden are either municipalities or municipally owned and have a monopoly in their respective areas. The water and sewerage sectors are seen as parts of the municipalities. In addition, Sweden has some 800,000 private wells.

<b>Freshwater</b>	
Annual availability (2000)	178.0km <sup>3</sup>
Per capita	19,581m <sup>3</sup>
Annual withdrawal (2000)	3.0km <sup>3</sup>
Domestic (2000)	37%
Industrial (2000)	54%
Agriculture (2000)	9%

### Financing services

Every landowner has the right to groundwater resources below his property and small lakes are likewise private, but larger ones are in the public domain. For agricultural use there is no pricing policy. In the case where the water is delivered by the municipality, the industry will pay for the production of water, the delivery and the treating of wastewater at cost price. Where the water is delivered by the municipality the households pay for distribution and treatment of water and wastewater at cost. Overall, almost all cost for water production, delivery and wastewater treatment are currently recovered through pricing policies already in force. The objective is to reach full cost recovery and for municipal services, 99% cost recovery has been experienced since 2000.

Average household charges, 2000-2003

<b>SEK/m<sup>3</sup></b>	<b>2000</b>	<b>2003</b>
Water & sewerage charge	21.17	25.15
Fixed charge	N/A	10.86
Variable charge	N/A	14.29

<b>Groundwater</b>	
Annual availability (2000)	20.0km <sup>3</sup>
Per capita	2,245m <sup>3</sup>
Annual withdrawal (1995)	0.6km <sup>3</sup>
Domestic (1987)	92%
Industrial (1987)	8%
Agriculture (1987)	0%

### Sewerage and sewage treatment

	1980	1990	1995	2000
Tertiary	61%	85%	87%	80%
Secondary	20%	9%	6%	5%
Primary	1%	0%	0%	0%
Sewerage only	N/A	1%	0%	0%
Not connected	N/A	5%	7%	14%

The proportion of the population connected to sewerage services increased from 82% in 1980 to 93% in 1995. The target is for 100% coverage in the medium term. 100% of urban sewage is treated, although there is no plan for the recycling of wastewater. By 2000, Sweden had already more than satisfied the UWWTD with 95% of the population served by tertiary sewage treatment works. In addition, 54% of all sewage undergoes advanced treatment. There are some 2,000 municipal sewage treatment works, removing 95% of the phosphorous and 36% of the nitrogen loading respectively. An area of concern is the extent of combined foul and storm water sewerage, accounting for 20-30% of the sewerage network in some areas.

<b>MAJOR CITIES</b>			
City	2000	2015	Comments
Stockholm	1,612,000	1,704,000	PSP currently ruled out
Gutenberg	778,000	808,000	PSP currently ruled out

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
Location	Contract	Company
Nortel	10 year contract, water and wastewater	VE

A number of local O&M contracts were undertaken with local companies on a trial basis in the late 1980s and early 1990s. In 2003, six municipalities out of 289 had outsourced their water activities through management contracts. All of these are with Swedish companies such as Rang-Sells, Slaska and NCC with the exception of Nortel, which awarded a contract to VE in 2002. The general consensus is that there will not be a great change in the medium term.

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
VE	VE (France)	50,000	50,000	<b>50,000</b>

Source:

OECD Environmental Performance Review: Sweden. OECD, Paris, 2004

## SWITZERLAND

### Sewerage runs like clockwork

The proportion of the population connected to sewerage services increased from 70% in 1980 to 90% in 1990. 180 out of the 900 municipal sewage treatment works are regarded as being in need of upgrading or replacement. By 1995, most sewage treatment works were seen as being UWWTD compliant, even though many lakes will fall into the sensitive waters category. 97-98% of urban domestic sewerage is treated, and 97% of this is to at least secondary standard. Switzerland seeks to have 100% of urban effluents treated in the medium term. 55% of these effluents were recovered for agricultural use in 1994. From 1990 to 2002, public spending on wastewater management has varied between CHF1.5 and 1.9billion. Since 2000, it has been in the CHF1.7 – 1.8billion pa range.

### Sewerage and sewage treatment

	1980	1990	1995	2000	2005
Tertiary	41%	62%	71%	74%	77%
Secondary	32%	28%	23%	22%	20%
Primary	0%	0%	0%	0%	0%
Sewerage only	N/A	1%	0%	1%	0%
Not connected	N/A	9%	6%	3%	3%

### Water services remain a public sector concern

The municipalities own all sewerage services, which were typically formed between 1950 and 1970. There are some corporatised water services, in that they were formed prior to 1950 and can have some private capital. However, the water and sewerage sectors are seen as parts of the municipalities and in 1996, Switzerland reaffirmed that privatisation is not to be considered in the foreseeable future. Indeed, existing shares of water concerns in private hands continue to be purchased by the municipalities. Water tariffs are intended to recover 60-80% of costs, while sewerage service charges seek to cover at least 90% of costs so as to encourage preventative measures

**TANZANIA**

<b>Economics (2005)</b>	
GDP per capita	USD340
GDP per capita (PPP)	USD730
GDP in Agriculture	45%
GDP in Industry	18%
GDP in Services	38%

**Good intentions, flawed outcomes**

The 20 year plan established in 1971 to bring universal access (within 400m) to water has not been a success. Indeed, some 30% of rural schemes put in place by 2003 were not fully functional due to poor staff training. According to Water Aid, households in towns and cities are spending more time fetching water than they did in the mid 1990s, indicating that population growth and urbanisation is almost outstripping infrastructure development.

<b>Access to water services</b>	<b>1986</b>	<b>2000</b>	<b>2003</b>	<b>2006</b>
Urban access	65%	68%	73%	74%
Rural access	42%	49%	53%	54%

Access to sewerage in urban areas increased from 10% in 2000 to 17% in 2003 and it remained at 17% in 2006.

In July 2002, the Cabinet approved a revised National Water Policy (NAWAPO), based upon universal water and sanitation access by 2025. In 2005, the Government launched a 10 year water plan to halve the number of people who do not have access to improved water supplies, currently 14million, some 39% of the population. This will cost USD1billion of capital spending, including a project to draw water from Lake Victoria at a cost of USD178million to supply the regions of Mwanza and Shinyanga. Germany and the European Union are currently providing USD51million to provide safe drinking water to 1 million water users in Mwanza, Iringa and Mbeya.

<b>Population</b>	
2005 (million)	38.3
2015 (million)	47.1
Urbanisation in 2005	24%
Urbanisation by 2015	47%
In urban agglomerations, 2015	18%

**Services in Dar es Salaam**

In 1993, only 22% of households in Dar es Salaam were connected to piped water and 6% had sewerage services. In 1999, Dar es Salaam got a USD117million loan from the World Bank for the installation of 100,000 water meters as a first phase towards a water demand management and distribution loss identification strategy. The city has 35-40% distribution losses and provides 272.8million L/day of water, against a demand for 409.2million L/day in 2003. Vended water costs TZS12/L or USD12.0/m<sup>3</sup>, while the middle classes use tankered water, paying USD60/10 m<sup>3</sup> tanker load, or USD6/m<sup>3</sup>.

Dar es Salaam has the oldest sewage system in the country. Approximately 35% of the city's sewage was treated and with 98,000 connections, only 20% of Dar es Salaam's 3 million inhabitants have a sewerage connection. 27% of the population who live in high density urban sectors use pit latrines which are in typically in a poor state of repair. The majority of the waste collected in the sewage system is channelled to an ocean outfall without treatment. The Government has attempted to treat part of the waste through waste stabilisation ponds. Nine of these ponds have been set up in Dar es Salaam and several others in small municipalities. The ponds are capable of removing up to 70% of the BOD, leaving the water with a reasonable dissolved oxygen level. These are at best an interim measure, but better than no treatment.

<b>Urban data</b>	
Served by piped water	73%
Access to sewerage	97%

**Rural scarcity remains the norm**

Much of Tanzania is characterised by extreme aridity and the need for water for basic agricultural development. The country has been largely dependent on international finance and aid agencies. For example, between 1983 and 1994, WaterAid, the UK water and sanitation charity provided potable water supply infrastructure to approximately 630,000 people. It is of interest to note that WaterAid found that villagers were willing to exchange 10-15% of their household cash income for water from these projects.

<b>Freshwater</b>	
Annual availability (1998)	80.0km <sup>3</sup>
Per capita	2,416m <sup>3</sup>
Annual withdrawal (2000)	2.0km <sup>3</sup>
Domestic	6%
Industrial	1%
Agriculture	93%

### **New approaches to rural needs**

In 1999 it was announced that after a series of field trials, WorldWater Corp. of the USA was to provide up to USD30million of solar water pumps to the Tanzanian Ministry of Water and the Drilling and Dam Construction Agency. These pumps have a capacity of 5-2,000 gal/min and can be used for potable water and irrigation in rural areas.

<b>Groundwater</b>	
Annual availability (1998)	30.0km <sup>3</sup>
Per capita	932m <sup>3</sup>

<b>MAJOR CITIES</b>			
<b>City</b>	<b>2000</b>	<b>2015</b>	<b>Status</b>
Dar es Salaam	2,115,000	4,080,000	City Water contract terminated

### **Urban services were privatised...**

The Government's divestiture programme in 1993 concentrated on the privatisation of commercial enterprises, the majority of which were planned for completion during the first five year period. By 1998, the Government's privatisation programme had resulted in the sale of nearly half of the state owned enterprises. In June 1996, policies affecting the National Urban Water Authority (NUWA)/Dar es Salaam Water and Sewerage Authority (DAWASA) were changed to encourage cost recovery, and the Dar es Salaam Water and Sewerage Authority (Dawasa) Act was enacted in 2003 as part of the Government's economic liberalisation programme to enable PSP. In consequence, the Parastatal Sector Reform Commission (PSRC) awarded a 10 year O&M contract for the water and sewerage services in Dar es Salaam to the Cascad led City Water.

### **...for a while**

City Water, a joint venture of Biwater International (UK), Gauff Ingenieure (Germany) and Superdoll Trailer Manufacturers Ltd. (Tanzania), began operations on 1 August 2003. On 13<sup>th</sup> May 2005, the contract was cancelled by the Government. Tanzania has made a series of allegations against City Water, which in turn believes it has a case against the Tanzanian Government for alleged breach of contract. They believe that water quality and quantity had improved and that 10,000 new customers had been gained in the previous two months. Although City Water admits works were behind schedule, it said it had offered to invest a further USD5million in 2006. The Government maintains that its goal is to create an environment where all stakeholders, public and private, work together in the sector and in spite of the setback with City Water, the Government will continue to look to the private sector.

Source:

African Development Bank/OECD (2007) African Economic Outlook

## TUNISIA

### Water provision

All households in urban areas are connected to the mains for potable water, along with an 85% connection rate in rural areas in 2004, against 37% in 1987. The average household usage is 87L/day. Distribution losses in 1993 were 34% (280million m<sup>3</sup> of water distributed and 209million m<sup>3</sup> billed for). There was a reduction in leakage of 28% in 1996. Deep boreholes account for 45% of drinking water. Current groundwater resources are expected to be used up by 2010, but new sources are being developed.

### Sewerage and sewage treatment

Million m <sup>3</sup> pa	1998	1999	2000	2001	2002
Volume collected	125.0	133.8	146.0	153.3	155.0
Volume treated	114.0	123.0	135.0	148.0	150.0
Volume recovered	23.3	25.8	28.6	31.5	36.0

### Access to improved water services

	1994	2002	2006
<b>Overall</b>			
Access to water	84.7%	93.9%	100.0%
Household access	70.1%	76.7%	98.5%
<b>Rural</b>			
Access to water	60.6%	83.2%	91.6%
Household access	25.1%	35.1%	53.4%

TND102.5million was spent on sewerage and wastewater treatment in 2002, with TND585million budgeted for 2002-06 (10<sup>th</sup> Plan), compared with TND392million for 1997-01 and TND234million for 1992-96. TND1,856millions has been budgeted for water services during 2002-06, with TND758 spent between 2002 and 2003.

Water is provided by the Société Nationale de Distribution des Eaux (Sonede), sanitation by the Office National de l'Assainissement (ONAS) and the Government collects the taxes. The water and sanitation charges are split into a fixed part and a part which varies according to the volume of water consumed. The fixed part is supposed to cover the cost of maintaining the network. The last tariff revision was in February 2003, the first since 1998. ONAS's financial results reflect the low tariff structure, with losses equivalent to 35% of turnover in 2004 compared to 18% in 2002. Sewerage costs are covered by a state subsidy. In 2004, this contribution represented TND56million, some 65% of user charges. In 2000, water and sewerage tariffs accounted for 0.93% of household spending.

### Water resources

Million m <sup>3</sup> , 1996	Surface water	Deep underground	Groundwater
Resources	2,700	1,210	719
<b>Usage</b>			
Irrigation	754	730	745
Drinking	200	165	0
Industry	0	85	0
<b>Total</b>	<b>954</b>	<b>980</b>	<b>745</b>

### Sewerage and sewage treatment

40% of households are connected to the sewerage network, with an urban connection rate of 78%. 199 towns will be connected to the sewerage network by 2011, with current sanitation plans for 160 towns. There are also plans to separate stormwater flows from sewage effluent in the country's earlier systems. Secondary treatment is being used wherever it is possible. There were 52 sewage treatment works in operation by 2000, treating 123million m<sup>3</sup> of water (51% of the total discharged) with plans to recover 200million m<sup>3</sup> for irrigation and amenity gardens by 2010. In 2004, 208million m<sup>3</sup> of waste water was collected; of which 193million m<sup>3</sup> was treated at 71 sewage treatment works. The level of connection of households to the network rose from 60% in 1994 to 81% in 2006. In urban areas, the number of households connected to the ONAS network rose from 0.67million in 1994 to 1.25million in 2005, representing 5.3million people on the basis of 4.24 persons per household.

### Sewage treatment development

Million m <sup>3</sup> pa	Plants	Capacity	Treated
1995	48	135	111
1996	50	140	120
2001	66	175	155
2006	83	185	165

**Privatisation projects and prospects**

The Tunis West Water Treatment Project is designed to promote the participation of the private sector in the management and financing of the country's infrastructure. The project involves the construction of a new water treatment facility with a capacity to serve 1.4million people by the 2023 target date. The European Investment Bank lent Tunisia EUR50million for encouraging the privatisation of businesses and utilities in December 1998. The Tunis West wastewater treatment plant proposal, serving 0.7-1.0million people is to be developed for USD100million via a 25 year BOT concession remains under consideration nine years after it was originally proposed in 1998.

Meanwhile, two WWTWs in Tunis are to be expanded: The Choutrana plant's capacity will be raised from 110,000m<sup>3</sup>/day to 150,000m<sup>3</sup>/day, with 40,000m<sup>3</sup>/day of capacity being added to the existing 80,000m<sup>3</sup>/day Sud Meliane plant. To meet demand by 2006, a further 100,000m<sup>3</sup>/day of capacity is required.

Sources:

Sihem Jebardi, 'Water and Soil Management in Tunisia' presentation, Lund, 3<sup>rd</sup> May 2005

African Development Bank/OECD (2007) African Economic Outlook

**TURKEY**

<b>Economics (2005)</b>	
GDP per capita	USD4,710
GDP per capita (PPP)	USD8,420
Agriculture	12%
Industry	24%
Services	65%

<b>Population</b>	
Total (2005, million)	72.1
Total (2015, million)	80.7
In urban areas (2005)	67%
In urban areas (2015)	72%
In urban agglomerations (2015)	30%

Water shortages in recent years have become a widespread problem that has been exacerbated by rapid urbanisation.

**Privatisation**

Turkey was one of the pioneers in the use of BOT contracts in the developing economies during the early 1980s. There is a high level of public support for privatisation, but political opposition and legal problems remain. Turkish courts are responsible for the operation of BOT concessions whereby the courts have to clear each project and all objections to them. This makes life difficult for international finance, whereby some form of independent international arbitration would be more attractive. It is widely expected that water privatisations will take place in the medium term. In this sense, Izmit (bulk water provision) and Antalya (O&M, water and sewerage) are groundbreaking contracts.

<b>Urban services</b>	
Safe drinking water	91%
Access to sewerage	84%
% Sewage treated	5%

**Sewerage and sewage treatment**

	1985	1990	1995	1998	2002	2002
Tertiary	0%	0%	0%	0%	0%	3%
Secondary	0%	1%	4%	8%	8%	21%
Primary	0%	7%	9%	9%	9%	12%
Sewerage only	N/A	N/A	50%	N/A	N/A	34%
Not connected	N/A	N/A	38%	N/A	N/A	32%

**International players noted**

Suez and Thames Water have a major presence in the country, while United Utilities/Bechtel and SAUR were involved in the bidding for Antalya.

**Spending plans**

The Istanbul Water and Sewerage Administration (ISKI) allocated USD450million for infrastructure projects in 2003, with an emphasis on sewerage and sewage treatment.

<b>Freshwater</b>	
Total (1998, km <sup>3</sup> )	196.0
Per capita (2000, m <sup>3</sup> )	3,171
Withdrawals (2000, km <sup>3</sup> )	37.5
For domestic use (2000)	15%
For industry (2000)	11%
For agriculture (2000)	74%

**Izmit**

Izmit had a troubled start because of the Turkish BOT award system delaying the start of the contract implementation process for nearly two years. Since then, the three year construction phase has been completed, and in 1999 the contract entered its 15 year operational phase. A reservoir supplies water to Izmit, the surrounding towns and villages and to Istanbul.

The project involved 100km of pipeline being built, connecting the reservoir to the city of Izmit. The reservoir has a capacity of 60billion L with an annual yield of 142billion L. The water treatment works is 5km downstream from the reservoir, and has a capacity of 480million L/day. The treatment facilities cost USD100million to build.

The project was 85% debt and 15% equity financed. USD140million of equity finance was provided by Thames Water (UK, 35%), Mitsui (Japan, 7.5%), Sumitomo (Japan, 7.5%), Gama (Turkey, 23%), Guris (Turkey, 12%) and the remaining 15% by the Izmit municipality. These investments are reflected in their respective holdings in Izmit Su As, the operating company. USD803million of debt finance was arranged. The principal components were: USD236million Export Credit Guarantee Department (ECGD) supported credit loan arranged by Nat West (UK), USD167million Turkish commercial loan, USD180million COFACE buyer credit loan, USD40million Japanese commercial loan and USD180million JEXIM credit loan.

<b>Groundwater</b>	
Total recharge (1998, km <sup>3</sup> )	20.00
Per capita (1998, m <sup>3</sup> )	314
Withdrawals (1990, km <sup>3</sup> )	6.3
For domestic use (1990)	43%
For industry (1990)	0%
For agriculture (1990)	57%

<b>MAJOR CITIES</b>			
<b>Population</b>	<b>2000</b>	<b>2015</b>	<b>Status</b>
Istanbul	8,953,000	11,362,000	Bulk water and wastewater PPP
Ankara	3,155,000	3,778,000	N/A
Izmir	2,214,000	2,704,000	Privatisation under consideration
Bursa	1,166,000	1,551,000	Privatisation under consideration
Adana	1,091,000	1,288,000	Short term WWTW BOT
Gaziantep	757,000	933,000	N/A

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Antalya	10 year O&M for water and sewerage	ANTSU
Istanbul	9 year wastewater DBO	WTE
Izmit	15 year concession, bulk water	Izmit Su SA
Antalya, Bursa, Fethiye, Izmir, Balikesir & Malatya	Wastewater treatment operation	Remondis-Sistem Yapi

#### **Adana – a short term wastewater treatment BOT**

Adana had a population of 1.22million in 2003. The city had no wastewater treatment facilities until a BOT contract was signed in 2001 with a consortium headed by VA Tech Wabag (Austria) funded through a EUR45million EIB loan. The two treatment plants entered service in 2004 and will be operated by VA Tech until 2007. They can treat 0.2million m<sup>3</sup>/day, a capacity which will be increased to 0.4million m<sup>3</sup>/day by 2015 and 0.52million m<sup>3</sup>/day by 2025, serving up to 2.6million people. In 2001, the city awarded MVV (Germany) a 2 year water leakage management contract, which has now been concluded.

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
ANTSU	Suez (France)	535,000	535,000	<b>535,000</b>
WTE	Energie (Austria)	0	2,000,000	<b>2,000,000</b>
Izmit Su As	RWE (Germany)	1,200,000	0	<b>1,200,000</b>
Remondis S-Y	Remondis (Germany)	0	4,000,000	<b>4,000,000</b>

## UGANDA

<b>Economics (2005)</b>	
GDP per capita	USD280
GDP per capita (PPP)	USD1,500
GDP in Agriculture	34%
GDP in Industry	21%
GDP in Services	46%

### The NWSC

The National Water and Sewerage Corporation (NWSC) is responsible for water provision to Uganda's main urban areas. It was formed in 1972 for the provision of urban water and sewerage services. Having started off in Kampala, Jinja and Entebbe, NWSC has extended its services to cover Masaka, Mbarara, Fort Portal, Kasese, Lira, Gulu, Tororo and Mbale. Water and sanitation service provision in rural areas and smaller urban centres is run by the Government's Directorate of Water Development, which also oversees the overall management of Uganda's water resources.

Until 1987 there were no formal measures to recover water fees, nor an effective charging system. NWSC therefore relied on Government subsidies, which in most cases have been inadequate. In consequence, operation and maintenance work and capital spending have been minimal except where directly supported by donor agencies. The water supply systems in the urban centres operated at less than 10% of capacity, providing services for about two hours a day, by 1985. Subscribers thus had to purchase untreated water from vendors.

<b>Population</b>	
2005 (million)	28.8
2015 (million)	41.8
Urbanisation in 2005	13%
Urbanisation by 2015	15%
In urban agglomerations, 2015	0%

### Commercialising the NWSC

In 1987, the Ugandan Government liberalised the economy. The NWSC was expected to strengthen measures for cost recovery, and become fully self-financing in its operations. With international credit guaranteed by the Government (but lent to NWSC at commercial interest rates), NWSC rehabilitated water and sewerage systems in nine major towns. Kampala had its water treatment works capacity expanded to meet the demand up to 1998. By 1997, service coverage in the area served by NWSC had improved to about 50%. In Kampala, an attempt had been made to improve revenue collection by privatising that department in late 1997. H.P Gauff, a German firm, was contracted to manage the Kampala Revenue Improvement Project (KRIP), but KRIP has been hampered by lack of administrative support.

Paid for water increased from 3-5% in the mid-eighties to 30% in 1993 and levelled off at 40% for the next three years. The collection of bills ranged between 60% and 100%. In consequence, since 1993, arrears have built up by an average of some UGX5billion pa. Revenues increased from UGX5.5billion in 1992 to UGX21.5billion in 1996 and operational expenditure rose from UGX5.0billion to UGX19.5billion, with NWSC attaining an operating profit in three of those five years. These were interim measures, since they did not take into account the NWSC's debt, which, is charged at the full rate of interest.

<b>Urban data</b>	
Served by piped water	60%
Access to sewerage	96%
With sewage treatment	0%

### Reforming the NWSC

In 1998, NWSC lost UGX4,200million, due to the cost of servicing its accumulated debt. The NWSC has seen seven phased performance enhancement programmes since William Muhairwe took over as Managing Director in November 1998.

#### Reform programme

<b>Programme</b>	<b>Duration</b>
100 Days	Feb 1999 – May 1999
SEREP I	Aug 1999 – Jan 2000
SEREP II	Mar 2000 – Aug 2000
GoU Contract I	Sep 2000 – Nov 2003
GoU Contract II	Dec 2003 –

Ndombolo ya Solo, the initial improvement programme addresses five areas: Bulk water and sewerage services, water distribution, revenues, cost reduction and customer care. Subsequent programmes have addressed management efficiency and operational delivery. The second Government of Uganda contract (GoU) has emphasised the internal delegation of management responsibilities, with rewards for performance against service targets for each of NSWC's cities.

### Programme implementation

	1997	1999	2001	2004
UFW* – Kampala	60%	53%	39%	38%
UFW* – others	44%	37%	28%	21%
Meter coverage	70%	80%	89%	93%
Connections pa	4,560	5,052	6,840	14,000
Debt age (days)	414	451	278	278
Staff/1000 connections	40	22	13	10
Water connections	47,412	53,824	65,021	100,475
Break even rate	3/12	5/12	10/12	12/12

\*-Unaccounted for water

NWSC profits rose by 180%, from UGX4.3billion (USD2.5million) in 2001 to UGX12.3billion (USD8million) in 2004, on the basis of increased water demand and network efficiency work. Revenues increased from UGX21billion in 1998 to UGX42.6billion in 2004. By the end of March 2005, there were 112,618 metered accounts and a total of 115,873 accounts, with an average of 2,000 new connections per month, partly due to a simplified customer connection procedure. Tariffs were not increased between 1994 and 2004. The NWSC increased water tariffs by 10%, from UGX10 (EUR0.0048) to UGX11 (EUR0.0053) per jerrycan (20L) in August 2004, equivalent to EUR0.27/m<sup>3</sup>. This was part of a programme to replace water vending with direct access to standpipes, as vendors have been selling water on to people at EUR2.40/m<sup>3</sup>.

L/capita/day	1998	2004
Production capacity	197	219
Actual production	123	152
Domestic sales	60	110

Customers living within 50 metres from the NWSC main water pipe were connected free of charge, along with paying their monthly water bills directly to the corporation. A connection fee of UGX50,000 (EUR23.90) was payable by customers living further from the pipe.

Freshwater	
Annual availability (1998)	39.0km <sup>3</sup>
Per capita	2,472m <sup>3</sup>
Annual withdrawal (2000)	0.2km <sup>3</sup>
Domestic	45%
Industrial	15%
Agriculture	39%

In 2005/06 six water systems were completed, along with the construction of water systems in a further 13 towns having started. Service coverage in the NWSC towns improved from 67% in June 2005 to 70% in June 2006, with UFW falling from 33.8% in 2005 to 29.3% by 2006, along with 22,000 new water connections in 2004/05 and 28,000 in 2005/06. The total investment requirements for achieving the Water Supply and Sanitation (WSS) MDGs range from USD1.5billion to USD1.85billion, including 32% for small towns and 16% for large towns. In 2006, 17 out of 53 small towns were able to cover their operation and routine maintenance costs. Funding comes from both the Government of Uganda and donors. In 2005/06, the total spending on water and sanitation sector was UGX103billion, 61% of which was financed by donors. 47% of the Medium Term Expenditure Framework (MTEF) allocation for water and sanitation was spent on urban water supply and sanitation.

### Long term plans

The Minister for Water, Lands and Environment stated in August 2000 that the Government plans to provide safe water and sanitation facilities to all Ugandans by 2015. In 2002, 40% of the population had access to safe water and 30% had access to adequate sanitation. 63% of the urban (NWSC) population has access to water services and 8% is connected to sewerage networks. A sewerage development object has been drawn up by the NWSC in 2005, which will cost EUR190million. A suitable funding mechanism is currently being sought.

### Privatisation prospects

Private sector involvement is in line with the NWSC statute, No 7 of 1995. The NWSC and politicians support some degree of privatisation and the current state of legislation is regarded as being adequate to take this forward. There have been some pilot projects using the private sector for community management in Jinja and Njeru and private sector involvement in arrears collection. The World Bank and the ODA have been involved with

the NWSC in the development of proposals for the contracting out of water and sanitation services. The Public Enterprises Reform and Divestiture (PERD) Statute No.9 of 1993 seeks to reform and divest public enterprises, with asset sales typically linked to a market listing. To date, the NWSC has yet to be formally included in the asset sale process. In 2000, the World Bank loaned Uganda USD48.5million for the Privatisation and Utility Sector Reform Project. This project is designed to improve the efficiency of utility operations, while encouraging the privatisation of them where appropriate. In January 2002, Ondeo was awarded an O&M contract for various O&M services in Kampala. The contract seeks to reduce losses and waste from the water distribution system, extend water metering, improve the customer data base, billing system and operate the water supply and sewerage systems in Kampala on an efficient and cost effective basis. This contract was viewed as a trial for greater PSP. Suez carried out a two year management contract with NWSC between 2002 and 2004, but decided not to seek to renew it when it expired in February 2004.

Private-sector firms operate under contract to local and central Governments for O&M services to water users in small towns that have piped water. Six private water operators responsible for water supply in 34 towns in Uganda have formed the Association of Private Water Operators in Uganda (APWO-Uganda) in 2003. These urban centres are small towns with populations between 5,000 and 15,000. Since 1994, these operators have connected 191,000 people to water services. In 2006, household connection rates in small towns were 35% where operated by the state and 65% when operated by the private sector.

<b>Groundwater</b>	
Annual availability (1998)	29.0km <sup>3</sup>
Per capita	1,360m <sup>3</sup>

Sources:

W T Muhairwe (2002). Strategies and challenges of improving water and sanitation service delivery – a case of National Water and Sewerage Corporation, Uganda. Water 21, Africa Energy Forum, London, July 2002.

W T Muhairwe (2005). Performance Improvement Programmes, the case of NWSC – Uganda, Managing Water Supply and Sanitation in Large Cities and Urban Areas WSP Workshop, 23-24<sup>th</sup> February 2005, Karachi, Pakistan

NWSC (2005) Review of Performance for the Period July 2004 – March 2005. NWSC, Kampala, Uganda

African Development Bank/OECD (2007) African Economic Outlook

## UKRAINE

### Water and sewerage connections in urban areas

Size of urban area	Water	Sewerage	Distribution loss
>300,000	88%	81%	27%
100,000 – 300,000	92%	85%	32%
50,000 – 100,000	75%	48%	34%
10,000 – 50,000	74%	45%	23%

In urban areas, the average water delivery is for 17 hrs/day, with 94% of drinking water samples meeting health standards. Some improvement in unaccounted water levels has been noted, with a fall from 47% in 1997 to 44% by 2001.

Service connections, 2001	Urban	Rural
Water connection	83%	26%
Sewerage connection	57%	9%

Most wastewater treatment plants were built between 1960 and 1980, with an average age of about 25 years. In cities with a population above 100,000 people, about 80% of wastewater treated is subject to secondary treatment, while in smaller towns, the average is at about 45%. Many of these plants only operate to primary treatment standard due to lack of maintenance and the need for chemicals and power.

### Cost recovery and realities

Billed revenues for Ukraine from centralised water and wastewater services accounted for EUR507million in 2001, with water fees rising 16 times more than other consumer goods and services (1.46million times against 89 thousand times) between 1992 and 2001. Although cost recovery has been an official aim since 1998, this remains some way away, with the average duration for collecting bills varying between 11.0 and 16.9 months between 1997 and 2001. In 2001, billings received met 77% of operating costs for water and wastewater services. Tariffs in 2001 for water and wastewater were the equivalent of USD0.158/m<sup>3</sup>, implying an average monthly spending of USD1.27/person.

Odesvodokanal is a case in point about the economics of non-cost recovery. The Odesa utility's 960,000m<sup>3</sup>/day water treatment works were rehabilitated between 1997 and 2001. Due to a lack of revenues (low charges and low bill collection rates) the Odesvodokanal utility was put into liquidation in 2006.

### Private sector responses

The first international loan for a water or wastewater project did not take place until May 1999. The EBRD has lent EUR26.5million to Zaporizhzhia Vodokanal, the water and sewerage entity serving the city of Zaporizhzhia's 500,000 people. The loan is being used to upgrade the city's water and sewage treatment works to improve the quality of the city's drinking water and to ease discharges into the Dnieper basin. The city was selected because it charges for its services on a cost recovery basis and is financially self-sufficient.

Sources:

DEPA (2003) Environmental Financing Strategy for the Municipal Water and Wastewater Sectors in the Ukraine. DEPA/DANCEE, Copenhagen, Denmark

OECD (2004) Urban Water Reform in Eastern Europe, Caucasus and Central Asia: Progress Since the Almaty Ministerial Conference, OECD, Paris, France

OECD (2004) Affordability, Social Protection, and Public Participation in Urban Water Sector Reform in Eastern Europe, Caucasus and Central Asia, OECD, Paris, France

## UNITED ARAB EMIRATES

The individual Emirates have experienced an increase in water demand of 10 to 40 times since 1970. Part of the water shortfall for agriculture and municipal gardens is to be met through a comprehensive programme of sewage treatment and effluent recovery. A study by the UAE's Federal Environment Agency states that from around 0.63million m<sup>3</sup>/day in 2000, consumption is expected to reach 2.3million m<sup>3</sup> in 2005 and 4.7million m<sup>3</sup> in 2010. While the annual recharge for groundwater in the UAE is 20million m<sup>3</sup>, the rate of groundwater extraction has been around 880million m<sup>3</sup> pa. In consequence, groundwater levels are falling by one metre every year for the past 30 years. In Dubai, water supply is currently 210,000 m<sup>3</sup>/day and is projected to rise to 660,000m<sup>3</sup>/day by 2020. Water demand for Abu Dhabi was 1.87million m<sup>3</sup>/day in 2003 and is forecast to rise to 3.12million m<sup>3</sup>/day by 2015.

### Privatisation in various forms is taking place

All the major combined power and desalination projects currently under development have a significant degree of private sector involvement. The emphasis has been shifting towards the private sector management of water and sewerage services. The UAE continues to seek ways of making privatisation play a positive role, by attracting international investors and reducing its budget burden. Bidders will need to emphasise technology transfer and training. The UAE envisages the positive use of water meters, cuts in subsidies and ending subsidies for expatriates. Water is currently sold at 25% below its cost price.

In September 2005, the Abu Dhabi Distribution Company (ADDC) sought proposals for an eight-year O&M contract for water and electricity services. A similar contract will be sought for the Al-Ain Distribution Company (AADC), Abu Dhabi's other water and power utility. The Abu Dhabi Water & Electricity Authority will also sell 40% in the two companies; 20% tranches will be sold to local institutional investors and a further 20% will then be offered through an initial public offering. ADDC has 170,000 water and 200,000 electricity customers while AADC has 50,000 water and 90,000 electricity customers.

### Ajman is the pioneering Emirate

The Emirate of Ajman has been one of the privatisation pace setters in the Gulf. KEOIC (Kuwait) and Black & Veatch (USA) were originally awarded a concession for all sewerage services and tertiary wastewater treatment in the Emirate of Ajman in 1996. The concession was delayed for five years before construction started in 2001 by United Utilities and was completed in 2003. Operations started in 2003, with Thames Water and Sharjah's Metito (Overseas) being awarded a 27.5 year operation and maintenance contract. Capital spending of USD140million was needed for the first phase, with revenues expected to be USD450million over the BOT's life. The system is designed to have a PE of 350,000, or 150,000 people connecting 45,000 properties. Costs are to be recouped via the charging of households and the resale of recovered water.

### Al Taweelah desalination facility

In Abu Dhabi, USD250million in capital spending for desalination and new resources is being mobilised between 1990 and 2010. Since 2005, 80% of water is provided by desalination. In Abu Dhabi, the Al Taweelah A-1 extension generated 40-50million gal/day and privatisation of its management is being considered. Al Taweelah A-2 was built for 2001 at a cost of USD700million. Al Taweelah A-2 was constructed on the coast of the Arabian Gulf north-east of Abu Dhabi. The facility has a water desalination facility capable of producing 50-76million gallons of water per day. Al Taweelah project stages:

Taweelah	72million gallons per day currently available
Taweelah A-1 expansion	40-50million gallons per day from 1999
Taweelah A-2	50-76million gallons per day from 2001
Taweelah A-3	70million gallons per day by 2010

### Sewage treatment works projects

All of the Emirates are considering the installation of comprehensive sewerage networks and sewage treatment works so as to optimise the retention of effluents. In Abu Dhabi, the 1982 Mafraq sewage treatment works served 330,000 people. It was upgraded to handle 210,000m<sup>3</sup>/day by the end of 1999 and 260,000m<sup>3</sup> by 2001. Sharjah's Al-Awir sewage treatment works underwent an expansion from 260 to 520m<sup>3</sup>/day at a cost of USD54million in 1997.

The Abu Dhabi Company for Sewage Services was formed in June 2005 as a public shareholding company with its shares held by Abu Dhabi Water and Electricity Authority (Adwea). The company will own all drainage facilities — including pipe network, pumping stations, treatment plants, maintenance and development of the sewage system in Abu Dhabi. Adwea may sell or cede all or some of its shares in the company through a public or private offer or auction.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	Contract	Company
Ajman	27 year wastewater concession	Moalajah

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Moalajah	VE (France)	0	235,000	235,000

**UNITED KINGDOM**

<b>Economics (2005)</b>	
GDP per capita	USD37,600
GDP per capita (PPP)	USD32,690
Agriculture	1%
Industry	26%
Services	73%

**Regulatory environment**

Water and sewerage in England and Wales is governed by the need to comply with UK national and EU environmental law and international conventions, along with providing the highest standard of customer service and value and by the principle that utilities should not exploit their monopoly position. Companies are subject to regulation from three principal bodies.

The Office of Water Services (Ofwat) is the Government appointed regulator for the privatised water utilities in England and Wales. Set up in 1989, its role is to ensure that all the private sector water companies provide good value for money in terms of services provided along with meeting specified water quality and certain environmental compliance targets. Since April 2006, Ofwat was succeeded by Water Services Regulatory Authority with a Board, a Chairman and a separate Chief Executive.

The Drinking Water Inspectorate (DWI) was established in 1990 by the Government to monitor the quality of water after it had been treated and at various stages of its distribution process. Its role is to ensure that potable drinking water is provided by the water service companies, and that it complies with Government, EU and World Health Organisation (WHO) standards. In 2003, 99.9% of the 2.8million samples taken by the DWI complied with these standards.

The Environment Agencies (England, Wales, Scotland and Northern Ireland) were established in 1995 to take over monitoring the quality, availability and use of all non-tidal waters in England and Wales, along with designated bathing areas. Since 1990, the EA has been markedly more aggressive towards polluters, regularly taking transgressors, including the water companies, to court. In 1992, the EA became increasingly concerned about over-abstraction of water from rivers and groundwater, and is advocating stricter water conservation strategies.

<b>Population</b>	
Total (2005,million)	60.2
Total (2015,million)	61.7
In urban areas (2005)	90%
In urban areas (2015)	90%
In urban agglomerations (2015)	23%

**Sewage treatment development**

	<b>1990</b>	<b>2000</b>	<b>2003</b>
Tertiary	13%	28%	35%
Secondary	62%	64%	57%
Primary	8%	2%	2%
Connected	84%	94%	95%

**Inland water quality**

The quality of inland waters has improved since 1990, as spending has increased on sewage treatment since the sector was privatised in 1989. The improvement in quality chiefly stems from setting mandatory targets for sewage treatment works performance, rather than the expansion of the sewage treatment infrastructure itself. The latter has made itself felt from 2000.

**Inland water quality (2001)**

<b>Category</b>	<b>1994-96</b>	<b>2001</b>
RE1/A Very Good	27.1%	31.0%
RE2/B Good	31.5%	35.2%
RE3/C Fair	21.2%	18.0%
RE4/D Fair	10.3%	8.2%
RE5/E Poor	8.8%	6.9%
Worse/F Bad	1.0%	0.4%

Inland waters in the UK are regarded as Europe's cleanest. This reflects the favourable geomorphology whereby short, fast flowing rivers discharge into the sea without the potential for pollution build-ups seen in longer rivers

such as in Germany or France. Between 1990 and 1998 there was a net improvement in water quality in 25% of the monitored length of rivers and canals in England and Wales.

### Competition

Since 1998, there have been three announcements by the Government and Ofwat allowing greater degrees of direct competition for the provision of water and sewerage services to industrial users. In 1998, users of more than 250ml pa were opened to competition. In 2000 this was extended to users of 100-249ml pa and in 2002 to all users of more than 50ml pa.

The industrial and commercial water market in England and Wales is worth GBP1.65billion, of which GBP1.26billion is accessible to competition under current conditions via inset appointments and common carriage agreements. The on site treatment of dilute industrial wastes is also open to competition, but this is a separate market with its own specialist players.

Competition for industrial water is at best developing slowly in England and Wales and it has become a reactive process whereby water tariffs are renegotiated to head off the threat of losing a large customer. This has led to a 'water broking' market developing where companies seek to gain such contracts on behalf of a client and in turn gain a percentage of the savings.

### The England and Wales major user market by client size

Market segment	Customers	Water	Sewerage	Sources
50-99 MI pa	1,900	GBP200million	GBP220million	Ofwat, 2002/Author
100-250 MI pa	1,500	GBP300million	GBP330million	Author/Author
<250 MI pa	500	GBP100million	GBP110million	DETR, 2000/Author
<b>Total</b>	<b>3,900</b>	<b>GBP600million</b>	<b>GBP760million</b>	

To date nine awards have been made, all of which were based upon licence variations, with the exception of Albion Water's (Enviro-Logic) Shotton Paper contract, where a new licence was granted, to mobilise a new source of water for the facility. Enviro-Logic advised Ofwat in 2000 that it was pursuing new 200 opportunities, while AWG was pursuing 55 at the time. Enviro-Logic stated that a total of 18 applications were at the discussion stage with Ofwat in April 2002. No further progress has been noted.

Sewage treatment		
England & Wales	2000	2005
Tertiary	13%	28%
Secondary	64%	56%
Primary	4%	0%
Connected	97%	98%
Scotland	2001	2005
Tertiary	16%	45%
Secondary	54%	44%
Primary	10%	2%
Connected	96%	92%
Northern Ireland	2000	2005
Tertiary	25%	N/A
Secondary	15%	N/A
Primary	10%	N/A
Connected	80%	N/A

AWG's Hartlepool Water is to supply water to a new industrial complex at Wynyard Park in Teesside. This is in place of Northumbrian Water, with customers being charged the same tariff as Hartlepool Water's existing customers, which is lower than Northumbrian Water's. AWG has also gained a service contract for RAF Finningley near Doncaster, which was previously served by the Ministry of Defence. This is within the service areas of Yorkshire Water (Kelda Group Plc). AWG has also gained the water provision contract from Essex and Suffolk Water Plc (Northumbrian) to Buxted Chickens. Hartlepool was acquired by AWG in order to boost AWG's presence in the region. Thames Water gained the PFI contract for water supply and sewerage upgrade for Tidworth Garrison against Southern and Wessex. The garrison serves water and sewerage to 11,000 people, 75% being service personnel and their dependants. The inset appointment is for a minimum period of 20 years. Thames Water will spend GBP3million in upgrading the current system and will be paid GBP640,000 pa for 20 years (GBP12.8million in total).

The Ministry of Defence's Project Aquatrine is also using the PFI scheme for three 25 year regional water and sewerage contracts serving 3,000 bases with a total capex of GBP1.1billion. The first award (A) was in June 2003 to Brey Utilities (Earth Tech & Kelda), worth GBP1billion in revenues. In November 2004, Nevis Water (RWE Thames Water) gained the contract for the operations in Scotland (B, revenues GBP0.9billion) and in January 2005, C2C (Severn Trent & Costain) gained package B, with total revenues of GBP1.0billion.

<b>Groundwater</b>	
Total recharge (1998, km <sup>3</sup> )	9.8
Per capita (1998, m <sup>3</sup> )	168
Withdrawals (1990, km <sup>3</sup> )	3.0
For domestic use (<1990)	51%
For industry (<1990)	47%
For agriculture (<1990)	3%

### Northern Ireland's Water Service

In 2003, the Government started considering the reform of Water Service (WS), Northern Ireland's water and sewerage services. WS was created as an agency of the former Department of the Environment for Northern Ireland in 1996. It serves 720,000 domestic, agricultural, commercial and business customers (1.7million people) across Northern Ireland against a backdrop of historic under investment and ageing water and sewerage infrastructure. Northern Ireland, along with the Irish Republic, does not directly charge for its domestic water and sewerage services. In August 2004, the Government decided that Water Services Northern Ireland will become a Government Owned Company from April 1<sup>st</sup> 2006. From 2008/09, the Water GoCo will be entirely self-financing, in time for the EU's Water Framework Directive's 2010 self-financing deadline. The implementation of household bills was postponed in 2007 to at least April 2008 and this matter has now been devolved to Stormont.

99% of households are connected to the water network, which supplies 710ml per day. Demand is forecast to grow by 150ml per day by 2030. In contrast, only 83% of households are connected to the sewerage network, and Water Service has to service 59,000 private septic tanks. Average leakage levels in Northern Ireland are 37% of treated water supplies. In 2003, WS aims to treat 56% of the population's effluents and it is already set to miss the EU's 2005 wastewater treatment targets by at least 20%.

#### (a) Scottish Water

Scottish Water was formed from the merger of North of Scotland Water, East of Scotland Water and West of Scotland Water in 2002. These in turn arose from the merger of 11 municipal entities in 1996.

The Water Industry Commissioner (Scotland's equivalent of Ofwat) has earmarked GBP1.8billion capital spending to be carried out between 2003 and 2006. Over the next four years, Scottish Water, through two private consortia (Stirling Water and United Utilities, under the title of Scottish Water Solutions), will upgrade water and sewage treatment facilities throughout the country. Scottish Water is responsible for 1,127 reservoirs and operates 441 water treatment plants and 643 sewage treatment works.

<b>MAJOR CITIES</b>			
<b>Population</b>	<b>2000</b>	<b>2015</b>	<b>Status</b>
London	7,640,000	7,640,000	Thames Water
Birmingham	2,272,000	2,272,000	Severn Trent
Manchester	2,252,000	2,252,000	United Utilities
Leeds	1,433,000	1,433,000	Kelda Group
Tyneside	980,000	1,026,000	Northumbrian Water
Liverpool	915,000	951,000	United Utilities

### PFI in Scotland and Northern Ireland

The Private Finance Initiative (PFI) is being used to help fund Scotland's sewage treatment compliance programme after it became evident that political and public opposition to privatising Scotland's water and sewerage assets and operations would be insurmountable. In 1993, the Government estimated that the cost of EU environmental compliance for these activities would be GBP5billion by 2005-10. The EU's UWWTD and its 2000 and 2005 compliance deadlines have driven the PFI in Scotland. While water and sewerage in Scotland and Northern Ireland remain public, they will be subject to constraints on spending and have limits on borrowings.

There are a total of 23 PFI sewerage schemes in Scotland, with an original value of GBP587million. Wherever possible, construction work was due to commence in 1998 with a completion date of 2000. In reality, there have been significant delays in the awarding process. For example, Aberdeen and Peterhead was only awarded to Kelda's consortium in August 1999, with completion of the main project in 2001 and for a further facility in 2005. A number of the original schemes have been grouped together in order to achieve economies of scale. The main schemes to date are as follows:

Scheme	Area	Value (GBPmillion)	Consortium
Almond Valley & Seafeld	East	100	Thames Water, MJ Gleeson & Montgomery Watson
Esk Valley	East	20	Thames Water, MJ Gleeson & Montgomery Watson
Levenmouth	East	50	Northumbrian and Degrémont
Ayrshire	East	50	Northumbrian, Degrémont and AMEC
Inverness & Fort William	North	45	United Utilities
Tay	North	84	United Utilities
Morray Coast	North	60	United Utilities
Aberdeen & Peterhead	North	80	Yorkshire Water, BICC & Earth Tech
Daldowie & Shieldhall	West	57	Caledonian
Dalmuir	West	50	Taylor Woodrow, SAUR, Stereau, Barr & Halcrow
Inverclyde	West	50	Northumbrian & Degrémont (Suez) & AMEC
Kinnegar	NI	10	UU & Lagan Holdings
Newry	NI	N/A	Earth Tech

In Northern Ireland, proposals are being developed for PFI financing through the Alpha (GBP174million on water treatment works, provisionally awarded to Earth Tech/Kelda) and Omega (GBP130million on wastewater treatment works) projects for implementation in by 2006. Further privatisation projects are under consideration.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
Location	Contract	Company
England & Wales	Project Aquatrine, Package A	Kelda/Earth Tech
England	Inset appointment for RAF Tidworth	Veolia Water
England	Inset appointment for RAF Finningley	Anglian Water
England	Inset appointment for Wynward Park	Anglian Water
England	Inset appointment for Buxted chickens	Anglian Water
England	Inset appt for brewery sewerage	Albion Water
Wales	Inset appointment for Shotton Paper	Albion Water
West Scotland	Daldowie sewage treatment PFI	Caledonian (ScottishPower)
West Scotland	Dalmuir sewage treatment PFI	SAUR (PAI)
West Scotland	Inverclyde sewage treatment PFI	Northumbrian Water Group
North Scotland	Inverness sewage treatment PFI	United Utilities
North Scotland	Moray Coast sewage treatment PFI	United Utilities
North Scotland	Tay sewage treatment PFI	United Utilities
North Scotland	Aberdeen sewage treatment PFI	Yorkshire Water (Kelda Group)
East Scotland	Esk Valley sewage treatment PFI	Veolia Water
East Scotland	Almond Valley sewage treatment PFI	Veolia Water
East Scotland	Ayr sewage treatment PFI	Northumbrian Water
East Scotland	Levenmouth sewage treatment PFI	Northumbrian Water
Northern Ireland	Kinnegar sewage treatment PFI	Hyder Infrastructure
Northern Ireland	Newry sewage treatment PFI	Earth Tech
Northern Ireland	Project Alpha (water treatment)	Kelda/Earth Tech

Only companies referred to in this book are mentioned in the above table. There is a number of specialist non-sewerage service companies involved in various PFI consortia. For the sake of brevity, only contract awards made since 1989 have been included in the above table, while the table below consolidates all of each company's contracts. For example, the Northumbrian Water Group entry represents two former SWCs, three PFI contracts and Northumbrian Water.

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
Anglian Water	Osprey (Canada/UK)	4,075,000	5,700,000	5,792,000
Dŵr Cymru	Glas Cymru (UK)	2,788,000	3,043,000	3,043,000
Northumbrian Water	Northumbrian Water (UK)	4,185,000	2,547,000	5,406,000
United Utilities	United Utilities (UK)	6,840,000	7,230,000	7,230,000
Severn Trent Water	Severn Trent (UK)	7,280,000	8,280,000	8,280,000
Southern Water	South Downs (UK)	2,200,000	4,170,000	4,170,000
South West Water	Pennon Group (UK)	1,516,000	1,394,000	1,516,000
Thames Water	Macquarie (Australia)	7,360,000	12,400,000	12,400,000
Wessex Water	YTL Holdings (Malaysia)	1,162,000	2,397,000	2,397,000
Yorkshire Water	Kelda Group (UK)	5,325,000	5,093,000	5,258,000
Bournemouth	Biwater Group (UK)	430,000	0	430,000
Bristol Water	Aguas de Barcelona (Spain)	1,066,000	0	1,066,000
Cambridge Water	CKI (China)	290,000	0	290,000
Cholderton Water	Cholderton Water (UK)	3,000	0	3,000
Dee Valley	Dee Valley Group (UK)	258,000	0	258,000
Veolia Water UK	VE (France)	3,310,000	585,000	3,310,000
East Surrey	Terra Firma (UK)	645,000	0	645,000
Portsmouth Water	South Downs (UK)	652,000	0	652,000
South East Water	Westpac (Australia)	2,069,000	0	2,069,000
South Staffordshire	First Islamic Bank (Bahrain)	1,233,000	0	1,233,000
Earth Tech	Tyco International (USA)	700,000	63,000	763,000

### The UK remains a pointer for the sector's future development

The complex nature of the relationship between the private sector and the various water entities in England & Wales, Scotland and Northern Ireland means that the UK is something of a testing bed for the private sector globally. Three new (or indeed secondary) markets have emerged over the past five years:

### Old markets – the implosion of the Statutory Water Companies

In 1989 there were 29 SWCs and the ten WaSCs. By 2007, while all ten WaSCs remained, there were 12 SWCs. More dramatically, while there were eight market listed SWCs in 2003, one remains today. Seven of the WaSCs have been acquired during this time, with one (NWG) having been re-floated.

Bournemouth & District	Merged with West Hampshire (Bournemouth & West Hants), 1994
Bristol Water	Acquired by Aguas de Barcelona (Spain), 2006
Cambridge Water	Acquired by Union Fenosa in 1999 and by CKI in 2004
Chester	Merged with Wrexham & East Denbighshire as Dee Valley, 1998
Cholderton Water	Independent, as Cholderton Water Ltd (privately held)
Coln Valley	Merged with Rickmansworth, as Three Valleys (Veolia), 1990
East Surrey	Merged with Sutton & District as Sutton & East Surrey, 1996
East Worcester	Acquired and absorbed by Severn Trent, 1993
Eastbourne	Merged with Mid-Sussex & West Kent as South East Water, 1994
Essex	Merged with Suffolk as Essex & Suffolk, 1994
Folkestone & Dover	Acquired by Veolia Water Services (Veolia, France), 1989
Lee Valley	Merged with Three Valleys (Veolia), 1994
Hartlepool	Acquired and absorbed by AWG, 2000
Mid Kent	Merged with South East, 2007
Mid Southern	Merged with South East as South East Water, 1999
Mid-Sussex	Merged with Eastbourne & West Kent as South East Water, 1994
Newcastle & Gateshead	Merged with Sunderland & South Shields, as North East Water, 1990
North Surrey	Merged with Three Valleys (Veolia), 2000
Portsmouth Water	Management buy out as South Downs (private equity), 2001
Rickmansworth	Merged with Coln Valley, as Three Valleys (Veolia), 1990
South Staffordshire	Acquired by First Islamic Bank (Bahrain), 2004
Suffolk	Merged with Essex as Essex & Suffolk, 1994
Sunderland & S Shields	Merged with Newcastle & Gateshead as North East Water, 1990
Sutton & District	Merged with East Surrey as Sutton & East Surrey, 1996
Tending Hundred	Acquired by Veolia Water Services (Veolia, France), 1989
West Hampshire	Merged with Bournemouth & District (Bournemouth & West Hants), 1994
West Kent	Merged with Eastbourne & Mid-Sussex as South East Water, 1994
Wrexham & E Denbigh	Merged with Chester as Dee Valley, 1998
York Waterworks	Acquired and absorbed by Kelda, 2000

In 1996 North East was absorbed into Northumbrian Water, followed by Essex & Suffolk in 2000.

### New markets (1) Outsourcing activities

In the run up to the 1999 Periodic Review, the idea of a Water Plc outsourcing its core activities was not a pressing issue. By the time the 2004 Periodic review had been completed, it was a fact of life in the sector; either as a company outsourcing its services to others or having its services outsourced. While much of the running has been taken up by companies such as Costain and Halcrow, UU, Thames Water, Wessex and Severn Trent amongst others, have all sought to enter this market. To date, UU has made the most progress, securing GBP3.3billion in utility related contracts across the UK during 2004-05 and revenues of at least GBP650million pa in the medium term.

#### United Utilities water outsourcing contracts

Year	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

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. In the case of Costain, this market now accounts for the majority of its revenues.

### New Markets (2) Repackaging debt

Companies have been refinancing existing and new debt and are looking at more creative and efficient ways to secure funding for the current capital programme.

AWG raised GBP400million from the capital markets in April 2005 through a repackaged bond at a coupon 0.125% lower than the original floating rate bond, reducing interest costs by GBP0.5million pa. The original bond, issued by Anglian Water Services Financing was sold on to Freshwater Finance, a special purpose vehicle. By selling the debt on, AWG was able to hedge its debt for interest rate exposure.

In 2004, Wessex and Northumbrian repackaged a total of GBP325million in existing debt as a monoline or wrapped issuance, allowing debt to be granted an AAA (the highest possible) rating through placing guarantees on assets and cash flow backing that portion of the company's overall debt. In this case, Lunar Funding Limited issued GBP325million in 5.75% senior bonds.

According to Standards and Poor's, water company debt has been responsible for 30% of European securitised bond activity since 1998, demonstrating how well the sector is suited to this form of packaging. This market has become increasingly important in England & Wales having been pioneered in the UK by Glas Cymru in 2001. AAA rated wrapped issuances would have typically gained a BBB to AA rating and therefore cost between 0.75% (AA) and 1.50% (BBB) more, or GBP7.5-15.0million pa in interest savings per GBP1.0billion of corporate debt. Southern Water's Artesian Finance issue is another important example of this type of deal.

The monoline insurers in structured finance are the leading creditors, as they have first call in terms of the covenants and trigger ratios providing mechanisms that stop money from being paid out from the appointed business if it got into financial difficulties. Interestingly, it has also become clear that lowly rated corporate debt (that left over from the structured rating process) is also of a high quality, as the improved financial performance of a company means that it is appreciably less risky than the markets have realised. This has resulted in further refinancings by Glas Cymru over the past two years, so that all of its corporate debt now has pretty low interest rates.

South West Water and York Water continue to exist, but only in the parallel universe of listed companies in the USA.

Anglian Water	AWG	Osprey (private equity), 2006
North West Water	United Utilities	Listed
Northumbrian Water	NWG	Bought by Suez, 1996/Re-Listed, 2003
Severn Trent Water	Severn Trent	Listed
Southern Water	Southern Water	Bought by ScottishPower 1996/Private equity, 2003
South West Water	Pennon Group	Listed
Thames Water	Thames Water	Bought by RWE, 2000/Private equity, 2006
Welsh Water	Glas Cymru	Bought by WPD, 2000/Not for profit company, 2001
Wessex Water	Wessex Water	Bought by Enron, 1998/Sold to YTL, 2002
Yorkshire Water	Kelda Group	Listed

In 1989 there were 29 SWCs and the ten WaSCs. By 2007, while all ten WaSCs remained, there were 12 SWCs. More dramatically, while there were eight market listed Statutory Water Companies in 2003, one remains today. Seven of the WaSCs have been acquired during this time, with one (NWG) having been re-floated.

### New Markets (3) Private equity

Of the eight SWCs that still had a market listing in 2000, Dee Valley Holdings alone remains as an independent, market listed entity. While Ofwat has expressed some regret about the loss of market listed companies, in the case of Mid Kent, it is a sale from one private equity fund to another and a subsequent merger with South East Water.

AWG, Southern Water, Thames Water, South East Water, Portsmouth Water, South Staffs Water and Sutton & East Surrey Water are all now held by private equity entities, demonstrating how the current regulatory climate has favoured the private equity approach over retaining a market listing since 2000.

The remaining SWCs and market listings versus private equity

Bournemouth & W Hants	Biwater (UK, privately held)
Bristol Water	Aguas de Barcelona (Spain)
Cambridge Water	CKI (China)
Cholderton Water	Cholderton Water Ltd (UK, privately held)
Dee Valley	LSE Listed
Folkestone & Dover	Veolia Water Services (Veolia, France)
Portsmouth Water	South Downs (UK, private equity)
South East Water	Westpac (Australia, private equity)
South Staffordshire	First Islamic Bank (Bahrain, private equity)
Sutton & East Surrey	Terra Firma (UK, private equity)
Tending Hundred	Veolia Water Services (Veolia, France)
Three Valleys	Veolia Water Services (Veolia, France)

This points to an emphasis on secondary markets in these companies, as the private equity funds seek to sell holdings on either to realise gains or cut their losses as the case may be.

Bournemouth & District	Merged with West Hampshire (Bournemouth & West Hants), 1994
Bristol Water	Acquired by Aguas de Barcelona (Spain), 2006
Cambridge Water	Acquired by Union Fenosa in 1999 and by CKI in 2004
Chester	Merged with Wrexham & East Denbighshire as Dee Valley, 1998
Cholderton Water	Independent, as Cholderton Water Ltd (privately held)
Coln Valley	Merged with Rickmansworth, as Three Valleys (Veolia), 1990
East Surrey	Merged with Sutton & District as Sutton & East Surrey, 1996
East Worcester	Acquired and absorbed by Severn Trent, 1993
Eastbourne	Merged with Mid-Sussex & West Kent as South East Water, 1994
Essex	Merged with Suffolk as Essex & Suffolk, 1994
Folkestone & Dover	Acquired by Veolia Water Services (Veolia, France), 1989
Lee Valley	Merged with Three Valleys (Veolia), 1994
Hartlepool	Acquired and absorbed by AWG, 2000
Mid Kent	Merged with South East, 2007
Mid Southern	Merged with South East as South East Water, 1999
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Newcastle & Gateshead	Merged with Sunderland & South Shields, as North East Water, 1990
North Surrey	Merged with Three Valleys (Veolia), 2000
Portsmouth Water	Management buy out as South Downs (private equity), 2001
Rickmansworth	Merged with Coln Valley, as Three Valleys (Veolia), 1990
South Staffordshire	Acquired by First Islamic Bank (Bahrain), 2004
Suffolk	Merged with Essex as Essex & Suffolk, 1994
Sunderland & S Shields	Merged with Newcastle & Gateshead as North East Water, 1990
Sutton & District	Merged with East Surrey as Sutton & East Surrey, 1996
Tending Hundred	Acquired by Veolia Water Services (Veolia, France), 1989
West Hampshire	Merged with Bournemouth & District (Bournemouth & West Hants), 1994
West Kent	Merged with Eastbourne & Mid-Sussex as South East Water, 1994
Wrexham & E Denbigh	Merged with Chester as Dee Valley, 1998
York Waterworks	Acquired and absorbed by Kelda, 2000

In 1996 North East was absorbed into Northumbrian Water, followed by Essex & Suffolk in 2000.

**YEMEN**

Annual renewable water resources are estimated at 2.5billion m<sup>3</sup> pa, equivalent to 140m<sup>3</sup>/person pa, compared with the Middle East and North Africa average of 1,250. By 2005, consumer demand in the country is expected to rise to 3.42billion m<sup>3</sup> pa, a shortfall of 920million m<sup>3</sup> pa. The uneven nature of water resources means that 90% of the population has less than 90m<sup>3</sup> annually for domestic use, some 10% below the worldwide norm. 44% of the population have access to mains water supply and only 12% to safe sanitation. 50% of Sanaa's 1.7million residents have access to piped water. For the rest, water vendors cost some YER2,800/month (USD15).

According to the UNDP and other donors, the exhaustion of the usable non-renewable groundwater stock (estimated at about 3billion m<sup>3</sup>) will occur by 2010-2020, meaning that total water availability in the Lusaka Basin would be then limited essentially to the estimated annual natural recharge of 30-50million m<sup>3</sup> which is equivalent to the present level of domestic and industrial water use.

Yemen depends almost entirely on some 45,000 wells that are being rapidly depleted by poor management and wasteful irrigation methods. Up to 60% of water consumed in Yemen is used for irrigating qat, a mild narcotic plant popular in Yemen and the Horn of Africa, which has been cited as an impediment to economic development.

In 2002, the World Bank approved a EUR134million (USD130million) loan to upgrade water supply and sanitation services in urban communities. Through improved operation and reduction of water losses, the project will increase water supplies and provide affordable sewerage facilities, which will enable wastewater to be reused for agriculture. Cost recovery mechanisms will be introduced. This is to be linked to creating opportunities for PSP in the longer term.

Also in 2002, the World Bank and IDA announced that it was inviting prequalification bids for a lease contract for the provision of water and wastewater services for Sana'a's Water Supply and Wastewater Services Local Corporation (SWSWSLC). In the Sana'a basin, where 10% of the population live, it was estimated in the mid 1990s that water extraction (224million m<sup>3</sup>) exceeded the level of recharge (42million m<sup>3</sup>) by over 400%. In Amran water levels have dropped 60m during the last twenty years and by 30 metres between 1995 and 2000.

In 2004, Yemen completed the preparation of a ten year, integrated water and environmental sector strategy, action plan and investment program. The National Water Sector Strategic Investment Plan (NWSSIP), supported by WSP-Africa and other partner organisations, is the first sectoral strategy in Yemen to clearly define targets and achievement indicators for each sub-sector, and provide institutional arrangements that allow for measuring progress towards program goals. In January 2005, representatives of key donors active in the water sector in Yemen signed a Declaration of Support for the NWSSIP, which is expected to become fully operational by the end of the year. Including irrigation, the NWSSIP calls for USD1.54billion in investment.

There are currently 20 WWTPs in Yemen, either operating, under construction or at the design stage, with a total treatment capacity that will reach about 200,000m<sup>3</sup>/day. These are mainly waste stabilisation pond systems, which can effectively be combined with irrigation agriculture for effluent recovery and reuse. In 2003, Yemen's Water and Sanitation Corporation invited contractors to pre-qualify for a contract to design and build a 10,000m<sup>3</sup>/day extension to the existing Ibb sewage treatment plant. The work will be financed by Germany's KfW and the Government.

Source:

EBay R & Hall J (2005) Effluent and Sludge Management in Yemen, MWH Arabtech Jardaneh, Sana'a, Yemen

**ZAMBIA**

During 2002, Zambia embarked on water resources reform through the Water Resources Action Program (WRAP) under the Ministry of Energy and Water Development (MEWD). The program, supported by the Water and Sanitation Program's (WSP) Zambian office, aims to develop a new institutional and legal framework to manage the water resources of the country, promoting poverty alleviation and sustainable development. The process will encourage the engagement of policymakers and public-private sector discussions.

Officially, access to water supply in 2002 was 89% for urban and 57% for rural populations while access to sanitation was 73% and 35% for urban and rural areas respectively. However, due to non-functioning facilities the actual service coverage in both urban and rural areas is much lower, with estimates of the effective coverage in urban areas of 54%, while rural access to safe drinking water and sanitation in 2004 was assessed at 28% and 30% respectively. The peri-urban population with access to improved water supply is 44% and 10% for sanitation. The Government aims to increase urban water supply and sanitation coverage to 75% by 2005 and 100% by 2015, and for rural water supply to 50% by 2005 and 75% by 2015.

50 out of 72 local authorities have established nine commercial water utilities (CUs) in urban areas, which are expected in the long term to be commercially viable. CUs are responsible for service provision to 86% of the urban population; the remaining areas are serviced either by 22 local authorities (13%) or private providers (1%). Commercialisation has been crucial to sustaining improvement in service delivery. The CUs have extended water supply coverage (from 58% in 2004/05 to 73% in 2005/06). Six out of nine commercial utilities had reached operational cost coverage by the end of 2006.

The Aruba municipality's Water and Sewerage Company (KWSC) has instigated water kiosks for the 13,000 people in Kalikow community, where residents can buy water at a nominal fee of ZMK2 (EUR0.01). The 19 kiosks will include a tap connected to the municipality's water pipeline, and are manned by a member of the community who fills the residents' containers with water.

Unaccounted for losses in urban areas are at 51%, with only 21% of accounts being metered. Chapatti Water Supply Company, which has a 100% metering rate, has by some way the lowest UFW levels at 25%.

In Lusaka, the water sector estimated generated revenues of ZMK260million in 1999 through billing with expenditure requirements of ZMK1.5billion for recurrent expenditures alone. Capital spending was ZMK5.23billion in 1998 and ZMK5.09billion in 1999. If all potential revenues were collected under the current pricing regime, these could have totalled up to ZMK1.52billion in 1999, indicating that new sources of finance are required for capital expenditure work. In order to cover capital expenditure, the LWSC needs the following:

- up-dating of the water right holder data base;
- an efficient billing system;
- functioning revenue collection system;
- inclusion of ground water tariffs; and
- regular adjustments of tariffs to ensure that the real value of revenues is not being eroded.

In 1998, the Water Sector Reform Unit estimated that for 86 – 100% water and sanitation coverage by 2015, USD683million would be needed for the urban population and USD247million for rural areas.

In 2002, a PSP workshop was held by the World Bank to consider options for the LWSC (Lusaka Water and Sewerage Authority). Lease and concession models were considered to be the most appropriate for the city. In 2003, Nana Water and Sewerage Company became the first company to issue a municipal bond on the Lusaka Stock Exchange (LSE). The bond is intended for a water provision project in which the company would be building a pipeline from Kitwe to Kalulushi.

Source:

African Development Bank/OECD (2007) African Economic Outlook

# **PART 3(i): COMPANY ANALYSIS: MAJOR PLAYERS**

**SAUR (France)/PAI (France)**

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 is to sell SAUR to a consortium comprising of Caisse des Dépôts et Consignations, Séché Environnement and Axa Investment Managers.

**Saur/Novasaur**

Y/E (EURmillion)	2003 [1]	2004 [1]	2005 [2]	2006 [3]	2006 [4]
Net sales	1,591.6	1,570.3	309.5	1,397.4	1,095.0
Operating income	87.8	91.1	2.7	75.2	70.9
Pre-tax income	67.4	83.8	-5.9	10.6	30.1
Post-tax income	-2.8	7.9	-4.1	4.0	20.0
Net income	-16.7	-2.5	-4.6	-27.3	0.0

[1] 2003 & 2004: Y/E 31/12

[2] 2005: 3 months to 31/03

[3] 2006: Y/E 31/03

[4] 2006: 9 months to 31/12

**SAUR water services revenues**

SAUR (EURmillion)	2004	2005	2006 [1]	2006 [2]
Saur France	832.4	842.3	896.1	714.4
Saur International	80.6	86.3	94.5	70.0
Total	913.0	928.6	990.6	784.4

2004 Y/E is to 31/12, 2005 & 2006 [1] Y/E is to 31/03

2006 [2] is for the 9 months to 31/12

The new entity, including Steerau (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, 94% of SAUR's 2004 revenues came from France (65% Saur, 21% Coved & 8% Stereau).

**SAUR, population served**

Country	Water	Sewerage	Total
France	5,500,000	5,500,000	<b>5,500,000</b>
Argentina	1,140,000	950,000	<b>1,140,000</b>
China	3,500,000	0	<b>3,500,000</b>
Armenia	1,447,000	1,000,000	<b>1,447,000</b>
French Overseas Territories	359,000	14,000	<b>359,000</b>
Poland	502,000	505,000	<b>505,000</b>
Scotland	0	400,000	<b>400,000</b>
Spain	2,210,000	700,000	<b>2,210,000</b>
<b>Total – Outside France</b>	<b>8,018,000</b>	<b>2,619,000</b>	<b>8,421,000</b>
<b>Global total</b>	<b>13,518,000</b>	<b>7,819,000</b>	<b>13,621,000</b>

**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 were retained.

**UK – Scotia Water**

1999	Dalmuir, Glasgow	25 year PFI BOT	600,000, PE sewage treatment
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Scotia Water (SAUR UK/Stereau (SAUR), Innisfree, Taylor Woodrow, Barr & Halcrow) are to construct 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 Spain, SAUR holds 32% of Aguas de Valencia (AgVal). SAUR's EMALSA (EUR46million unconsolidated turnover in 2003), Gestagua (EUR29million unconsolidated turnover in 2003) and AgVal serve water to 2.2million people and sewerage to 700,000 people (see separate entry for AgVal). EMALSA and Gestagua had a consolidated turnover of EUR46million and EUR30million in 2003 respectively. AgVal's water provision contract for Valencia was renewed for 50 years in 2002. It has been in operation since 1904 and covers 780,000 people.

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 374,000 people and sewerage and sewage treatment for 300,000 people. Gestagua provides water to 380,000 people and sewerage and sewage treatment for 159,400 people.

## Gdansk, Poland

SAUR Neptune Gdansk, a water and sewerage management JV with the municipality of Gdansk, started in late 1992 and runs until 2010. The venture is charging PLN13.95/m<sup>3</sup> (USD0.184) for drinking water and PLN3.45 /m<sup>3</sup> (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 55% in 1992 to 10% in 1999, with water consumption falling by 43%. STWs now operate at secondary level and are to be upgraded to tertiary level standard in line with the UWWTD. The contract generated sales of EUR30million in 2003 and EUR31million in 2004.

## Armenia

2004	National	Four year O&M	1.447 million water & sewerage
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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
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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 (518,050 m<sup>3</sup>/day) and 3,550L/sec (302,400 m<sup>3</sup>/day) respectively. The contract was rescinded in 2006.

## West Indies and Reunion Island

Three contracts for the various French Overseas Territories.

	La Réunion	Martinique	Guadeloupe	Total
<b>Water provision</b>				
Connections	86,726	22,084	10,575	119,385
People served	260,000	68,100	31,100	359,200
<b>Sewage treatment</b>				
People served	13,500	2,618	2,425	14,043
<b>Turnover (EURmillion, 2001)</b>	<b>27.0</b>	<b>8.5</b>	<b>6.9</b>	<b>42.4</b>

## China – Shanghai Fengxian SAUR Water (SFSW)

2001	Shanghai Fengxian	28 year concession	700,000 water provision
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Shanghai Fengxian is a district to the south-west of Shanghai. The plant, operated by SFSW, has a production capacity of 100,000m<sup>3</sup>/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
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This is a 0.225million m<sup>3</sup>/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: PAI Partners  
Address: 43, avenue de l'Opéra  
75002 Paris, France  
Tel: +33 1 55 77 91 01  
Web: [www.paipartners.com](http://www.paipartners.com)

Amaury de Seze (Chairman & CEO)  
Dominique Mégret (Deputy Head)  
Michel Paris (Senior Partner, Consumer Services)

**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](http://www.saur.com)

Nordine Hachemi (Chairman, SAUR)  
Christian Jacqui (Managing Director, SAUR)  
Patrick Barthelemy (Deputy CEO, SAUR France)

## SUEZ SA

Suez SA, through SUEZ Environment its branch of environmental activities, 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 and its consultant engineering specialist Safège. SUEZ Environment currently works in more than 70 countries. The Group supplies 68million people with drinking water and provides 44million people with sanitation services. Through its Ondeo Industrial Solutions subsidiary, it also provides services to industrial customers. Historically, Europe is the home ground for the development of SUEZ Environment and remains its reference market (79% of its sales turnover). SUEZ Environment manages the water and sanitation services or the construction of their infrastructures of some major cities like Shanghai, Casablanca, Perth, Jakarta, Barcelona, and Algiers.

On September 2007, Suez and Gaz de France announced their merger and the spin off of SUEZ Environment, the environmental activities within the SUEZ Group.

### Suez, profit and loss account

Y/E 31/12 (EURmillion)	2002	2003	2004	2005	2006
Turnover	46,784	39,622	38,058	41,489	44,289
Operating income	3,708	3,205	3,737	3,902	4,497
Net income	-863	-2,165	1,696	2,513	3,606
Earnings/share (EUR)	-0.87	-2.18	1.70	2.39	2.86
Dividends/share (EUR)	0.71	0.71	0.79	1.00	1.20

Société Lyonnaise des Eaux et de l'Éclairage 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 Financière 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'Éclairage founded
1914-46:	Activities in Morocco, Tunisia, Togo, Congo & New Caledonia
1939	Degrémont, a water treatment company, is created in Paris.
1948	Degrémont builds the first drinking water treatment plant in Egypt.
1958:	300,000 subscribers in France
1972:	Acquisition of Degrémont
1975	First reverse osmosis desalination plant in Riyadh, Saudi Arabia.
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 F7.4 billion
1996:	Buys out Eau et Force SA
1997:	Creation of Suez Lyonnaise des Eaux, the world leader in community services, further to the merger between Suez and Lyonnaise des Eaux.
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:	Suez Lyonnaise des Eaux becomes SUEZ. Its water business in France is consolidated under the name Lyonnaise des Eaux.
2002:	Consolidation of the environment business of SUEZ within a single branch
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 waste activities sold
2007:	Contract closed in Bolivia, expansion in USA, MENA, India & China
2007-2008	As part of the GDF SUEZ merger project, creation of the only industrial Group exclusively dedicated to water and waste services: SUEZ Environment.

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 customers (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.

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 & Electabel) 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	
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	Fiesole (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, & Hungary
1995	55	9	Czech Republic, Hungary, China, Brazil & Colombia
1996	57	16	USA, Colombia, UK, Germany, Australia
1997	82	17	USA, Bolivia, Colombia, Mexico, Argentina, Morocco, Hungary, Turkey, China, Indonesia & Philippines
1998	89	16	USA, Colombia, Uruguay, Mexico, Germany, China, Indonesia & Australia
1999	100	16	USA, Mexico, Chile, Germany, Norway, Slovakia & Italy
2000	108	10+	Australia, Chile, China, Cameroon, Brazil, Mexico, Germany & Korea
2001	110	5+	Korea, China, Chile, Mexico, Ireland
2002	131	25+	Taiwan, Canada, China, Mexico, Puerto Rico, Jordan, USA
2003	121	3+	Italy
2004	117	5+	Mexico, Russia, China
2005	120	5+	Australia, Morocco, Algeria
2007	115	7+	Qatar, Oman & China
2006	117	4+	Australia, Saudi Arabia, China, Spain & USA
2007	123	5+	India & 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 Argentinian 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	2003	2004	2005	2006
Water provided	Million m <sup>3</sup> pa	7,291	5,599	5,154	3,213
Process water	Million m <sup>3</sup> pa	47	61	74	78
Sewage/effluent treatment	Million m <sup>3</sup> pa	2,396	2,244	2,160	2,017
Water coverage	People within contract area	93%	92%	93%	92%
Sewerage coverage	People within contract area	78%	78%	84%	95%
Water network efficiency	Water reaching customers	73%	73%	73%	75%

The decrease in water delivered and sewage treated reflects the ending of some major contracts.

**Suez Environnement, profit and loss account**

Y/E 31/12 (EURmillion)	2003	2004	2005	2006
<b>Revenues</b>				
European Water Services	3,944	4,115	3,500	3,800
European Waste Services	4,923	4,420	4,600	5,000
International/Other	3,442	2,871	2,040	1,600
Degremont	N/A	N/A	960	1,038
<b>Total</b>	<b>12,310</b>	<b>10,538</b>	<b>11,089</b>	<b>11,439</b>
<b>EBITDA</b>				
European Water Services	597	595	651	N/A
European Waste Services	793	733	746	N/A
International/Other	554	437	517	N/A
<b>Total</b>	<b>1,944</b>	<b>1,765</b>	<b>1,914</b>	<b>1,983</b>

**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
<b>Total</b>			<b>9,676,000</b>

2004	Location	Contract	Population served
Colombia	Bogota	Wastewater BOT	1,500,000
Puerto Rico	Puerto Rico	Water & wastewater O&M	3,900,000
<b>Total</b>			<b>5,400,000</b>

2005	Location	Contract	Population served
Australia	Perth	Desalination DBO	250,000
Argentina	Santa Fe	Water & wastewater BOT	1,830,000
<b>Total</b>			<b>1,830,000</b>

2006	Location	Contract	Population served
Argentina	Córdoba	Water & wastewater BOT	1,270,000
Argentina	Buenos Aries	Water & wastewater BOT	7,900,000
Australia	Gold Coast	Waste water reuse DBO	60,000
Brazil	Limeira	Water & w/water concession	1,656,000
Brazil	Manuas	Water & w/water concession	1,656,000
<b>Total</b>			<b>10,726,000</b>

2007	Location	Contract	Population served
Bolivia	La Paz	Water & wastewater BOT	1,400,000
<b>Total</b>			<b>1,400,000</b>

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 EUR3.1 billion 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 USD4.35 billion. Nalco and Calgon were acquired for USD4,157 million and USD406 million respectively in 1999.

**Suez, populations served by country**

Country	Water	Sewerage	Total
France	12,300,000	9,000,000	<b>21,300,000</b>
Belgium	300,000	0	<b>300,000</b>
Czech Republic	2,165,000	2,165,000	<b>2,165,000</b>
Germany	272,000	642,000	<b>642,000</b>
Hungary	2,255,000	255,000	<b>2,255,000</b>
Ireland	0	220,000	<b>220,000</b>
Italy	2,740,000	2,740,000	<b>2,740,000</b>
Russian Federation	1,000,000	0	<b>1,000,000</b>
Slovakia	150,000	150,000	<b>150,000</b>
Slovenia	0	190,000	<b>190,000</b>
Spain *	12,347,000	13,380,000	<b>16,000,000</b>
Chile*	5,420,000	5,300,000	<b>5,420,000</b>
Mexico	5,080,000	5,380,000	<b>9,880,000</b>
United States	6,350,000	250,000	<b>3,250,000</b>
Australia	3,000,000	110,000	<b>3,110,000</b>
New Zealand	0	160,000	<b>160,000</b>
China & Macao	14,400,000	1,500,000	<b>15,900,000</b>
India	4,000,000	0	<b>4,000,000</b>
Indonesia	3,800,000	0	<b>3,800,000</b>
Malaysia	1,565,000	0	<b>1,565,000</b>
Philippines	4,300,000	500,000	<b>4,300,000</b>
South Korea	0	900,000	<b>900,000</b>
Taiwan	3,000,000	0	<b>3,000,000</b>
Cameroon	5,300,000	0	<b>5,300,000</b>
Jordan	2,500,000	2,500,000	<b>2,500,000</b>
Morocco	3,800,000	1,300,000	<b>3,800,000</b>
Algeria	3,500,000	3,500,000	<b>3,500,000</b>
Qatar	0	700,000	<b>700,000</b>
Oman	500,000	0	<b>500,000</b>
Saudi Arabia	3,500,000	0	<b>3,500,000</b>
South Africa	700,000	280,000	<b>700,000</b>
Turkey	535,000	535,000	<b>535,000</b>
<b>Total outside France</b>	<b>92,729,000</b>	<b>43,682,000</b>	<b>105,502,000</b>
<b>Global total</b>	<b>109,729,000</b>	<b>52,682,000</b>	<b>122,502,000</b>

\* Except where stated, via Aguas de Barcelona

**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.

**BAL-ONDEO:** A 50/50 JV with Peñoles. Peñoles, which is part of BAL Group, has integrated operations in the areas of exploration, mining, metallurgy and chemicals, and it's the world's largest producer of refined silver

**Suez and Agbar**

In 2007, Suez, La Caixa, and HISUSA (51% Suez Environment, 49% Caixa Holding), which jointly own 49.7% of Agbar, launched a public tender offer for Agbar's outstanding shares. After the offer, Agbar will retain its listing on the Spanish stock exchange, with a free float of around 30-33%. Suez currently uses Agbar to represent all of its water services interests in South America.

## 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

Suez 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 1.5 million people. In 2006, Suez provided 12.3million people with water and 9million with sewerage services, where it has since remained. The sewerage market is growing at an appreciably faster rate than the water market. The company currently has 2,470 contracts with various municipalities and communes in France, representing 19.4% of the water and 18% of the sewerage market. In 1997, Suez acquired all the outstanding shares in Degrémont SA.

City/Commune	Duration	Revenues
Dunkirk	12 years	EUR140million
Creilloise	12 years	EUR96million
Vallauris Golfe-Juan	20 years	EUR80million
Syndicat des Eaux Rhone Ventoux	8 years	EUR70million
Le Vestinet	18 years	EUR34million
Verneuil-Vernouillet	20 years	EUR29million

A further five contracts gained/retained during 2005 will generate cumulative revenues of EUR179million. It is likely that there may be increased pressure for the market to be seen to open up in the future. 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.

## Spain

Suez's main involvement in Spain is through its 25.8% stake in Aguas de Barcelona's (Agbar) equity, via its 51% holding of Hisusa SA, which in turn holds 47% of Agbar, along with its direct 1.5% holding in the company. Agbar's activities are described in a separate entry.

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 200,000 m<sup>3</sup> 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<sup>3</sup>/day, rising to 80,000 m<sup>3</sup>/day in the tourist season. Degremont anticipated operating plants desalinating at least 2million m<sup>3</sup>/day of water worldwide by 2009.

## 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.

1998	Aque Toscane	3 concession contracts	4,000 water and sewerage
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Suez holds 100% of Aqua Toscane, which concentrates on water provision for Fiesole, Montecatini Terme and Ponte Buggianese.

1999	Arezzo	25 year concession	350,000 water and sewerage
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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 the Nuove Acque, with 54% being held by public entities. The contract was formally signed in June 1999. The concession will in turn form a JV with the 37 communes involved.

2003	Pisa ATO	ATO privatisation	800,000 water & wastewater
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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 ATO	ATO privatisation	350,000 water & wastewater
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A 40% equity stake in the Acquedotto del 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
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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.

### Ireland

2002	Cork	22 year BOT	220,000 wastewater treatment
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The EUR70 million contract is part of a EUR270 million drainage and effluent treatment scheme for the city, which is due to be completed in 2004. The STW will have a 270,000m<sup>3</sup> capacity with a PE of 440,000, half being for industrial clients.

### Slovakia

1999	Trencin	20 year lease	150,000 water & wastewater
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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
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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 Degremont 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
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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 Fővárosi Vízművek (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
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In 2006 Degremont and Veolia, along with Hídépítő and Alterra, two local civil works companies, gained a EUR290million contract to build (EUR249million) and operate for four years (EUR40million) a 350,000 m<sup>3</sup>/day wastewater treatment works (wet weather capacity 900,000 m<sup>3</sup>) 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
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Suez holds 48% of the operating company, with the municipality holding the remaining 52%.

1995	Kaposvar	25 year lease	75,000 water & sewerage
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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
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Karlovy 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<sup>3</sup> 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
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Suez currently holds 50.07% of OVAK. 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
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EVN's WTE awarded the BOOT contract to Degrémont in June 2004. The 275,000m<sup>3</sup>/day plant will provide potable water to South West Moscow from 2007.

**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.

2004	Cottbus	25 year partnership	147,000 water & sewerage
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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
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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<sup>3</sup> of water and the treatment of 1.3million m<sup>3</sup> 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<sup>3</sup> pa.

1994	Goslar	25 year concession	55,000, sewerage
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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
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In February 2000, a concession was signed for services to the city of Kriensen.

2001	Schwerin	Participation	100,000 water & sewerage
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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.

### Turkey

1997	Antalya	10 year O&M	535,000 water & wastewater
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This is a delegated management contract for the Antalya Water and Sewerage Authority. Suez beat Thames Water, 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
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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<sup>2</sup> 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 18<sup>th</sup> 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.

The water contract is worth MAD5billion (USD517million) for the expansion and upgrading of water distribution and treatment. Over 80% of the population is currently connected, which will increase to 85% in 5 years, 90% in 10 years and 100% in 20 years, with price rises in years 2 and 3. The wastewater contract is worth MAD16billion (USD1.6billion). 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 0.2million m<sup>3</sup> pa have been dealt with since 1997, equivalent to 5% of water delivered.

2000	Oum Er Rbia	30 year concession	Bulk water provision
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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<sup>3</sup> of water to the city, generating EUR305million over the concession's life.

2005	Marrakech	5 year DBO	1million, wastewater treatment
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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
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This is a 605,000 m<sup>3</sup>/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
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This is a 262,500 m<sup>3</sup>/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 management contract	3.5million, water & wastewater
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The contract is initially worth EUR120million. 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'Algiers (SEAAL), 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
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Barka 2 is the first private sector water and power facility in Oman. The contract was gained by SUEZ Energy International with Oman's National Trading Company and Mubadala. Degrémont is the sub-contractor for the desalination plant.

**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.

2007	Jubail	23 year BOOT	3.5million, water desalination
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In June 2007, financing was completed for the USD3.44billion required by the independent power and water project. 800,000 m<sup>3</sup>/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	2.5million water & wastewater
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The contract, announced in July 2002, is designed to bring new water resources into the north of the country. It represents an evolution of the 1999 O&M contract for Greater Amman. 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 2.5million residents in Amman and surrounding towns. Construction started in December 2003 with the consortium operating the plant for 22 years after it comes into service in 2006. The facility will handle 268,000m<sup>3</sup>/day of wastewater and the contract will generate revenues of USD15million pa.

**Qatar**

2006	Lusail	10 year DBO	200,000 wastewater
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Degremont, along with Marubeni Corporation (Japan, pumping stations and conveyor/SCT) and Mushrif Trading and Construction Company (Qatar, civil engineering) will build a 60,000 m<sup>3</sup>/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
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A joint venture between Degremont and Marubeni was awarded a USD180million construction (50/50) and USD80million operation (70/30) contract for the 135,000 m<sup>3</sup>/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.

**Cameroon**

2000	SNEC	20 year concession	5.3million water provision
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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 Inc. was founded in 1869 and was listed on the NYSE in 1886. In 1994 United Water merged with Suez's General Waterworks Company, giving Suez a 30% holding in United Water and a 50% holding in United Water Services, the company's contract division. In 2000, Suez acquired the remaining 67% of United Water's equity that it did not hold and consolidated its 50% holding in United Water Services, for EUR1,108 billion.

Today, United Water is one of the nation's largest water services companies and provides water and wastewater services to 7.7 million people in 21 states. United Water is comprised of both a regulated water utilities group and a contract services group. The regulated segment owns and operates 25 utilities while the contract services segment operates 145 public private partnerships. In 2006, revenues were USD550 million.

### Regulated Activities

United Water Resources operates regulated water and wastewater utilities in eight states. Together, these operations serve approximately 1.9million people.

In May 2007, United Water acquired the Aquarion Water Company of New York, a regulated utility, for USD28million. This business unit provides water service to 50,000 people in three communities in New York. In addition, South County, a regulated water and wastewater supply company in New York, was acquired for USD3million in May 2004.

### Contract Services Activities

United Water Services has 145 operation and management contracts which serve a total of 5.8million people. Four of the United States largest water and wastewater contracts are operated by United Water: Milwaukee, Wisconsin; Indianapolis, Indiana; Gary, Indiana and Jersey City, New Jersey.

In August 2002, United Water acquired the Bechtel/United Utilities O&M outsourcing company, US Water. This acquisition added 40 O&M contracts, serving more than 1million people in five states. The largest UW Water operation is a wastewater treatment facility in Springfield, Massachusetts, valued at USD8.5 million.

In July 2007, United Water acquired Aquarion Operating Services (AOS), part of Kelda Group. This acquisition added 82 O&M contracts which serve 650,000 people in six states. The largest AOS operation is a wastewater treatment facility in Holyoke, Massachusetts, valued at USD5.3million.

United Water has been providing wastewater treatment service for 800,000 people in Indianapolis since 1994 and was recently selected to start a new contract term in 2008. United Water has been providing water services for 240,000 people in Jersey City, New Jersey since 1996 and is currently negotiating a new contract which is scheduled to begin in 2008.

### Current and recently gained activities (USD million, 2006)

Regulated markets	347
O&M outsourcing	203

### Regional breakdown of people served by regulated activities in 2006

Arkansas	55,000
Connecticut	16,353
Delaware	109,000
Idaho	225,000
New Jersey	927,562
New York	464,550
Pennsylvania	161,000
Rhode Island	19,750
<b>Total utility operations</b>	<b>1,928,215</b>

**Contract Services Contracts**

Location (state)	Contract	Water	Sewerage	Combined
Allamuchy (NJ)	O&M, WTW & WWTW	3,900	3,900	<b>3,900</b>
Avalon (CA)	5 Year O&M, WWTW	0	4,000	<b>4,000</b>
Banning (CA)	5 Year O&M, WWTW	0	27,200	<b>27,200</b>
Bedminster (NJ)	5 Year O&M, WW	0	9,048	<b>9,048</b>
Big Canoe (GA)	5 Year O&M, WTW & WWTW	6,000	6,000	<b>6,000</b>
Burbank (CA)	5 Year O&M, WWTW	0	100,316	<b>100,316</b>
Camden (NJ)	20 Year O&M, WTW & WWTW	80,000	80,000	<b>80,000</b>
Cumberland (IN)	5 Year O&M, WWTW	0	8,000	<b>8,000</b>
DeSoto County (MS)	5 Year O&M, WWTW	0	145,000	<b>145,000</b>
Durham County (NC)	5 Year O&M, WWTW	0	38,000	<b>38,000</b>
El Segundo (CA)	5 Year O&M, WWTW	0	900,000	<b>900,000</b>
East Providence (RI)	10 Year O&M, WWTW	0	125,000	<b>125,000</b>
Fairfield (CA)	5 Year O&M, WWTW	0	126,000	<b>126,000</b>
Gary (IN)	10 Year O&M, WWTW	0	180,000	<b>180,000</b>
Glynn County (GA)	5 Year O&M WTW & WWTW	35,000	35,000	<b>35,000</b>
Hoboken (NJ)	20 Year O&M, WTW	35,000	0	<b>35,000</b>
Holyoke (MA)	20 Year O&M, WWTW	0	43,000	<b>43,000</b>
Hull (MA)	10 Year O&M, WWTW	0	11,000	<b>11,000</b>
Indianapolis (IN)	10 Year O&M, WWTW	0	800,000	<b>800,000</b>
Jacksonville (FL)	20 Year O&M, WWTW	56,400	0	<b>56,400</b>
Jersey City (NJ)	8 Year O&M, WTW	240,000	0	<b>240,000</b>
Killingly (CT)	5 Year O&M, WWTW	0	2,600	<b>2,600</b>
Laurel (MS)	5 Year O&M, WTW & WWTW	18,332	18,332	<b>18,332</b>
Manalapan (NJ)	20 Year O&M, WTW	8,500		<b>8,500</b>
Manchester (NJ)	O&M, WTW	26,000	0	<b>26,000</b>
Milwaukee (WI)	10 Year O&M, WWTW	0	1,200,000	<b>1,200,000</b>
North Adams (MA)	10 Year O&M, WTW	15,500	0	<b>15,500</b>
Phillipsburg (NJ)	O&M, WWTW	0	31,450	<b>31,450</b>
Stoutsville (MO)	O&M, WTW	42,000		<b>42,000</b>
Rahway (NJ)	20 Year O&M WTW	26,000	0	<b>26,000</b>
Reidsville (NC)	O&M, WTW	14,300	0	<b>14,300</b>
San Antonio (TX)	10 Year O&M, WTW	110,000	0	<b>110,000</b>
Southern Pines (NC)	O&M, WTW	11,700	0	<b>11,700</b>
Springfield (MA)	20 Year O&M, WWTW	0	275,000	<b>275,000</b>
Stonington (CT)	5 Year O&M, WTW	16,000	0	<b>16,000</b>
<b>Total</b>		<b>713,132</b>	<b>4,203,846</b>	<b>4,770,246</b>

**Mexico**

Suez operates in Mexico through BAL-ONDEO (before ASIM), a 50:50 JV with Peñoles. In July 2002, BAL-ONDEO acquired Azurix's Mexican operations through. The four contracts acquired bring Suez's population served in Mexico to 9. million.

1993& 2004	Mexico City (TECSA)	10+5 year O&M	2.7 million commercial system & infrastructure works
1993 & 2004	Mexico City (IACMEX, bought from Azurix in 2002)	10+5 year O&M	1.8 million commercial system & infrastructure works

In 1993, TECSA & IACMEX were awarded a 10 year O&M contract for water metering, billing and collection, as well as water infrastructure works for half of Mexico City (8 districts) The contracts awarded to TECSA and IACMEX were extended for five more years,.

1993	Cancun	30 year concession	580,000 water, sewerage and sewerage treatment
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Cancun has a population of 580,000 inhabitants, which has grown 25 times in the last 26 years. It receives 3million tourists pa and generates 35% of Mexico's tourist income. There are currently 160,000 connections, 100% of the population has water, the sewerage coverage is 89% and 100% of the collected sewerage is treated. 60% of the concession's revenues currently come from hotels. BAL-ONDEO bought from Azurix 49% of Desarrollos Hidráulicos de Cancun (DHC). Grupo Mexicano de Desarrollo (GMD) holds 50.1% of DHC shares, but although BAL-ONDEO holds 49% of the concession shares it is responsible of the operation of the company.

There are also 2 BOT contracts previously operated by Azurix:

1999	Torreón	BOT	600,000 sewage handling
1999	Matamoros	BOO	Industrial sewage treatment

Degrémont operates in Mexico since 1978, building water treatment plants for both industrial and municipal clients. Since 1997, Degremont has also entered the growing market of BOTs, and operates today six sewage BOTs/BOOs in Mexico. These contracts are listed below:

1997	Pemex Salina Cruz	2+12 year BOO	Reverse osmosis+industrial sewage treatment
1998	Cd. Juarez	2+12 year BOT	1.4million Sewage treatment
1999	Puebla	2+20 year BOT	1.7million Sewage treatment
2000	Culiacan	2+20 year BOT	0.6million Sewage treatment
2001	Salina Cruz II	1+12 year BOO	0.1million Sewage treatment
2004	San Luis Potosi	2+18 year BOT	0.4million Sewage treatment

The Cd. Juarez, Puebla and Culiacan projects were designed with an advanced primary treatment. Biological treatment will be needed in the near future and will require additional investment to expand the existing facilities. More recent projects like Salina Cruz and San Luis Potosi are now directly including tertiary treatment in order to achieve a reuse of the water that can be sold to an industrial offtaker (PEMEX in the case of Salina Cruz and CFE in the case of San Luis Potosi)

The O&M activity of the BOT portfolio generates a turnover of USD30million, to which must be aggregated the turnover of the design & build activity which vary from USD15million to USD40million depending on the market cycles.

The financing of the BOTs is ensured through SPCs where Degremont is associated to partners like Sumitomo (Cd. Juarez, Culiacan, San Luis Potosi), Marubeni (Pemex Salina Cruz) and Mitsui (Salina Cruz II).

### 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
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Suez and Agbar acquired 51% of Empresa 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
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Energis 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 Environment operates in China in the water sector through two structures, the first of which is a joint-venture with New World Development Co. Ltd. of Hong Kong called Sino-French Holdings (S-FH). The operational branch of that entity is called Sino French Water Development and provides in water and waste water management services to 16 municipalities in China. The second is Degrémont, a wholly owned subsidiary that specialises in the design, construction and operation of water treatment plants and technology. In Macao and Mainland China, SUEZ Environment has been active in China and Macao for over 30 years and its portfolio includes 21 major joint-venture companies. These JVs are BOT or concession contracts for rehabilitating and expanding current municipal and industrial networks and services. Degrémont have been operating in China since 1975, has completed 170 municipal and industrial water and sewage treatment plants in China, cover 20% of China's urban population.

SUEZ Environment now serves approximately 13.5million people in China and manages over EUR645million of revenues in its environmental business, with the water business registering a 25% increase in sales in 2006. The company has indicated it will spend 100 million euros a year on the water industry in China if current trends prevail.

2006	Changshu	30 year concession, S-F	1,500,000 - Water
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SFH holds 49% of the equity of Changshu Water Supply Co. This contract covers the production and distribution of drinking water through three treatment plants with a total capacity of 675,000 m<sup>3</sup>/day, and 2,500km of piping networks. The contract will generate revenues of approximately EUR30million pa through its operational life.

2006	Chongqing Tangjiatuo	30 year concession, S-F	1,000,000 - Wastewater treatment
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A 50/50 joint venture contract between S-FH and the Water Company of Chongqing was signed in September 2006 for funding, developing and operation of a 300,000m<sup>3</sup>/day wastewater treatment works serving the Jiang Bei and Yubei sectors of the city in Tangjiatuo, 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.

2005	Shangai SCIP	50 year O&M, S-F	Water and Waste water – industrial park
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The Shangai Chemical Industry Park Sino French Development Company is a 50/50 joint venture between S-FH and Shangai Chemical Industry Park Development Co. The joint venture has been awarded a 50 year contract to collect and treat the waste water of the resident industries of the park to international standards and also to produce and distribute potable water and industrial water. At present there are about 20 well known multi-national enterprises installed at the Park such as BP, Bayer or BASF. The water treatment capacity is 200,000 m<sup>3</sup>/day for industrial water and 7,000 m<sup>3</sup>/day for potable water. Concerning the waste water treatment facility, its capacity is 37,500 m<sup>3</sup>/day (equivalent to a population of about 150,000 inhabitants). The industrial water treatment plant has a 200,000 tons/day capacity.

2004	Tianjin	35 year concession S-F	850,000 - Water
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The Tianjin Tanggu Sino-French Water Supply (S-FH) is a 50/50 joint venture between the city and S-FH. The Joint Venture is in charge of water production, distribution and sale to the customers in the area of Tanggu. The investment is EUR69million. The main facilities are three water treatment plants with a total production capacity of 310,000m<sup>3</sup>/day and a 620km long distribution network.

2002	Chongqing	50 year concession, S-F	1,000 000 - Water
2002	Qingdao	25 year BOT S-F	2,300,000 - Bulk water supply
2002	Shangai SPARK	30 year S-F	Water - Industrial Park

Two WTWs in Chongqing are to be refurbished and expanded for a total cost of EUR150 million. The two plants can produce 500,000 m<sup>3</sup>/day of water. Likewise, two WTWs in Qingdao are to be refurbished and expanded for a total cost of EUR45 million. The two plants treat 720,000m<sup>3</sup>/ day of water.

The SPARK concession consists of producing and distributing water to the an industrial area. It is a 50/50 joint venture with Shangai Pudong Spark United Development Corporation. It manages a 100,000 m<sup>3</sup>/day water treatment plant.

2001	Panjin	30 year BOT	267,000 - Bulk water supply
2001	Xinchang	30 year BOT	135,000 - Bulk water supply
2004	Sanya	30 year O&M	300,000 - Water

Sino French operate three water treatment works in Hainan delivering a total of 235,000m<sup>3</sup>/day of water for EUR36 million and managing them on behalf of the city. The system is 50% held by S-FH and 50% by the municipality's Hainan Tianya Water Industry Holding Co. The Sanya concession contract started in 2004 for a duration of 30 years.

2000	Zhengzhou	30 year BMO, S-F	1,200,000 - Bulk water supply
2000	Baoding	20 year BMO, S-F	860,000 - Bulk water supply
2000	Siping	30 year BMO, S-F	330,000 – Bulk water supply

The contracts for Zhengzhou (Henan) and Baoding (Hebei) were announced in March 2000. They serve a total of about 2million people, with USD62million being spent on capital works for facilities delivering 560,000m<sup>3</sup>/ day of water and generating a turnover of USD500 million over the contracts' life.

1999	Changtu	30 year BMO, S-F	100,000 - Bulk water supply
1998	Zongshan	22 year BMO, S-F	1,700,000 - 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<sup>3</sup>/day to 1.3million m<sup>3</sup>/day. 66% of the Zongshan contract is held by Sino-French Holdings, with the remainder in municipal hands. Revenues are in the region of EUR15 million pa. Degrémont carried out the engineering work and the extended facility entered service in 1999.

1992	Tanzhou	35 year BOT, S-F	Water concession
1996	Nanchang (Jiangxi)	28 year BOT, S-F	0.9 million bulk water supply

1996	Macao	25 year concession	540,000 water supply
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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.

#### Taiwan

2002	Kaohsiung	17 year BOT	3,000,000 water treatment
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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 produces 450,000m<sup>3</sup>/day of drinking water since March 2004.

#### Korea

2000	Yangju	24 year BOT	100,000 sewage treatment
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Suez and Ondeo Degrémont (60%) and Hanwha (Korea, 40%) were awarded a contract to design, build and manage three sewage plants for a total daily volume of 75,000m<sup>3</sup> and an 85km collecting network in the county of Yangju, in the province of Kyonggi. The initial population was 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
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The 135,000gal/day facility and 24km of collecting sewerage pipes has cost USD160million to build, and the contract will generate 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 a number of drinking water and wastewater treatment plants including the water plants in Mumbai (11million people), Bangalore (1.5 million people) and Delhi (3.5million people), but also the water treatment plants in Nagpur, Kolkata and the first membrane plant in India for tertiary sewage treatment in Bangalore. Since 1986, Degremont works in partnership with the Indian Group ANAND.

2007	Chennai	7 year O&M	4million, water treatment
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Construction of the 530,000 m<sup>3</sup>/day of drinking water treatment plant for the Chennai Metro Water Supply and Sewerage Board started in July 2005 for 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.

On September 2006, Degrémont inaugurated the Sonia Vihar water treatment Plant at Delhi. It is India's largest single stage water treatment plant with a capacity of 635,000 m<sup>3</sup>/day. The population supplied is 3.5million inhabitants.

## Philippines

### Manilad Water Services (MWSI)

1997	West Manila	25 year concession	4.3million, water & sewerage
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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.

While MWSI had a difficult start due to its low original tariffs, MWSI has suffered from a mid concession-life 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 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.

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, although distribution losses are a problem, while its PHP33.22/m<sup>3</sup> tariff compares unfavourably with MWSI PHP19.74/m<sup>3</sup>. Maynilad has paid USD200million of the USD800million in foreign debts (or concession fees) which it assumed from MWSS at privatization. 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. The one area of weakness has been the extension of the sewerage service coverage and sewage treatment capacity. This is mainly due to shortage of funds and priorities towards water service delivery.

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 2006 and is currently preparing to sell these shares to a new third party. Manila Water has made clear its intention to bid for Maynilad. The results of operations of MWSI for the period January 1 to July 20, 2005 and the year ended December 31, 2004 are as follows:

Y/E 31/12 (PHPmillion)	2005	2004
Revenues	4,301	3,905
Costs and expenses	3,616	6,203
Net income (loss)	685	(2,298)

## Indonesia

1997	West Jakarta	25 year concession	3.5million water
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West Jakarta has an estimated population of 4.5million. Initially, Suez owned 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 IDR 650billion 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
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This is a USD85 million BOT for drinking water supply plant for Medan. It is 85% held by Suez. There are currently 2.5million people in the city. The production capacity for Phase 1 was 170,000m<sup>3</sup>/day in 2000, to be increased to 260,000m<sup>3</sup>/day. Turnover will be USD2billion over the contract's life, or USD80million pa. Medan's population is expected to grow to 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
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Johor-Barhu involves the lease of a water production facility generating 0.63million m<sup>3</sup>/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
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In Kota Kinabalu (province of Sabah) a 20 year bulk supply concession for 0.24million m<sup>3</sup>/day of water to 0.5million people was granted to Jetama Sdn. Bhd. 35% of which was held by Suez in 1995, falling to 20% by 2006. After its partial privatisation via three BOT contracts (including Jetama) in 1995, Sabah's water systems were to be completely upgraded. In 1997, Jetama opened a new dam to increase water availability in the area and has been able to offer effectively universal access through increasing water pressure through the expanded mains network.

1989/95	Taiping, Perak	20 year BOT contract	350,000 water supply
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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 m<sup>3</sup>/day water treatment plant was commissioned in 1995.

### Australia

1993	Sydney	25 year BOO	3.5 million water treatment
1998	Sydney	5 year DBO	80,000 waster water treatment
1996	Noosa	25 year BOT	45,000 wastewater

Australian Water Services (AWS) is the Degremont subsidiary for Australia and Degremont. The Sydney water provision BOT signed in 1993 saw the USD200 million 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 3,000 MI/day capacity. A BOT concession for Noosa, Queensland was gained in 1996. Water & waste water revenues for Suez in Australia and New Zealand in 2006 were EUR166 million .

2006	Pimpama	4 year DBO	75,000 wastewater reuse
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This is a wastewater treatment plant for the Gold Coast near Brisbane, with a capacity of 17,000 m<sup>3</sup>/day. This facility will supply new development areas with class A+ recycled water to be used for indoors and outdoors purposes. The treatment will use a three barrier disinfection process including filtration, UF and UV.

2005	Perth	25 year DBO	1,500,000 water
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In April 2004, Perth's Western Australia Water Corporation chose Degremont and Multiplex Engineering to design, build and operate Perth's first reverse osmosis desalination plant. The 25-year contract for a 143,000m<sup>3</sup>/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.

1998	Auckland	5 year DBO	1,200,000 waste water treatment
2002	Hutt Valley	20 year DBO	160,000 wastewater

**Ondeo Industrial Solutions – Industrial water outsourcing**

Ondeo Industrial Solutions is part of SUEZ Environment and is responsible for its industrial water and wastewater activities, including design and build, equipment, and operation and optimisation of water treatment plants. The company is present on all the industrial water cycle, from water resource management, to sludge and by-products management, as well as process water, and wastewater treatment. From its European network of branches and skills, in France, UK, Spain, Italy, Benelux, and in the whole world with its Petrochem Centre of Expertise, Ondeo Industrial Solutions has built up over a broad base of installations in Europe and beyond, representing 3,800 projects and 200 operating contracts. It has two subsidiaries: Infilco (Sales of modular equipment and related services with locations in France and activities in Africa and South America.), and Purite (Sales of modular equipment and related services for Laboratories in the United Kingdom). Ondeo Industrial Solutions had a turnover of EUR138 million in 2006.

**Major contracts gained by Ondeo**

Akzo Nobel  
 Bristol Meyers Squibb  
 Procter & Gamble  
 Sanofi Aventis  
 L'Oréal  
 Pfizer  
 Air France  
 EADS – Airbus  
 PSA  
 Renault  
 Safran  
 Ajinomoto  
 Arkema  
 Degussa  
 Ineos  
 Osiris  
 Solvay  
 Comurhex (groupe AREVA)  
 CPCU  
 EDF  
 Tarragona Power  
 BP  
 Conoco Philips  
 ENI R&M Spa  
 Ineos  
 Naphatchimie  
 Ahlstrom  
 Arjo Wiggins  
 Mreal  
 Smurfit  
 Aceralia  
 Acerinox  
 Arcelor  
 Ascometal  
 Cezus Areva  
 3A – SODIAAL  
 Andia Lacteos  
 Danone  
 Groupe Bel  
 Mars – Masterfoods  
 Unilever  
 Alcatel  
 Altis Semiconducteur  
 Celestica  
 STMicroelectronics  
 Owens-Illinois  
 Groupe Saint-Gobain

Ondeo IS gained a 20 year EUR120million water management contract for the BP Grangemouth complex in Scotland in 2004. This includes cooling water, process water and wastewater. Other clients in the UK include Chevron Texaco, Scottish Courage Brewing and Bairds Malt. Ondeo IS 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. Other contract gains by Ondeo IS in 2005 included Arkema (EUR26 million) and Arcelor Group (EUR10 million), both in France.

**Contact Details**

Name: Suez 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.com](http://www.suez.com) / [www.suez-environnement.com](http://www.suez-environnement.com)  
Web: [www.lyonnaise-des-eaux.fr](http://www.lyonnaise-des-eaux.fr)  
Web : [www.degremont.com](http://www.degremont.com)  
Web : [www.ondeo-is.com](http://www.ondeo-is.com)  
Web: [www.unitedwater.com](http://www.unitedwater.com)  
Web : [www.sinofrench.com](http://www.sinofrench.com)

Gerard Mestrallet (CEO and Chairman of SUEZ)  
Gerard Lamarche (Chief Finance Officer of SUEZ)  
Jean-Louis Chaussade (CEO of Suez Environment)  
Bernard Guirkinger (Water Europe and CEO of Lyonnaise des Eaux)  
Thierry Mallet (CEO of Degrémont)

## 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)	2002	2003	2004	2005	2006
Turnover	30,078.7	28,063.0	22,500.3	25,570.4	28,620.4
Operating profit	1,587.6	-766.9	1,480.6	1,892.9	2,132.9
Net profit	339.2	-2,054.7	391.5	622.2	758.7
Earnings/share (EUR)	0.93	-5.13	0.99	1.59	1.91

### Water

Turnover	13,294	9,585*	9,805	9,134**	10,088
Operating profit	1,024	743*	800	1,002**	1,161

\* 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).

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.

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 4,000 municipalities 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	2002	2003	2004	2005	2006
France	6,201	6,116	4,205	4,459	4,802
UK	655	454	413	464	552
Germany	828	708	766	1,205	1,283
Rest of Europe	842	900	953	1,111	1,279
USA	3,378	1,893	497	582	641
Rest of Americas	400	315	105	92	122
Africa and Middle East	500	621	629	609	705
Asia	360	391	355	434	579
Australia and New Zealand	240	N/A	77	101	124
<b>Total</b>	<b>13,300</b>	<b>11,340</b>	<b>7,977</b>	<b>9,134</b>	<b>10,088</b>

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

**Water activities (excluding Proactiva)**

<b>VE: overall water and wastewater activities</b>	2002	2003	2004	2005	2006
Treatment efficiency of wastewater treatment plants	86%	92%	93%	91%	90%
Water provided (million m <sup>3</sup> /pa)	5,400	6,112	6,270	N/A	N/A
Industrial provided (million m <sup>3</sup> /pa)	N/A	217	226	190	369
Customers equipped with a water meter	N/A	91%	91%	93%	93%
Efficiency of water systems – Worldwide	75%	77%	77%	77%	78%
Efficiency of water systems – Europe (EU 15)	82%	80%	81%	80%	81%

\* Figures restated for 2002

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.

**Population served in each country**

Country	Water	Sewerage	Total
France	24,100,000	16,200,000	<b>24,100,000</b>
Albania	550,000	550,000	<b>550,000</b>
Armenia	1,000,000	1,000,000	<b>1,000,000</b>
Belgium	0	1,100,000	<b>1,100,000</b>
Czech Republic	4,122,600	3,943,600	<b>4,122,600</b>
Denmark	83,000	0	<b>83,000</b>
Germany	4,950,000	5,030,000	<b>5,050,000</b>

Great Britain	3,313,000	585,000	<b>3,898,000</b>
Ireland	0	90,000	<b>90,000</b>
Hungary	275,000	2,225,000	<b>2,225,000</b>
Italy	1,795,000	2,100,000	<b>2,450,000</b>
Malta	290,000	290,000	<b>290,000</b>
Netherlands	0	1,700,000	<b>1,700,000</b>
Poland	80,000	70,000	<b>80,000</b>
Portugal	185,000	295,000	<b>295,000</b>
Romania	2,250,000	0	<b>2,250,000</b>
Slovak Republic	950,000	950,000	<b>950,000</b>
Sweden	50,000	50,000	<b>50,000</b>
Argentina*	45,000	45,000	<b>45,000</b>
Brazil *	8,100,000	2,750,000	<b>8,100,000</b>
Canada	127,000	1,238,000	<b>1,331,000</b>
Colombia *	3,480,000	272,000	<b>3,480,000</b>
Mexico *	5,980,000	3,450,000	<b>5,980,000</b>
USA	7,000,000	6,000,000	<b>13,000,000</b>
Venezuela *	552,000	0	<b>552,000</b>
Australia	2,292,000	1,326,000	<b>2,418,000</b>
China	25,450,000	8,450,000	<b>27,500,000</b>
Indonesia	100,000	0	<b>100,000</b>
Malaysia	1,400,000	0	<b>1,400,000</b>
New Zealand	81,000	251,000	<b>251,000</b>
Philippines	10,000	0	<b>10,000</b>
South Korea	0	410,000	<b>410,000</b>
Burkina Faso	900,000	0	<b>900,000</b>
Gabon	910,000	0	<b>910,000</b>
Israel	1,400,000	0	<b>1,400,000</b>
Morocco	3,200,000	2,200,000	<b>3,200,000</b>
Niger	1,900,000	0	<b>1,900,000</b>
Oman	350,000	700,000	<b>10,505,000</b>
UAE	0	235,000	<b>235,000</b>
<b>Total outside France</b>	<b>83,170,600</b>	<b>47,305,600</b>	<b>109,810,600</b>
<b>Global total</b>	<b>107,270,600</b>	<b>63,505,600</b>	<b>133,910,600</b>

\* Proactiva activities

The number served in France has remained effectively constant in recent years. 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. 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

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 24.1million 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 8,000 municipalities 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 weighted 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).

### 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
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The contract covers managing three WWTWs, the sewerage system and overhauling the municipality's sludge recycling system for agricultural application.

### The Netherlands

2002	Delfland	30 year DBFO	1,700,000 sewage treatment
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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 115million m<sup>3</sup> pa plant at Harnaschpolder (1.3million PE) by 2008. VE (50%) will lead 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 F1billion. The Proactiva joint venture in Latin America is to continue for the time being.

### Portugal

1995	Mafra	25 year concession	45,000 water & sewerage
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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<sup>3</sup>, compared with the current price of EUR0.65/m<sup>3</sup> and Agbar's tender of EUR0.48/m<sup>3</sup>. The municipality intends to invest EUR200-250 million on improved sewerage systems over the length of the contract.

1995	Ourem	25 year concession	40,000 sewerage
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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
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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
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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
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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.

### The Czech Republic

Veolia Voda ([www.veoliavodacz](http://www.veoliavodacz)) serves 3.9million 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
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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
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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
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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 EUR525 million. Kralovehradecka Provozni AS had revenues of CZK534 million in 2006.

2004	Kladno-Melnik	20 year concession	331,000 water & sewerage
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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
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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 CZK700 million which was steady at CZK737 million 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 Pibram 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 CZK274 million 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 EUR4 million pa.

1998	Northern Bohemia	15 year concession (1995)	1,238,000 water & sewerage
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Hyder's stake was sold for CZK795 million (USD26.7 million) 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, 1.07 million 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 Piznec (6,000) and Stod (6,000).

2000	Olomouc	20 year concession	140,000 water
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This concession was awarded to Stredomoravska 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 CZK395 million.

2001	Prague	28 year concession	1.4million water & wastewater
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VE and AWG paid EUR174million for a 66% stake in PVK, and VE subsequently bought out AWG's stake. The 13 year concession will generate EUR60 million in 2001 and EUR120 million 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 CZK4.6 billion.

## 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
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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
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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.

2006	Erd Region	25 year concession	100,000 water & sewerage
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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%.

1994	Szeged	15 year concession	175,000 water & sewerage
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The Szeged contract had an HUF1.16billion turnover (HUF40million) 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 HUF200million 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
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In 2006 Dergremont and Veolia, along with Hídépítő and Alterra, two local civil works companies, gained a EUR290million contract to build (EUR249million) and operate for four years (EUR40million) a 350,000 m<sup>3</sup>/day wastewater treatment works (wet weather capacity 900,000 m<sup>3</sup>) 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
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The management company formed by VE (35%), BWI (35%) and EBRD (30%) took a 25.1% stake in Fővárosi Csatornászási Művek Rt., Budapest's wastewater company. Secondary treatment capacity has increased from 220,000 m<sup>3</sup>/day in 2000 to 280,000 m<sup>3</sup>/day in 2004 (76% being used), with the number of customer connections rising from 137,813 to 162,753.

### Poland

2006	Wozniki	10 year management	10,000 water
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VE's PWIK Wozniki gained the contract for the town of Wozniki in Upper Silesia in February 2006.

2001	TGMS	25 year concession	70,000 water & sewerage
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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 EUR125 million.

### Romania

2000	Ploiesti	25 year concession	250,000 water
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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	2million water and wastewater
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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 1.67 with wastewater. This is to increase to 2.0million during the contract.

**The Russian Federation**

2005	St Petersburg	5 year management	2million water
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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<sup>3</sup>/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	1million water & wastewater
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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 interest in Southern Water to Southern Water Capital Limited in April 2006 for EUR89.6million.

Y/E 31/03/2007 (GBPmillion)	Population	Equity Holding	Turnover	Operating Profit
Three Valleys Water	3,000,000	100.0%	212.78	55.81
Tendring Hundreds	150,000	99.1%	16.74	6.35
Folkestone & Dover Water	163,220	78.7%	14.32	6.08

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<sup>3</sup>/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 200,000 meters 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 sold to Veolia Water UK for EUR115million (GBP78million) in August 2007. UK revenues of EUR160million (GBP109million) are anticipated for 2008. The company has two principal contracts in Wales and Scotland.

**Scotland**

1998/99	Eastern Scotland	30 year PFI BOT	585,000 sewage treatment
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Sterling Water (TWS (49%), M J Gleeson (41%) and Montgomery Watson (10%)) gained the Eastern Scotland contract. The original Almond Valley and Seafeld 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
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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**

2006	Limerick	20 year BOT	90,000, wastewater
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This is a EUR71million repair, enlargement and operation contract for the city's wastewater treatment plant, which will increase its treatment capacity from 51,000 m<sup>3</sup>/day to 87,000 m<sup>3</sup>/day.

**Germany****Berliner Wasserbetriebe (BWB)**

Y/E 31/12 (EURmillion)	2002	2003	2004	2005	2006
Water sales	363	374	393	404	N/A
Sewerage services	587	581	647	679	N/A
<b>Total turnover</b>	<b>1,114</b>	<b>1,202</b>	<b>1,228</b>	<b>1,234</b>	<b>1,147</b>
Net profit	34	116	62	85	98
Water sales (million m <sup>3</sup> )	208	214	201	197	209
Sewage treated (m m <sup>3</sup> )	248	230	232	227	231

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
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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 Berlinwasser International to Marubeni in 2005 was rescinded in 2006. Please see the RWE company entry for BWB International's activities.

**Other contracts directly held by VE**

1995	Döbeln/Oschatz	20 year management	135,000 water and sewerage
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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
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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
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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%)	80,000 municipal services
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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
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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
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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
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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
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Construction of the Brussels North STW started in 2003, with completion in 2007. 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<sup>3</sup> pa.

### Sweden

2001	Norrstalje	10 year 'concession'	50,000 water & wastewater
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The turnover over the life of the contract will be EUR25million. This is the first water PPP in Sweden.

### Norway

2003	Oslo	Construction/operation option	Water treatment
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This is to be the largest water treatment plant in Norway, serving some 250,000 people and costing EUR73million in total. There is an option for a 20 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.

Operations and stakes in Italy	Holding	Population	Services
CGA	100%	345,000	Water
SAP	100%	50,000	Water
Siemec	72%	700,000	Sewerage

### 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
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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
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VE and Acquedotto Pugliese hold 49% of Societa Risorse 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
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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 contracts, serving some 30 million people in China.

2007	Tianjin	30 year management	3million water
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Veolia Water is to acquire 49% of the Tianjin Shibe Water Company Ltd from the Tianjin Water Works (Group) Company Ltd. The contract will generate revenues of EUR2.65 billion. The project will cover the district of Shibe, the Northern part of Tianjin, and the Binhai district on the Eastern coast. It includes managing the Xinkaihe water production plant (1million m<sup>3</sup>/day) and a 1,988 km of mains and the 500,000m<sup>3</sup>/day Jinbin water treatmentworks, 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
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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<sup>3</sup>/day and 640km of water mains.

2006	Liuzhou	30 year management	1.0million, water
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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<sup>3</sup>/day. Revenues over the contract will be some EUR330million.

2005	Kunming	30 year BOT	3.5million, water
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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<sup>3</sup>/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
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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<sup>3</sup>/day), a 1,750km distribution network and customer services.

2005	Handan	25 year BOT	800,000 wastewater
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This contract involves the construction of a new wastewater treatment plant with a capacity of 100,000m<sup>3</sup>/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
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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 200,000 m<sup>3</sup>/day will increase to 400,000 m<sup>3</sup>/day by 2008. Total revenue for Veolia Water for the contract will be EUR260million.

2003	Shenzhen	50 year BOT	4,400,000 water & wastewater
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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.

2004	Weinan	22 year BOT	300,000, water
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This is a EUR190million rehabilitation and operation contract for bulk water services, providing 160,000m<sup>3</sup>/day.

2004	Hohhot	30 year BOT	2.5million, water
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The rehabilitation and operation of the Inner Mongolian capital's water production and treatment system (10 plants) has a capacity of 515,000m<sup>3</sup>/day will generate revenues of EUR600million.

2004	Beijing	20 year BOT	wastewater
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The Bei Yuan wastewater treatment plant will be adjacent to the Olympic Village and the contract will generate total revenues of EUR20million.

2004	Zunyi	35 year concession	600,000 water
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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
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The contract (with China Everbright) covers the operation of two wastewater treatment works to be developed in anticipation of the 2008 Beijing Olympiad. Revenues will total EUR110million. The capacity of the Maidao plant will be increased from 80,000m<sup>3</sup>/day to 140,000m<sup>3</sup>/day by 2006.

2003	Beijing	20 year BOT	250,000 wastewater
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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
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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
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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	1.9million water services
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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<sup>3</sup>. 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
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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<sup>3</sup>/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
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This was awarded for upgrading the Lingzhuang water treatment works, which has a 500,000m<sup>3</sup>/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<sup>3</sup>/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
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The Kumdan WWTW is located near Incheon. The facility will have a capacity of 40,000m<sup>3</sup>/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
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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, 70,000 m<sup>3</sup>/day and Songdo, 30,000 m<sup>3</sup>/day) with a total capacity of 100,000 m<sup>3</sup>/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 O&M wastewater treatment works in 2006 (Saaitama, a district near Tokyo and for Hiroshima) and in April 2007, VE gained a three year O&M contract for a 283,000m<sup>3</sup>/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.

### Indonesia

1997	Sidoarjo	25 year BOT	100,000 bulk water supply
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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 Rp130billion, or a EUR4million investment by Veolia Water. The facility will have a 20,000m<sup>3</sup> 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
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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
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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
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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<sup>3</sup>/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	1.9million, water
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Supported by USD65million in funding by the World Bank's IDA, the French Development Agency and the West African Development Bank, this 10 year affermage contract for Société d'Exploitation des Eaux du Niger (SEEN, 55% VE, 45% local investors) covers 52 urban centres and charges on average XOF208/m<sup>3</sup> (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
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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
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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 3.2million people in 38 local authorities through 511,000 customer connections including 16,000 low cost water and sewerage connections. 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	1.2million water & electricity
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The concession serves a total of 23 districts within the two cities. VE is the lead company in 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 1.2million people. The Tangiers contract was 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. 40,000 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	1,700,000 water & sewage
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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<sup>3</sup> of water was delivered in 2000. Dragados sold its stake to VE in November 2002. MAD700million (EUR64million) will be 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.

#### Oman

2006	Muscat	5+3 year management	700,000 wastewater treatment
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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 DBO	350,000 water provision
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In January 2007, VE gained a EUR434million 22 year contract to build, finance and operate a 80,200 m<sup>3</sup>/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.

#### United Arab Emirates

2006	Ajman	27 year Concession	235,000 wastewater treatment
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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<sup>3</sup>/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 USD 100million 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
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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 50million m<sup>3</sup> 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<sup>3</sup> 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

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 EUR1billion for the State of Queensland.

2006	Queensland – I	DBO	Wastewater recovery
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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 232,000 m<sup>3</sup>/day. The water will be used by industrial customers. The facilities will enter service by 2008.

2006	Queensland – Il	10+5 year DBO	450,000 water
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A 125,000 m<sup>3</sup>/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 year BOT	1.2million water & sewerage
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This was the first contract gain by the TWI/VE UW alliance. 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
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A EUR43million construction and operation contract for a wastewater treatment plant to serve the city.

1999	Ballarat	25 year BOOT	115,000 water supply
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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
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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
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This is a reverse osmosis desalination plant with an initial capacity of 250,000 m<sup>3</sup>/day which can be expanded at a later date to 500,000 m<sup>3</sup>/day. The EUR570million contract includes a three year construction phase followed by a 20 year operating phase.

1998	Noosa	15 years DBO	54,000 water treatment
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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
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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
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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
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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
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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
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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
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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
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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 inservice, 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
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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	3million water
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This is the contract for upgrading and expanding the TIBITOC water treatment works in consortium with 2 local partners. The contract involves USD78million in investment, USD52million in the first 3 years. Total contract revenues will be USD300million. The plant has a capacity of 1million m<sup>3</sup>/day and can serve 5million people. Currently it is producing 900,000 m<sup>3</sup>/day serving some 3million 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 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
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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 6 million 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.

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, 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).

2007	Tampa Bay	16 year DBO	Water treatment
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A USD158.4million contract to expand the regional water treatment plant in Florida from 72million gal/day to 120million gal/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
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A USD 45million contract for the 1.5million gal/day (7,000 m<sup>3</sup>/day) facility serving Rockland County.

2005	Gresham, Oregon	7 year O&M	106,000 wastewater treatment
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The contract is worth USD21million and involves handling 20million gal/day of effluent.

2004	Richmond, CA	18 year O&M	wastewater treatment
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The contract is worth EUR50million.

2004	Virgin Islands	20 year BOT	75,000 wastewater treatment
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Two 18,000m<sup>3</sup>/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
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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
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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
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The contract announced in July 2006 involves the management of three water treatment plants with a capacity of 2.29million gal/day and one wastewater treatment plant with a capacity of 1.98million gal/day. Revenues will be USD0.47million pa.

1997	Haldimand/Norfolk	O&M	200,000, wastewater
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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 24million gal/day and the Haldimand contract is for four WWTWs with a capacity of 16million gal/day.

1999	Toronto	15 years, DBO	1,000,000, wastewater biosolids
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The contract covers the biosolids drier and pelletiser facility serving the city's 216million gal/day Ashbridges Bay WWTW.

1998	Moncton	20 years, DBFO	100,000, water
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This was the first major PPP contract gained in Canada. It was agreed in April 1998 and covers a 94,635m<sup>3</sup>/day (25million gal/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.

### 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<sup>3</sup>/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**

A EUR43million contract was signed in 2006 for taking over water treatment at the Bayswater Power Plant run by Macquarie Generation and serving Sydney and New South Wales. The project includes two years of design and construction works and five years of O&M.

### **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<sup>3</sup>/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. 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.

### **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<sup>3</sup>/day including the recovery of 40,000m<sup>3</sup>/day of process water.

**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](http://www.veoliaenvironnement.com)  
[www.veoliawater.com](http://www.veoliawater.com)  
[www.generale-des-eaux.com](http://www.generale-des-eaux.com)

Henri Progllo (Chairman and CEO)  
Jerome Contamine (CFO)  
Antoine Frerot (Head, Water Division)  
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 2007:**

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 (cUSD300million)
Thames Water	England	Sold to Macquarie in 2006
American Water Works	USA	IPO planned for 2007

**RWE AG, profit and loss account\***

Y/E 30/06 (EURmillion)	2002	2003	2004	2005	2006
Turnover	46,633	43,875	42,137	39,487	44,256
Pre-tax profit	2,722	2,123	3,935	3,156	3,567
Net profit	1,050	936	2,137	2,231	3,847
Earnings/share (EUR)	1.87	1.69	3.80	3.97	6.84

<b>FY 31/12 (EURmillion)</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
Turnover – Thames	1,719	1,603	1,680	N/A	N/A
Turnover – Europe & ROW [1]	2,439	2,335	2,264	N/A	N/A
Turnover – Americas	411	1,914	1,801	1,878	1,702
Total turnover	2,850	4,249	4,065	N/A	N/A
Operating profit – Thames	N/A	1,218	612	687	N/A
Operating profit – Europe & ROW	N/A	169	311	238	N/A
Operating profit – USA	N/A	600	466	586	425
<b>Total operating profit</b>	<b>963</b>	<b>1,374</b>	<b>1,389</b>	<b>1,416</b>	<b>N/A</b>
Capital spending	2,182	6,129	1,465	1,405	1,588

[1] Non BWI C&EE water activities were transferred to RWE energy. These generated revenues of some EUR100million in 2003.

### Subsidiary companies

<b>FY 31/12/2006 (EURmillion)</b>	<b>Revenues</b>	<b>Operating profit</b>
Thames Water (UK)	2,278	472
American Water (USA)	1,702	425
Pridesa (Spain)	102	N/A

### RWE, breakdown of populations served

<b>Country</b>	<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Germany	11,500,000	6,200,000	13,200,000
Hungary	1,950,000	1,500,000	1,950,000
Croatia	0	750,000	750,000
Poland	135,000	135,000	135,000
Puerto Rico	1,600,000	0	1,600,000
USA	16,400,000	2,820,000	17,500,000
Canada	560,000	0	560,000
<b>Total – international</b>	<b>20,645,000</b>	<b>5,205,000</b>	<b>22,495,000</b>
<b>Grand total</b>	<b>32,145,000</b>	<b>11,405,000</b>	<b>35,695,000</b>

### RWE Energie

No separate information is provided about RWE's water activities.

### 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 and has 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 (Ludwigsburg) 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)	2002	2003	2004	2005	2006
Water sales	363	374	393	404	N/A
Sewerage services	587	581	647	679	N/A
<b>Total turnover</b>	<b>1,114</b>	<b>1,202</b>	<b>1,228</b>	<b>1,234</b>	<b>1,147</b>
Net profit	34	116	62	85	98
Water sales (million m <sup>3</sup> )	208	214	201	197	209
Sewage treated (m m <sup>3</sup> )	248	230	232	227	231

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
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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.

**Berlinwasser International**

The sale by VE and RWE of Berlinwasser International to Marubeni in 2005 was rescinded in 2006.

**Hungary**

1997	Budapest	25 year O&M	1.5million water distribution
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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.

**Croatia**

2000	Zagreb	26 year BOT	0.75million sewage treatment
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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
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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%.

**American Water****Puerto Rico**

1996	San Juan	5+15 years DBO	1.6million water
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A 5 year DBO (3 years construction and 2 years operation) 50:50 JV with Dick Corporation of Pittsburgh for water services to 1.6million people in San Juan. The USD300million contract has been extended for a further 15 years as a full concession contract. There have been some delays, but no material impact to TWI and the facility entered service in September 2000. The 0.4million m<sup>3</sup>/day, 5 year O&M contract ran to September 2005.

**USA – American Water Works**

E'town Water dates back to 1854 and the American Water Works & Guarantee Company was founded in 1886. American Water Works (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.

Since 2003, the absence of SEC filings has meant that there is minimal information available about their progress. 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. AWW has 72 subsidiaries in the USA and Canada.

Regulatory approval is needed for 13 of the 29 states in the USA where AWW operates:

	June 2007	July 2007
No approval needed	16	16
Approval granted	9	13
Approval pending	4	0

The exact timing of the IPO remains dependent on the SEC registration procedures, the requirements of the Sarbanes Oxley Act and market conditions, but it is now expected to be completed during 2007.

**Major acquisitions, 1996-2002**

Year	Company	People served	Cost (USDmillion)	Turnover USDmillion
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	31million (1999)
2000	UWR subsidiaries	122,500	50	N/A
2001	City of Coatesville	53,000	48	7million (2001)
2001	Azurix North America	2,000,000	160	134million (2001)
2002	Citizens Utilities subsidiaries	1,100,000	859	140million (2001)

Currently AWW serves approximately 18million people, more than 10.3million via regulated utility operations and over 7million via O&M contracts including those acquired from Azurix in August 2001. This also includes the Citizens acquisition, which was completed in February 2002.

**AWW's regulated activities in the USA, 2000-03**

State	People served
Pennsylvania	2,000,000
New Jersey	1,650,000
Missouri	1,300,000
Indiana	750,000
Illinois	650,000
California	500,000
West Virginia	490,000
Kentucky	300,000
New York	248,000
Arizona	230,000
Tennessee	180,000
Iowa	165,000
Virginia	160,000
Ohio	120,000
Connecticut	75,000
Massachusetts	55,000
New Mexico	45,000

State	People served
Hawaii	27,000
New Hampshire	24,000
Maryland	12,000
Michigan	10,000
<b>Total</b>	<b>8,991,000</b>

#### AWW, tuck-in acquisitions, 1998-2003

Year	Transactions completed	Customers served	Customers per deal	Total cost (USmillion)	USD per customer
1998	15	26,770	1,785	47	1,756
1999	21	14,000	666	12	857
2000	12	38,000	3,167	52	1,368
2001	8	20,000	2,500	55.9	2,795
2002	8	29,000	3,625	31.9	1,100
2003 & pending	26	14,500	N/A	N/A	N/A

Provisional offers for 23 further tuck-in acquisitions serving 65,500 customers (200,000 people) are also pending. A total of 180 tuck-in acquisitions have been completed between 1996 and June 2005. During 2005, 50 tuck-in acquisitions were completed.

#### Non-regulated activities: American Water Services

American Water Services is responsible for the company's non-regulated activities. It serves some 6million 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 1.0million people through managing 175 water and wastewater treatment facilities in seven states, with a 1999 turnover of USD31million.

In August 2001, AWW acquired all of the North American activities of Azurix from Enron for USD153.3million plus USD6.5million in debt. Azurix has 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. 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 2million people, including 1.82million for water provision and 0.35million for sewerage and wastewater treatment services (estimated).

#### Azurix contract gains in the USA (USDmillion)

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

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

RWE's American Water Services provide O&M outsourcing services in four Canadian provinces; Ontario, Alberta, British Columbia and Manitoba. 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: RWE AG  
Address: Opernplatz 1, D-45128 Essen, Germany  
Tel: +49 201 12 00  
Web: [www.rwe.com](http://www.rwe.com)  
[www.bwb.de](http://www.bwb.de)

Dr. Harry Roels (Chairman and CEO)  
Dr. Klaus Sturany (Vice President, financial control)

**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](http://www.amwater.com)

Jeremy Pelczer (Chairman)  
George MacKenzie (Interim President & CEO)  
Jim McGivern (COO)

**ACEA (AZIENDA COMUNALE 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, 8.6% by Suez 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)	2002	2003	2004	2005	2006
Rome-Water billed (million m <sup>3</sup> )	421	408	432	438	442
Wastewater billed (million m <sup>3</sup> )	447	455	459	473	N/A
Turnover	1,308.400	1,481.100	1,413.000	1,624.400	2,187.300
Water EBITDA	N/A	N/A	152.900	170.600	206.100
Operating profit	136.600	147.800	210.500	232.600	474.600
Net profit	-108.000	49.000	112.300	127.900	147.400
Earnings/share (EUR)	-0.509	0.230	0.527	0.600	0.692

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<sup>3</sup>.

Country	Water	Sewerage	Total
Italy	7,910,000	9,110,000	9,110,000
Albania	650,000	0	650,000
Peru	800,000	0	800,000
Honduras	495,000	495,000	495,000
Colombia	3,900,000	0	3,900,000
<b>Total-home markets</b>	<b>7,910,000</b>	<b>9,110,000</b>	<b>9,110,000</b>
<b>Total – international</b>	<b>5,845,000</b>	<b>495,000</b>	<b>5,845,000</b>
<b>Grand total</b>	<b>13,755,000</b>	<b>9,605,000</b>	<b>14,955,000</b>

**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: Activities in Italy, 2006**

Contract	Stake	City	Million people served	Water billed (million m <sup>3</sup> )
ATO 1	29%	Lazio-Centrale	3.29	438
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 18% of the Italian water and sewerage market. The corporate business plan is based on gaining additional ATOs in western Italy and becoming the dominant regional player.

Regulated activities		2005	2008
ATO2 – Lazio	Million m <sup>3</sup>	438	527
Other ATOs	Million m <sup>3</sup>	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 3.5million 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 Galliciano. 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.

To date, 93 municipalities have opted for ACEA's services in the region, accounting for 97% of the addressable population.

### Subsequent ATO awards

2003	Frosinone	ATO privatisation	430,000 water & wastewater
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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
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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
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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
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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
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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 1<sup>st</sup> 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 Impreglio 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
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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
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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
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ACEA (Consortio 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 Chillón. 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<sup>3</sup> 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
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The contract is with the municipality's Empresa de Acueducto y Alcantarillado de Bogotá (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 Domingo	4 year O&M	1,400,000 water
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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. Suez holds 24% of Agbar's equity via Hisusa (51% Suez, 49% La Caxia) which in turn holds 47.1% of Agbar's equity. Suez also has a direct holding of 1.8% of Agbar's equity. Agbar dates back to the Compagnie des Eaux de Barcelone founded in 1867 and incorporated in Paris as La Société 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. In 2007, Suez and La Caxia announced that they would be tendering to increase their holdings in Agbar, with the aim of retaining the company's market listing.

**Agbar, profit and loss account**

Y/E 31/12 (EURmillion)	2002	2003	2004	2005	2006
Water turnover	840.5	892.7	1,057	1,204	1,427
Group turnover	2,555.7	2,676.5	2,589	2,749	3,122
Water operating profits	N/A	N/A	131	184	250
Group operating profits	155.8	183.0	238	303	372
Water net profit	N/A	N/A	173	185	N/A
Group net profit	173.4	243.0	266	338	308
Minority interests	-40.7	-48.7	-50	-86	141
Group net profit	132.7	194.3	216	252	167
Earnings/share (EUR)	0.92	1.33	1.47	1.70	1.13

2005 results have been restated.

**Agbar, unconsolidated water and sewerage revenues**

Y/E 31/12 (EURmillion)	2000	2001	2002	2003	2004
Spain	840	893	998	1,081	1,135
International	1,076	1,153	613	562	582
Global	1,916	2,046	1,611	1,643	1,717

**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 <sup>3</sup> pa)	1,274	795
Treatment capacity (m <sup>3</sup> /day)	2,430,775	2,996,434
<b>Sewerage</b>		
Municipalities served	355	49
Population served	6,214,277	5,818,873
Sewer systems (km)	17,811	9,980
<b>Sewage treatment</b>		
Municipalities served	478	49
Population served	11,049,432	3,830,748
Capacity (m <sup>3</sup> /day)	1,845,495	1,008,143

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 – water and sewerage contracts population served**

	2002	2003	2004	2005	2006
<b>Water provision</b>					
Contract retention rate	91%	96%	N/A	98%	99%
New contracts	212,748	145,431	218,656	161,334	159,069
<b>Sewerage</b>					
New contracts	226,253	62,589	316,537	162,067	N/A
<b>Sewage Treatment</b>					
New contracts (PE)	2,033,261	417,406	498,582	1,044,000	673,410

Excepting Barcelona, Agbar's water and sewerage contracts in Spain have an operating life ranging from 5 to 30 years. Currently the company provides sewerage services for nearly 12 million people and 15 million 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 Barcelona (2.22% more than in 2004), a total of 2.83 million people. In 2006, the Alicante concession, serving 725,000 people, was extended from 2016 to 2036.

**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 Ferrosar 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 Aguagest Sur was sold to Unicaja and Caja Granada in July 2005 for EUR73.5 million. 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	Wastewater	Total
Spain	12,347,000	6,214,000	<b>13,000,000</b>
United Kingdom	1,066,000	0	<b>1,066,000</b>
Chile	5,939,000	5,819,000	<b>5,939,000</b>
Colombia	895,000	0	<b>895,000</b>
Cuba	500,000	0	<b>500,000</b>
Mexico	650,000	0	<b>650,000</b>
<b>Total outside Spain</b>	<b>9,050,000</b>	<b>5,819,000</b>	<b>9,050,000</b>
<b>Global Total</b>	<b>21,397,000</b>	<b>12,033,000</b>	<b>22,050,000</b>

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 (GBP million)	2003	2004	2005	2006	2007
Bristol Water Plc	70.4	70.7	70.6	81.9	86.3
Other activities	42.2	42.8	27.9	0.0	0.0
Group turnover	112.6	113.5	98.5	81.9	86.3
Operating profit	20.4	20.0	15.1	24.9	25.2
Pre-tax profit	16.1	14.5	1.6	18.4	18.9

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 sold to its local partners in December 2006.

**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 Empresa 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
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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 (CLP million)	2002	2003	2004	2005	2006
Water revenues	98,521	103,366	101,594	104,241	107,436
Sewerage revenues	53,683	61,526	77,548	91,239	98,274
Other – regulated	7,126	9,082	7,571	9,254	9,366
Other – non regulated	5,877	8,645	12,868	14,890	17,068
Turnover	150,870	168,398	195,433	219,623	232,143
Operating profits	62,485	71,199	86,614	103,632	112,869
Net income	54,113	59,659	64,754	77,540	84,622
EPS (CLP)	8.84	9.75	10.21	12.41	13.55

	2002	2003	2004	2005	2006
Water clients ('000)	1,401	1,436	1,467	1,503	1,550
Sewerage clients ('000)	1,372	1,405	1,438	1,474	1,521
Water coverage	100%	100%	100%	100%	100%
Sewerage coverage	98%	98%	98%	98%	N/A
Sewage treatment coverage	28%	63%	67%	69%	N/A

1995	Valdivia	Concession	120,000 water & sewerage
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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.

### 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
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Aguas de Cartagena SA ESP has been profitable since its onset. 44.8% of its shares are held by Agbar, 50% by Distrito Turístico y Cultura de Cartagena and 5.1% by local shareholders. Agbar's stake cost COP280million. In 2004 water coverage was 99% against 73% in 1995, with sewerage coverage at 78% against 61%. The aim is for 100% water coverage by 2005. 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 500,000 people, with an eventual coverage of 1,400,000 people. The contract serves La Habana 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

<b>Varadero</b>	<b>1994</b>	<b>2006</b>
Population covered	95%	100%
Hours service/day	18	24
Number of connections	5,000	11,000
<b>Havana</b>	<b>2000</b>	<b>2006</b>
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	650,000 water & sewerage
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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.

**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](http://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)

**BIWATER PLC/CASCAL BV**

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. Biwater is a privately owned company, specialising in water treatment and sewerage engineering.

Biwater became a Plc in 1997 and Biwater Capital Plc (now Cascal) was set up in 1998 for international concession contracts. The company has been seeking bids in most of the currently active international markets, with a balance between wastewater and water provision. Biwater has been bidding internationally and construction and management contracts have been secured in the Dominican Republic, Ghana, South Africa, Sudan, UK China and the USA.

**Biwater Plc, profit and loss account**

YE 31/03 (GBP million)	2004	2005	2006	2007
Turnover	185.3	191.9	203.0	250.6
Share of joint ventures	(24.2)	(26.6)	(28.4)	(18.5)
Group turnover	161.1	165.3	174.6	232.1
Operating profit	2.8	7.0	10.1	13.2
Pre-tax profit	0.1	6.0	(0.7)	5.2

June 2006 saw Biwater buy back the 50% stake in Cascal (previously known as Biwater Capital BV) from Nuon NV. Nuon paid USD130million for its holding in the joint venture in March 2000. Cascal is the operations and investments arm of Biwater Plc.

**Cascal BV, profit and loss account**

YE 31/03 (USD million)	2003	2004	2005	2006	2007
Water supply turnover	75.5	89.2	94.7	98.8	107.3
Water contracting turnover	8.3	7.6	16.2	11.8	14.4
Group turnover	83.8	96.8	110.9	110.6	121.7
Operating profit	16.4	21.1	30.1	31.5	36.2
Pre-tax profit	10.0	16.3	23.1	23.1	15.7

**Biwater/ Cascal, number of people served internationally**

Country	Water	Sewerage	Total
UK	430,000	0	430,000
Philippines	250,000	250,000	250,000
Indonesia	700,000	0	700,000
China	510,000	0	510,000
Chile	300,000	300,000	300,000
Mexico	0	250,000	250,000
Panama	300,000	0	300,000
South Africa	385,000	385,000	385,000
<b>Grand Total</b>	<b>2,875,000</b>	<b>1,185,000</b>	<b>3,125,000</b>

**UK**

Biwater was the first company to acquire a UK statutory water company, East Worcester Water, in 1988. This company was sold to Severn Trent in 1993. Bournemouth Water (founded in 1863) and West Hampshire Water (founded in 1893) were both acquired in 1989 and merged in 1994. The combined company has 195,000 connections, serving a resident population of 430,000 which rises to 500,000 in the summer. The water companies have formed the backbone of Biwater's profitability in recent years. The UK water company is 100% held by Cascal and has an operating licence in perpetuity, subject to 25 years notice of termination.

**Bournemouth and West Hampshire Water Company financial highlights**

YE 31/03 (GBP million)	2003	2004	2005	2006	2007
Water supply turnover	27.17	28.41	29.98	34.52	34.85
Non-regulated turnover	1.95	2.31	2.81	3.06	4.67
Group turnover	29.11	30.70	32.78	37.58	39.52
Operating profit	9.37	9.43	11.13	14.17	14.34
Pre-tax profit	8.31	8.65	9.94	-3.69*	10.95

\* 10.5 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	25 year concession (extendible to 50 years)	220,000 water & sewerage
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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.

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.

**Indonesia**

1995	Batam Island	25 year concession	700,000 water provision
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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 120,000 by 2007, with the volume of water delivered rising by 16% during the year. Adhya Tirta Batam currently serves 700,000 people.

**China****The China Water Company**

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 USD20 million, plus a USD50 million 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 four water service companies in China which are based in Xinmin and Qitaihe (in the North), Yanjiao (near Beijing) and Fuzhou (in the South East). The water service companies are all joint ventures with local water companies or development zones. Together, these operations serve 510,000 people.

City (Province)	Project	Construction
Xinmin (Liaoning)	Water infrastructure, 30,000 m <sup>3</sup> /day WTW, Serving 80,000 people, 25 year BOT	2000-2001
Yanjiao (Hebei)	Water infrastructure, 60,000 m <sup>3</sup> /day WTWs, serving 150,000 people, 25 year BOT	2000-2003
Qitaihe (Heilongjiang)	Water infrastructure, 120,000 m <sup>3</sup> /day WTWs, Serving 130,000 people, 25 year BOT	2001-2003
Fuzhou (Fujian)	Water infrastructure, 125,000 m <sup>3</sup> /day WTW, Serving 150,000 people, 30 year BOT	2004-2006

The Fuzhou CWC Water Company Limited contract is a 30 year concession which started in December 2004. Fuzhou CWC operates the water supply assets of the Fuzhou Economic & Technological Development Zone (FETDZ) Water Supply Company.

### Chile

The Calama project (wastewater concession serving 150,000 people) was sold to ESSAN, the incumbent private utility in 2006.

1994	Santiago	Concessions	13,000 water & wastewater
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Cascal acquired Servicios de Agua Potable Barechea SA (SAPBSA) and Aguas Chacabuco SA, two companies operating outside Santiago, with concessions serving medium to high quality residential and industrial areas in the North and East of the city. These have been grouped together as Aguas Santiago SA and started supplying water in 1996. A water treatment works for the Pan de Azucar concession area was constructed in 2004. The company owns USD50million in water rights.

1994	Antofagasta	30 year concession	342,000 water & wastewater
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This is the first privatised WWTW in 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.

2001	Noranda	22 years	Industry
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This USD6million project provides 2.2million m<sup>3</sup> pa of treated wastewater to Noranda and other companies in La Negra, Chile, some 45km from Antofagasta.

### Mexico

1993	Puerto Vallarta	15 year O+M	250,000 sewerage
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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 216Ml/day. In 2004, the BOOT contract was sold to SEAPAL for a profit of USD12.9million and Cascal's interest continues under an O&M contract until 2008.

### Panama

2004	Laguna Alta	30 years, BOOT	300,000 water
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This is Panama's first BOOT water project involving the construction of a 76Ml/day 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 the IFC providing USD15million of the project's USD25million funding. The facility entered service in 2004.

**South Africa**

1999	Nelspruit	30 year concession	335,000, water & sewage
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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 91kms of new water mains were laid as well as 18kms 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 6Ml/day have been saved to date; over 8,000 broken meters have been replaced and a further 15,000 new meters have been installed.

1999	Dolphin Coast	30 year concession	50,000 water & sewerage
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In May 2007, Cascal acquired 73.4% of Siza Water from Bouygues. 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. Turnover was ZAR35 million in 2005. The population served varies between 30,000 (low season) and 100,000 (high season).

**Sudan**

2005	Khartoum	12 year management	2.5 million, water provision
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A USD108million water treatment works on the banks of the River Nile for Khartoum State Water Corporation will enter service in 2008 and will be operated by Biwater with the management contract signed in December 2005. Funding for the facility has been provided by the Dutch Ministry of Foreign Affairs (USD58 million) and the Industrial Development Cooperation (IDC), a South African development bank.

**Tanzania**

City Water, a joint venture of Biwater International (UK), Gauff Ingenieure (Germany) and Superdoll Trailer Manufacturers Ltd. (Tanzania), began operations on 1<sup>st</sup> August 2003, implementing a USD143.5million donor funded project. On 13<sup>th</sup> 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 was made on 2<sup>nd</sup> August and was registered on 2<sup>nd</sup> November 2005.

**Contact Details**

Name: Biwater Plc  
 Address: Biwater House, Station Approach,  
 Dorking, Surrey RH4 1TZ  
 Tel: 01306 740740  
 Fax: 01306 885233  
 Web: [www.biwater.com](http://www.biwater.com)

Adrian White (Chairman & CEO)  
 David White (Deputy Chairman)  
 Philip Wainwright (Finance Director)  
 Martin Duffy (Company Secretary)  
 Larry Magor (Director & Cascal Chairman)

**Contact Details**

Name: Cascal BV  
 Address: Biwater House, Station Approach,  
 Dorking, Surrey RH4 1TZ  
 Tel: 01306 746080  
 Fax: 01306 746031  
 Web: [www.cascal.co.uk](http://www.cascal.co.uk)

Stephane Richer (Chief Executive Officer)

Steve Hollinshead (Chief Financial Officer)  
David Sayers (Chief Commercial Officer)  
Brian Winfield (Chief Growth Officer)  
Andrew Young (Projects Director)

## UNITED UTILITIES PLC

United Utilities Plc (UU) is a company specialising in managing 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 is being 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, wastewater and electricity assets within its statutory areas of operation. In June 2007, it was announced that the electricity assets would be sold.
- 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.

United Utilities' GBP1million rights issue (GBP500million in September 2003 and GBP500million in June 2005) is the first 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 will review its capital structure when the electricity assets sale has been completed.

### United Utilities, profit and loss account

Y/E 31/03 (GBPmillion)	2003	2004	2005	2006	2007
<b>Turnover</b>					
UU North West	1,230.1	1,300.7	1,384.7	1,502.9	1,636.2
UU Contract Solutions	N/A	N/A	N/A	654.5	742.2
<b>Operating Profits</b>					
Multi Utilities	502.8	516.9	541.7	637.5	750.1
UU Contract Solutions	N/A	N/A	N/A	68.5	69.1
Group turnover	1,878.8	2,060.0	2,103.7	2,086.0	2,323.0
Operating profit	561.7	597.1	651.4	729.5	827.5
Net interest	-231.4	-248.1	-283.8	-284.4	-170.2
Disposal of businesses	34.0	1.9	-9.4	-114.9	-67.2
Pre-tax profit	327.5	349.0	367.6	445.1	500.7
Earnings/Share (p)	45.7	54.2	30.1	24.3	49.2

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.

Bathing water compliance	2001	2003	2004	2005	2006
Guideline	4	4	7	7	8
Mandatory	26	32	29	25	28
Fail	4	1	1	2	0

**UU Industrial: Industrial water outsourcing**

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.

Year	2001-02	2003-04
Customers	N/A	400
On-site customers	N/A	21
Wastes treated (million m <sup>3</sup> )	38	40
Revenues (GBPmillion)	12	20

Park Environmental in Newport, South Wales and Ellesmere Port was acquired for GBP8million in 2004; this liquid waste treatment facility has revenues of approximately GBP10million. The Newport facility is being expanded to handle 150,000 tonnes of liquid wastes pa. Other liquid waste facilities operated by UU Industrial are at Bridgend and Ellesmere Port, and can handle 47,000 t/pa and 100,000 t/pa respectively. 13million tonnes of liquid waste were treated in 2004-05, falling to 11million tonnes in 2006-07, via 1,500 customers.

**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**

Year	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 Edison in 2005 (see company entry).

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	1,300,000	1,200,000	1,300,000
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
<b>Total-home market</b>	<b>9,628,000</b>	<b>10,328,000</b>	<b>10,328,000</b>
<b>Total-international</b>	<b>12,119,000</b>	<b>6,170,000</b>	<b>13,505,000</b>
<b>Grand total</b>	<b>21,723,000</b>	<b>16,358,000</b>	<b>23,828,000</b>

#### Poland

1999	Biesko Biala	12 year concession	300,000 water and wastewater
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In November 1999, UI 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 surrounding area. The privatisation is being supported by the World Bank.

#### Estonia

2000	Tallinn	15 year concession	405,000 water and wastewater
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The total contract is worth USD700million. UU and IW bid EEK, 338million (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 12.3% from January 2008 has been proposed.

#### Tallinna Vesi AS, profit & loss account

FY 31/12 (EEKmillion)	2002	2003	2004	2005	2006
Water sales	201.5	200.9	220.7	262.7	289.3
Wastewater sales	178.0	180.7	204.5	232.9	259.7
Other sales	140.0	122.4	123.3	94.4	144.2
Total revenues	512.5	504.0	548.5	592.0	693.2
Net Income	146.2	104.5	173.0	174.4	248.0

For further details, please see the separate company entry for Tallinna Vesi.

**Bulgaria**

1999	Sofia	25 year concession	1,300,000 water and wastewater
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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 GBP700million over its life. UU holds 57.8% of Sofiyska Voda.

**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 privatisation.

2004	Fleurieu Peninsula	20 year BOT	5,000 wastewater
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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
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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	300,000 water
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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
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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 265MI/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
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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 2,000billion L of water. It is located in the Officer Basin, 400km from the mining area of Kalgoorlie. The water is suitable as industrial water or could be treated for human consumption.

**India**

2003	Tirupur	30 year BOT	1.6million water treatment
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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 185MI/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
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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 11.8% of Metro Manila.

Water services	1997	2007
Cost of water (Ps/m <sup>3</sup> )	10.70	5.55
Compliance with drinking water standards	91%	100%
Non-revenue water	63%	25%
Households served	325,000	909,000
Water delivery (million L/day)	440	1,054
Delivery 24 hours/day	26%	98%

Just under 1million 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 170,000 households since 1998. PHP17.5billion was spent between 1997 and 2005. The company is currently developing new contracts outside its original territory and is preparing to bid for Maynilad Water, the company serving West Manila.

### Manila Water, profit and loss account

FY 31/12 (PHPmillion)	2002	2003	2004	2005	2006
Water sales	2,111.0	3,062.3	3,357.2	4,538.4	5,250.2
Environmental charges	209.5	305.9	339.9	464.9	532.1
Sewer charges	121.3	198.6	213.6	279.8	308.1
<b>Total revenues</b>	<b>2,682.5</b>	<b>3,777.9</b>	<b>4,291.2</b>	<b>5,763.1</b>	<b>6,784.7</b>
Net Income	558.4	1,150.5	1,329.7	1,939.7	2,226.0

Water supply in 1Q 2006 is running at a peak of 887million L/day. 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.

### Kuwait

2001	Sulaibiya	30 year BOT	1.9 million sewage treatment
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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 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](http://www.unitedutilities.com)  
 Web: [www.unitedutilities.com.au](http://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**

**AUSTRIA****AQUAPLUS**

Aquaplus is jointly held by Vienna Water (33%, owned by the city of Vienna), Porr Infrastruktur GmbH (33%, construction) and Österreichische Bundesforste (33%, the Federal forestry company). It has been developed to allow Vienna Water to operate in the private sector for BOT contracts in Austria and Central and Eastern Europe. Aquaplus has two subsidiaries; Ariwa Abwasserreinigung im Waldviertel GmbH (Ariwa) and Aquasystems, and a management contract with VAK Plus.

**Czech Republic**

2005	Hodonin	Management	70,000 water & wastewater
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VAK Plus holds 61% of VAK Hodonin, the company responsible for water and wastewater services in Breclav, Hodonin and Bzenec in Moravia. The contract started in January 2005 and is responsible for the management of the municipal water and sewerage services. VAK Hodonin was in turn awarded a 30 year concession in 1993. In 2004, a new water treatment plant entered service at Bzenec, serving the area. The wastewater treatment plant has a PE of 100,000.

**Ariwa**

Ariwa was founded in 2001 for developing water and sewage treatment BOT contracts in Austria. That year, it gained the first sewage treatment BOT in Lower Austria, serving the city of Waidhofen/Thaya. Construction was begun on September 21, 2001 and the facility entered service in September 2003, with the municipality commencing payments in March 2003. The sewage treatment plant has a capacity of 16,000 PE with a capital cost of EUR4million and an operational period of at least 25 years.

**Aquasystems**

Aquasystems DOO was founded for the Maribor wastewater treatment concession project in Slovenia. This concession was operated by Suez, with Porr Infrastruktur being one of the main shareholders in Aquasystems.

**Slovenia**

1997	Maribor	25 year concession	190,000 wastewater treatment
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Suez was the preferred bidder for the Maribor concession in 1997 and subsequently joined with Aquasystems. 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 190,000 (equivalent to EUR29/capita pa) and can be expanded to 285,000 at a later date. Construction started in June 2000, with the pre-treatment phase completed in June 2002 and the facility became fully operational in February 2004. The operational contract runs from 2004. Maribor is Slovenia's second largest city. This was the first BOT wastewater treatment contract to be awarded in Central and Eastern Europe.

**Contact Details**

Name: Aquaplus  
 Address: Absberggasse 47 A-1103  
 Vienna, Austria  
 Tel: Tel: + 43 (0)1 603 10 12-3917  
 Fax: Fax: + 43 (0)1 603 10 12-3920  
 Web: [www.aquaplus.at](http://www.aquaplus.at)  
 Web: [www.ariwa.at](http://www.ariwa.at)

Dr. Günter Heisler (General Manager)  
 Dr Kiril Atanasoff-Kardjalieff (Manager)  
 Dr. Robert Nusser (Manager)

## ENERGIE AG

Energie Oberösterreich AG is the regional power utility serving Upper Austria. It is 75% held by the regional Government, with EVN (as defined below) holding 9.3%. In December 2003, Energie's Energie AG Bohemia acquired AWG's remaining water interests in the Czech Republic for EUR115million. Energie is concentrating on developing its water activities in Austria and the Czech Republic, along with one contract in Germany and is actively seeking to expand into Hungary and the Slovak Republic.

All of Energie's water and wastewater interests in Austria were merged into Energie AG Wasser in 2006. At the end of 2006 Energie served 652,306 people with drinking water and provided wastewater services for 376,137 people in Austria and the Czech Republic.

### Energie, profit and loss account

Y/E 30/09 (EURmillion)	2002	2003	2004	2005	2006
Revenues	544.6	601.3	695.2	958.4	1,095.3
Operating profits	45.3	48.6	79.6	79.9	94.1
Net profits	24.2	59.4	76.7	66.6	68.4
Water – people served	N/A	N/A	508,000.0	596,000.0	652,000.0
Water – potable (million m <sup>3</sup> )	N/A	N/A	45.4	46.7	45.0
Water – waste (million m <sup>3</sup> )	N/A	N/A	34.6	N/A	N/A
Water – sales	N/A	N/A	32.2	45.7	57.2
Water – operating profit	N/A	N/A	1.1	0.1	1.3

In Austria, Energie AG Wasser holds two companies: OOE Landeswasserversorgungsunternehmen AG (LWU, 98% share) and WDL Wasserdienstleistung GmbH (WDL, 35% share). LWU serves 30 municipalities with 150,000 inhabitants. The total amount of drinking water supplied during the 2006 business year was about 6.2million m<sup>3</sup> generating revenues of EUR3.8million. From May 2007, a water transfer project to Burghausen in Bavaria (Germany) is supplying 15,000 people with up to 1.5million m<sup>3</sup> of drinking water pa.

### Energie, populations served

Country	Water	Sewerage	Total
Austria	150,000	0	150,000
Germany	15,000	0	15,000
Czech Republic	502,000	355,000	502,000
<b>Grand Total</b>	667,000	355,000	667,000

### Czech Republic

1995	South Bohemia	15 year concession	306,000 water and sewerage
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Vodovy a Kanalizace Jizni Cechy (VAKJC) is based in Ceske Budejovice and serves 340 municipalities, 306,000 people with water and 232,000 with sewerage. VAKJC was privatised in 1994 and AWG of the UK built up a 95.2% stake over the next five years and Energie currently holds 98.2% of the entity. VAKJC had revenues of EUR38.1million in 2006, providing 36million m<sup>3</sup> of water. A further 120,000 are served through bulk water supplies.

2000	Beroun	Asset ownership	64,000, water & sewerage
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AWG acquired 58.3% of Severomoravske Berounske Vodovy in 2000 and Energie currently holds 59.2% of the entity. SBV owns 30% of the asset owning entity. Beroun is adjacent to Prague. The company had revenues of EUR6million in 2006, providing 3.1million m<sup>3</sup> of drinking water and treating 4.2million m<sup>3</sup> of wastewater. Water is provided to 64,000 people and sewerage for 44,000.

2005	Kolln	Concession	51,000, water & sewerage
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100% of VODOS Kolln was acquired in 2005 and the company was integrated into Energie during 2006. Water is provided to 51,000 people and sewerage for 34,000, with revenues of EUR5.1million in 2006.

2005	Chrudim	Concession	80,000, water & sewerage
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95% of VS Chrudim was acquired in 2005 and the company was integrated into Energie during 2006. Water is provided to 80,000 people and sewerage for 45,000, with revenues of EUR4.7million in 2006.

**Contact Details**

Name: Energie AG

Address: PO Box 298, Boehmerwaldstrasse 3, A-4021 Linz, Austria.

Web: [www.energieag.at](http://www.energieag.at)

Leo Windtner (Chairman, Board of Management)

Werner Steinecker (Board of Management)

Roland Plumberger (Board of Management)

**EVN**

Energie-Versorgung Niderösterreich (EVN) is the regional power utility serving the province of Lower Austria. 51% of its equity is owned by the state Government. In January 2001, EVN acquired Nösiwag from the state Government for EUR87million. The company has 16 supply areas and 75 reservoirs, with a storage volume of 197,000m<sup>3</sup>, as well as a 1,450km supply network. With the acquisition of WTE in 2003, EVN now provides water and wastewater services to 1.2million people in six countries. EVN Wasser's 2003/04 revenues were EUR19.4million, against EUR98.9million for WTE. The fall in EVN Wasser's revenues was due to a wetter summer than in 2003.

Y/E 30/09 (EURmillion)	2002	2003	2004	2005	2006
Water sales (million m <sup>3</sup> )	24.0	25.8	23.5	24.3	25.2
Water revenues	18.7	21.4	119.2	N/A	N/A

EVN Wasser provides water services to 615 municipalities, or some 480,000 inhabitants, or around one-third of the Lower Austrian population. 131 industrial customers are also supplied. Nösiwag is the second largest Austrian water supplier behind the Vienna waterworks. EVN aims to expand EVN Wasser across Lower Austria (water supply), along with a planned entry into the end customer market. It is also anticipated that the sewerage and wastewater treatment markets will be addressed. In the longer term, other markets in Austria and internationally will be sought. In June 2002, EVN acquired 50% of Wiental-Sammelkanal (WISAK), which operates WWTWs in Wiental, Ludweis-Aigen, Großmugl and Niederhollabrunn in Lower Austria.

From October 2005, EVN has provided the operation of water services to 11,000 people in Gerasdorf, along with 1,760 people in Grossmugl in 2006. EVN currently supplies some 16,500 people in the region outside its traditional contract partner.

EVN has one contract outside Austria; DTV Rt. (51% held with Resonátor Kft of Hungary), providing water and wastewater services for 3,100 households (c10,000 people) in six municipalities in the Dunavarsány region of Hungary. Since the original contract was signed in 2001, two more municipalities have joined and negotiations are underway with a further six.

**EVN, profit and loss account**

Y/E 30/09 (EURmillion)	2002	2003	2004	2005	2006
Revenues	1,113.9	1,082.1	1,207.3	1,609.5	2,071.6
Pre-tax profits	137.6	145.4	135.9	186.2	304.9
Net profits	89.5	102.6	117.4	144.4	221.9
Earnings/share (EUR)	2.39	2.73	3.08	3.53	5.43

**EVN, populations served**

Country	Water	Sewerage	Total
Austria	479,000	9,000	<b>488,000</b>
Hungary	10,000	10,000	<b>10,000</b>
Germany	21,000	105,000	<b>105,000</b>
Slovenia	0	24,500	<b>25,000</b>
Croatia	0	760,000	<b>760,000</b>
Russia	0	350,000	<b>350,000</b>
Turkey	0	2,000,000	<b>2,000,000</b>
Total-home markets	479,000	9,000	<b>488,000</b>
Total-international	31,000	3,249,500	<b>3,249,500</b>
<b>Grand Total</b>	<b>509,000</b>	<b>3,258,500</b>	<b>3,747,500</b>

**WTE**

In July 2003, EVN acquired WTE Wassertechnik (WTEW) from Berlinwasser. WTE has built wastewater treatment plants in Germany, Austria and Denmark along with Poland, Bosnia, Croatia, Lithuania, Russia, Slovenia and the Ukraine. By 2004, 70 sewage treatment plants had been constructed, serving 8.5million people. 23 are currently managed by WTE. WTE has a turnover of EUR62.7million, with a pre-tax profit of EUR6.6million. WTE seeks to operate a BOOT model for construction contracts, handing over the facilities to a local partner after its construction.

**Austria**

2004	Zistersdorf	3+25 year BOT	9,000, wastewater
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During 2004, WTE Austria took over the operation of a wastewater treatment plant and sewerage system in Zistersdorf, Lower Austria. The plant is currently being refurbished at a cost of EUR12million and is designed to serve around 9,000 inhabitants. This work will be completed by the beginning of 2007.

**Germany**

2000	Hecklingen	30 year BOOT	24,000, sewage treatment
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A 48,000 PE (population equivalent, in this case 2 PE for each person) municipal wastewater treatment facility and 250km of allied sewerage systems constructed over six years for EUR93million.

2002	Windeck	25 year BOOT	21,000, water & sewerage
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Windeck is in North Rhine Westphalia. The contract involves managing and operating the municipality's water and sewerage services, including the construction of 100km of sewerage systems and 21km of water mains a new WWTW. The operational contract started in January 2003 and the construction phase was completed in 2005 with EUR37million spent on capital projects.

1993	Altenburg	10+10 year BOOT	60,000, sewerage
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The city's WWTW was constructed in two phases between 1993 and 1995, with a BOOT contract running to 2003. This contract was renewed for another 10 years in 2003.

2003	Langnese-Iglo	14+7 year O&M	Industrial wastewater
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Langnese-Iglo GmbH in Heppenheim operates Europe's largest ice cream facility. The WWTW handles 1,600m<sup>3</sup>/day of effluent, reducing its COD loading by 91%.

**Croatia**

2005	Vodice	23 year DFBOT	10,000 sewage treatment
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Vodice is on Croatia's Adriatic coast. WTE is the municipality's private partner for a 51km sewerage system and a wastewater treatment plant for 20,000 PE.

2000	Zagreb	28 year BOT	0.75million sewage treatment
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This is the largest sewage treatment concession award in central and Eastern Europe to date, involving EUR265million in capital spending. The project scope includes design, construction and operation of the wastewater treatment plant 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%) and the City of Zagreb (3%). Construction began in July 2002 and was completed between April 2004 (mechanical treatment) and October 2006 (biological treatment) with a final PE of 1.5million. During 2007, an energy recovery system is being developed.

**Russian Federation**

1998	Moscow	11 year Build, O&M	0.25million PE sewage treatment
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A EUR31million 80,000m<sup>3</sup>/day WWTW covering new housing estates in the district of South Butowo. The contract covers the construction of the facility and its operation until 2011.

2000	Moscow	12.5 year Build, O&M	0.47million PE sewage treatment
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A 140,000m<sup>3</sup>/day EUR65million WWTW for the Zelenograd area of Moscow. The O&M element of the contract runs until 2013.

#### Slovenia

2006	Bled	25 year BOT	16,000 sewage treatment
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The WTE developed plant entered operation in October 2006 and WTE has been awarded a 25 year operations contract.

2006	Laško	25 year BOT	5,000 sewage treatment
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This plant has a pre-treatment facility for brewery wastewater.

1998	Kranjska Gora	15 year Concession	3,500 sewage treatment
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This is a tourist area, which accommodated 258,000 visitors in 1999. The concession covers the complete sewerage system, including a new WWTW. In 2002, BOT contracts for sewerage were gained for the municipalities of Komenda and Bled.

#### Turkey

2007	Istanbul	2+7 year DBO	2.0million sewage treatment
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The Istanbul Metropolitan City Water and Sewerage Directorate awarded the EUR108million wastewater treatment facility contract to WTE in April 2007, which will enter service in 2010.

#### Contact Details

Name: EVN AG  
 Address: EVN Platz, A-2344 Maria Enzersdorf, Austria.  
 Tel: + 43 2366 200-0  
 Fax: + 43 2366 200-2030  
 Web: [www.evn.at](http://www.evn.at)  
 Web: [www.wte.de](http://www.wte.de)

Burkhard Hofer (Chairman)  
 Rudolph Gruber (CEO)  
 Peter Layr (Director)

**ESTONIA****TALLINNA VESI AS**

United Utilities led a consortium that was awarded the contract for managing Tallinn's water and wastewater networks in 2000, in a contract at the time worth USD700million. UU and IW (International Water, UU's joint venture bidding partner at the time) bid EEK1,338million (USD75.6million) for a 50.4% stake in AS Tallinna Vesi. The city of Tallinn also holds a single Golden Share. The 2005 IPO of Tallinna Vesi saw UU's stake fall from 38% to 26.5%. The city's public water supply was first recorded in 1337 and an extant wheel well serving the city dates from 1375. In contrast, the first water treatment plant at Ülemiste was built in 1927, which along with a second plant built at the site in 1970 provides 90% of the city's water.

**Tallinna Vesi AS, profit & loss account**

<b>FY 31/12 (EEKmillion)</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
Water sales	201.5	200.9	220.7	262.7	289.3
Wastewater sales	178.0	180.7	204.5	232.9	259.7
Other sales	140.0	122.4	123.3	94.4	144.2
Total revenues	512.5	504.0	548.5	592.0	693.2
Net Income	146.2	104.5	173.0	174.4	248.0

There were 15% price increases in 2004 and 2005 and a rate rise of 12.3% from January 2008 has been proposed. The current emphasis for capital spending is on developing a municipal and stormwater sewerage and effluent treatment system. A new wastewater treatment works at Paljassaare opened in 2006 reduced nutrient inputs into the Bay of Tallinn by 37.5%.

**Tallinna Vesi, operating data**

<b>FY 31/12</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
Water use (L/cap/day)	N/A	N/A	103.1	100.6	101.8	101.9
Water quality compliance	95.1%	99.0%	99.0%	99.0%	99.7%	99.6%
Wastewater plant efficiency	N/A	57.1%	56.9%	58.5%	77.1%	78.9%

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.

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. Expansion has taken place through gaining new service areas near Tallinn. To date, five service areas have been added and three potential service areas identified.

**Contact Details**

Name: AS Tallinna Vesi  
 Address: 10 Ädala Str., 10614 Tallinn, Estonia  
 Tel: +372 6262 200  
 Fax: +372 6262 30  
 Web: [www.tvesi.ee](http://www.tvesi.ee)

Roch Jean Guy Antne Chérourx (Chairman & CEO)  
 David Hetherington (COO)  
 Ian Plenderleith (CFO)

**FRANCE****BOUYGUES**

Bouygues is one of the leading French construction companies. Société d'Aménagement Urbain et Rural (SAUR) was part of the Bouygues Group from 1984 to 2004. Bouygues has eased back its involvement in the water sector in recent years, having sold its Czech activities to Veolia and South East Water in the UK to Macquarie during 2004, followed by the sale of all of SAUR's activities outside Italy and Africa to PAI (see SAUR company entry) in 2004 for EUR1,037million. The sale brought a total net gain of EUR221million for Bouygues. Bouygues in turn acquired 15% of Novasaur for EUR58million and 5% was sold on in April 2005. Finally, Sigesa, the holding company for the Italian activities was sold to ACEA in July 2005 and the contract in Mali was terminated that year. Revenues for the water and power activities in Africa were EUR260million in 2006. Contracts in Guinea and the Central African Republic were terminated in 2002 and SAUR withdrew from the Mozambique concession that year. Siza water, Bouygues's contract in South Africa, was sold to Biwater's Cascal in 2007.

**Bouygues SA, profit and loss account**

Y/E 31/12 (EURmillion)	2002	2003	2004	2005	2006
Turnover	22,247.00	21,822.00	23,402.00	23,983.00	26,408.00
Operating profit	1,058.00	1,238.00	1,547.00	1,745.00	1,877.00
Net profit	666.00	450.00	858.00	832.00	1,246.00
Earnings/share (EUR)	1.93	1.34	2.68	2.42	3.60
Dividend/share (EUR)	0.36	0.50	0.75	0.90	1.20

**Bouygues, population served**

Country	Water	Sewerage	Total
Côte d'Ivoire	5,000,000	1,500,000	5,000,000
Senegal	3,800,000	0	3,800,000
Zambia	300,000	300,000	300,000
<b>Global total</b>	<b>9,100,000</b>	<b>1,800,000</b>	<b>9,100,000</b>

**Senegal**

1996	Urban areas	10+10 year lease	3.8 million water management
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Operations and management for water provision services to 54 towns and cities (1.8million outside Dakar) through its 62.83% stake in Sénégalaise Des Eaux. Turnover was EUR67.5million in 2004. The contract was renewed for a further 10 years in 2006.

**Côte d'Ivoire**

1987	Abidjan	20 year concession	5.0 million water & sewerage
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SODECI has the O&M contract for water and sewerage services for Abidjan, the capital city. This is a renewal of the original 1959 concession. 5 million people are provided with water services, along with 1.5 million for sewerage. SAUR holds 48.9% of SODECI. Turnover was EUR74million in 2003 and including the power activities rose by 11% to EUR410million in 2004. Despite political instability in the country, the contract continued to operate to expectations during 2006.

**Zambia**

2000	Copper belt	O&M	300,000 water & sewerage
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The copper belt covers industrial towns in the north of Zambia.

**Contact Details**

Name: Bouygues SA  
 Address: Challenger, 1, av. Eugène Freyssinet, 78061  
 St-Quentin-Yvelines Cedex, France  
 Tel: +33 1 44 30 60 32 11  
 Web: [www.bouygues.fr](http://www.bouygues.fr)

Martin Bouygues (Chairman and CEO)  
 Olivier Poupart-Lafarge (Deputy CEO)

Olivier Bouygues (Deputy CEO)

**GERMANY****E.ON**

E.ON was founded in June 2000 through the merger of VEBA and VIAG, two German regional power utilities. It is the world's largest privately held power utility. E.ON's water activities are grouped under E.ON Aqua, part of E.ON Energie AG. E.ON's 80.5% holding in Gelsenwasser (See separate entry) was sold to the municipalities of Dortmund and Bochum in August 2003 for EUR835million, at a profit of EUR418million, on the order of the German Cartel Commission as a result of its acquisition of Rhurgas due to Gelsenwasser's natural gas activities.

**E.ON, profit and loss account**

Y/E 31/12 (EURmillion)	2002	2003	2004	2005	2006
Turnover	36,624.00	46,364.00	49,103.00	56,141.00	67,759.00
Pre-tax profit	-720.00	3,950.00	4,348.00	7,159.00	5,133.00
Net profit	2,777.00	4,647.00	4,339.00	3,640.00	4,386.00
Earnings/share (EUR)	4.26	7.11	6.61	11.24	7.67
Dividends/share (EUR)	1.75	2.00	2.35	2.75	3.35

E.ON Aqua has a broad portfolio of water investments, generally at or below the 50.0% equity holding level and therefore not consolidated. 28 water and wastewater entities were held by the company at the end of 2003, along with a significant number of municipal Stadwerke. In 2004, these were grouped round seven regional power utilities. Examples include:

Company	Location	Stake
Harzwasserwerke GmbH.	Hildesheim	20.8%
Wasserwerk Gifhorn BG	Gifhorn	49.8%
Abwasserentsorgung Bleckede GmbH	Bleckede	49.0%
Abwasserentsorgung Schoppenstedt GmbH	Schoppenstedt	49.0%
Wasser und Abwassergellschaft Vienenburg mbH	Aachen	49.0%
Städtische Werke Magdeburg GmbH	Magdeburg	26.7%

Water activities (EURmillion)	2001	2002
Water turnover	245	267
Operating profits	47	55
Capital spending	196	48

E.ON Aqua has had a very low key existence since the Gelsenwasser divestiture. Turnover is likely to be in the region of EUR70-80million.

**Contact Details**

Name: E.ON  
 Address: E.ON-Platz 1, D-40479 Düsseldorf,  
 Germany  
 Tel: +49-211-4579-0  
 Fax: +49-211-4579-501  
 Web: [www.eon.com](http://www.eon.com)

Dr. Wulf Bernotat (Chairman and CEO)  
 Dr. Hans Michael Gaul (Director)  
 Dr. Erhard Schipporeit (Finance Director)

## GELSENWASSER AG

Gelsenwasser is a water supply company operating in North Rhine Westphalia and, until the privatisation of Berlin Water, was the largest and oldest water company in Germany. In 1887 it was awarded the contract for the operation of Gelsenkirchen's water provision services. In 1997, this contract was renewed to 2027. Gelsenwasser serves 400 industrial customers and 1.4million people directly, 1.5million people via other water suppliers and 2.6million through its subsidiary companies. The company is developing its presence in the Eastern Länder and central and Eastern Europe. E.ON's 80.5% stake in Gelsenwasser was sold to the municipalities of Bochum and Dortmund for EUR835million in 2003. The municipalities had sought to sell at least 25% to another company, and held talks with various players during 2004, but decided to retain their stakes for the medium term.

### Gelsenwasser AG, profit and loss account

Y/E 31/12 (EURmillion)	2002	2003	2004	2005	2006
Water	191.10	196.20	205.20	199.70	210.70
Gas	171.00	180.80	179.04	197.00	230.70
Other	19.70	19.70	21.00	30.30	37.80
Revenues	381.80	396.60	405.06	427.00	471.00
Operating profits	36.40	73.10	70.02	96.90	64.60
Net profits	39.70	47.20	-1.50	112.90	102.50
Earnings/share (EUR)	11.55	13.73	-0.41	32.83	29.82

The company has some EUR260million earmarked for capital spending between 2007 and 2011, including EUR96million for infrastructure maintenance and EUR104million for business expansion.

### Gelsenwasser, populations served

Country	Water	Sewerage	Total
Germany	4,650,000	1,150,000	5,800,000
Hungary	190,000	190,000	190,000
Czech Republic	96,800	96,800	96,800
Poland	75,000	75,000	75,000
Total – home markets	4,650,000	1,150,000	5,800,000
Total – international	351,800	351,800	351,800
<b>Grand Total</b>	<b>5,001,800</b>	<b>1,501,800</b>	<b>6,151,800</b>

Water services are via direct water supply on behalf of municipalities, the sale of water to industrial users (mainly in coal mining and steel manufacturing) and the resale of water to neighbouring utilities. Household sales are broadly stable or showing a slight decline as water conservation measures gain in popularity. Prices for domestic water remained constant at EUR1.37/m<sup>3</sup> between 1997 and 2006, when they were increased to EUR1.56/m<sup>3</sup>.

Y/E 31/12 (million m <sup>3</sup> pa)	2002	2003	2004	2005	2006
Gelsenwasser AG	189.4	195.5	195.8	193.3	195.6
VGW	6.8	7.1	7.2	7.4	7.5
NGW	33.4	37.6	37.7	38.1	38.3
Gelsenwasser Group	229.6	240.2	240.7	233.1	235.5
Sales to industrial customers	88.6	97.9	99.6	93.8	96.7
Sales to domestic customers	64.5	65.5	64.5	63.9	63.5
Sales to other utilities	76.5	76.8	76.6	75.4	75.3
<b>Total sales</b>	<b>459.2</b>	<b>480.4</b>	<b>481.4</b>	<b>400.9</b>	<b>403.8</b>
<b>Wastewater treatment:</b>					
Hanse Wasser (million m <sup>3</sup> )	77.2	80.7	N/A	N/A	N/A
Hanse Wasser (revenues)	153.3	156.8	N/A	N/A	N/A
<b>Overall (million m<sup>3</sup>)</b>	<b>N/A</b>	<b>94.0</b>	<b>125.2</b>	<b>127.5</b>	<b>130.6</b>
<b>Overall (revenues)</b>	<b>N/A</b>	<b>170.9</b>	<b>219.7</b>	<b>238.1</b>	<b>255.5</b>

Gelsenwasser has three main 100% held subsidiaries involved in water and sewerage service provision. Vereinigte Gas und Wasserversorgung GmbH (VGW) and Niederrheinische Gas und Wasserwerke GmbH (NGW), which operate in Gelsenwasser's region. NGW was acquired in 1973, while VGW was incorporated by Gelsenwasser in 1968. VGW supplies water to 22,445 customers, or 120,500 people in four municipalities. AWS Abwassersysteme GmbH (AWS) specialises in sewerage contracts. AWS is still at the start up stage, with one sewage treatment work construction project awarded and 2004 revenues of EUR5.5million. Otherwise, the company believes that in Western Germany it has suffered from the fiscal discrimination against awarding service contracts to the private sector. Gelsenwasser (51% stake) took over the operations of

Abwassergesellschaft Gelsenkirchen GmbH in April 2004, which is responsible for the operation of the city of Gelsenkirchen's sewage disposal operations, serving 275,000 people. This represents a return to the company's origins, handling all aspects of the city's water cycle.

3,700 new domestic customers were gained in 2003, along with a metalworking company moving into its operational area (4.5million m<sup>3</sup> pa). The population of the company's core operating area is forecast to fall by 350,000 by 2015, hence the geographic diversification strategy.

In August 2004, Gelsenwasser gained 49% of Stadtentwässerung Dresden GmbH, which runs the waste-water operations for the state capital of Saxony. With 480,000 inhabitants around 26million m<sup>3</sup> of wastewater will be disposed of. In August 2004, 49.9% of the shares in Technische Werke Emmerich am Rhein GmbH (TWE) were acquired. TWE operates the 223km of sewerage pipes and the sewage treatment plant in the city of Emmerich-on-Rhine. The city of Emmerich-on-Rhine holds 50.1% of the shares.

In 2005, the Datteln and Oer-Erkenschwick concessions were both extended until 2028, along with a contract with Werl until 2015 and with Wickede until 2029, in total a water supply volume of 6.4million m<sup>3</sup> for 92,500 customers. Three water supply contracts with different utilities were also extended: Lünen until 2023, Werl until 2015 and Stadtwerke Münster for a further 16 years. Contracts with industrial customers involving a total supply volume of 20million m<sup>3</sup> were extended.

In 2006, the 120 year partnership with Castrop-Rauxel was extended until 2028 along with the contract with Marl until 2030. Along with Nordkirchen and Welper, these four towns represent 16% of Gelsenwasser's population base. External contract renewals included the Münster municipal utilities (until 2020) and with Wasserversorgung Herne (until 2036), securing an annual sales volume of 30.6million m<sup>3</sup> over the next two decades.

In 2006, Stadtentwässerung Dresden GmbH acquired two sewage treatment management contracts serving Pirna and Heidenau in Saxony covering 70,000 people.

#### **Wasserbeschaffung Mittlere Ruhr GmbH (WMR), Bochum**

WMR is jointly held (50% each) by Stadtwerke Bochum GmbH (commercial management) and Gelsenwasser (technical management) under a 1971 agreement covering water supply to the city of Bochum and Gelsenwasser's supply territories south of the River Ruhr. Water is supplied by Gelsenwasser's Essen plant and Wasserbeschaffung Mittlere Ruhr GmbH's Stiepel waterworks.

<b>FY 31/12 (EURmillion)</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
Sales	9.2	9.5	11.0	11.7	11.6
Water provision (million m <sup>3</sup> )	30.4	31.2	30.6	30.0	30.0

#### **Wasserversorgung Herne GmbH (WVH), Herne**

The company (50% held by Gelsenwasser and 50% Stadtwerke Herne AG) was formed in 1961 after Gelsenwasser had provided water to the municipality for some decades via franchise contracts. In 2006, the contract was renewed for a further 30 years.

<b>FY 31/12 (EURmillion)</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
Sales	16.9	16.5	16.8	16.8	17.4
Water provision (million m <sup>3</sup> )	9.7	9.8	9.8	9.5	9.5

#### **Wasserversorgung Voerde GmbH (WVV), Voerde**

This is 1994 joint venture (50% each) between NGW and the municipality, providing water to 15,314 households in Voerde. Drinking water is sourced exclusively from NGW's Bucholtwelm Waterworks.

<b>FY 31/12 (EURmillion)</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
Sales	4.5	4.6	4.9	4.8	4.9
Water provision (million m <sup>3</sup> )	2.3	2.5	2.4	2.4	2.4

#### **Wasserwerke Westfalen GmbH (WWW), Dortmund**

WWW was formed in 2000 as a joint venture (50% each) between Gelsenwasser and Dortmunder Energie-und Wasserversorgung GmbH (DEW), serving DEW in Westhofen, Ergste, Villigst, and Hengsen and for Gelsenwasser in Witten, Echthausen, and Halingen. The contract is designed as an open option for further expansion.

FY 31/12 (EURmillion)	2002	2003	2004	2005	2006
Sales	33.4	36.3	41.2	42.8	43.9
Water provision (million m <sup>3</sup> )	112	114	111	109	110

In August 2001, a 20 year contract was gained for supplying 1.2million people in 400,000 households in Bochum and Hamm, Iserlohn and Sendenhorst. WWW abstracts the water and Gelsenwasser (50%) with Dortmundener Energie und Wasserversorgung GmbH (50%) distribute the water. Up to 120million m<sup>3</sup> of water pa is delivered from eight waterworks along the River Ruhr.

### Hanse Wasser

In 2000, Gelsenwasser formed Hanse Wasser GmbH, a 49%/51% joint venture with Stadtwerke Bremen AG, a municipal water utility serving the municipality of Bremen. Hanse Wasser gained a 74.9% stake in Abwasser Bremen GmbH, paying the city DEM708million to use the sewerage and sewage treatment network, which serves its 550,000 people in the City of Bremen and 150,000 (Lemwerder, Schwanewede, Ritterhude, Lilienthal and Oyten) Achim in the surrounding area. The network has 160,000 connections and is served by two tertiary level treatment plants: Seehausen purification plant (serving a population equivalent of 1million) and Farge (population equivalent of 150,000). 43.9million m<sup>3</sup> of wastewater was treated in 1999.

### Hungary

2001	Miskloc	20 year concession	190,000, water & wastewater
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Gelsenwasser holds 49% of the equity of Borsodviz Rt., a regional utility providing water and wastewater services to 109 municipalities in Miskloc in the Borsod region. The municipality holds 51% and an annual turnover of DEM12million is anticipated.

### Poland

2002	Glogowie	20 year concession	75,000 water & wastewater
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46% of PwIK w Glogowie Sp zoo (PwIK) was acquired in 2002. Revenues were PLN16.3million in 2003 and PLN16.2million in 2004.

FY 31/12 (PLNmillion)	2004	2005
Sales	13.2	18.2
Water provision (million m <sup>3</sup> )	3.0	2.9
Wastewater treated (million m <sup>3</sup> )	2.8	2.6

### Czech Republic

NGW holds 30.58% of Chevak Cheb a.s. with the remainder being held by local municipalities. The company provides water and sewerage services to Cheb, Mariánské Lázně, Ash, Františkovy Lázně and surrounding municipalities (total population 87,800). It was founded in 1994 and NGW acquired its stake in 1998.

FY 31/12 (CZKmillion)	2002	2003	2004	2005	2006
Sales	226.1	231.3	243.5	267.6	272.9
Water provision (million m <sup>3</sup> )	5.7	5.8	5.6	5.2	5.2
Wastewater treated (million m <sup>3</sup> )	5.7	5.8	5.8	5.7	5.6

In 1999, NGW acquired 50% of KMS Kraslickla Mestska Spolecnost s.r.o., which provides water, wastewater and heating services to 9,000 people in the town of Kraslice, near Pilsen. 50% of KMS's shares are held by the municipality. A new wastewater treatment plant entered service in 2003.

FY 31/12 (CZKmillion)	2005	2006
Sales	48.40	56.30
Water provision (million m <sup>3</sup> )	0.31	0.29
Wastewater treated (million m <sup>3</sup> )	0.49	0.49

### Industrial water and wastewater services

**Rhur Oel, Gelsenkirschen:** A ten year lease contract with Rhur Oel GmbH and Veba Oel Verarbeitungs-GmbH was signed in July 2002. Two 4m<sup>3</sup>/hour wastewater treatment plants (0.7million m<sup>3</sup> pa) are operated, with an investment of EUR4million and total revenues of EUR9million. A new contract signed in 2004 increased total revenues to EUR17million pa.

**Ciba Speciality Chemicals, Grenzach:** A ten year contracting agreement to supply desalinated industrial process water to the Rhineland facility was signed in 2003. There is an option to extend this to other facilities.

**Krupp Thyssen Nitrosda, Düsseldorf:** Operation of a pilot plant for the dewatering of slurry from the company's speciality steel production unit. The contract was renewed in 2004, covering 40m<sup>3</sup>/hour of wastes.

**Thyssen Krupp Steel AG, Bochum:** In 2006, AWS was commissioned to build and operate a demineralisation plant with a capacity of 110,000m<sup>3</sup> pa. The contract will run for 10 years.

**Henkel and Stora Enso, Düsseldorf:** Operation pilot plants for the advanced treatment of paper manufacturing wastes generated at the Stora Reishoz facility and chemical manufacturing wastes for the Henkel facility.

**Agust Storck KG, Halle/Westphalia:** 10 year build and operate agreement for a 1,300m<sup>3</sup>/day tertiary wastewater treatment plant running from the plant which entered service at the end of 2004.

**Rudolph Wild GmbH & Co., Eppelheim:** A long term contract was gained in 2006 for the management of the sewage treatment plant near Heidelberg. This plant handles about 0.8million m<sup>3</sup> sewage annually.

#### Contact Details

Name: Gelsenwasser AG  
Address: Willy-Brandt-Allee 26, 45891  
Gelsenkirchen, Germany  
Tel: + 49 209 7080  
Fax: + 49 209 708 650  
Web: [www.gelsenwasser.de](http://www.gelsenwasser.de)

Dr Manfred Scholle (Chairman)  
Dr-Ing Bernhard Hörsgen (Management Board)

## THE LINDE GROUP

The Linde Group (Linde) specialises in the manufacture and distribution of gasses for industrial and medical customers and engineering and logistic services.

### Linde Group, profit and loss account

YE 31/12 (EURmillion)	2002	2003	2004	2005	2006
Group turnover	8,726.00	8,992.00	9,421.00	9,511.00	12,439.00
Operating Profits	647.00	544.00	785.00	953.00	1,371.00
Pre-tax profit	356.00	287.00	518.00	808.00	2,557.00
Net profit	240.00	108.00	266.00	514.00	1,838.00
Earnings/share (EUR)	2.01	0.91	2.23	4.30	13.30

In October 2002, BOC Group acquired Environmental Management Corp, a privately held St. Louis-based water services company, for USD50million, with a further USD10million payable if certain performance conditions were met over five years. In September 2006, Linde acquired BOC for EUR15billion and the merged entity was renamed The Linde Group.

Environmental Management Corp, which had revenues of some USD40million in 2001, manages water and wastewater treatment facilities for both industrial and local municipal customers around the US. BOC Process Gas Solutions aims to expand EMC's client base through its established relationships in the industrial sector. EMC serves municipal clients with populations ranging from 5,000 to around 200,000. Turnover was marginally up during 2004, with the company operating at break-even. Major contract gains have been made in the animal food sector in the USA.

### EMC, main water and wastewater treatment O&M contracts

Brighton, IL	0.55 MGD wastewater treatment plant
Lichfield, IL	1.72 MGD wastewater treatment plant
Godfrey, IL	2.2 MGD wastewater Plant
Monmouth, IL	4.2 MGD wastewater plant
Mount Vernon, IL	5.0 MGD wastewater plant
Oregon, IL	0.625 MGD wastewater plant
Pittsfield, IL	1.5 MGD wastewater plant
Evansville, IL	East – 18.0 MGD wastewater plant
Evansville, IL	West – 20.6 MGD wastewater plant
Jeffersonville, IL	5.2 MGD wastewater plant
Sellersburg, IN	1.5 MGD wastewater plant
Sellersburg, IN	2.5 MGD water treatment plant
St Charles, MO	Missouri – 5.0 MGD wastewater plant
St Charles, MO	Mississippi – 5.5 MGD wastewater plant (being expanded to 7.9 MGD)
Seymour, IN	4.3 MGD wastewater plant
Vincennes, IN	4.56 MGD wastewater plant

#### Contact Details

Name: Linde Group AG  
 Address: Leopoldstrasse 252,  
 80807 Munich, Germany  
 Tel: +49 89 35757 01  
 Fax: +49 89 35757 269  
 Web: [www.linde.com](http://www.linde.com)

Professor Dr Wolfgang Reitzle (CEO)  
 J Kent Masters (Director, America & Africa)  
 Georg Denoke (FD)

#### Contact Details

Name: EMC  
 Address: 1001 Boardwalk Springs Place,  
 O'Fallon, MO 63366  
 Web: [www.emcinc.com](http://www.emcinc.com)

### Mannheimer Versorgungs und Verkehrsgesellschaft mbH (MVV AG)

MVV was corporatised in 1974 and partially floated in 1998. The free float was increased from 12% to 25% through increasing the company's issued equity in 2005. 62% of MVV is now held by the municipality and 15% by Rhurgas AG. As well as water, MVV provides gas, energy, waste-to-energy, district heating and mass transit services. MVV provides water services to 375,000 people within the city of Mannheim and adjacent municipalities. Water deliveries increased from 35.0million m<sup>3</sup> in 2000-01 to 57.9million m<sup>3</sup> in 2005-06.

#### MVV, profit and loss account

Y/E 31/09 (EURmillion)	2002	2003	2004	2005	2006
Water turnover	66.80	73.00	86.00	106.00	107.00
Group turnover	1,678.70	1,438.00	1,652.00	1,958.00	2,276.00
Water operating profit	9.50	11.00	12.00	15.00	21.00
Group operating profit	99.70	121.00	97.00	158.00	201.00
Group net income	50.40	25.00	12.00	28.00	50.00
Earnings/share (EUR)	1.00	0.50	0.24	0.55	0.91

Since 2000, 48.8% stakes in Energieversorgung Offenbach AG (Offenbach in the state of Hesse) and Stadtwerke Solingen GmbH (Solingen in North Rhine-Westphalia) have been acquired. In June 2003 Energieversorgung Offenbach gained a 25 year O&M contract for water and wastewater operations for the parish of Mainhausen in the border region between the states of Hesse and Bavaria.

#### MVV, breakdown of 2005-06 water revenues (EURmillion)

Contracts	Water revenues	%	Population served
Energie (Mannheim)	45	42%	375,000
Investments	62	58%	615,000

In April 2004, MVV Energie acquired 51% of Stadwerke Kiel from TXU Germany Ltd., a subsidiary of the American electric power concern TXU. The company provides water and sewerage services to 320,000 people in the city, 26.8million m<sup>3</sup> pa for water (1999) and 23million m<sup>3</sup> pa for wastewater. Kiel is the capital of Schleswig-Holstein. Stadwerke Kiel generated revenues of EUR292million in 2002 for a range of utility services and net earnings of EUR23.5million. Revenues rose from EUR336million in 2004/05 to EUR370million in 2005/06 with operating profits of EUR35million.

The Stadwerke Ingolstadt Beteiligungen (48.4% holding) power and gas services contract, which covers 96,000 people in Bavaria, was extended to cover water provision during 2004. Stadwerke Buchen (25.1% holding) provides water services to 15,900 people in Buchen and there are plans to extend water services to surrounding municipalities. Including these activities, MVV now provides water and wastewater services to approximately 990,000 people in Germany.

In January 2004, MVV sold its 33% stake in AquaMundo to Inframan, a subsidiary of Saudi Arabia's Amiantit. MVV continues to be involved in international consulting projects and short term asset management and rehabilitation projects in developing economies.

#### Contact Details

Name: MVV Energie AG  
 Address: Luisenring 49, 68159 Mannheim,  
 Federal Republic of Germany  
 Tel: +49 621 29 00  
 Fax: +49 621 2860  
 Web: www.mvv.de

Dr Rudolf Schulten (CEO)  
 Dr Werner Dub (Board)  
 Hans-Jürgen Farrenkopf (Board)

## REMONDIS

Remondis was founded by Josef Rethmann in 1934 as a haulage company in Selm, North Rhine-Westphalia. From the 1960s, it started concentrating on waste collection, becoming one of Germany's leading municipal waste management companies by the 1990s. Renamed Remondis, the company operates in 14 countries including water and wastewater operations in Germany, Spain, Poland and Turkey. Remondis remains under the control of the Rethmann family and has revenues of approximately EUR2.2billion. Remondis has been involved in waste water treatment services since 1982, but traditionally this was a low key adjunct of its waste management activities.

### Germany – four municipal contracts

The Wesendorf local authorities assigned operation of their sewage treatment plant to Remondis in 1982, thus being one of the first Public Private Partnerships. The plant has a capacity of 300,000m<sup>3</sup> pa (820m<sup>3</sup>/day). Remondis took over the operation of the sewage treatment plant for the city of Genthin in 1992, treating more than 1.2million m<sup>3</sup> of municipal and industrial wastewater pa (3,300m<sup>3</sup>/day). In 1998, Rethmann Wasserwirtschafts GmbH acquired an equity participation in Gotha municipal services company. Stadtwirtschaft Gotha GmbH is responsible for the entire water supply and sewage disposal system (population equivalent: 150,000), from the operation of the water treatment and sewage treatment plants and the canalisation network to invoicing the final consumers.

Since the beginning of 2002, Remondis has managed the whole waste water management system for the city of Bremerhaven as a Public Private Partnership. Remondis is responsible for the operation of two sewage treatment plants (population equivalent: 612,000) and 600km of sewers, handling up to 60,000m<sup>3</sup>/day of waste water. Remondis Aqua operates industrial water and wastewater contracting work in Germany, serving customers including Lorenz Snack-World, MAN, BASF and the Humana Group.

### Poland

In 2006, Remondis acquired 49.9% of Zaklad Gospodarki Komunalnej i Mieszkaniowej (ZGKiM Sp. zoo) the water company serving Drobin. This is for a small town, with 10,000 people 2,000 households, with 450,000m<sup>3</sup> of water being provided pa (1,250 m<sup>3</sup>/day) through a 350km distribution system. Investments of EUR0.6million will be made between 2007 and 2010.

### Turkey – Joint venture

In December 2006, Remondis established a joint venture with the Turkish company, Sistem Yapi A.S. (Remondis International 51%/Yapi 49%). Remondis-Sistem Yapi A.S. operates nine wastewater treatment plants in the cities of Antalya, Bursa, Fethiye, Izmir, Balikesir and Malatya, treating wastewater from around 4million inhabitants. The total initial investment in these facilities was EUR145million. Sistem Yapi is part of the Sistem Group which has an annual turnover of EUR56million.

### Spain – Industrial wastewater

In 2006, Remondis Aqua GmbH took over the management of a wastewater treatment and energy recovery facility owned by Deprovesa Wild. The BOT contract will run for fifteen years with anaerobic pre-treatment of the wastewater which will generate biogas as a natural gas substitute.

### Contact Details

Name: Remondis AG & Co KG  
 Address: Brunnenstraße 138, D-44536 Lünen  
 Federal Republic of Germany  
 Tel: +49(0)2306  
 Fax: 49(0)2306  
 Web: www.remondis.de

Ludger Rethmann (Spokesman, Director)

**GREECE****ATHENS WATER SUPPLY AND SEWERAGE COMPANY SA**

The Athens Water Supply and Sewerage Company SA (EYDAP) dates back to the Greek water Company (EEY) formed in 1926. EYDAP was partly floated in January 2000. 28.2% of the company's equity was sold at that time, with 1.4% being acquired by EYDAP's staff, the Greek Government retaining 61.0% of the company's shares and the Agricultural Bank of Greece a further 10.7%. The Government and the Agricultural Bank were planning to sell a further 10.3% and 10.0% of EYDAP respectively by the end of 2003, but market conditions caused the issue to be postponed. EYDAP provides water to 4,000,000 people in Athens and its suburbs and sewerage for 3,300,000.

**EYDAP, profit & loss account**

Y/E 31/12 (EURmillion)	2002	2003	2004	2005	2006
Turnover	285.0	329.9	325.4	348.7	362.0
Operating profits	44.0	54.8	43.0	42.8	53.1
Net profit	48.1	61.6	28.5	20.0	33.3
Earnings/share (EUR)	0.452	0.579	0.267	0.188	0.313
Capital spending	66.0	73.0	N/A	N/A	N/A

EYDAP has a 20 year concession with the Government for the provision of water and sewerage services. The state retains responsibility for bulk water provision to the company and for its storm sewerage services. EYDAP is carrying out a EUR1,245million investment plan between 2000 and 2008, concentrating on expanding of its sewerage system and preparing Athens for the 2004 Olympic Games. In June 2003, a EUR405million investment programme for Attica was announced. This compares with EUR166million being spent between 1994 and 1998. Revenues from the flotation, along with a subsidy from the Government via EU structural funding are being used to finance part of the capital spending.

Y/E 31/12 (EURmillion)	2003	2004	2005	2006
Water distributed (million m <sup>3</sup> )	404.6	409.7	400.3	413.6
Unaccounted for water	22.0%	22.6%	19.2%	22.7%
Water revenues	212.3	218.9	228.2	225.4
Sewerage revenues	75.6	78.9	92.9	89.8

In the final quarter of 2003, EYDAP acquired water systems serving two neighbouring municipalities. In each case EYDAP is developing a sewerage network for the municipality.

2003	Aspropyrgos	EUR2.75million	31,000, water
2003	Elephsina	EUR1.80million	23,000, water

In February 2003, EYDAP started delivering gas and power supply and telecommunications services in a venture with Aktor and Hellenic Technodomiki. In July 2002, the company entered into a partnership with Veolia Water to discuss joint approaches for gaining water and wastewater contracts in the Mediterranean and Balkan regions. In April 2005, this venture was named Attika. To date, no contract awards have been noted.

**Contact Details**

Name: EYDAP  
Address: 156 Oropu Street, Galatsi,  
Athens, 111 46, Greece.  
Tel: +30-10-214-4444  
Fax: +30-10-214-4159  
Web: [www.eydap.gr](http://www.eydap.gr)

Constantinos Kostoulas (Chairman)  
Antionis Vartholomeos (CEO)  
Christos Aggelopolous (Operating Manager)  
Evaggelia Kakkou (FD)

**THESSALONIKI WATER & SEWERAGE**

The Thessaloniki Water Supply and Sewerage Co. (EYATH) serves 850,000 in the city of Thessaloniki, along with selling bulk water to surrounding municipalities. The company dates back to the Ottoman Water Company of Thessaloniki, which was formed in 1888. EYATH (EYAΘ) was formed in 1998 through the merger of the city's Water Supply Company (OYΘ, established in 1939) and the Sewerage Company (OAO, established in 1970). EYATH is situated in Central Macedonia, a part of Greece that has suffered from poor water levels. During the summer, average daily consumption is 280,000m<sup>3</sup>, compared with an availability of 220,000m<sup>3</sup> and as a result, since 2002 a banded tariff structure has been introduced that allows for improved returns for the company, while rewarding households that use less water.

**EYATH, profit & loss account**

Y/E 31/12 (EURmillion)	2002	2003	2004	2005	2006
Water revenues	42.60	N/A	N/A	N/A	N/A
Sewerage revenues	14.90	N/A	N/A	N/A	N/A
Turnover	57.50	51.10	60.30	60.20	66.00
Operating profit	N/A	11.50	16.80	13.10	13.90
Net profit	19.70	7.20	15.00	8.40	9.60
Earnings/share (EUR)	0.989	0.394	0.825	0.465	0.531

26% of the company's shares were sold to investors in September 2001. The EUR17million raised from the listing was partly used to finance upgrading and modernisation of the water and sewerage network. EYATH remains under state control, with 60% of its capital spending funding coming from the EU's Cohesion Fund, 30% from the state and 10% being internally funded.

EUR177.7million was allocated for capital spending in the area for 2002-06, including EUR100million for extending and upgrading the sewerage network and EUR75million on water distribution. EUR80million of this is being directly financed by EYDAP. EUR200million is provisionally earmarked for the next service extension phase from 2006.

**Contact Details**

Name: Thessaloniki Water Supply and Sewerage Co. (EYATH)  
 Address: Melenikou & Engatias127,  
 Thessaloniki, Greece  
 Tel: +30 23 10 209231  
 Fax: +30 23 10 250642  
 Web: www.eyath.gr

Professor Christos Tsogas (Chairman and MD)  
 Spyridon Sklavounos (Deputy Chairman)  
 Vassileios Paparassileiou (FD)

**ITALY****ACEGAS-APS**

Acegas is the city of Trieste's municipal services company, providing electricity, gas and water services. The Commune of Trieste reduced its holding from 99.99% to 54.92% after its IPO in February 2001. A merger with Pavoda's APS was completed in 2003. 230,000 people are served with water by Acegas and 239,000 in Padova. The company seeks to compete for water and wastewater concessions in other ATOs as the market liberalises.

**Acegas-Aps, profit and loss account**

Y/E 31/12 (EURmillion)	2003	2004	2005	2006
Electricity	NA	152.20	173.60	170.10
Methane	NA	146.50	218.60	244.20
Waste management	NA	94.70	101.70	103.20
Water	NA	57.10	58.60	60.20
Other services	NA	55.0	62.90	77.40
Revenues	454.60	470.90	559.50	578.10
<b>Total turnover</b>	<b>488.90</b>	<b>503.20</b>	<b>596.70</b>	<b>619.10</b>
Operating profit	24.80	41.70	52.70	44.30
Net profit	20.10	17.50	22.30	17.70
Earnings/share (EUR)	NA	0.32	0.41	0.32

The combined entity, following the 2003 merger, serves 1million people in 144 municipalities and communes. In 2006, the enlarged company treated 94.5million m<sup>3</sup> of water and provided 60.4million m<sup>3</sup> of water to 226,000 customers, 470,184 people. Water services were taken on by APS's predecessor in 1891 and by 1929 in Acegas's case.

	Trieste	Padua	Total
Water – people supplied	230,800.0	239,384.0	470,184.0
Water – customers	109,836.0	114,530.0	225,697.0
Water – domestic customers	91,379.0	94,810.0	187,133.0.0
Water – other customers	18,457.0	19,720.0	38,564.0
Water supplied (million m <sup>3</sup> )	49.8	42.8	94.5
Sewerage customers	100,055.0	104,695.0	204,750.0
Sewage treated (million m <sup>3</sup> )	41.0	18.2	59.2

**Acquisition of APGA**

In July 2007, Acegas announced that it would be acquiring Azienda Piovese Gestione Acque (APGA) which provides integrated water services, performing its activities in 10 municipalities in part of the Bacchiglione water district: Piove di Sacco, Legnaro, Sant'Angelo di Piove, Brugine, Codevigo, Correzzola, Arzergrande, Pontelongo, Cona, and Polverara. APGA had revenues of EUR10.1million in 2006 and serves slightly under 200,000 people.

**Contact Details**

Name: Acegas-Aps  
 Address: Via Maestri del Lavarò 8, 34123  
 Trieste, Italy  
 Tel: +390-40-7793111  
 Fax: +390-40-7793427  
 Web: www.acegas-aps.it

Massimo Paniccia (President)  
 Manlio Romanelli (VP, Finance)

## ACSM COMO

ACSM Como (ACSM), the water and energy utility serving Como which has a population of 250,000 people, was partially privatised in November 1999. To date, the company has concentrated on developing its core activities, which had a flat turnover in 1999, but are offering an improved performance in the current year. A second share sale in November 2000 reduced the municipality's holding to 50.6% and subsequent sales in 2003 and 2006 reduced this to 40.5% with AEM holding 20.0% of ASCM and Edison a further 3.2%.

In April 2003, ASCM entered into merger talks with Bergamo's municipally held BAS Bergamo Ambiente Servizi SpA. Bergamo is located near to Como and would add some EUR85million to ASCM's turnover. To date, these talks have not progressed.

### ACSM Como, profit and loss account

YE 31/12 (EURmillion)	2002	2003	2004	2005	2006
Natural gas	35.6	66.0	76.3	N/A	110.5
Waste management	21.9	18.3	15.3	N/A	14.0
Water	8.5	9.7	8.0	N/A	6.8
Group turnover	63.9	102.6	104.6	109.7	130.7
Operating profit	8.6	11.1	12.4	16.8	16.4
Net profit	3.2	3.8	3.6	2.7	-4.8
Earnings Per Share (EUR)	0.087	0.103	0.097	0.057	-0.102
Dividend Per Share (EUR)	N/A	0.060	0.070	0.070	0.035

ACSM sells water to 14,797 domestic and commercial customers, selling 13million m<sup>3</sup> in 2006 at EUR0.44/m<sup>3</sup>, along with 1.0million m<sup>3</sup> to 28 industrial clients. The company has a total water treatment capacity of 16million m<sup>3</sup> pa. ACSM's ComoDepur is responsible for water treatment and sewage and sewage treatment is carried out by the Municipality of Como. ACSM is currently seeking to expand into these areas. Until this can happen, the company seeks to maintain its water activities in a steady state until at least 2010, with plans for its internal customer base to rise by 1.6% pa to 15,867 by 2010 with a stable tariff structure.

### Contact Details

Name: Acsm Como  
 Address: Via Pietro Stazzi 2,  
 22100 Como, Italy  
 Tel: +(390) 31 529 111  
 Fax: +(390) 31 523 267  
 Web: [www.acsm.it](http://www.acsm.it)

Giorgio Bordoli (Chairman)  
 Enrico Poliero (General Director)  
 Pietro Perini (Operations Director)

## GRUPPO IRIDE

Iride is 36.9% held by the municipality of Turin, 25.5% by the municipality of Genoa and 37.6% by various shareholders. It was formed in October 2006 in the wake of the merger between AEM Torino and Amga. Azienda Mediterranea Gas e Acqua (Amga) is the city of Genoa's gas and water utility. Amga was partly privatised in October 1996. Amga split off its local water division from the rest of its activities into Genova Acque, to ensure that it has the maximum flexibility to develop its activities outside Genoa once the municipality sees fit to sell off its majority holding. In 2003, Genova Acque was granted a five year contract to manage the Genova ATO. This contract involves capital spending of EUR115million (EUR35million supplied by the municipality) designed to upgrade sewerage and sewage treatment and to expand water distribution by 8million m<sup>3</sup>. The combined water activities are grouped under Iride Acqua Gas, which is based in Genoa.

### Genova Acque and its neighbouring companies

Acquedotto Nicolay SpA (AN) and Acquedotto de Ferrari Galliera SpA (ADFG) have been responsible for water distribution to parts of the city of Genoa since 1853 and 1880 respectively, serving a total of 330,000 people. In 2000 ACEA (see company entry) bid for AFDG and AN. After gaining 67.0% of ADFG's shares, ADFG's management accepted the bid. Genova Acque held a further 27.62% of ADFG's equity. After gaining 53.15% of AN's shares, the company's management accepted the bid. In 2000 Veolia acquired 20% of Genova Acque in return for its 28% and 34% stakes in Acquedotto de Ferrari Galliera and Acquedotto Nicolay respectively. ACEA sold its 67% stake in Acqua Italia, the holding company for its stakes in Acquedotto de Ferrari Galliera and Acquedotto Nicolay, to Amga in July 2005 for EUR57million. ADF and AN were reorganised as Mediterranea delle Acque, which has a market listing.

### Turin – Amga's acquisition of Acque Potabili

Amga acquired the 67.05% stake held by Italgas (ENI) in Condotta di Acque Potabili in March 2005. Acque Potabili was founded in 1852 for water provision to parts of the city of Turin. The company is involved purely in water distribution in parts of Alessandria, Aosta, Asti, Cueno, Mantova, Savona, Turin, Vercelli & Novara. There were 291,991 customers (950,000 people) served in 2001, an increase of 128,197 over the 2000 figure, due to the transfer of contracts from Italgas. A further 190,000 people are served indirectly by the company. Water sales in volume terms have been steady in recent years at 68million m<sup>3</sup> pa. Water revenues were EUR48.6million in 2003.

ENI was involved in water through the acquisition of Italgas. Its principal subsidiaries are Acque Potabili, Acquedotto di Savona, Acquedotto Vesuviano, Eniacqua Campania, Metano Arcore and Napoletana Gas. In 2001, the company served 1.94million people. Water sales have fallen from 43million m<sup>3</sup> in 2002 to 37million m<sup>3</sup> in 2003, mainly due to the dry weather and subsequent water shortages. 10million m<sup>3</sup> of wastewater was treated in 2003 at 18 wastewater treatment works, compared with 17million m<sup>3</sup> in 2002.

Currently Iride holds 68.3% of Mediterranea delle Acque and 44.0% of Mediterranea delle Acque. For further details, see the company entries for Acque Potabili and Mediterranea delle Acque.

### IRIDE, profit and loss account

Y/E 31/12 (EURmillion)	2002	2003	2004	2005	2006
Energy	N/A	N/A	N/A	1,196	1,925
Energy networks	N/A	N/A	N/A	400	423
Water	N/A	N/A	N/A	121	161
Services	N/A	N/A	N/A	146	110
Turnover	843	1,093	1,371	1,816	2,507
Operating profit	113	124	143	192	179
Net income	48	65	73	95	83

### Other activities in Italy

In 1999, Amga was part of the Suez led consortium that gained the 25 year water and sewerage concession for Arezzo and 36 surrounding communes. This was the first water concession awarded in Italy, reflecting the belated impact of the 1994 Galli Law. By 2004, Amga provided water and/or sewerage services for 915,000 people in the Genova ATO region.

In March 2000, Amga was awarded three potable water supply contracts in Sardinia for 62,000 people; Sulcis Iglesinete (11,000), Campidano (25,000) and Trexenta-Marmilia-Mandrolisai (26,000), with a total turnover of ITL7billion pa. In April 2000, Amga gained two contracts in Calabria with a ITL50billion turnover, with ITL8.5billion of investment in the first year and rising from then on. The contract signed with Ente Acquedotti Siciliana SpA

and AMAP involves 90 water treatment plants in Reggio Calabria, serving 300,000 people and 150 water treatment plants in the province of Cosenza, serving 500,000 people.

Amga acquired 35% of Atena SpA, the utility company serving Vercelli in January 2003. Atena serves a total of 100,000 people with water, sewerage, gas, power and waste management services and had a 2001 turnover of EUR52million. In January 2004 Amga acquired 27% of IdroCons S.r.l., a company working mostly in the Valle Scrivia area in analysis and monitoring of drinking water, water treatment and waste management. The main partners in the company are Azienda Consortile Intercomunale Bacino dello Scrivia (43%) and Idroterra (22%).

**Iride Acqua's holdings and alliances in Italy are as follows:**

<b>Contract</b>	<b>Entity (stake)</b>	<b>Inhabitants</b>
ATO Genovese	IAG (100%)	878,082
<b>Affiliated Cos – NW Italy</b>		
ATO Alessandrino	Acos/Asmt	418,231
ATO Astigiano-Monf	Asp (5%)	208,339
Sub Astigiano	Asp (5%)	71,276
ATO Vercellese	Atena (35%)	45,132
ATO Cuneese	Mondoacque (39%)	556,330
ATO Savonese	Acq. di Savona	310,389
Sub Costiero-Levante	Acq. di Savona	128,271
ATO Imperiese	Amat/Aiga/Sap	205,238
<b>Total</b>		<b>1,424,478</b>
<b>Affiliated Cos – Tuscany</b>		
ATO Alto Valdarno	Nuove Acque (16%)	296,000
ATO Toscana Costa	Asa (39%)	326,000
<b>Total</b>		<b>622,000</b>
<b>Total Inhabitants directly served</b>		<b>2,924,560</b>
Alliance with Turin		
ATO Torinese	SMAT	2,165,619
<b>Total Inhabitants served with alliances</b>		<b>5,090,179</b>

In 2006, figures were boosted by a three month consolidated contribution from Acque Potabili and a nine month consolidated contribution from Acquedotto de Ferrari Galliera. Total volume of water sold rose from 46million m<sup>3</sup> in 2004 (pre merger) to 98million m<sup>3</sup> in 2005 (post merger) and 122million m<sup>3</sup> in 2006 (partial consolidation of Acque Potabili and Acquedotto de Ferrari Galliera).

The 2007-2011 strategy concentrates on the integration and consolidation of the various Genovese interests along with a 20 year capital spending plan. In North West Italy, expansion is based on consolidating the position in ATO Alessandrino and in West Liguria (ATO Savonese and Imperiese) where IRIDE already has a presence. IRIDE is working with the Turin municipal utility SMAT to gain effective control of Acque Potabili. AP has 108 Concessions regulated by CIPE. Acque Potabili also owns the concession for Palermo which it gained in December 2006. This concession runs for 30 years and covers 82 municipalities, serving 1.2million people.

### **Moldova and Croatia**

In August 1997, Amga gained a water management contract for Chisinau, the capital of Moldova, serving a total of 667,000 people. In August 2000, Amga reached an agreement with three Croatian towns in the district of Fiume for water, gas and telecommunications services.

### **Albania**

2001	Tirana	4 year management	650,000 water
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Amga and ACEA both hold 32% of Tirana Acque, an Italian consortium developed to take advantage of bilateral agreements between Italy and Albania. The longer-term aim is to be involved in the privatisation of the Greater Tirana Water Supply and Sewerage Enterprise.

### **Contact Details**

Name: Iride SpA  
 Address: Via Bertola 48,  
 10122 Torino, Italy.  
 Tel: +39 101 55 8115  
 Fax: +39 010 55 86284  
 Web: [www.gruppo-iride.it](http://www.gruppo-iride.it)

Roberto Bazzano (Chairman)  
Roberto Garbati (CEO)

## ASM BRESCIA SPA

Azienda dei Servizi Municipalizzati (ASM) Brescia was founded in 1908 by the city's municipality, which sold 28% of its shares in July 2002. The remainder are held by the local commune and some related entities. A second share sale is currently under consideration. Water supply services have been offered since 1933 and wastewater and sewerage since 1995. In 2001, the company provided 51.3million m<sup>3</sup> of water to 513,000 people in 49 communes, while treating 36.3million m<sup>3</sup> of sewage effluent, the population equivalent of 434,000 people. In 2006, 86million m<sup>3</sup> of water was provided, 55million m<sup>3</sup> of sewerage collected and 54million m<sup>3</sup> of effluents treated. Much of the increase has been due to mergers in 2003 and 2004.

In 2003, ASM acquired the water and wastewater activities of Valgas and ASVT, adding approximately 50,000 people to the number served at the time of its partial privatisation. In 2004, ASM merged with the Municipality of Bergamo's Bergamo Ambiente Servizi (BAS). BAS has 44,000 water and sewerage customers, providing 31million m<sup>3</sup> of water, collecting 17million m<sup>3</sup> of sewage and treating 9million m<sup>3</sup> of sewage in 2004. The company's Verziano (Brescia) and Bergamo wastewater treatment works have a respective treatment capacity of 590,000 PE and 250,000 PE.

### ASM Brescia, profit and loss account

Y/E 31/12 (EURmillion)	2002	2003	2004	2005	2006
Turnover-Water supply	43.5	52.2	50.0	70.0	72.0
<b>Total turnover</b>	<b>785.2</b>	<b>854.2</b>	<b>1,237.6</b>	<b>1,672.4</b>	<b>2,051.8</b>
Operating income	105.4	154.8	176.3	208.4	244.3
Net income	63.0	96.5	112.8	212.4	238.3
Earnings/share (EUR)	0.087	0.131	0.153	0.274	0.308

EUR228million will be invested on water services between 2007 and 2011, with water revenues being boosted from EUR72million to EUR97million by an annual 5.7% tariff rise. ASM's 2007-2011 plans call for water gross profits increasing from EUR16million in 2006 to EUR59million by 2010. Tariffs are expected to rise from EUR0.88/m<sup>3</sup> in 2006 to EUR1.07/m<sup>3</sup> by 2011, with a planned sale of 98million m<sup>3</sup> of water, 63million m<sup>3</sup> of sewerage services and 69million m<sup>3</sup> of sewage treatment.

### Merger with AEM

In June 2007 it was announced that ASM would merge with Turin's AEM, with the aim of completing the process by the end of 2007. After the merger, the municipalities of Turin and Brescia will each hold 27.5% of the new entity, with 45% of the shares being held by outside investors. The combined entity had pro forma revenues of EUR9,224million, 1% of which is in the water sector.

### Contact Details

Name: ASM Brescia Spa  
 Address: Via Lamarmora 230,  
 25124 Brescia, Italy  
 Tel: +390-303-5531  
 Fax: +390-303-553204  
 Web: [www.asm.brescia.it](http://www.asm.brescia.it)

Renzo Capra (Chairman)  
 Elio Tomasoni (General Manager)  
 Luciano Aletto (Central Manager)

**EDISON SPA**

Edison is an Italian power utility, owned by a number of Italian municipal energy companies and institutional investors. In 2000, it acquired UU's stake in the International Water joint venture with Bechtel. While most of IW's activities were either wound down in 2003-05 or sold back to UU, it retained its activities in Ecuador. UU sold its 49% interest in International Water Services (Guayaquil) to Edition and Bechtel in 2005.

International Water Services (Guayaquil), contribution to Edison's profit & loss account

EURmillion	2004	2005	2006
Revenues	27	31	34
EBITDA	4	8	10

**Ecuador**

2001	Guayaquil	30 year concession	2.5million water & wastewater
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The Interagua SA concession will serve 2.5million people in the city. Empresa Cantonal de Agua. Potable y Alcantarillo de Guayaquil (ECAPAG) has 250,000 customers, and made a USD1million operating profit in 2000. USD500million will be spent on infrastructure over the contract's life, including service extension. Previously, ECAPAG suffered from underfunding to cover costs and expansion. IW (now UUI) holds 90% of ECAPAG, which in 1997 provided water to 65% of the city's inhabitants, and 1,730,000 with sewerage. 55,238 new connections were planned in the first five years, with a USD146million 2002-06 capital spending programme. The principal targets were to reduce non revenue water from 70% to 30% and to connect 300,000 people in informal settlements, especially in Isla Trinitaria, where by 2004 piped water was made available for a seventh of the cost of the water vendors.

During the first five years of the concession, Interagua invested USD50million in extending services to the city, connecting 40,000 new clients to the city's mains water and 20,000 to sewerage systems. Between 2006 and 2011, the company will invest USD250million in new infrastructure, with the aim of providing water services to 95% of the city's residents and sewerage for 90%. A cross subsidy rate scheme ensures that industrial clients subsidise in part the water that is used by residents.

Y/E (EURmillion)	31/12	2002	2003	2004	2005	2006
Group turnover		4,418.00	5,141.00	5,627.00	6,629.00	8,523.00
EBITDA		1,002.00	1,087.00	1,475.00	1,288.00	1,536.00
Operating profits		291.00	439.00	815.00	639.00	752.00
Net profits		-400.00	339.00	354.00	504.00	654.00
Earnings/share (EUR)		-8.48	7.35	7.68.00	10.60	13.75.

Giuliano Zuccoli (Chairman)  
Umberto Quadrino (Chief Executive Officer)

**Contact Details**

Name: Edison Spa  
Address: 31 Foro Buonaparte  
20121 Milan, Italy  
Tel: +39 06 6222.1  
Web: [www.edison.it](http://www.edison.it)

## HERA SPA

Hera Spa operates in a number of municipalities in northern Italy, providing water and wastewater services to 797,000 customers and 679,000 customers respectively in Bologna, Ravenna-Lugo, Forli-Cesena, Rimini, Savignano, Imola-Faenza and Ferrara. The company was founded through the consolidation of 12 municipal entities in 2001. After a series of mergers, Hera now manages seven ATO concessions in the provinces of Ravenna (8 municipalities), Ferrara (23 municipalities), Forli-Cesena (26 municipalities), Rimini (26 municipalities), Modena, Bologna (46 municipalities) and Pesaro. 2.5million people in 180 municipalities are served by the company for water, sewerage, power, gas and waste management, rising to in excess of 3million in the summer. Hera aims to acquire local utilities in order to increase its size and improve operating efficiency over the next four years. 44% of Hera's equity was sold in June 2003, with the commune of Bologna holding 19.8% of the company via Seabo Spa.

### Hera SpA, profit and loss account

EURmillion	2002	2003	2004	2005	2006
Water revenues	241.0	248.0	305.0	346.2	398.4
Group revenues	1,133.3	1,331.3	1,639.0	1,730.7	2,311.5
Operating profits	77.6	112.8	144.3	178.4	231.2
Net profits	33.2	49.4	56.7	87.7	100.2
Earnings/share (EUR)	0.042	0.062	0.097	0.100	0.089

The principal water concessions are secured until at least 2012. In 2004, a ten year service provision contract extension to 2022 was granted, worth a total of EUR5billion in revenues.

	2002	2003	2004	2005	2006
Municipalities served – Water	127.0	128.0	143.0	161.0	180.0
Municipalities served – Sewerage	88.0	90.0	111.0	163.0	N/A
Municipalities served – Wastewater	123.0	125.0	141.0	163.0	N/A
Customers served – Water	616,000	639,000	797,000	914,000	982,400
Customers served – Sewerage	470,000	488,000	626,000	827,500	N/A
Customers served – Wastewater	530,000	545,000	679,000	827,600	N/A
Residential population (million)	1.9	2.0	2.2	2.6	2.6
Water sold (million m <sup>3</sup> )	176.3	180.2	206.0	228.4	243.6
Water sold (EURmillion)	241	248	305	346	398

### Acquisition of Agea

In August 2004, Hera acquired a further 51% of Agea, having bought 49% of the company for EUR65million in 2003. Agea provided multi utility services in Ferrara province. Acosea owned the water assets through Acosea Reti and operates them through Acosea Spa. Acosea Impianti, took over Acosea Reti and those assets to the Ferrara municipalities in 2005, while Acosea Spa was integrated into Hera. Acosea generated water sales of EUR31million in 2004, selling 20.8million m<sup>3</sup> of water in 2003.

### Acquisition of Aspes Multiservizi

In July 2006 Hera completed the acquisition of 49.8% of Aspes Multiservizi, the company responsible for water, energy and waste services in the Pesaro area of Italy. In 2005, water supplied to its 13 districts amounted to 16.6million m<sup>3</sup>, with a consolidated turnover of EUR90million. 50.1% of Aspes Multiservizi is held by Pesaro and district municipalities. Aspes 3 Multiservizi contributed EUR18.8million in revenues in 2006.

### Acquisition of SAT

In October 2006, Hera acquired 46.5% of SAT Spa, with the remaining 53.5% being held by the municipalities of Sassuolo, Formigine, Maranello, Fiorano and Serramazzoni. SAT operates in the waste management, gas distribution and integrated water supply service sectors, and in 2005 the company recorded a consolidated turnover of EUR62million.

### Acquisition of Meta Modena

In June 2005, Hera and Meta Modena agreed to a merger, firstly by Hera acquiring 29% of Meta in November 2005 and subsequently through a full acquisition which was completed in January 2006.

Meta SpA serves the city and province of Modena in northern Italy and was originally owned by a consortium of 30 local municipalities. It was privatised in March 2003, through a new equity issue and a partial divestiture by 17 of the municipalities. 72% of its equity remains in municipal hands, with the commune of Modena holding 58% of

the company. Meta serves 432,000 people with power, gas, water, heating and waste services. Water sold rose from 28.4million m<sup>3</sup> in 2002 to 29.8million m<sup>3</sup> in 2003 and 29.8million m<sup>3</sup> in 2004, serving 314,989 residents in 18 municipalities. Some 211,207 residents are also served by the sewerage system and sewage is treated for 327,074 residents. There are a total of 651,920 residents in the province of Modena, 48.3% served by Meta Modena for water, 32.45% for sewerage and 50.2% for sewage treatment. 55% of 2004 water revenues were for water distribution, 27% for wastewater treatment and 6% for sewerage.

**Contact Details**

Name: Hera SpA  
Address: Viale Carlo Berti Pichat 2/2, 40127  
Bologna, Italy  
Tel: +39 051 287 111  
Fax: +39 051 281 4036  
Web: [www.gruppohera.it](http://www.gruppohera.it)

Tomaso Tommasi di Vignano (Chairman)  
Maurizio Chiarini (CEO)  
Roberto Barilli (General Manager)

## MEDITERRANEA DELLE ACQUE

Acquedotto Nicolay SpA (AN) has been responsible for water distribution to parts of the city of Genoa since 1853, serving a total of 330,000 people. In June 2006, it was merged with AMGA's (now Iride) Genova Acque, Acquedotto de Ferrari Galliera and ACEA's Acqua Italia and renamed Mediterranea delle Acque. Iride Acqua currently holds 68.3% of its equity, Veolia 17.1% and Impregilo 5.1%, with 9.5% held by various investors.

### Mediterranea delle Acque, profit & loss account

Y/E 31/12 (EURmillion)	2002	2003	2004	2005	2006
Turnover – Water	8.50	4.40	N/A	N/A	N/A
Total turnover	9.70	9.00	8.30	9.90	100.90
Net income	1.40	1.60	1.30	1.60	8.40
Earnings/share (EUR)	0.11	0.12	0.10	0.15	0.11

As part of the company's reorganisation, various companies serving Genoa have been integrated within the new entity. In 2006 it provided 77million m<sup>3</sup> of water. The company owns four reservoirs, five hydroelectric plants, three water treatment plants, 26 pumping plants, 38 storage and balance tanks and 730km of pipelines. Water is distributed to approximately 950,000 residents of 67 municipalities in the Genoa Province.

### Contact Details

Name: Acquedotto Nicolay SpA  
 Address: Piazza della Vittoria, 11/A, 16121 Genoa, Italy  
 Tel: +(390) 10 587 441  
 Fax: +(390) 10 532 756  
 Web: [www.mediterraneadelleacque.it](http://www.mediterraneadelleacque.it)

Dr Giancarlo Piombino (Chairman & MD)  
 Vincenzo Puca (Vice Chairman)

**ACQUE POTABILI SPA**

Condotta di Acque Potabili is 43.99% held by Metro Acque and 43.99% by Iride Acque. The company was founded in 1852 for water provision to parts of the city of Turin. The company is involved purely in water distribution in parts of Alessandria, Aosta, Asti, Cueno, Mantova, Savona, Turin & Novara. There were 291,991 customers (950,000 people served) in 2001, an increase of 128,197 over the 2000 figure, due to the transfer of contracts from Italgas. A further 190,000 people are served indirectly by the company. Water sales in volume terms have been steady in recent years at 68million m<sup>3</sup> pa, rising to 88million m<sup>3</sup> in 2006.

**Acque Potabili, profit & loss account**

Y/E 31/12 (EURmillion)	2002	2003	2004	2005	2006
Water	58.70	48.60	53.30	55.60	53.50
Gas distribution	4.90	5.70	0.00	0.00	0.00
Group turnover	63.60	54.30	53.30	55.60	53.50
Operating profit	7.20	5.20	4.40	3.00	4.00
Net income	3.50	1.80	1.60	0.00	-1.00
Earnings/share (EUR)	0.43	0.22	0.19	0.00	-0.21

In December 2006 a 30 year concession for the integrated water service in the Palermo Province (ATO1) was assigned to Società Acque Potabili Spa. The user basin of the ATO1 Palermo includes, in addition to the regional capital, the management of which is safeguarded under AMAP Spa, 81 municipalities, for a total of 1.2million served residents with a total water production that will reach approximately 130million m<sup>3</sup> pa.

**Contact Details**

Name: Acque Potabili SpA  
 Address: Corso re Umberto 9 Bis, 10121 Torino, Italy.  
 Tel: +39 11 55 941  
 Fax: +39 11 562 9730  
 Web: [www.acquepotabilispa.it](http://www.acquepotabilispa.it)

Luigi Luzzati (Chairman)  
 Paulo Romano (Vice Chairman/MD)

**MOROCCO****LYDEC**

In 1997, Lyonnaise des Eaux de Casablanca (LYDEC) lead by Suez (France) was awarded the 30 year Urban Community of Casablanca (UCC) concession contract. This covers water, sewerage and electricity and was extended in 2001 to cover waste management. Between 1997 and 2006, MAD1.40 billion was invested in water assets and MAD1.95 billion in sewerage assets, 54% of total capital spending, reflecting the need to upgrade and extend the city's water and sewerage services. By 2004, leaks generating 25million m<sup>3</sup> pa of water losses had been repaired, equivalent to the water needs of 800,000 people.

<b>Service development</b>	<b>1997</b>	<b>2002</b>
Water connections	440,000	590,000
Unaccounted for water	38.9%	27.7%

Most of the water (649million m<sup>3</sup> out of 814million m<sup>3</sup> in 1999) is bought from ONEP, the National Drinking Water Administration, for MAD3.95/m<sup>3</sup> meaning that water for essential use is directly subsidised by LYDEC. As a result, 50% of customers pay less than USD3/month. LYDEC is obliged to make 45,000 low income connections every five years (65,000 by 2004). In addition Lydec is carrying out pilot projects for service extension through training staff to develop services for 10,600 households in two informal peri-urban settlements which lie outside its contract specification in 2004. This project will involve Lydec sub-contracting its services to small, local operators supported by USD21million in funding.

In 2006, water revenues were MAD928million and sewerage revenues were MAD270 million against MAD3,115 million for electricity. Water and wastewater spending accounted for 56% of 2006 capital spending, against 39% for electricity.

15% of LYDEC's equity was sold on the Casablanca Bourse on 18<sup>th</sup> July 2005, 80% of the shares being bought by local investors. Suez continues to hold 51% of LYDEC, with the remaining 34% being held by Moroccan institutions.

**Lydec, profit and loss account**

<b>Y/E 31/12 (MADmillion)</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
Revenues	4,256.0	4,736.1	4,332.7
Operating profits	170.0	381.1	395.1
Net profits	220.0	234.1	93.5

**Contact Details**

Name: Lydec  
 Address: 48 Rue Mohamed Diouri,  
 Bp 16408 Casablanca, Morocco  
 Tel: + 212 2 254 90 54  
 Fax: + 212 2 254 90 07  
 Web: www.lydec.ma

Jean-Pierre Ermenault (Managing Director)  
 Tahar El Agal (Director, Water and Sewerage)

**PORTUGAL****MOTA-ENGIL**

The two Portuguese engineering and construction companies Mota and Engil were merged in 2004. The company has a long standing involvement in water and wastewater treatment infrastructure construction and was Severn Trent's partner in the country since 1996. In 2004 Mota-Engil Ambiente e Serviços increased its stake in Indáqua through purchasing Severn Trent Water International's 12.82% holding to gain an overall holding of 42.86%. Revenues in 2004 were EUR10million and were EUR6.3million in 2006.

**Mota-Engil, profit & loss account**

Y/E (EURmillion)	31/12	2002	2003	2004	2005	2006
Revenues		916.4	1,050.7	1,226.9	1,381.0	1,308.2
Operating profits		48.1	57.3	70.7	87.6	84.2
Pre-tax profits		28.0	30.4	40.5	58.3	57.7
Net profits		19.4	15.4	22.1	30.4	32.2

Organic growth in the extant concessions saw the number of customers served rise by 2,830 during 2004. Indaqua returned an EBITDA of EUR1.8million in 2008. Prior to 2004 Indaqua was consistently loss making. Currently, the company serves 536,000 people in Portugal via five contracts.

2005	Matosinhos	25 year concession	167,000 water
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Revenues of EUR204million are anticipated, along with capital investments of EUR83million.

2005	Vila do Conde	40 year concession	78,000 water
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Investments in the first three projects, gained between 1996 and 1999 are expected to total EUR170million by 2007.

1998	Santo Tirso	25 year concession	106,000 water
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The concession entered into operation in 1998. At the outset, 28% of the population were connected with household water supplies.

1999	Santo Maria de Feira	35 year concession	135,000 water
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EUR76.5million of capital spending is planned for the concession, including EUR30million on wastewater services and treatment.

1996	Fafe	25 year concession	50,000 water
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Mota-Engil Ambiente e Serviços holds 30% of Indaqua Industria e Gestao de Aguas SA. Drinking water provision expanded from 67% of the town's inhabitants to 95% by 2004.

**Contact Details**

Name: Mota-Engil SA  
 Address: Rua do Rego Lameiro, No 38,  
 4300-454 Porto, Portugal  
 Tel: + 351 22 519 0300  
 Fax: + 351 22 519 0303  
 Web: [www.mota-engil.pt/www.indagua.pt](http://www.mota-engil.pt/www.indagua.pt)

Antonio M Queiros Vasconcelos da Mota (Chairman)  
 Antonio Jorge Campos de Almedia (Deputy Chairman)

## SAUDI ARABIA

### SAUDI ARABIAN AMIANTIT COMPANY

The Saudi Arabian Amiantit Company (SAAC) was founded in Dammam, Saudi Arabia in 1968. It specialises in manufacturing piping products for water, liquids, oil and industrial applications. Water and wastewater operational contracts have been developed through its subsidiary AmiWater, which has acquired 100% of the equity of AquaMundo. Amiantit seeks to become one of the top ten leading companies in the world that provide drinking water and waste water services. AmiWater has three principal subsidiaries: AquaMundo GmbH (Germany), InfraMan GmbH (Austria) and OMC (Thailand).

In February 2005, AmiWater formed Tawazee, a joint venture with Saudi Industrial Services (SISCO) for water service contracts in industrial cities in Saudi Arabia. They are currently bidding for water service contracts for First Industrial City, Jeddah and Second Industrial City, Riyadh,

#### Saudi Arabian Amiantit, profit and loss account

Y/E 31/12 (SRmillion)	2002	2003	2004	2005	2006
Revenues	1,219.00	1,621.60	1,856.80	2,492.50	2,659.80
Operating profits	158.90	119.50	20.80	69.00	146.70
Net profits	101.10	78.30	-53.00	-8.70	20.80
Earnings/share (SR)	0.96	0.76	-0.50	-0.08	0.18

#### Inframman

InfraMan GmbH, a subsidiary of the AmiWater Group, is responsible for the provision of services in operation and management of water supply companies. InfraMan is based in Austria, providing management services for water supply, sanitation services, and hydropower.

#### Amiantit, populations served

Country	Water	Sewerage	Total
Romania	200,000	0	200,000
Albania	477,000	25,000	477,000
Montenegro	150,000	150,000	150,000
Russia	250,000	250,000	250,000
China	0	400,000	400,000
<b>Total-home markets</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total – international</b>	<b>1,077,000</b>	<b>825,000</b>	<b>1,477,000</b>
<b>Grand Total</b>	<b>1,077,000</b>	<b>825,000</b>	<b>1,477,000</b>

Amiantit claims to serve 5million people globally, although details of other projects are not currently available. According to Amiantit in 2004, AmiWater is already operating or developing projects in Albania, Italy, Moldova, Russia, Kyrgyzstan and Thailand, along with projects that are under development in Azerbaijan, Indonesia, India, China, Romania, Ukraine, Peru and Guatemala.

#### Saudi Arabia

Taweza a joint venture between Amiantit and Saudi Industrial Services Co, was awarded a SAR3billion (USD800million) 30 year BOT contract for managing potable water supplies in industrial zones in Jeddah, Riyadh and Qassim in June 2007.

#### Russia

Two 25 year joint ventures were announced in 2003. In each case, Inframman holds 51% of the project's equity and is responsible for managing the water and wastewater services.

2003	Balashicha	25 year, O&M	150,000 water & wastewater
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Revenues for the contract will be USD20million. The town's population increases to 250,000 during the summer as a holiday destination.

2003	Dimitrovgrad	25 year, O&M	100,000 water & wastewater
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This contract has a budget of USD10million and includes extending the water distribution system for an additional 12,000 people.

### Romania

2003	Zetea	DBOT	200,000 bulk water
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Amiantit is leading a consortium for the Zetea water supply system management project, which is worth USD50million. It involves building a water intake from a lake, a water treatment plant, a 137km pipeline, and connections to the distribution tanks. The system will supply potable water to 200,000 people. Project implementation started in the spring of 2004 and the water supply system is expected to be completed by 2007. Amiantit already has ductile iron pipe manufacturing facilities in Romania, where the company produces its own raw material.

### OMC

Operation Management Company Ltd (OMC) provides operation and maintenance services of water and wastewater treatment plants in the Kingdom of Thailand. OMC, through its subsidiary Wastewater Operation Management Company (WOMC), has formed a joint venture with the Waste Management Authority of Thailand (WMA) in order to operate and maintain wastewater treatment plants.

### AquaMundo

ABB Kraftwerkstechnik of Germany (ABB AG), GW Water Consultants (Bilfinger & Berger AG (Germany) and MVV Energie AG Germany (MVV)), formed the Aquamundo JV in May 2000. AquaMundo seeks to gain contracts in the planning, financing and operating of water and sewerage projects worldwide. In April 2003, ABB AG and Bilfinger & Berger AG sold their stakes to Infran. MVV sold its stake to Infran in January 2004.

### Albania

2003	Durres, Fier, Lezhe and Saranda	5 year O&M	400,000 water & wastewater
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A JV of Berlinwasser International (60%) and Aquamundo (40%) 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. Sewage treatment will be upgraded to secondary (biological) standards and water supplies will be improved from 4 hours daily to a 24 hour supply.

In 2002, Aquamundo gained a 4 year O&M contract for drinking water provision (77,000 people) and wastewater disposal services (25,000 people) in the town of Kavaja. This project seeks to reduce unaccounted for water from 40% to 15%, while raising billing from 60% to 95% and to improve access to water from 4-6 hours to 24 hours a day.

### Montenegro

2001	Montenegro	30 year concession	Water and sewerage
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Aquamundo has gained a contract for the proposed privatisation of water provision services in the state of Montenegro, with investments of EUR33million required during the first 5 years. The contract covers the coastal municipalities of Herzeg Novi, Kotor, Tivat, Budva, Bar, Cetinje and most likely later Ulcinj Public Enterprise (PEW) for Water ŐCrnogorsko Primorje Ő, Budva. MonteAqua, a public-private water company in which Aquamundo has the largest shareholding, will manage the 30 year concession.

### China

2002	Foshan	20 year concession	Sewage treatment
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The Aquamundo (45%) and Foshan Waterworks (55%) JV is to develop and manage the 100,000m<sup>3</sup>/day sewage treatment works for the city in Guangdong Province. EUR30.4million in capital expenditure will be required, 40% from equity and 60% from debt. The facility will become operational in 2003. It is estimated that the facility will serve 400,000 people.

### Contact Details

Name: Saudi Arabian Amiantit  
Address: P.O. Box 1029,  
11431 Riyadh, Saudi Arabia

Tel: + 966 1 465 8665  
Fax: + 966 1 463 1389  
Web: [www.amiantit.com](http://www.amiantit.com)

Eng. Fared Al Khalawi (CEO and Managing Director)  
Abdullas Al Madhi (VP, Marketing)

**Contact Details**

Name: InfraMan GmbH  
Address: Spiegelgasse 8/5, 1010 Vienna, Austria  
Tel: +43.1.513064610  
Web: [www.aquamundo.com](http://www.aquamundo.com)

Volker Mitterhammer (Managing Director)

**QATAR****QATAR ELECTRICITY & WATER CO. (QEWC)**

QEWC is 42.74% held by the Government and 57.26% by companies and individuals.

<b>Y/E 31/12 (Q Riyalmillion)</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
Desalination revenues	N/A	N/A	596.20	579.90	627.70
Electricity revenues	N/A	N/A	860.90	901.70	1,086.20
Revenues	773.50	1,427.20	1,457.00	1,481.60	1,713.90
Operating profits	387.90	497.40	779.40	521.90	490.00
Net profits	272.00	384.90	751.20	651.70	771.70
Earnings/share (QR)	2.72	3.85	7.51	6.52	7.72

**RAF 'B':** Commissioned in 1995 and acquired by QEWC in 1999. The total capacity of the plant is 33 MI/day of potable water. It is operated under a PWPA under which the production is sold to the Government for 20 years.

**RAF 'A':** Built in different phases between 1970 and 1993 and acquired by QEWC in 2003. The total capacity of the plant is 70 MI/day of potable water. It operates under a PWPA under which the production is sold to the Government for 12 years.

**DUKHAN DESALINATION PLANT:** Commissioned in 1997, the plant was acquired by QEWC in 2003 from Qatar Petroleum (QP). Dukhan Water Desalination is an independent water desalination plant located in the Eastern part of the country, 70km away from Doha. The total capacity of the plant is 2MI/day of potable water. The plant is operated under a WPA under which the production is sold to the Government for 25 years.

**RAS LAFFAN POWER COMPANY:** QEWC holds 25% of Ras Laffan Power Company Limited. The plant is located at the Ras Laffan Industrial City. The total capacity of the plant is 40million gal/day of potable water. The facility started its operation in the year 2003. The plant is operated under a PWPA under which the production is sold to the Government for 25 years.

**Q POWER (RAS LAFFAN B):** In September 2004, QEWC won the Ras Laffan B Project, the country's next power and water producing facility to be built in the Industrial City of Ras Laffan. A new joint venture company has been incorporated in the name of Q Power Q.S.C. where QEWC shares 55%, International Power Plc shares 40% and Chubu Electric Power Company shares 5%. The total project cost is estimated at USD900million which would be funded by 80% debt and 20% equity. This will deliver 60million gal/day of potable water to the country in different phases and should be completed by the middle of 2008.

**Contact Details**

Name: Qatar Electricity & Water Co  
 Address: Qatar Electricity & Water Co.  
 West Bay, PO Box: 22046, Doha-Qatar  
 Tel: +974 4858 585  
 Fax: +974 4831 116  
 Web: www.qewc.com

H.E. Abdullah bin Hamad Al-Attiya (Chairman)  
 Hamza Al Kuwari (Vice Chairman)  
 Fahed Al-Mohammed (General Manager)

**SPAIN****ACCIONA**

Acciona is an infrastructure and services company based in Spain. Its chief activities are the development and management of infrastructure concessions and renewable energy projects. In 2005 the company was consolidated into three divisions: Infrastructure, Energy and Services. The Services division includes water and waste management operations contracts and water engineering under the Acciona Aguas brand.

Acciona, profit & loss account

Y/E 31/12 (EURmillion)	2002	2003	2004	2005	2006
Revenues	3,415.00	3,865.00	4,046.00	4,853.00	6,277.00
Pre-tax profit	218.00	258.00	333.00	512.00	630.00
Net profit	160.00	1,948.00	226.00	324.00	408.00
Earnings/share (EUR)	2.51	30.65	3.55	5.10	6.42
Dividend/share (EUR)	1.20	1.38	1.67	1.46	1.83

**Pridesa**

Thames Water (then part of RWE) acquired 75% of Proyectos Y Instalaciones De Desalinacion S.A (Pridesa) and Ondagua S.A. from Iberdrola Diversificacion S.A in July 2002 for EUR100million and the remaining 25% for EUR31million in October 2004. In 2005, Acciona sought to acquire Pridesa from RWE but the sale fell through. However, in March 2006, RWE sold Pridesa and Ondagua to Acciona for EUR150million. Pridesa was renamed Acciona Agua and its activities merged with Acciona's extant water treatment activities. Pridesa and Ondagua's revenues in 2001 were EUR148million.

More than 50million people are served by Acciona Agua's water and wastewater treatment plants built by the company. Since 1980, Acciona Agua has designed, built and operated over 60 desalination facilities and 320 water treatment plants around the world. Acciona Agua specialises in reverse osmosis desalination and wastewater reuse systems and also has extensive experience in the conventional water and wastewater sector. The company operates some 99 water and wastewater treatment plants across Europe providing water to 2.3million people and wastewater treatment for approximately 4.5million people. Acciona Agua runs 28 water treatment and distribution projects, all in Spain, serving a total of 470,000 people.

**O&M contracts**

<b>Drinking water</b>			
Country	Contracts	m <sup>3</sup> /sec	Population
Spain	9	6.12	677,000
Italy	3	2.77	1,169,000
<b>Total</b>	<b>12</b>	<b>8.89</b>	<b>1,846,000</b>
<b>Wastewater</b>			
Country	Contracts	m <sup>3</sup> /day	Population Eq
Spain	56	1,595,871	6,862,425
Italy	3	395,800	2,255,000
<b>Total</b>	<b>59</b>	<b>1,991,671</b>	<b>9,117,425</b>

Acciona is involved in 68 desalination projects at various stages of development in the USA (including Carlsbad and Tampa Bay), the United Kingdom (Thames Water's proposed Thames Gateway project), Algeria and Spain, along with small scale projects in Italy, Cape Verde and Peru. The total capacity for projects where Acciona is or expects to be involved in an O&M capacity is for 1.282million m<sup>3</sup>/day.

Acciona Agua's extant activities made a number of concession contract gains in 2003. These include a 50,000m<sup>3</sup>/day desalination plant at Canal de Alicante. This facility is being operated by Infilco for 15 years for the provision of water to the Canales del Taibilla district in Murcia. This is part of a scheme providing water to 600,000 people. It was also awarded the concession to operate the Yecla (population 32,000) sewage treatment plant by the Murcia regional Government.

Other operating contracts for sewage treatment plants are in Castilla-La Mancha, which have since 2000 been serving Albacete (population 155,000), Villaviciosa de Odón (Madrid, population 22,000), Talavera (population 80,000) and smaller contracts in Socuéllamos (Toledo), Montsiá (Tarragona), Montornés (Barcelona), Madrid, Tecla (Murcia) and Ibiza. These contracts typically run for five year, renewable periods.

Acciona's subsidiary GESBA (Gestión de Servicios Urbanos de Baleares) manages the drinking water concessions in the municipalities of Andratx, Deià and Paguera in the Balearic Islands. In Andratx, under a 50 year concession, 1,090,000m<sup>3</sup> of water was supplied to a population of 12,000.

**Contact Details**

Name: Acciona  
Address: Avda. De Europa, 18,  
28018 Alcobendas, Madrid, Spain  
Tel: +34 91 663 31 31  
Web: [www.acciona.com](http://www.acciona.com)  
Web: [www.acciona-agua.es](http://www.acciona-agua.es)

José Manuel Entrecanales (President)  
Juián Ignacio Entrecanales (Vice President)  
Juan Muro-Lara (Finance Director)  
Luis Castilla (Acciona Agua)

## AGUAS DE VALENCIA SA

Aguas de Valencia SA (AgVal) was founded in 1890. Operations commenced in 1904 and in 1967 the operational mandate to supply the city of Valencia was renewed to 2002. AgVal controls 80% of the new contract and was paid EUR26million by the municipality to accept the new contract. The company was privatised in 1976 via a partial flotation. SAUR is the principal shareholder with a 33.0% stake. Other significant shareholders are; Banco de Valencia (19.1%), Lubasa (9.8%), Gruppo Boluda (11.5%) and Facsa (15.0%). While Banco de Valencia is seeking to acquire SAUR's stake, SAUR in turn wishes to acquire Mr. Boluda's corporate stake. The company serves a total of 2,040,000 people with water and 700,000 with sewerage in Spain. Contract gains for 15,000 people in L'Ampolla and 15,000 in Masalfassar were made in 1994. In both cases, these were 10 year water/wastewater tenders. Further gains for a total of 60,000 people were made in 1995. The company serves 407,000 for water in Valencia and has stakes in various contracts covering 1,600,000 people in the rest of Spain. AgVal has also gained local concessions in San Jose (Costa Rica) and Escobar (Argentina, water supply for 150,000 people).

### Aguas de Valencia, profit and loss account

Y/E 31/12 (EURmillion)	2002	2003	2004	2005	2006
Water supply	51.0	54.2	59.3	NA	NA
Group turnover	100.0	103.5	114.4	125.9	149.4
Operating profit	8.4	10.6	13.2	17.1	18.5
Net profit	29.3	5.4	7.8	10.7	11.9
Earnings/share (EUR)	17.41	3.21	4.69	NA	NA

AgVal is diversifying from the Valencia contract, gaining contracts in Spain and internationally in water provision, wastewater and waste management. Aguas de Chinas, a 50:50 JV was formed between Union Fenosa Accion Exterior (Acex) and Aguas de Valencia in July 1998. The JV seeks to bid for water contracts in China, Macao and Taiwan. Acex already has a promotion agreement with the Government of Hubei for power projects. Although AgVal aimed to see its turnover increase to EUR240million by 2003, it is evident that international contracts have not developed according to plan to date.

In 2004, AgVal sought to acquire Ferrosfer, Ferrovial's water services division. At the time, Ferrosfer served 27million m<sup>3</sup> of water pa to 500,000 people, generating EUR15million in revenues.

### AgVal, operational performance

	2001	2002	2003
Customer connections	710,998.0	731,047.0	751,931.0
Water provision (million m <sup>3</sup> )	157.3.0	159.7.0	169.0.0
Wastewater (million m <sup>3</sup> )	111.50	109.80	119.50

### Aguas de Valencia, numbers served

Country	Water	Sewerage	Total
Spain	2,040,000	700,000	2,040,000
Argentina	150,000	0	150,000
<b>Global Total</b>	<b>2,190,000</b>	<b>700,000</b>	<b>2,190,000</b>

### Contact Details

Name: Aguas de Valencia SA  
 Address: Gran Via Marques del Turia 19,  
 46005 Valencia, Spain  
 Tel: +34 96 386 0507  
 Fax: +34 96 386 0567  
 Web: [www.aguasdevalencia.es](http://www.aguasdevalencia.es)

Vicente Boluda Fos (Chairman)  
 Jose Manuel Calderero (First Vice Chairman)  
 Eugenio Calabuig Gimeno (Second Vice Chairman)

## FOMENTO DE CONSTRUCCIONES Y CONTRATAS SA

Fomento de Construcciones Y Contratas SA (FCC) is the result of the 1992 merger between Construcciones Y Contratas SA and Formento de Obras y Construcciones SA (Focsa). Focsa was a Spanish construction company which had traditionally dominated Spain's urban waste collection and street cleaning sectors. Focsa was founded in 1900 and gained the Barcelona sewerage contract in 1911. FCC's water and sewerage operations are, along with VE's SOGESUR, the second largest in Spain after Agbar.

In 1999, Alica Koplowitz sold her 28% stake in FCC to VE. While the original aim was for VE to take control of FCC, the company sold this stake back to Ms Koplowitz for EUR916million in July 2004. The stake sale does not affect the Proactiva joint venture. However, since 2004, FCC has sought new contracts in Latin America on its own, as demonstrated by the Queretaro contract gain in Mexico in 2007.

During 2006 and 2007, FCC gained three major water contracts in Portugal, Italy and Mexico as well as acquiring one of the leading regional utilities in the Czech Republic.

### Fomento de Construcciones Y Contratas SA, profit and loss account

Y/E 31/12 (EURmillion)	2002	2003	2004	2005	2006
Turnover – services	1,606	1,709	1,828	2,078	2,836
<b>Total turnover</b>	<b>5,497</b>	<b>6,051</b>	<b>6,349</b>	<b>7,090</b>	<b>9,481</b>
Operating profit	498	519	565	656	881
Pre-tax profit	455	496	591	696	881
Net attributable profit	273	309	363	421	536

Water revenues in Spain (Aqualia SA) were EUR550million in 2005, rising to EUR712million in 2006 with international water revenues of EUR38million and industrial clients (Aqualia Industrial) contributed EUR61million. Aqualia had an order backlog of EUR10.6billion at the end of 2006, including EUR3.06billion in contracts gained that year. FCC currently serves 13million people in Spain: it covers 850 towns and cities and provides sewerage services for 9.5million people, water distribution services for 7.2million people and water (as well as sewerage) services for 2.3million.

### Sewage treatment works (PE above 200,000)

Municipality	Population equivalent
Barcelona (Bogatell)	550,000
Crispiana (Vitoria)	350,000
El Copero (Seville)	550,000
Rejas (Madrid)	543,000
Sistema de Igualada	300,000
Tablada (Sevilla)	200,000
Terrassa (Barcelona)	300,000
Vilaseca Salou (Tarragona)	254,000
Viveros (Madrid)	670,000

### Sewerage: O&M contracts (250,000+ people)

Municipality	Population equivalent
Barcelona (8 years)	1,505,000
Bilbao	354,000
Córdoba	314,000
Granada	243,000
L'Hospitalet (Barcelona, 10 years)	242,000
Madrid (Central Zone, 4 years)	2,900,000
Málaga (Cartama, 25 years)	534,000
Sevilla (La Ranilla, 13 years)	703,000
Vigo (Pontevedra, 14 years)	287,000
Zaragoza	611,000

Water treatment and provision: 46 large Spanish municipalities, serving a total of 2.85million people.

#### Spanish contracts serving a population of more than 100,000

Municipality	Population	Contract expiry
Aguas de la Loma, Jean	113,700	2026
Alcoy (Alicante)	110,500	2021
Algericas (Cadiz)	102,000	2026
Almeria	168,000	2026
Badajoz	155,000	2044
Jaen	107,200	2026
Lleida	112,207	2019
Oviedo	199,550	2046
Salamanca	158,460	2022
Santander	184,000	2031
Vigo (Pontevedra)	290,580	2016

#### FCC, number of people supplied in Spain and internationally

Country	Water	Sewerage	Total
Spain	7,200,000	9,500,000	13,000,000
Italy	275,000	275,000	275,000
Portugal	200,000	0	200,000
Czech Republic	1,070,000	870,000	1,070,000
Venezuela *	552,000	0	552,000
Colombia *	423,000	0	423,000
Argentina *	200,000	0	200,000
Mexico *	5,180,000	0	5,180,000
China	0	2,000,000	2,000,000
<b>Total outside Spain</b>	<b>7,900,000</b>	<b>3,045,000</b>	<b>9,900,000</b>
<b>Total</b>	<b>15,100,000</b>	<b>12,545,000</b>	<b>22,900,000</b>

\* Includes Proactiva

The Proactiva contracts are examined in the VE entry.

#### Czech Republic

FCC acquired SmVaK from Penta Finance in 2006 for EUR248million. SmVaK's 2006 revenues were EUR57million. Penta Finance acquired AWG's 54.30% holding in SmVaK (Severomoravské vodovody a kanalizace Ostrava a.s.) in February 2004 for CZK1.75billion (GBP38million). AWG acquired this stake for GBP19million in 1999. In April 2004 Penta purchased a further 44.07% interest from Suez. 1.5% of the shares are held by Moravian municipalities. In August 2005, the company was given a Baa-short term international debt rating by CRA, the first time SmVaK has been rated. In June 2005 the company issued CZK2billion in bonds in order to retire earlier debts, with CZK0.25billion available for acquisitions in Moravia, Poland and Slovakia.

#### SmVaK, profit & loss account

Y/E 31/12 (CZKmillion)	2000	2001	2002	2003	2004
Water supply	720.9	760.7	834.7	883.1	905.6
Wastewater treatment	410.1	448.3	480.5	501.0	522.2
Revenues	1,240.0	1,273.1	1,374.2	1,441.1	1,484.5
Net profits	173.0	178.9	192.3	355.5	218.7
EPS	37.5	51.7	55.6	102.8	63.4

SmVaK holds the water and sewerage management contract for the Severomoravske region, including serving the Frýdek – Místek, Karviná, Nový Jičín, and Opava regions, along with the cities of Ostrava, Hlučín, Studénka, and for other municipalities of Moravia and Silesia region; and under a contract, it also supplies water to near-border areas of Poland. It owns 26 water treatment plants and operates 60 sewage treatment plants. Currently, 1.07million of the region's 1.20million inhabitants are connected to the mains water supply and 0.87million to the sewerage network. SmVaK is the second largest water and wastewater entity in the Czech market.

**Portugal**

2006	Leziria del Tajo	40 year concession	220,000 water & wastewater
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This contract involves EUR200million in capital spending (EUR53million from public funding) and will generate total revenues of EUR1,500million.

**Italy**

2006	Caltanissetta	30 year concession	275,000 water & wastewater
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The water and wastewater management contract for the Caltanissetta province in Sicily involves capital spending of EUR247million (EUR85million from public funding) and is expected to generate revenues of EUR1.5billion. Caltanissetta's two largest towns are Gela (72,000) and Caltanissetta (61,000). Aqualia is the majority participant (51%), the other members being the Italian firms Galva (47%), CCC (1%), Gate (0.5%) and AIEM (0.5%).

**Mexico**

2007	Queretaro	20 year concession	700,000 water
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A EUR178million project that will deliver and treat bulk water at 1.5 m<sup>3</sup>/sec to the greater Queretaro area, generating revenues of EUR330million over the operational period.

**Latin America-Proactiva**

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
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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**

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 with water and 124,000 with sewerage. The Tunja concession serves 151,000 with water and 148,000 with sewerage.

**Mexico**

VE's JV company Omsa, operates four contracts serving a total of 6.0million 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.

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

**China**

2005	Bengbu	25 year BOT	2million wastewater
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This is FCC's first international contract in Asia and its first since ending its relationship with Veolia. The contract is being operated as a joint venture between FCC's Aqualia and BCCA of China. Bengbu is in Anhui Province and has a population of some 2million people. EUR40million is to be spent upgrading and expanding the city's wastewater treatment works and the contract will generate revenues of EUR500million. Bengbu Treatment Plant Number 1 (100,000m<sup>3</sup>/day) will be managed for 25 years and expanded to 200,000m<sup>3</sup>/day and a second plant (Yantaizi, Treatment Plant Number 2) with a capacity of 200,000m<sup>3</sup>/day will be built and managed. FCC's SPA has been involved in providing equipment for six WWTW projects since 1999, including hardware for the first phase of Bengbu Number 1.

**Contact Details**

Name: Formento de Construcciones Y Contratas SA  
Address: Federico Salmón, 13,  
28016 Madrid, Spain  
Tel: +(34) 91 35 95 400  
Fax: +(34) 91 34 54 923  
Web: www.fcc.es

Marcelino Oreja Aguirre (Chairman)  
Rafael Montes Sánchez (CEO)  
José Trueba (CFO)  
Miguel Jurado (Director, Aqualia)

## GRUPO ACS, ACTIVIDADES DE CONSTRUCCION Y SERVICIOS SA

In October 2003 Grupo Dragados SA (GD) merged with ACS, Actividades de Construcción y Servicios SA (ACS) and its activities were subsumed within the enlarged group. Urbaser, the water and waste management services arm of Dragados is now the principal component of the Environmental Services section of the Services and Concessions Division.

### Grupo ACS, pro-forma profit and loss account

Y/E 31/12 (EURmillion)	2002	2003	2004	2005	2006
Environment turnover	903.00	N/A	1,001.00	1,191.00	1,082.00
Group turnover	4,420.00	8,825.00	10,961.00	12,114.00	14,067.00
Operating profit	305.00	574.00	724.00	817.00	972.00
Net profit	181.00	230.00	460.00	609.00	1,250.00
Net profit (EUR)	0.94	0.76	1.30	1.74	3.58

Urbaser, along with FCC is one of Spain's leading waste management companies. It also has a number of major concessions, including the Huesnar water and sewage treatment works concession for Seville (1993) serving 220,000 people in 15 towns. The concession will generate ESP60billion over its 25 year life. In 1999, Urbaser gained a 30 year (extendable to 50 years) concession worth ESP5billion serving 150,000 people in the Spanish district of El Ferrol.

### Water & sewerage activities in Spain, 2005-06

	People		Million m <sup>3</sup> pa	
	2005	2006	2005	2006
Distribution of drinking water	2,904,206	2,935,182	268	269
Treatment/Supply of drinking water	2,841,628	2,872,604	260	262
Sanitary control of drinking water	2,974,206	3,005,182	274	276
Sewage network maintenance	3,254,206	3,285,182	268	269
Purification of waste water	2,619,665	2,650,641	232	234
Management of subscribers	3,086,475	3,117,451	285	287

Contracts gained in 2005 included water management in Naval Moral de la Mata (EUR19million contract value) and sewage systems in Las Palmas. Contracts gained in 2006 included a water management contract for the city of Almodóvar del Campo (Extremadura, 20 year contract for EUR75million) and a water treatment BOT for Zone 2 in Aragón region, Spain (20 year contract for EUR50million).

### Grupo ACS, number of people served in Spain and internationally

	Water	Sewerage	Total
Spain	3,000,000	3,600,000	<b>2,200,000</b>
Argentina	2,100,000	2,100,000	<b>2,100,000</b>
<b>Total</b>	<b>4,300,000</b>	<b>2,600,000</b>	<b>4,300,000</b>

### Argentina

1999	Misiones Province	30 year concession	300,000 water & sewerage
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The Servicio de Aguas de Misiones (SAMSA) concession was awarded in August 1999 and serves the cities of Posada and Garupa, which involves the upgrading of water provision networks and in the longer term developing sewerage and sewage treatment facilities. Water will be supplied to the cities from the Parana River. A total investment of ARS31.9million is to be made over two phases, with partial funding from the World Bank for the initial phase. Revenues of ARS120billion will be generated over the life of the concession. ACS holds 90% of the concession's equity.

1999	Aguas del Gran BA	30 year concession	1,800,000 water & sewage
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GD paid USD44million for its 27% share of Aguas del Gran Buenos Aires, in the metropolitan area of the city. Its Spanish partners are Impregilo (31%) and Aguas de Bilbao (20%) and the concession was awarded in December 1999. Revenues over the concession life will be ARS600billion, with capital spending of ARS166billion.

**Contact Details**

Name: ACS, Actividades de Construccion y Servidos SA  
Address: Avda. Pio XII, 102,  
28036 Madrid, Spain  
Tel: +34 91 343 92 00  
Fax: +34 91 343 94 56  
Web: [www.grupoacs.com](http://www.grupoacs.com)

Florentio Perez Rodriguez (Chairman and CEO)  
Antonio Garcia Ferrer (Vice Chairman)  
Angel Garcia Altozano (Corporate General Manager)  
Demetrio Ullastres Llorente (Manager, Services and Concessions)

## IBERDROLA SA

Iberdrola SA is the Spanish electricity utility with a 41% share of the Spanish electricity distribution market and extensive power projects in North and South America. The company acquired Obrascon's Agua Ondagua in 1997 and Sercomsa in 1998. In 2000, Iberdrola acquired 75% of Pridesa, a Bilbao based water and wastewater engineering company. In 2002-04, Iberdrola sold Pridesa and Agua Ondagua to RWE as part of a 2000-06 strategy to concentrate on energy.

### Iberdrola, profit and loss account

Y/E 31/12 (EURmillion)	2002	2003	2004	2005	2006
Turnover	9,594.00	9,488.00	10,314.00	11,783.00	11,017.00
Operating profit	1,564.00	1,823.00	2,019.00	2,262.00	2,655.00
Net profit	963.00	1,060.00	1,211.00	1,382.00	1,660.00
Earnings/share (EUR)	1.06	1.17	1.34	1.53	1.84
Dividend (EUR)	N/A	N/A	N/A	0.77	0.89

### Uruguay

2000	Maldonado	30 year concession	260,000 water & sewerage
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The Aguas de Maldonado contract was awarded to Iberdrola (49%), Aguas de Bilbao and Banco Bilbao Bizaia in January 2000. It covers 74,000 connections in the Department of Maldonado, including the towns of Punta del Este, Maldonado, Piriapolis, Pan de Azucar and San Carlos. The consortium bid EUR15million for the concession and will invest USD140million in the project, including USD5.2million in 2003. Revenues have been affected by currency weakness, falling from USD19million in 2001 to USD11million in 2003, but it did contribute EUR1million in earnings during 2004.

### Chile

1999	ESSAL	Acquisition	650,000 water and sewerage
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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. It was announced in 2002 that Iberdrola was considering selling ESSAL, but no further developments have taken place. Revenues were EUR38million in 2006.

### Iberdrola, number of people served internationally

	Water	Sewerage	Total
Chile	500,000	100,000	<b>500,000</b>
Uruguay	260,000	260,000	<b>260,000</b>
<b>Total</b>	<b>760,000</b>	<b>360,000</b>	<b>760,000</b>

### Contact Details

Name: Iberdrola SA  
 Address: Gardoqui 8, 48008 Bilbao,  
 Spain  
 Tel: +34 94 479 14 11  
 Fax: +34 94 479 01 93  
 Web: www.iberdrola.es

Inigo de Oriol Ybarra (Chairman)  
 Jose Ignacio Sanchez Galán (Vice Chairman)  
 Julian Martinez-Simancas Sanchez (CEO)  
 Jose Miguel Martinez Urquijo (Director, Non-Energy Activities)

**OHL**

OHL is a Spanish construction company which was formed as a result of the mergers of Obrascon and Huarte in 1997, along with Construcciones Lain in 1999. In 2001, OHL acquired Inima, a company specialising in water and waste management engineering that has also developed a number of BOT water and wastewater concession contracts for municipal customers.

Y/E 31/12 (EURmillion)	2002	2003	2004	2005	2006
Turnover – Environment	N/A	79.30	N/A	62.70	83.90
Total turnover	1,772.00	2,111.80	2,230.10	2,442.70	3,278.20
Operating profit	73.50	143.00	163.00	160.70	326.80
Net profit	42.10	48.50	57.40	102.30	105.1-
EPS (EUR)	0.47	0.54	0.54	1.14	1.20

Inima Servicios Europeos de Medio Ambiente SA had a long term order backlog of EUR2,991million in 2006. In 2003, the company decided to sell its water treatment activities in order to concentrate on wastewater treatment and desalination engineering and concessions. Water and wastewater concessions generated revenues of EUR35million in 2003. At the time, Inima served some 1.6million people. Inima is responsible for a third of Spain's desalination capacity. Contracts are also being sought in China.

**Spain**

2000	Trapiche	20 year BOT	300,000 water
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The EUR20million EM SER Trapiche plant treats 146,880m<sup>3</sup>/day of water, serving the Axarquia district of Malaga. Inima is currently selling this concession.

1996	Cadiz	25 year concession	350,000 wastewater treatment
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A 24 year concession after the facility entered service in 1997. The AIE Cadiz-San Fernando facility treats 75,000m<sup>3</sup>/day of wastewater, serving Cadiz and San Fernando.

Other desalination BOT projects in Spain:

Location/Client	Capacity	Construction	Operation
Carboneras/ACUSUR	120,000m <sup>3</sup> /day	2000-01	2001-25
Marbella/Decosol	55,000m <sup>3</sup> /day	1996	1996-16

**Brazil**

2003	Robeirao Petro	16 year concession	Wastewater treatment
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The two wastewater treatment plants were built by OHL and are to be operated by Inima until 2019. Inima holds 100% of the concession, which involves a total investment of EUR35million.

**Desalination concessions**

Chile	Antofagasta	Desalant	20 year BOT, 2003-23
Chile	Arica	Desalinizadora Arica	10 year BOT, 1998-08
Mexico	Los Cabos	Promoagua Desalacion de LC	20 year BOT, 2003-23
Spain	Churriana de la Vega	Inima	24 year BOT, 123,000m <sup>3</sup> /day
Algeria	Mostaganem	AEC	25 years, BOT, 200,000m <sup>3</sup> /day
Algeria	Cap Djinet	AEC	25 years, BOT, 100,000m <sup>3</sup> /day
USA	Brockton, MA	Aquaria Water LLC	20 year BOT, 2005, 22,500m <sup>3</sup> /day

The Antofagasta plant cost USD54million and currently provides 13,000m<sup>3</sup>/day of water, which will be expanded to 52,000m<sup>3</sup>/day by 2010. It will provide 70% of the city of 300,000's water needs.

**Contact Details**

Name: OHL SA  
 Address: Gobelos, No 35-37 El Planto,  
 28023 Madrid, Spain  
 Tel: +34 91 348 41 00  
 Fax: +34 91 348 44 63  
 Web: www.ohl.es

[www.inima.com](http://www.inima.com)

Juan-Miguel Villar Mir (Chairman)  
Jose Luis Garcia-Villalba Gonzalez (Deputy Chairman)  
Juan-Miguel Folque Usan (Managing Director)

## SACYR VALLEHERMOSO

Sacyr is involved in construction, real estate, contracting and asset operating activities. Sociedad Anonima de Caminos y Readios was formed in 1986, changing its name to Sacyr in 1991 and acquired Vallehermoso in 2002. In Portugal, the company operates under the name Somague.

### Sacyr, profit & loss account

Y/E 31/12 (EURmillion)	2002	2003	2004	2005	2006
Valoriza revenues	N/A	48.0	90.1	376.6	512.1
Group revenues	2,064.2	3,333.7	3,703.3	4,395.6	4,890.4
Operating profits	N/A	451.2	579.6	619.8	861.9
Pre-tax profits	406.6	468.7	507.7	614.0	722.8
Net profits	331.1	334.3	376.3	413.1	542.2

Valoriza Gestion, Sacyr's services division, specialises in water contracts, waste management, renewable energy generation and multi service contracts. Valoriza's revenues increased from EUR48million in 2003 to EUR512million in 2006 through contract gains and acquisitions, including Emmasa and Emalsa. In 2006, 26% of revenues and 66% of the order backlog were in the water sector.

### Sacyr, populations served

Country	Water	Sewerage	Total
Spain	822,600	220,000	<b>822,600</b>
Portugal	1,342,000	1,342,000	<b>1,342,000</b>
Brazil	412,000	0	<b>412,000</b>
<b>Grand Total</b>	<b>2,576,600</b>	<b>1,562,000</b>	<b>2,576,600</b>

### Spain – Aguas de Toledo

2003	Grand Canaria	40 year concession	398,000, water
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Sacyr holds 33% of Emala, which serves Las Palmas and Santa Brígida. Revenues in 2006 were EUR52.2million with an order backlog of EUR1,090million.

2001	Tenerife	30 year concession	223,200, water & wastewater
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Sacyr holds 97% of Emmasa, which provides water services (55,000m<sup>3</sup>/day) and sewage treatment (40,000m<sup>3</sup>/day) to 220,000 people in Santa Cruz. Revenues in 2006 were EUR32.0million with an order backlog of EUR1,630million.

1999	Alcala de Henares	30 year concession	210,400, water
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Sacyr holds 25% of Aguas de Alcala. Revenues in 2006 were EUR9.6million with an order backlog of EUR100million.

### Portugal

AGS controls 40% of the private sector's share of the Portuguese water market, serving 1.35million people and generating revenues of EUR21.6million in 2004 and EUR49million in 2006 with an order backlog of EUR2,700million. These activities were acquired through AGS's Somague Ambiente. The earlier concessions were acquired from the state, having been originally awarded to Aguas de Barcelona's Lusagua before Agbar sold this company to the Government.

1997	Setubal	25 years, concession	117,000, water & wastewater
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Somague holds 40% of Aguas de Sado. Revenues in 2006 were EUR12.5million with 61,300 customers and a total population of 113,934 people, 97% of whom have water and 90% have wastewater services. Total capital spending of EUR90.8million is foreseen for the concession with an order backlog of EUR130million.

1998	Vale do Ave	25 years, concession	360,000, water & wastewater
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Somague holds 40% of TRATAVE (Tratamento de Águas Residuais do Ave, S.A.); the concession company for the Vale do Ave (Municipalities of Guimarães, Santo Tirso and Vila Nova de Famalicão). 2006 revenues were EUR7.4million, with a contract capital spending of EUR17.5million. This is a management concession with an order backlog of EUR70million.

1999	Figueira da Foz	25 years, concession	70,000, water & wastewater
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Somague holds 40% of Aguas da Figueria. Revenues in 2006 were EUR7.7million with an order backlog of EUR159million and capital spending of EUR15.2million foreseen for the concession.

2000	Cascais	25 years, concession	188,000, water & wastewater
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Somague holds 43% of Aguas de Cascais. Revenues in 2006 were EUR31.4million with an order backlog of EUR411million and capital spending of EUR117.2million foreseen for the concession.

2001	Carrazeda de Ansiaes	30 years, concession	9,000, water & wastewater
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Somague holds 75% of Aguas de Carrazeda. Revenues in 2006 were EUR0.6million with an order backlog of EUR39million and total capital spending of EUR4.2million foreseen for the concession.

2001	Gondomar	25 years, concession	194,000, water & wastewater
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Somague holds 42.5% of Aguas de Gondomar. Revenues in 2006 were EUR16.8million with an order backlog of EUR242million and total capital spending of EUR71.3million foreseen for the concession.

2003	Alenquer	30 years, concession	40,000, water & wastewater
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Somague holds 40% of Aguas de Alenquer. Revenues in 2006 were EUR6.2million with an order backlog of EUR98million and total capital spending of EUR22.3million foreseen for the concession.

2004	Pacos de Ferreira	35 years, concession	53,000, water & wastewater
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Somague holds 90% of Aguas de Alenquer. Revenues in 2006 were EUR3.7million with an order backlog of EUR381million and total capital spending of EUR58.6million foreseen for the concession.

2004	Barcelos	30 years, concession	155,000, water & wastewater
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Somague holds 75% of Aguas de Barcelos. Revenues in 2006 were EUR8.2million with an order backlog of EUR748million and total capital spending of EUR91.7million foreseen for the concession.

2005	Marco de Canaveses	Concession	56,000, water & wastewater
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Somague holds 51% of Aguas de Marco. Revenues in 2006 were EUR1.7million with an order backlog of EUR434million.

2005	Taviraverde	Concession	75,000, water & wastewater
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Somague holds 32% of Tavira. Revenues in 2006 were EUR7.0million with an order backlog of EUR76million.

2005	Covilha	Concession	21,000, water & wastewater
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Somague holds 51% of Aguas de Serra. Revenues in 2006 were EUR0.7million with an order backlog of EUR109million.

2005	Faro	35 years, concession	57,000, water & wastewater
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This is a public-private partnership contract, which also includes waste collection and street cleaning for the council. Somague holds 51% of Faro. Revenues in 2006 were EUR8.8million with an order backlog of EUR45million.

## Brazil

AGS operates two concessions in San Paulo province.

1995	Mandaguahy	21 years, concession	103,000, bulk water
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Somague holds 85% of Aguas de Mandaguahy. Revenues in 2006 were EUR1.8million with a total capital spending of EUR5.5million foreseen for the concession and an order backlog of EUR31million.

1996	Machado & Baguacu	15 years, concession	329,000, water & wastewater
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Somague holds 54% of Aguas de SANEAR (Saneamento de Araçatuba, S.A.), a concession for sewerage, sewage treatment and disposal covering the Machado de Melo and Baguaçu bays. Revenues in 2006 were EUR2.7million with a total capital spending of EUR4.5million foreseen for the concession and an order backlog of EUR15million.

#### **Desalination and wastewater treatment – Sadyt**

Sociedad Anónima de Depuración y Tratamiento specialises in wastewater treatment and desalination engineering. It was set up in 1995 and recently has become involved in the operation of contracts. In 2003, services accounted for 20% of Sadyt's revenues. By 2005, this had increased to 36% of revenues. Desalination plants have been built (155,000m<sup>3</sup>/day capacity) or are under construction in Spain and Algeria (250,000m<sup>3</sup>/day, serving 1.25million people and due to enter service in 2007) and a third of these are also operated by the company. The two Algerian facilities will be operated with ACS and Abengoa of Spain.

#### **Contact Details**

Name: Sacyr Vallehermoso  
Address: Paseo de la Castellana 83-85,  
28046, Madrid, Spain  
Tel: +91 545 50 00  
Web: [www.gruposyv.com](http://www.gruposyv.com)

Luis Fernando del Rivero Asensio (Chairman)  
Manuel Manrique Cecilla (CEO)

## TECNICAS VALENCIANAS DEL AGUA

Technicas Valencianas Del Agua (Tecvasa) is a privately held venture company specialising in tendering for water projects. It is held by Anton Trust SL, Inversiones Americanas del Agua, SA Caja de Ahorros del Mediterráneo (G.I. CARTERA) SA, Red Control SL, Comercial Virosque SL (COMVIR), Válvulas Arco SL and G.T. Inversiones y Cartera 2001, SL. The venture was formed in 1999 and has stated that it currently serves a total of 8.5million people in Latin America. Tecvasa entered the Latin American market by forming an alliance with Colombia's Triple A. Tecvasa holds 49% of the Lassa JV (Sociedad Latinoamerica de Aguas y Servicios) and 49% of AAAS Servicios, the water operations division of Triple A (La Sociedad de Acqueducto, Alcantarillado y Aseo de Barranquilla SA). The company is actively seeking contracts in Panama (LASSA, Latinoamericana De Aguas Y Servicios S.A.) and Chile (in association with Mendes Júnior y Asociados Chile SA).

Triple A had revenues of USD74million and net profits of USD9million in 2001.

### Technicas Valencianas Del Agua, number of people served

	Water	Sewerage	Total
Colombia	1,770,000	1,770,000	<b>1,770,000</b>
Dominican Republic	1,300,000	0	<b>1,300,000</b>
Ecuador	100,000	100,000	<b>100,000</b>
Venezuela	3,500,000	3,500,000	<b>3,500,000</b>
<b>Total</b>	<b>8,470,000</b>	<b>5,370,000</b>	<b>8,470,000</b>

### Colombia

1997	Santa Marta	20 year concession	400,000, water & sewerage
2001	Soledad	20 year concession	400,000, water & sewerage
1996	Barranquilla	37 year concession	1,359,700, urban services

The Santa Marta district concession (Metroagua SA) covers bulk water provision, sewerage and waste management services. Barranquilla (AAA Servicios SA) is the fourth largest city in Colombia. The concession encompasses domestic refuse collection (390,000 tonnes pa) as well as water provision and sewerage services. Water and sewerage coverage are to rise from 78% and 68% respectively to 99% and 96% during the concession's life. In 2000, water supply coverage was 94% and sewerage coverage 80%. Until 1999, Agbar had a 43% holding in the concession company for these contracts. Agbar sold its stakes to Tecvasa and Triple A after disputes over water tariffs. The Soledad concession involves USD37million in capital spending on a network with 75% water and 65% sewerage coverage. Between 2001 and 2004, average delivery increased from 12-18hrs/day. Customers served increased from 42,300 to 72,300 (water) and 32,400 to 62,300 (sewerage).

### Dominican Republic

2001	Santo Domingo	O&M	1.3million water
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AAA Dominicana SA has an O&M contract serving the western half of the city of Santo Domingo. The contract was awarded in 2001 and metering coverage rose from 1% to 35% by 2003, with customer connections rising from 116,420 to 142,228.

### Ecuador

Aguas de Samborondón (Amagua CEM) provides water and sewerage services to the city of Samborondón in Guayas province. The contract started in 2000.

### Venezuela

2001	Zulia	O&M	3.5million water
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Technicas Valencianas del Agua and Colombia's Triple A gained an O&M contract for the state of Zulia, including Hirdolago de Maracaibo, serving Maracaibo Venezuela's second largest city. A total of 21 municipalities were served, covering a population of 3.5million people. The contract was ended in 2004.

**Contact Details**

Name: Technicas Valencianas Del Agua (Tecvasa)  
Address: C/Espinosa, 8-3ª Planta, 310-46008 Valencia, Spain  
Tel: +34 96 315.32.32  
Fax: +34 96 315.35.18  
Web: [www.tecvasa.com](http://www.tecvasa.com)  
[www.aaa.com.co](http://www.aaa.com.co)

Ferrer Baltran Jose (President)  
Virosque Verduy Carlos Francisco (Vice President)

**SWEDEN****LÄCKEBY WATER GROUP**

Läckeby was founded in 1935 and is a privately held water engineering and services company which is 13% held the Sixth Swedish National Pension Fund (Sjätte APfonden), 41% by the Baltic Rim Fund Ltd, (managed by Euroventures Management AB), LR Miljö and Energi AB owns 36% and Hans Malm 10%.

**Läckeby Water Group, profit & loss account**

<b>SEK (million)</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
Purac (Contracting)	112.0	350.0	458.0	468.0
Läckeby Products (Products)	27.0	43.0	40.0	48.0
Läckeby (Servicing)	17.0	33.0	61.0	77.0
Operating revenues	156.0	426.0	559.0	593.0
<b>Total operating income</b>	<b>158.3</b>	<b>436.8</b>	<b>594.2</b>	<b>601.4</b>
Operating profits	3.7	17.0	55.5	17.3
Interest	-0.4	-3.8	-2.5	2.3
Pre-tax profit	1.5	13.2	56.1	19.4

Läckeby provides day-to-day servicing, renovation and maintenance work for municipal and industrial clients in Sweden. This includes the municipalities of Borgholm, Halmstad, Håbo, Kalmar, Kristianstad, Strängnäs, Trosa, Vetlanda and Värmdö, while industrial clients include NSR, Syvab, VA-Ingenjörerna, Veolia Water AB and WSP.

Läckeby acquired Purac from AWG in December 2003. Acquiring Purac represents the largest expansion in the company's history, bringing Purac's process engineering activities into the group. Purac is one of the leading process engineering companies in China and has gained a broad range of contracts in South East Asia, Scandinavia and Central & Eastern Europe. AWG used Purac as a technology platform for gaining international concession contracts. Bekkelaget Vann AS (the Oslo wastewater treatment works operations company) was sold to Läckeby Water AB by AWG in 2005.

**Norway**

2000	Oslo	13 year concession	250,000 sewerage
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Purac was awarded a GBP40million design and build contract with Kaldnes and Selmer for the Bekkelaget sewage treatment works serving Oslo in 1998 with a PE of 350,000. The first phase entered into operation in 1999, with completion due in 2001. In October 2000, AWI was awarded a 13 year operating concession for the facility with an optional five year extension period. The 13 year contract is worth GBP100million.

**Contact Details**

Name: Läckeby  
Address: Mosekrogsvägen 2  
SE 380 31 Läckeby  
Tel: Tel. +46 480-381 00  
Fax: Fax +46 480-606 63  
Web: www.lackebywater.se

Carsten Olsson (Chairman)  
Martin Hagbyhn (Managing Director)

**UNITED KINGDOM****AWG PLC**

AWG is the holding company for Anglian Water Services and a number of infrastructure related activities. Following the acquisition of Morrison Plc in 2000, the company was re-branded as AWG Plc. Since 2003, AWG has been rationalising its activities as a result of problems associated with both its international operations and Morrison, resulting in exceptional write-downs of GBP450million. In November 2006, AWG was acquired by Osprey Acquisitions Limited, a private equity consortium comprising of Canada Pension Plan Investment Board (32%), Colonial First State Global Asset Management (32%), Industry Funds Management (19%) and 3i Group plc (16%). After the acquisition, AWG was broken up into Anglian Water Services, Morrison and AWG Property.

**Regulated activities: Anglian Water Services**

Anglian Water Services Limited provides water to 4.2million people and sewerage services to 5.5million people in eastern England. The Anglian region is characterised by low rainfall (which will be exacerbated in the longer term by climate change), population growth and development, especially when related to information technology. At the same time, the region's emphasis towards industrial agriculture, allied with slow flowing waterways, makes the region vulnerable to environmental degradation. 200,000 new houses are forecast to be built in the Anglian water region by 2015 and 1million by 2032.

As a result, AWG has concentrated on delivering high service quality, through a well developed infrastructure, with an emphasis on environmental compliance. The company manages demand via a twin-track approach; the widespread use of domestic metering and low leakage rates. The high cost of water encourages the widespread use of domestic metering and makes it feasible to have notably low leakage rates which have reduced significantly since privatisation. The company is also seeking to develop ways of recycling grey water (e.g. bath water) for domestic applications such as flushing lavatories and use of grey water in the garden. Distribution losses of 5.5m<sup>3</sup>/km of pipes during 2006-07 compares with an industry average of 11m<sup>3</sup> per km, along with metering in 60% of AWG's domestic base being now covered against 14% across England and Wales as a whole. In addition, 85% of the distribution network is covered by district metering for measuring leakage at all points along the network.

In 1998 AWG acquired Hartlepool Water Plc, a SWC. Since then, Hartlepool has gained two inset appointments in northern England within the territory served by Northumbrian Water Group Plc.

In 2002 Anglian Water Services was 'ring fenced' and re-financed. Ring fencing has enabled the capital structure of the business to be changed with AWS now being largely debt financed through a GBP1.76billion asset backed bond issue. The GBP128million cost of this refinancing means that it will take five years for the lower cost of debt to benefit the company. In addition, GBP678million was returned to shareholders in 2002 and 2003. A further GBP500million refinancing took place in 2007, including the retirement of the outstanding higher coupon debt.

**Anglian Water Services, profit and loss account**

Y/E 31/03 (GBPmillion)	2006	2007
<b>Turnover</b>		
Water – Measured	183.2	209.0
Water – Unmeasured	128.7	128.9
Water – Large user	28.3	26.6
Wastewater – Measured	253.9	287.4
Wastewater – Unmeasured	213.4	206.8
Wastewater – Trade effluent	7.2	7.5
Wastewater – Large user	25.5	23.2
<b>Total appointed turnover</b>	<b>856.7</b>	<b>909.4</b>
Non appointed	9.0	9.6
<b>Total turnover</b>	<b>865.7</b>	<b>919.0</b>
Operating profit	359.6	404.8
Pre-tax profit	297.1	352.9
Post-tax profit	247.9	335.1

**Anglian Water International Ltd.**

Anglian Water International and Anglian Water Processes (AWP) were merged in 1996 to form a combined AWI. Since 2003, the company has sought to sell off its international water activities. To date its activities in Scotland, Chile, the Philippines, Sweden, Vietnam, New Zealand, Russia, South Africa, Australia and the Czech Republic have been sold, along with one contract in China and AWG's 4.5% stake in Aguas Argentinas. The process engineering activities, along with the Oslo contract were sold to Lackeby of Sweden (see separate company

entry). In May 2005, AWG sold its Taizhou contract to the Jiangsu Taizhou Water Company for GBP5.7million. The Irish activities are being retained.

#### AWG, number of people served in the UK and internationally

Country	Water	Sewerage	Total
UK-Anglian Water Services	3,983,000	5,700,000	5,700,000
UK-Hartlepool Water	92,000	0	92,000
Ireland	50,000	1,200,000	1,250,000
Brazil	0	200,000	200,000
People's Republic of China	2,500,000	0	2,500,000
Total-home market	4,075,000	5,700,000	5,792,000
Total-international	2,550,000	1,400,000	3,950,000
<b>Grand total</b>	<b>6,625,000</b>	<b>7,100,000</b>	<b>9,642,000</b>

#### Ireland

2000	Dublin	20 year BOT	1,200,000 sewerage
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Ascon, an Irish construction company, Binnie Black & Veatch and AWG Water are to build Ireland's largest sewage treatment works, serving the city of Dublin and surrounding areas in a contract worth GBP185million including GBP120million of construction work. This has been expanded to serve a total of 1.6million PE, includes advanced treatment and is now operated by AWI, with its Celtic Anglian Water JV managing the sewage sludges. In addition this JV won a GBP20million four year contract in 1998 to tackle leakage in the Dublin area for a population of 1.5million.

2002	Sligo	10 year O&M	50,000 water
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In 2002, AWG gained a contract to operate a new water treatment works on behalf of Sligo County Council. The 10 year, GBP5million contract is to deliver 11million L/day of water to the Sligo area.

#### Brazil

In southern Brazil, AWI set up Cejen-Anglian (37.5% held) in 1994, a JV with Fidem, owning and operating a deep shaft industrial effluent treatment work in the city of Brusque with a population equivalent capacity of 300,000. The facility serves approximately 200,000 people. Problems relating to the contract meant that a GBP7million write down of assets/development costs was made in 1996/97. Nevertheless, the BOOT facility has been operational since 1996.

#### China

2001	Beijing	3 year build and 20 year BOT	2.5million water treatment
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The USD200million facility will treat 500million L/day and is the largest water treatment project awarded to the private sector during 2001. A further USD50-100million in capital expenditure will be needed for related infrastructure. AWG bid with Mitsubishi of Japan, who have access to funds from the Japan Bank for International Co-operation. After six years the project has yet to reach its financial closing which, if achieved, will be sold by AWG to a third party.

#### Contact Details

Name: AWG plc  
 Address: Anglian House, Ambury Road, Huntingdon,  
 Cambridgeshire, PE29 3NZ, UK  
 Tel: +44 1480 323 000  
 Fax: +44 1480 323 115  
 Web: [www.anglianwater.co.uk](http://www.anglianwater.co.uk)  
 Web: [www.awg.com](http://www.awg.com)

Johnson Cox (CEO and Chairman)  
 Peter Simpson (COO)  
 Scott Longhurst (Group Finance Director)

**COSTAIN GROUP PLC**

Costain is an engineering and construction company that in recent years has become increasingly involved in managing water contracts and assets, often as a consortium partner. The Asset Management division is responsible for managing the development of new projects, while the PFI division handles a variety of BOT contracts in the UK.

**Costain Group Plc, profit and loss account**

Y/E 31/12 (GBPmillion)	2002	2003	2004	2005	2006
Group turnover	521.8	623.5	673.2	773.5	886.3
Operating profits	0.5	5.4	10.2	8.7	-58.4
Joint ventures & associates	7.5	10.1	8.7	13.4	-7.0
Pre-tax profit	11.3	16.1	15.2	25.0	-61.7
Earnings/share (p)	2.8	3.7	4.3	6.7	-15.1

Water contracts worth GBP2,915million have been gained since 2005 and account for 35-50% of group revenues as the AMP4 contracts and Project Aquatrine enter into operation. This is equivalent to 20% of the asset management programmes being carried out in England and Wales during the 2005-10 AMP4 period.

2005	Southern Water	5 years, capex management	Water & wastewater services
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4D's Southern Water contract (Costain 40%, UU 40% & Montgomery Watson Hazra 20%) is worth GBP300million to Costain and covers 270 water and wastewater projects, involving a total of GBP800million in work. During AMP3, Costain and Black & Veatch gained GBP110million of business.

2005	UK MoD	25 year PFI	Water & wastewater services
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Coast to Coast Water (C2C), consisting of Costain (50%) and Severn Trent Services (50%) gained Package C of Project Aquatrine, serving 1,500 military sites in South East, East and North England. The contract is worth GBP1.2billion and started in April 2005.

2005	United Utilities	5 years, capex management	Water & wastewater services
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GCJV, a joint venture with Galliford Try and Atkins is the Southern Area Framework Contractor for AMP4, with 200 projects worth a total of GBP400million to Costain. During the final three years of AMP3, GCJV oversaw 176 projects, generating GBP196million in revenues.

2005	Thames Water	5 years, capex management	Water & wastewater services
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Costain worked with Thames Water during AMP2 and AMP3 including GBP162million in water treatment projects for London and wastewater projects for the south east part of the company. The GBP200million AMP4 framework contract covers all works within the M25 area and includes a ten year extension covering AMPs 5&6 and GBP103million in projects at Perry Oaks and South Iwer.

2005	Bristol Water	5 years, capex management	Water services
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Costain, along with Purac (AWG) and Black & Veatch was appointed in June 2005 as the preferred partner for 10 projects worth GBP60million of business overseeing clean water management.

2005	Glas Cymru	5 years, capex management	Water & wastewater services
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This is a 5 year contract initially covering the AMP4 period. Revenues for Costain will be GBP20million pa covering 20 civil engineering projects in North Wales.

2005	Yorkshire Water	5 years, capex management	Water & wastewater services
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GBP112million of revenues under AMP3 have increased to GBP200million during AMP4 through retaining the wastewater management contract and gaining the drinking water management contract for the eastern area of the company.

**Contact Details**

Name: Costain Group Plc  
Address: Costain House, Nicholsons Walk  
Maidenhead, Berkshire SL6 1LN  
Tel: 01628 842444  
Web: [www.costain.com](http://www.costain.com)

David Jefferies (Chairman)  
Andrew Wyllie (CEO)  
Tony Bickerstaff (FD)

**DEE VALLEY GROUP PLC**

(DVG) supplies water to Wrexham and parts of Clwyd in North Wales and Chester and parts of Cheshire in North West England, with sewerage services being provided by Dŵr Cymru (Glas Cymru) and North West Water (United Utilities Plc). DVG was formed from the merger of the Wrexham Water and Chester Waterworks companies in 1994. 41% of the company's shares are held by AXA and the BFS Small Companies Dividend Trust, two institutional investors. Distribution losses in 1999/00 were 12.5Ml/day against Ofwat's target of 11.8Ml/day and the company reduced this to 10.0Ml/day in 2003-04, against its target of 10.9Ml/day by 2004/05. DVG has 106,000 domestic and 8,250 commercial customers.

The company diversified into gas supply (North Wales Energy) and pipeline maintenance (DVS Pipelines) along with an alliance with Norweb (United Utilities Plc) for marketing electricity distribution within the Dee Valley franchise area. In 2001, the company sold its energy businesses to Scottish and Southern Energy plc. The pipeline activities not directly connected with Dee Valley's operations were sold in 2002 and Dee Valley now concentrates on water supply services.

Following a GBP32million refinancing in 2003, the B shares have been redeemed.

**Dee Valley Group Plc, profit and loss account**

<b>Y/E 31/03 (GBPmillion)</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
Water turnover	16.47	16.66	16.84	18.32	18.45
Other turnover	1.90	0.00	0.00	0.00	0.00
Group turnover	18.37	16.66	16.84	18.32	18.45
Operating profit	5.41	6.47	6.82	10.19	9.70
Pre-tax profit	3.06	4.33	4.62	4.98	4.27
Earnings/share (p)	79.70	66.50	68.70	74.70	65.40

**Contact Details**

Name: Dee Valley Group Plc  
 Address: Packsaddle, Wrexham Road,  
 Rhostyllen, Wrexham, Clwyd, LL14 4EH, UK  
 Tel: +44 1978 846 946  
 Fax: +44 1978 846 888  
 Web: [www.deevalleygroup.com](http://www.deevalleygroup.com)

Graham R Scott (Chairman)  
 Bryn Bellis (MD)  
 David J Guest (Finance Director)

## SUTTON & EAST SURREY WATER PLC

Sutton & East Surrey Water supplies water to Croydon, Sutton and East Surrey and parts of Kent and Sussex in South East England, with sewerage services being provided by Thames Water Plc. Sutton and East Surrey Water Plc was formed in 1996 through the merger of Sutton District Water Ltd and East Surrey Water Ltd.

The company dates from 1862 when the Caterham Spring Water Company was founded. Caterham merged with Kenley Water Co. to form East Surrey Water in 1885. Sutton & Cheam Water Co was founded in 1863 and was taken over by Sutton District Water in 1871. East Surrey merged with Leatherhead & District Water in 1927, the Chelsham and Warlingham Water Company and the Limpsfield and Oxted Water Company in 1930 and the Dorking Water Co in 1959.

### East Surrey Holding Plc, profit and loss account

Y/E 31/03 (GBPmillion)	2003	2004	2005	2006	2007
Water provision	37.2	38.0	38.6	44.3	45.6
Other activities	9.4	35.1	70.3	1.1	1.1
Group turnover	46.5	73.1	108.9	45.4	46.7
Operating profit	13.0	14.9	21.7	12.2	13.0
Pre-tax profit	15.2	9.2	12.0	6.5	6.88
Population served (000)	642	643	643	645	645
Measured water supplies (000m <sup>3</sup> )	214	249	226	226	175
<b>Total leakage (MI/day)</b>	<b>24.4</b>	<b>24.5</b>	<b>24.3</b>	<b>24.3</b>	<b>24.0</b>

Non-regulated activities include plumbing services, assurance and materials recovered from water treatment operations. Classic Water (mineral water) was sold in 2003 for a profit of GBP2.4million. In 2007 there were 248,000 domestic customers and 16,000 commercial customers, serving 645,000 people. 12,900 domestic properties were connected to water meters between 1998 and 2001, but the take-up since then has been weak. Leakage (including customer leaks) fell from 16.4% in 1998/99 to 15.8%, the third lowest in England & Wales. While Ofwat has stated that their economic level of leakage is 27.2MI/day, in 2006-07, the company reduced it to 24.0MI/day.

In December 2003, the company purchased 75.5% of Phoenix Gas, a company providing gas to 68,500 customers in Northern Ireland for GBP180million. Phoenix generated revenues of GBP58.2million in 2004-05.

In April 2004, Kellen Acquisitions Ltd, a subsidiary of Terra Firma made an offer to acquire the company. This was accepted by the Board in May 2005. While the Office of Fair Trade decided not to refer the Offer, the Northern Ireland Authority for Energy Regulation subsequently decided to impose tariff reductions on Phoenix Gas. Kellen Acquisitions in consequence sought to have the offer declared lapsed in August 2005.

### Contact Details

Name: Sutton and East Surrey Water Plc  
 Address: London Road, Redhill,  
 Surrey, RH1 1LJ, UK  
 Tel: +44 1737 772 000  
 Fax: +44 1737 766 807  
 Web: [www.eastsurreyholdings.com](http://www.eastsurreyholdings.com)

Patrick Barrett (Chairman)  
 Nicholas Fisher (MD)  
 J B Hornby (Finance Director)

## FIRST AQUA (SOUTHERN WATER PLC)

Southern Water provides water services to 2.3million people (938,000 households) in south and south east England. The company provides sewerage services to a further 2.2million people (1.7million domestic and business connections in total) who are served by the following water only companies: Folkestone and Dover Water, Mid Kent Water, South East Water, Portsmouth Water, Bournemouth & West Hampshire Water Cholderton and District Water, (not covered in this book, 1,500 people served) and Sutton and East Surrey Water. Since 1989, the company has reduced distribution losses from 26% to 11%, saving 148 MI/day. Leakage in 2006-07 was 82MI/day against Ofwat's target of 93MI/day. 33% of households were metered in 2007. Despite its changing hands twice over the past six years, the company has been one of the most consistent performers in terms of service delivery.

Southern Water was acquired by ScottishPower in 1996 following a hostile take-over. ScottishPower sold Southern Water to the Royal Bank of Scotland's First Aqua consortium in April 2002 for GBP2,050million, equivalent to Southern Water's regulatory value. As part of this, Veolia Water UK (the UK water arm of VE) was granted an option to acquire 20% of Southern Water and in turn to launch a full bid for the company. After political pressure in the UK prevented VE's bid proceeding, VE consolidated a partial acquisition. First Aqua was acquired by Southern Water Investments in March 2003. In turn, Southern Water Capital (49% held by Royal Bank of Scotland and 51% by institutional investors) holds 75% of Southern Water Investments, with VE holding the other 25%. VE sold its holding to RBS in 2007 and, in October 2007, the company was acquired from RBS for GBP4.195 billion by Australia's Challenger Infrastructure Fund (27%), JP Morgan Asset Management (USA, 32%), UBS (Switzerland, 18%), Hermes (UK, 4%) and a group of seven Australian funds advised by Access Capital (Australia, 18%). The price represents a 27% premium to Southern Water's regulated asset value.

Southern Water Services Limited, profit and loss account

Y/E 31/03 (GBPmillion)	2003	2004	2005	2006	2007
Water turnover	115.6	118.2	120.7	139.6	150.3
Sewerage turnover	315.5	330.1	346.8	394.3	416.5
<b>Total turnover</b>	<b>436.5</b>	<b>455.1</b>	<b>475.0</b>	<b>541.5</b>	<b>575.8</b>
Operating profits	131.2	174.6	184.8	215.1	244.6

In 2003, First Aqua was refinanced based upon a series of AAA wrapped bond issues:

Bonds (million)	Maturity (date)	Rating & coupon
GBP350	2029	AAA 6.202% fixed
GBP188	2034	AAA 3.716% index linked
GBP300	2007	AAA 6.185% fixed
GBP350	2026	A-minus 6.650% fixed
GBP153	2023	A-minus 3.826% index linked
GBP120	2013	A-minus 6.935% fixed to 2009
GBP250	2038	BBB 7.879% fixed to 2014

In April 2005 Southern Water outsourced part of its capital investment programme to '4Delivery Limited', a joint venture vehicle owned by United Utilities (40%), Costain (40%) and Montgomery Watson Harza (20%). Under the contract, 4D is required to manage, design and deliver 270 schemes, which are all stand alone construction projects for the modification or extension of existing water mains, sewers, water supply works and wastewater treatment works during the 2005-10 asset management programme. The total value of the contract is for approximately GBP750m.

### Contact Details

Name: Southern Water  
 Address: Southern House, Yeoman Road,  
 Worthing, BN13 3NX  
 Tel: 0845 278 0845  
 E-mail: [www.southernwater.co.uk](http://www.southernwater.co.uk)

Robert Tian (Chairman)  
 Les Dawson (CEO)  
 Howard Goodbourn (Finance Director)

## GLAS CYMRU (DŴR CYMRU WELSH WATER)

The evolution of Glas Cymru came as a response to extraordinary circumstances. Hyder Plc was the holding company for Dŵr Cymru Welsh Water (DCWW, water and sewerage in Wales), Swalec (electricity and gas distribution in South Wales) and a number of related infrastructure service and investment activities. Despite its name (Hyder means 'confidence' in Welsh), the multi utility strategy came at a high price in terms of gearing, with debt rather than equity being used. As a result, by April 2000, the company expected gearing to rise above the levels stipulated in its debt covenants by the end of 2001. Crucially, there was inadequate investor support for a rights issue at the time.

In April 2000, St David's Capital, a company formed by Nomura International made an agreed bid for Hyder at 260p/share. The bid was designed to take the company private and to securitise its cash flows while ending dividend payments and selling off surplus assets. In June, WPD, a US utility JV, made a hostile 300p/share bid based upon breaking Hyder up and having Dŵr Cymru divested or its services operated by United Utilities. During August 2000 there were revised bids by Nomura at 320p, WPD at 340p and Nomura at 360p. The Stock Exchange ended the process by calling for sealed bids. WPD won with a 365p bid while Nomura retained their previous bid. On September 7<sup>th</sup> 2000 it was announced that WPD had gained a majority of Hyder's shares. The bid was completed on October 25<sup>th</sup> 2000 when the Hyder name was withdrawn in favour of Dŵr Cymru.

Glas Cymru's management developed the concept of a bond financed company in 1999 and made formal offers with the support of Barclays Capital to buy DCWW from Hyder in 1999 and 2000. From the outset, the non-shareholder model was designed to significantly lower DCWW's cost of capital through a single-purpose company designed to produce the highest quality debt rating. Glas Cymru was formally incorporated in April 2000 and became WPD's preferred bidder for DCWW in November 2000. Ofwat cleared the acquisition in January 2001 and the acquisition was finalised in May 2001. Glas Cymru is restricted to running DCWW. DCWW was acquired for GBP1.85billion against a Regulatory Asset Value of GBP2billion, and Glas Cymru has raised GBP1.91billion in debt finance. During the past year, Glas Cymru has concentrated upon developing conditions that would ease the cost of financing DCWW's debt burden. The bond covenants were structured specifically to optimise the debt ratings, by minimising the risk attached to each bond issue.

### Bonds in issue, 2007

Rating	Size (GBPmillion)	Bond Type	Bond Coupon	Maturity (years)
A1	350	Fixed	6.015%	2028
A4	265	Index linked	3.154%	2030
A5	85	Index linked	3.152%	2031
A6	100	Fixed	4.473%	2057
B1	325	Fixed	6.097%	2021
B3	128	Index inked	4.377%	2026
B4	75	Index inked	4.375%	2027
B5	50	Index inked	1.375%	2057
C1	125	Fixed	8.174%	2036

The original bond issue was 70% oversubscribed, which allowed more than GBP50million pa in savings to be generated. Finance leases were subsequently raised to retire the higher coupon debt, which brought the average interest cost down from 7.0% in 2001 to 6.3% in 2005. In 2007, DCWW had long term debts of GBP2,520million, including GBP1,593million in bonds, GBP131million in European Investment Bank loans and GBP762million in finance leases. The original business plan envisaged the Regulatory Capital Value growing from GBP2,201million in 2002 to GBP2,732million by 2005, with net debt growing from GBP2,028million to GBP2,332million, the GBP400million gap between these figures forming the equivalent of shareholders' funds. By 2005, net debt was GBP2,305million and with an RCV of GBP2,843million, meaning that reserves were in fact GBP538million. By 2007, reserves had reached GBP876million, an increase of GBP338million against a five year target of GBP495million during AMP4. The long term plan is to have an implied gearing rate of 70% against 93% in 2001 and 74% in 2007.

Customer rebates worth GBP10/household were made in 2003 and 2004. A GBP18/customer rebate was made in 2006, along with a GBP20 rebate in 2007, meaning that DCWW's bills will be 12% above the average for the sector by 2010 against 21% above average in 2001. In total these rebates have cost GBP99million. Discretionary spending of GBP50million on environmental and service quality enhancements during AMP3 will be increased to GBP90million during AMP4.

The Asset Management Alliance has been formed to take forward the outsourcing of AMP4, building upon the experience of the AMP3 outsourcing programme. The contract partners are:

**Contract**

Water network & process works  
Wastewater north  
Wastewater south west  
Wastewater south east

**Lead partner (secondary partners)**

United Utilities (Black & Veatch & Laing O'Rourke)  
United Utilities (Costain/Imtech Process)  
Kelda (Imtech Process/Morrison Construction)  
Kelda (Amec/Imtech Process)

**Other partners**

Chandlers KBS  
Capgemini  
EC Harris  
Hyder Consulting  
Logica CMG  
Tata Consulting  
Thames Water  
Severn Trent Laboratories

**Dŵr Cymru Cyfyngedig, profit and loss account**

Y/E 31/03 (GBPmillion)	2003	2004	2005	2006	2007
Turnover	462.9	469.7	494.1	553.5	578.0
Operating profit	192.0	185.7	212.6	194.8	153.3
Pre-tax profit	68.2	43.9	75.2	11.3	47.5
Post-tax profit	60.8	45.6	85.2	16.1	33.3

Dŵr Cymru has performed well in terms of improving its environmental performance, service delivery and relationships with its customers and stakeholders. Between 2001 and 2005, the equivalent of 2.56million people were connected to sewage treatment works. The Green Sea/Môr Glas initiative involved allying the company's GBP650million coastal sewerage programme from 1995 to 2000 with GBP40million of targeted spending to ensure that all 71 designated bathing areas reach the EU guideline standard by 2000. In 2004, all 78 designated bathing areas met the mandatory standard and 86% reached the guideline level. One bEach failed out of 80 in 2006, with 89% reaching guideline standards. In 2003, 98% of rivers were of good/fair quality, compared with 90% in 1990. Distribution losses have been reduced from 410MI/day in 1996/97 to 209MI/day in 2006/07, against Ofwat's target of 225MI/day. The 2010 target is 195MI/day. Overall water abstraction has been reduced by 25% since 1997.

Between November 2005 and January 2006, an outbreak of cryptosporidiosis in north Wales affected 231 people, making it the largest such water borne outbreak in Wales and the largest in the UK since 1989. As a result, 70,000 people were issued with a 'boil order' (only to drink boiled or bottled water) until the cryptosporidium could be eliminated from the system. Three quarters of those affected were supplied by the Llyn Cwellyn reservoir, although there were no elevated levels of cryptosporidium in the lake system. DCWW fitted a UV disinfection plant for the water treatment work fed by the lake and made a GBP25 ex gratia payment to each customer affected. Although no evidence was found that DCWW had failed to perform to expected standards, in June 2007 the Drinking Water Inspectorate announced that it would be prosecuting the company for 'supplying water unfit'.

**Contact Details**

Name: Glas Cymru Cyfyngedig (Dŵr Cymru Welsh Water)  
Address: Pentwyn Road, Nelson, Treharris,  
Mid Glamorgan CF46 6LY, Wales  
Tel: +44 1443 452 359  
Fax: +44 1443 452 809  
Web: www.glascymru.com  
Web: www.dwrcymru.com

Lord Terry Burns (Chairman)  
Nigel Annett (MD)  
Chris Jones (Finance Director)

NOTE: The author is a Member of Glas Cymru Cyfyngedig.

**KELDA GROUP PLC (YORKSHIRE WATER PLC)**

Yorkshire Water Plc (YW) was renamed Kelda Group Plc in August 1999. An aggressive approach towards resources management was unravelled by the 'once in every 500 years' drought conditions seen in 1995. In consequence, GBP300million was spent between 1996 and 1999 on developing a water grid. Distribution losses fell by more than 40% between 1995 and 2001 and were at Ofwat's target of 295 MI/day in 2003-04. Yorkshire Water has been unaffected by the water shortages during the summers of 2005 and 2006, with reservoirs at 93% of capacity. In 2006, Kelda was identified by Ofwat as the most efficient of the water and sewerage companies.

**Kelda Group, profit and loss account**

Y/E 31/03 (GBPmillion)	2003	2004	2005	2006	2007
<b>Turnover</b>					
Yorkshire Water	567.0	604.4	640.1	693.8	741.1
UK water services	16.9	30.7	59.3	78.5	85.1
Aquarion	93.7	94.1	92.2	104.2	99.4
<b>Operating profit</b>					
Yorkshire Water	233.7	252.5	284.6	312.7	332.7
UK water services	2.4	2.0	6.4	3.8	5.6
Aquarion	34.9	31.6	30.3	32.8	41.6
Group Turnover	838.1	822.6	806.2	825.4	878.9
Operating profit	277.1	292.2	310.2	315.4	338.2
Net interest	-108.9	-100.6	-98.2	-91.1	-97.0
Exceptional items	-10.9	14.6	-11.7	0.0	0.0
Pre-tax profit	164.3	191.6	212.0	174.1	151.3
Earnings/Share (p)	32.7	47.1	53.2	42.8	48.1
Dividends/Share (p)	26.1	26.8	29.0	30.4	32.3

**Kelda Group, number of people served in the UK and internationally**

	Water	Sewerage	Total
Yorkshire Water Services	4,451,000	4,843,000	4,843,000
York Waterworks	174,000	0	*174,000
Scotland – PFI	0	450,000	450,000
Northern Ireland	700,000	0	700,000
<b>Total</b>	<b>5,325,000</b>	<b>5,293,000</b>	<b>5,993,000</b>

\* Included in Yorkshire Water Services sewerage coverage

**UK – Acquisition of York Waterworks Plc**

York Waterworks was the smallest of the listed former SWCs when it was acquired for GBP27.9million in March 1999 and was cleared in June 1999. The acquisition involves existing customers of York Waterworks receiving extra price cuts of 15% by 2004, as well as enhanced metering and leak reduction services. York Gas was sold in 1999. York Waterworks generated a 1999/00 turnover of GBP9.6million. The company was subsumed within Yorkshire Water Services in 2000.

**UK – PFI in Scotland**

2000	Aberdeen	25 year PFI BOT	450,000, sewage treatment
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In May 2000, Aberdeen Environmental Services Ltd., a Kelda-led consortium (45% Kelda Group, the rest held by Balfour Beatty and Tyco's Earth Tech) gained the contract with the North of Scotland Water Authority for an GBP80million PFI sewage treatment works project serving Aberdeen, Stonehaven, Peterhead and Fraserburgh. Kelda's Grampian Waste Water Services Ltd is operating the facility until 2031 and generated revenues of GBP10.7million in 2004-05.

**UK – Project Aquatrine**

2003	UK MoD	25 year PFI	Water & wastewater services
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Brey Utilities, consisting of Kelda (45%), Earth Tech (Tyco International, 45%) and Kellogg Brown & Root (USA, 10%) gained Package A of Project Aquatrine, serving 1,100 military sites in South West England, the Midlands and Wales. The contract is worth GBP1billion, 80% of which is being operated by Yorkshire Water Projects. The project started in December 2003 and generated revenues of GBP32.0million in 2004-05.

**UK – Project Alpha**

2005	Northern Ireland	25 year PFI	Water treatment
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Dalriada Water Limited (Earth Tech, Kelda Water Services, and Farrans) is the preferred bidder for the water treatment Public Private Partnership with The Water Service in Northern Ireland. The GBP110million 25 year contract involves designing, building and upgrading four water treatment works responsible for 400MI/day or some 50% of Northern Ireland's drinking water.

**UK – Glas Cymru**

In January 2005, Kelda gained a 15 year contract to provide waste water operations and maintenance services to Dwr Cymru Welsh Water, with anticipated annual turnover around GBP50million. The contract involves the operation of 570 waste water treatment plants and over 13,000km of sewer network. KWS (Wales) a 100% subsidiary of KWS, began operations on 1 April 2005.

**USA-Acquisition and divestiture of Aquarion**

In June 1999, Kelda launched an USD444million agreed bid for Aquarion, a US water provision company. The acquisition was completed in January 2000. In February 2006, Kelda announced that it was selling Aquarion to Macquarie for USD625million with USD135million of assumed debt. Because of regulatory issues, in February 2007 Kelda agreed to sell the New York activities to United Water (see Suez company entry), which obtained regulatory clearance in April 2007. The sale of the rest of Aquarion's regulated activities was completed in May 2007 and in June 2007 Aquarion's contract operating services were sold to Suez (see Macquarie and Suez company entries).

**Contact Details**

Name: Kelda Group Plc  
Address: Western House, Halifax Road,  
Bradford, Yorkshire BD6 2SZ  
Tel: Tel: +44 1274 600 111  
Web: [www.keldagroup.com](http://www.keldagroup.com)  
Web: [www.yorkshirewater.com](http://www.yorkshirewater.com)

John Napier (Chairman)  
Kevin Whiteman (CEO)  
Martin Towers (Finance Director)

## NATURE TECHNOLOGY SOLUTIONS

Nature Technology Solutions (NTS) was floated on the UK AIM market as Owl Technologies in September 2001, and changed its name to Nature Technology Solutions in August 2002. The company operates a marine wastewater treatment plant in Gibraltar for oil, industrial and municipal wastewater under a 20 year agreement with the Government running to 2019. In June 2002, Owl Technologies acquired Nature Technology Solutions AS of Norway for GBP2.4million.

### Nature Technology Solutions, profit and loss account

YE 31/12 (GBP000)	2002 *	2003	2004	2005	2006
Turnover	336.50	555.10	1,110.00	933.80	1,191.20
Operating profit	-351.70	225.20	606.60	501.70	533.60
Pre tax profit	-1,296.70	-556.20	-31.70	-111.10	-104.40
Net profit	-1,296.70	-556.20	-44.10	-112.60	-73.30
Earnings/share (p)	-0.009	-0.002	-0.000	-0.000	-0.000

\* 17 month period

NTS's SAR Treatment AS has a wastewater storage and treatment facility at NorSea Base in Stavanger, Norway. From the unloading station, water is transferred to one of the NTS storage tanks. The total storage capacity available at the site is 2,300m<sup>3</sup>, with a treatment capacity of 10m<sup>3</sup>/hr. During 2007, the company seeks to offer offshore treatment units for oil rigs.

The Gibraltar facility handles hydrocarbon and other liquid wastes at 20m<sup>3</sup>/hr with 900m<sup>3</sup> in storage capacity available. A 2,500m<sup>3</sup> storage facility at the colony's Ministry of Defence base entered service at the end of 2004. The facility was expanded and upgraded during 2006 along with a 20 year operating agreement with the Government.

### Contact Details

Name: Nature Technology Solutions  
 Address: Ordnance House, 31 Pier Road,  
 St Helier, JE4 8PW Jersey, UK  
 Tel: +44 1841 521 087  
 Web: [www.naturetechsolution.com](http://www.naturetechsolution.com)

Richard Eldridge (Chairman)  
 John McJeown (CEO)  
 Barry Ridley (Director)  
 Stig O Keller (Technical Director)

## NORTHUMBRIAN WATER PLC

Northumbrian Water Plc was acquired by Suez in 1996. It was subsequently transformed into the holding company for all of Suez's water activities in Britain, along with being the base for their Anglophone markets. In 2001, Northumbrian Water Group was renamed Ondeo Services UK. The regulated water and sewerage activities of OSUK consist of the 1996 merger of Northumbrian Water Services Limited and North East Water Limited and the consolidation of Essex and Suffolk Water Limited. In May 2003, Suez reduced its stake to 25% through a buyout to a consortium set up by Ecofin Limited. The company was renamed Northumbrian Water Plc, floated on the AIM and returned to a full London Stock Exchange Listing in September that year. Suez sold its remaining stake in 2005.

In May 2004, Northumbrian Water arranged a GBP212million refinancing based on the securitisation of its Kielder Water cash flows through a 30 year bond. The Kielder contract with the Environment Agency generated revenues of GBP12.3million and an operating profit of GBP12.1million in 2006-07.

### Northumbrian Water, profit and loss account

31/03 (GBPmillion)	2004	2005	2006	2007
Northumbrian Water Limited	386.2	508.2	555.5	586.5
International	17.1	23.1	28.4	37.0
<b>Group turnover</b>	<b>442.1</b>	<b>578.6</b>	<b>591.5</b>	<b>633.5</b>
Northumbrian Water Limited	133.4	210.8	234.6	242.6
International	2.1	2.3	1.8	11.9
<b>Group operating profit</b>	<b>143.6</b>	<b>204.6</b>	<b>236.2</b>	<b>258.2</b>
Group pre-tax profit	45.5	108.8	130.3	147.8
Net profit	59.4	98.4	91.0	111.2
Earnings/share (p)	11.5	18.1	17.5	25.0

### Northumbrian Water Services Limited

The merger of Northumbrian Water Limited (NWL) with North East Water (acquired by Suez in 1989) allowed for immediate economies of scale. The only water entity in the region not held by NWG is Hartlepool Water (92,000 people), which was acquired by AWG in 1997. Essex & Suffolk Water (acquired by Suez in 1988) was merged with Northumbrian during 2000 and now operates under a single licence via two divisions, NWL North serving 1.21million customers (2.6million people) in the Northumbrian Water area and NWL South serving 760,000 customers (1.7million people) in the Essex & Suffolk Water area. NWL is now the sixth largest water and sewerage company in England and Wales.

Resources at Essex & Suffolk are being boosted through a series of water reuse projects at the Langton water treatment works using water from the Brookend WWTW operated by AWG. Metering in Essex has increased from 0% in 1990 to 34% by 2006.

Population served	Water	Sewerage	Total
Northumbrian Water	1,328,000	2,547,000	<b>2,547,000</b>
North East Water	1,195,000	0	<b>1,195,000</b>
Essex & Suffolk Water	1,662,000	0	<b>1,662,000</b>
<b>Total</b>	<b>4,185,000</b>	<b>2,547,000</b>	<b>5,406,000</b>

The company's GBP200million Regional Sludge Treatment Centre at Bran Sands was completed in 2002 and is designed both to treat effluents from 500,000 people and to offer effluent treatment services to major industrial customers. These include Corus Plc, Shell Plc, and Huntsman & Vopak who signed contracts in 2003-04 and a 25 year contract with Degussa in 2004-05. Phillips Petroleum signed a 15 year water treatment contract in 2000. In 1999, NWL signed a contract for water provision to all of the Scottish Courage breweries in the UK.

### Northumbrian Water International (NWI)

Suez developed NWG's international activities so that they address Suez's potential English speaking markets. The Australian activities have been kept by Suez.

Population served	Water	Sewerage	Total
Northumbrian Water	4,185,000	2,547,000	5,406,000
Scotland	0	890,000	890,000
Ireland	0	220,000	220,000
Gibraltar	26,000	0	26,000
<b>Total – UK</b>	<b>4,185,000</b>	<b>3,437,000</b>	<b>6,296,000</b>
<b>Total – International</b>	<b>26,000</b>	<b>220,000</b>	<b>246,000</b>
<b>Total</b>	<b>4,211,000</b>	<b>3,657,000</b>	<b>6,542,000</b>

### Gibraltar

This is a water service provision contract in a JV with the Government, along with a management contract for sewage pumping and utility billing and meter reading services. 26,000 people are served. The 30 year contract was awarded in 1991. NW holds 67% of AquaGib Limited, which generated a turnover of GBP7.8million in 2002. Due to limited water resources, particular emphasis has been placed on leakage management and total losses are currently 8%.

### Scotland

1999	Levenmouth	40 year PFI BOT	440,000 sewage treatment
1999	Ayr	30 year PFI BOT	450,000 sewage treatment

The two contracts were awarded to a consortium consisting of Northumbrian Water, Degrémont and AMEC, in the case of Ayrshire, and Northumbrian Water and Degrémont in the case of Levenmouth. Each contract involves GBP50million in capital spending. NWG holds 75% of Caledonian Environmental Services' (Levenmouth) equity and 50% of Ayr Environmental Services' equity. These contracts are being used to form the basis of PFI type contract marketing in Ireland.

### Ireland

2002	Cork	22 year BOT	220,000 wastewater treatment
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The EUR70million contract is part of a EUR270million drainage and effluent treatment scheme for the city, which was completed in September 2004. The STW has a 270,000m<sup>3</sup> capacity with a PE of 440,000, half being for industrial clients.

### Contact Details

Name: Northumbrian Water Plc  
Address: Northumbria House, Abbey Road,  
Durham, DH1 5FJ, UK.  
Tel: +44 (0)870 608 4820  
Fax: +44 191 301 6202  
Web: [www.nwg.co.uk](http://www.nwg.co.uk)

Sir Derek Wanless (Chairman)  
John Cuthbert (MD)  
Christopher Green (Finance Director)

**PENNON GROUP PLC (SOUTH WEST WATER PLC)**

In 1998, South West Water Plc was renamed Pennon Group Plc. Pennon is based on the Old English for a long flag or pennant. The regulated activities are still called South West Water Limited, while Haul Waste, the waste management arm operates under Viridor Ltd (the Latin 'to make green').

South West Water Services Limited remains firmly fixed between the rock of occupying some of the poorest regions of Britain and the hard place of the demands placed on its sewerage infrastructure by its large number of designated bathing areas within its territory. South West Water supplies water and sewerage services to 0.76million domestic and commercial customers, including 1.65million people in the south west peninsula of England. This figure is boosted by up to 500,000 tourists every year given the region's popularity as a holiday destination. Over the past 10 years, the company has moved away from primary treatment and long sea outfalls, to secondary and more advanced sewage effluent treatment. 30 schemes currently include ultraviolet disinfection of effluents before discharge. 141 out of 143 designated bathing waters met the EU's mandatory standard in 2004, rising to 143 out of 144 in 2005 and all 144 in 2006. In 2004, 116 out of 143 beaches reached the guideline standard rising to 132 out of 144 in 2006.

The area's rural nature is reflected by 3% of the population still obtaining their water from private springs and 12% using septic tanks.

**Pennon Group, profit and loss account**

Y/E 31/03 (GBPmillion)	2003	2004	2005	2006	2007
Water-Turnover	270.2	291.8	309.8	348.5	381.5
Water-Operating profit	111.5	118.9	121.7	127.0	156.8
Water-Pre-tax profit	67.1	70.1	67.1	87.4	98.9
Group turnover	417.2	471.3	54.2	645.7	748.3
Operating profit	127.0	129.8	151.5	175.1	200.0
Group pre-tax profit	74.2	72.3	87.4	110.9	131.1
Post-tax profit	57.1	61.5	68.8	75.9	93.9
Earnings/share (p)	14.7	16.5	18.2	9.8	26.3

**Contact Details**

Name: Pennon Group Plc  
Address: Peninsula House, Rydon Lane,  
Exeter, EX2 7HR UK  
Tel: +44 1392 446 688  
Fax: +44 1392 434 966  
Email: [www.pennon-group.co.uk](http://www.pennon-group.co.uk)

Ken Harvey (Chairman)  
David Dupont (Finance Director)  
Chris Loughlin (CEO, South West Water Ltd.)  
Colin Drummond (CEO, Viridor Ltd.)

## SEVERN TRENT PLC

Severn Trent Water supplies water and sewerage services to 8million people via 3.7million connections in the catchment areas of the rivers Severn and Trent. This includes Birmingham, Britain's second largest city, the English Midlands and a part of central Wales. Severn Trent is the third largest of the UK Water Plcs and was formed from the merger of 234 local entities in 1973. In the UK, the company sought to bid for South West Water Plc (Pennon) after Wessex Water launched a hostile bid in 1996. This bid was blocked by the MMC and since then, Severn Trent has concentrated on investigating potential inset appointments and PFI contracts in the UK. The company has a good reputation for water resource management and a pro-active approach to regulatory and environmental developments. Work on water leakage (a decrease of 30% from 1989 to 2002) and changes in industrial usage have seen the average annual water demand fall by 15% since 1995. The company has faced a number of challenges, including reporting issues between 2001 and 2004, leakage being above the 2006-07 target level and the impact of the flooding in July 2007, when water supplies were lost to 340,000 people for up to 14 days after the Mythe WTW was inundated. The 2007 floods will cost the company GBP25-35million of which GBP10-20million may be recoverable through insurance. Spending on leakage increased from GBP72.4million in 2005-06 to GBP91.9million in 2006-07.

In 2006-07, Biffa (waste management) was demerged and the US Laboratories business was sold, along with Severn Trent's stake in Aquafin and Severn Trent's property interests.

Industrial water contracts are being actively sought and Severn Trent has gained national accounts for Northern Foods (Bowyers) and Centre Parcs, generating a total turnover of GBP3.5million pa. Contracts gained in 2002-03 include Rank Hovis McDougalls, Dairy Crest and Northampton General Hospital, along with Britvic in 2006.

### Severn Trent, profit and loss account

Y/E 31/03 (GBPmillion)	2003	2004	2005	2006	2007
Severn Trent Water	917.9	956.7	1,015.1	1,150.9	1,218.1
Water Technologies & Services	N/A	N/A	N/A	277.0	288.9
Group Turnover	1,852.0	2,015.1	2,081.2	1,455.3	1,480.2
Severn Trent Water	N/A	N/A	N/A	395.6	434.3
Water Technologies & Services	N/A	N/A	N/A	17.1	34.4
Group operating profit	343.8	399.2	393.7	377.3	405.3
Pre-tax profit	184.4	254.4	217.3	177.8	325.5
Earnings/Share (p)	28.9	53.5	40.3	52.9	106.1
Dividends/share (p)	45.9	47.0	48.5	51.1	61.5

UK Laboratories had external revenues of GBP32.0million in 2006-07 and operating profits of GBP5.1million. Water Purification and Operating Services had revenues of GBP267.8million and operating profits of GBP12.0million, along with JV profits of GBP1.2million. Following the sale of the US Labs business, the full split out of Severn Trent's non-regulated water businesses (Water Technologies and Services) has been discontinued.

### Water Technologies and Services (WTS)

Severn Trent's non-regulated water activities have been grouped under the WTS banner. In the USA this covers their operating services (North American Operating Services), with an international arm serving customers in the same sectors in the UK and Europe. In 2000, WTS acquired Hyder Laboratories Ltd., to extend its testing activities into Wales.

Severn Trent Environmental Services' (STES) and Severn Trent Operating Services' (STOS) stated policy is to avoid BOT and construction type contracts and to concentrate on asset and services management, along with a number of investments in major projects. It is one of the lower key players in the international market, but with a good track record and steadily improving profitability. Severn Trent has one of the world's largest water and wastewater consulting operations, in recent years has carried out consulting work in 48 countries and is currently active in the USA, Belgium, Azerbaijan, Russia, the Ukraine, and South Africa.

### UK – Project Aquatrine

2005	UK MoD	25 year PFI	Water & wastewater services
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Coast to Coast Water (C2C), consisting of Severn Trent Services (50%) and Costain (50%) gained Package C of Project Aquatrine, serving 1,500 military sites in South East, East and North England. The contract is worth GBP1billion and started in April 2005.

Italy and the USA are regarded as the main markets for growth in the short to medium term. In 2001-02, the company had 600 water and wastewater contracts in the USA, with a 77% contract retention rate, against 80% in 2000-01. Indaqua, the Portuguese activities, were sold to Mota-Engil (Portugal) for a GBP4.3million profit in 2005. SVT's 20% stake in Belgium's Aquafin acquired in 1991 was sold back to the Flemish Government for in 2006 for GBP29.3million, a GBP14.7million profit.

#### Severn Trent, number of people served in the UK and internationally

Country	Water	Sewage	Total
England & Wales	7,250,000	8,280,000	8,280,000
Germany	0	45,000	45,000
Italy	350,000	350,000	350,000
USA	500,000	2,000,000	2,500,000
<b>Total-home market</b>	<b>7,250,000</b>	<b>8,280,000</b>	<b>8,280,000</b>
<b>Total-international</b>	<b>850,000</b>	<b>2,395,000</b>	<b>2,895,000</b>
<b>Grand total</b>	<b>8,100,000</b>	<b>10,675,000</b>	<b>11,175,000</b>

#### Germany

1993	Nohra	15 year O&M	45,000 sewage
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Severn Trent Wasser and Abwasser GmbH (STREWA) have a strategic stake in BFG Nohra. The sewage treatment works also handles wastes from a nearby abattoir, which adds considerably to its treatment load. With seven years of the contract to run, STREWA believes that the contract can be extended at the re-bidding stage.

#### Italy

In February 2000, Severn Trent Italia (SVTI) acquired Ecotechnica SRL as part of a strategy of bidding for water and wastewater privatisation opportunities in northern Italy. Ecotechnica is based in Milan and was purchased from Group Maffei. The company operates wastewater facilities in the Brescia region. It has a turnover of GBP8.5million pa, bringing SVTI's Italian turnover to GBP20million. Previous acquisitions were Baden Italia SPA in Lombardy (water treatment plants, April 1999), La Biodepuratrice in Bergamo (wastewater plants and operations, 1999) and Baltea Impianti Depurazione SRL (Valle d'Aosta, October 1998). These companies are active in water engineering in the region. SVTI serves 600,000 people in Italy.

2002	Terni	30 year concession	250,000 water & wastewater
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The Umbrian ATO concession award will generate revenues of EUR19.5million, linked with a EUR192million capex programme. SVTI holds 25% of the operating consortium, which gained the concession in February 2002.

#### USA

North American Operating Services believes that is it the third largest contract operations player in the US market for management services for municipal and industrial water and wastewater systems, with 425 contracts covering 450 water and wastewater treatment facilities in 20 states. Severn Trent started through the 1994 acquisition of AM-TEX, a company founded in 1974. In 1997, Severn Trent acquired MHPC, New York State's largest contract operator for water and wastewater facilities, with 75 communities served, and Texas' MTS, serving 26 municipal utility districts in Houston.

City/state	Contract started	Comments
Jackson, Mississippi	1985	3 WWTWs, 125 MGD
Glen Cove, New York	1996	20 Year O&M, WWTW
Chickasha, Oklahoma	1982	WWTW
Pasadena, Texas	1994	3 WWTWs

In 2006, a USD72million contract with the Florida Governmental Utility Authority was renewed for five years, to operate and maintain four water and wastewater systems for five years, with an additional five year extension option.

#### Industrial clients in the USA include:

General Motors (Automotive manufacture)  
 General Electric (Jet engine inspection, repair and maintenance)  
 The Minute Maid Company (Juice and beverage production)  
 C&H Sugar Company (Sugar refinery)  
 The Pillsbury Company (Refrigerated baked goods)

Precision Extrusions, Inc. (Aluminium extrusions, secondary machining, fabrication and assembly)  
Wawa Dairies (Milk products)  
Gulf State Cannery (Canning)  
IBM (Computer/electronic equipment)

**Contact Details**

Name: Severn Trent Plc  
Address: 2297 Coventry Road,  
Birmingham, B26 3PU, UK  
Tel: +44 121 722 4000  
Fax: +44 121 722 6150  
Web: [www.severntrent.com](http://www.severntrent.com)  
Web: [www.stwater.co.uk](http://www.stwater.co.uk)  
Web: [www.stwaterinternational.com](http://www.stwaterinternational.com)

Sir John Egan (Chairman)  
Colin Matthews (Chief Executive)  
Michael McKeon (Finance Director)  
Tony Wray (MD, Severn Trent Water)

## SOUTH DOWNS LTD/PORTSMOUTH WATER

South Downs Ltd owns Portsmouth Water Plc. Portsmouth Water supplies water to 652,000 people via 280,000 domestic and 15,000 business connections in Portsmouth and parts of the Hampshire and West Sussex coast, with sewerage services being provided by Southern Water (First Aqua). Portsmouth Water started operations 1857, building upon supply entities dating back to an Act of Parliament in 1740. The company merged with the Gosport Water Company in 1955 and acquired further entities serving Bognor Regis and Chichester in 1963. The number of households in the service area is expected to rise to 340,000 by 2030.

### Portsmouth Water Plc, profit and loss account

Y/E 31/03 (GBPmillion)	2003	2004	2005	2006	2007
Turnover	29.55	30.70	31.27	32.13	32.82
Operating profit	10.08	10.14	10.42	7.05	8.62
Pre-tax profit	9.53	7.84	8.74	7.58	10.50
Net profit	6.91	5.56	6.04	4.87	7.97

A bulk supply contract with Southern Water came into effect in 2003-04. This contract provides Southern Water with up to 15million L/day of water during periods of prolonged drought. A GBP1million lead reduction programme is upgrading four extant treatment plants, installing seven new treatment plants and dosing water to minimise its plumbsolvency. Full compliance with the proposed 10mg/L standard for lead in drinking water was attained in 2003. Leakage has fallen by 40% between 1990 and 2005 to 29.9MI/day and further to 29.2MI/day in 2006-07.

Until December 2001, Portsmouth Water Plc was owned by Brockhampton Holdings Plc a listed company founded in 1989. In October 2001, a GBP71million management buyout by South Downs Ltd was announced. At the outset, South Downs Ltd was 15% held by Brockhampton Holdings' management, 40% by the South Downs Employee Benefit Trust and 40% by Drummond Capital, part of the Royal Bank of Scotland Group (RBS). In March 2002, RBS sold 31% of the company to Abbey National Treasury Services Plc. In February 2005, Abbey National Treasury Services Plc sold 36% of South Downs to the Secondary Market Infrastructure Fund UK LP. A GBP66million AAA rated bond issue was completed in June 2002, reducing the cost of financing to 3.635%. The company's average household charge of GBP80 in 2006-07 is the lowest in England & Wales.

### Contact Details

Name: Portsmouth Water Ltd,  
 Address: P.O. Box 8, West Street, Havant,  
 Hampshire, PO9 1LG  
 Tel: +44 23 9249 9888  
 Fax: +44 23 9245 3632  
 Web: www.portsmouthwater.co.uk

Terrence Lazenby (Chairman)  
 Nicholas John Roadnight (MD)  
 Neville Smith (Finance Director)

## SOUTH STAFFORDSHIRE PLC

South Staffordshire provides water to the English West Midlands, including Walsall and West Bromwich. Sewerage services are provided by Severn Trent Plc. South Staffordshire Water Plc was founded in 1853, but only floated in 1991, making the company a late entrant to the stock market when compared with many of its peers. In April 2004, South Staffordshire Group was split into South Staffordshire Plc (regulated and non-regulated water activities) and Homeserve Plc (other non-regulated activities). In November 2004, the company was acquired by Arcapita Bank of Bahrain for GBP143million and was subsequently delisted.

### South Staffordshire Plc, profit and loss account

Y/E 31/03 (GBPmillion)	2003	2004	2005	2006	2007
Water provision	58.84	60.43	61.81	69.56	72.80
Non-regulated activities	26.59	24.69	27.98	2.75	3.94
(Inter-segment turnover)	-12.09	-12.29	-11.88	0.00	0.00
Group turnover	73.34	72.83	77.91	72.31	76.74
Operating profit	21.40	20.86	19.47	18.95	19.53
Pre-tax profit	16.78	14.52	12.99	13.49	13.05
Earnings/share (p)	97.5	83.1	91.2	518.1	470.7

Non-regulated activities include: Integrated Water Services was formed after the acquisition of OnSite from Homeserve in November 2004. OnSite provides water and wastewater services to utilities and industrial clients. These include United Utilities, Thames Water, Scottish Water and Wessex Water (YTL). In December 2000, OnSite gained a GBP20million four year contract to provide wastewater network services for half of Thames Water's sewerage network. Echo's RAPID customer management software is a market leader in the UK, where it is used for 2.4million customer accounts by Wessex Water, South West Water (Pennon Group), Bristol Water and for 100,000 industrial accounts for Hartlepool Water and Scottish Water. 90% of Echo's revenues are from UK water companies. Aqua Direct produces spring water for various retailers.

The company supplies 510,000 customers (1,233,000 people), with 56,500 being connected to metered supplies, along with 38,000 commercial customers. The company's average 2006-07 bill of GBP113/household is the second lowest in the UK private sector and the company has a policy of exceeding service and infrastructure targets set by Ofwat.

### Contact Details

Name: South Staffordshire Plc  
 Address: Green Lane, Walsall,  
 West Midlands, WS2 7PD, UK  
 Tel: +44 1922 638 282  
 Fax: +44 1992 723 631  
 Web: [www.south-staffordshire.com](http://www.south-staffordshire.com)  
 Web: [www.south-staffs-water.co.uk](http://www.south-staffs-water.co.uk)

David Sankey (Chairman)  
 Dr Jack Carnell (Managing Director, regulated activities)  
 Adrian Page (Group Finance Director)

# **PART 3(iii):COMPANY ANALYSIS: NEW ENTRIES (REST OF THE WORLD)**

**AUSTRALIA****MACQUARIE**

Macquarie was founded in 1969 as the Australian arm of Hill Samuel, a sometime British merchant bank, and was floated in 1996. At the start of 2007, Macquarie had GBP28billion invested in infrastructure assets. Macquarie sought to acquire Northumbrian Water in May 2003, but has since acquired South East Water from SAUR, Thames Water from RWE and Aquarion from Kelda. As a prelude to the Thames Water acquisition, South East Water was sold to Westpac (see company entry) in October 2006.

Macquarie led Kemble Water Limited, the winning bidding team for the bid to acquire Thames Water, in October 2006. The village of Kemble in the Cotswolds is adjacent to the source of the River Thames. The deal was completed in December 2006 with an enterprise value of GBP8.0billion. Macquarie paid GBP250million for a 11% stake in Thames Water, which is held by the Macquarie European Infrastructure Fund II (MEIF II), which has confirmed commitments of USD6.3bn (EUR4.6bn). MEIF II will invest in a diversified portfolio of 8 to 15 infrastructure assets located across the European Union.

**United Kingdom****Thames Water Plc**

Thames Water provides water supply to 8million people and sewerage services to 13million people in England, making it the leading UK water company. Thames Water's regulated activities are in the south-east and centre of England, including London. The company's origins lie in the New River Company, which was permitted by an act of Parliament in 1606 and incorporated in 1619. In 1822, the New River Company acquired the London Bridge Water Works Company, which was founded in 1582. The New River Company was eventually nationalised by the Metropolitan Water Board in 1902, when at the time, it served 1.25million people. The modern Thames Water was formed by a merger in public ownership in 1974, and floated in 1989.

Thames Water has a reputation for carrying out major water construction projects at home (notably the London Ring Main) and abroad ahead of time and budget. In contrast, there has been a tendency for the company to be seen as reactive over issues such as water resources and mobilising rising groundwater levels in central London. High distribution losses stemming from the age of some of its distribution infrastructure have not helped in this process, and this continues to be an area of concern for the regulator. After failing to reach its agreed leakage reduction targets for three years, in July 2006 Thames Water agreed with Ofwat on a binding undertaking for GBP150million in extra spending on leakage prevention between 2006 and 2009 on top of the GBP1,000million budgeted for 2005-10. As the investment will not be included in the company's RCV, Thames Water will not get a direct return from this investment. Thames Water needs to reduce its losses from 894MI/day in 2006 to 720MI/day by 2010 against the original target of 725MI/day. In 2006-07, 500 miles of water mains were replaced and losses reduced to 790MI/day against Ofwat's 2006-07 target of 810MI/day.

**RWE Thames Water**

Y/E 31/03 (EURmillion)	2005	2006
Revenue	2,332	2,278
Pre-tax profit	541	472
Post-tax profit	415	330

Thames Water Services was sold to Veolia Water UK for EUR115million (GBP78million) in August 2007. UK revenues of EUR160million (GBP109million) are anticipated for 2008. The company has two principal contracts in Wales and Scotland.

**Thames Water Ltd., regulated activities in England**

Y/E 31/03 (GBPmillion)	2003	2004	2005	2006	2007
Appointed business	1,073.7	1,105.2	1,142.2	1,351.3	1,385.8
Non-appointed business	36.6	36.1	35.5	41.7	45.2
<b>Total turnover</b>	<b>1,110.3</b>	<b>1,141.3</b>	<b>1,177.7</b>	<b>1,393.0</b>	<b>1,431.0</b>
Operating profit	279.6	378.0	389.1	479.2	439.1
Pre-tax profit	200.9	251.1	263.7	346.5	270.1

**Thames Water International**

It is understood that all international activities excepting the Izmit and Jakarta contracts have been sold to third parties and Thames Water is seeking to sell these contracts in due course.

**Turkey**

1995	Izmit	15 year BOT	1.2million bulk water
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The GBP571million Turkish bulk water construction, management and pumping contract for Izmit and Istanbul has been a challenging one, because of political and economic perturbations. Construction was completed in November 1998, ahead of schedule and budget, with a 15 year operational concession running to 2014, providing 142million m<sup>3</sup> pa of water, including 20million m<sup>3</sup> pa for Istanbul. Thames Water International (TWI) has a 35% holding in Izmit Su As, the operational company, with the rest being held by Turkey's Guris Insaat (12%) and Gama Endustri (23%) as well as Mitsui (7.5%), Sumitomo (7.5%) and the Izmit Municipality itself (15%). 15% of the finance is through equity and 85% from debt. The project serves 400,000 in Izmit, with the rest in surrounding areas. The operational contract is generating USD6million/month in revenues. TWI's stake in Izmit Su As was increased to 47% through the purchase of an 11.9% stake in August 1999 for GBP13.1million, including GBP1.1million in goodwill. The project continues to meet 100% of the contractual water quality targets since commercial operation. In 2005, the facility was delivering water at 82% of capacity to its sole customer, the Izmit municipality.

**Indonesia**

1997	East Jakarta	25 year BOT	2.85million water
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The project is being funded 30% by equity and 70% by debt. Revenues for Thames Parn Jaya are being driven upwards as more customers are connected. Some 2.85million people are currently served, up from 2.5million in 1998. 20,580 new connections were made during 2002, equivalent to 200,000 people. The East Zone's population is forecast to rise from 4.6million to 5.8million by 2020. It is understood that the weakness of the Rupia has caused the project to lose GBP1million/month since 2001. Non revenue water was 48.6% in 2004 and 49.7% in 2005 after a rebasing exercise. The concession aims to reduce this to 45% in 2006 (against an original target of 33% by 2008) and to 23% by 2017.

**USA****Aquarion**

Aquarion was incorporated in Delaware as The Hydraulic Company in 1969, to become the parent company to BHC, a Connecticut corporation founded in 1857. The corporate name was changed to Aquarion Company in 1991. Aquarion's utility subsidiaries, BHC Company (BHC) and Sea Cliff Water Company (SCWC, founded in 1873, water provision to 15,000 people in Long Island) collect, treat and distribute water to residential, commercial and industrial customers, to other utilities for resale and for private and municipal fire protection. The utilities provide water to 147,000 customers in 30 communities with a population of more than 500,000 people in Connecticut and Long Island, New York. In 1999, 75% of group turnover came from the company's water activities. Operating revenues of the utilities come from the following sources: residential customers 63%, commercial customers 16%, industrial customers 3%, fire protection customers 13%, and other sources 5%.

In June 1999, Kelda launched an USD444million agreed bid for Aquarion, a US water provision company. The two companies had been co-operating in various projects for a number of years previous to the bid. The acquisition was completed in January 2000. In February 2006, Kelda announced that it was selling Aquarion to Macquarie for USD625million with USD135million of assumed debt. Because of regulatory issues, in February 2007 Kelda agreed to sell the New York activities to United Water (see Suez company entry) and Aqua America, which obtained regulatory clearance in April 2007 and May 2007 respectively. The sale of the rest of Aquarion was completed in May 2007.

**Aquarion, profit & loss account**

Y/E 31/03 (GBPmillion)	2003	2004	2005	2006	2007
Turnover	93.7	94.1	92.2	99.4	104.2
Operating profit	34.9	31.6	30.3	32.8	41.6
Pre-tax profit	N/A	31.6	24.9	23.9	-14.2
Net profit	N/A	N/A	N/A	15.2	-20.4

Village Water, serving 5,200 customers (18,200 people), was acquired in May 2000. The utilities' service areas, primarily residential in nature, have experienced an average growth in accounts of approximately 1% percent pa over the last 10 years. Industrial use has declined significantly in that time. Kelda is currently concentrating on reducing distribution losses at Aquarion and developing the company as a base for further expansion into the USA.

In April 2002, Kelda acquired four of American Water Works' companies for USD120million, plus USD104million of debt. These companies cover 17 municipalities, serve 64,000 customers or 177,000 people across New England and were subsequently integrated into Aquarion's operations.

Over 60% of the customers are located adjacent to BHC's existing franchise. For the year ended 31 December 2000, the aggregate turnover of these was USD47.3million with a pre-tax profit of USD8.5million. The Connecticut activities were merged with BHC, while the other activities are operated as a separate entity.

#### Aquarion – people served by state

	Customers	People	Towns
Connecticut	176,000	587,000	36
Massachusetts	17,050	26,000	5
New Hampshire	12,000	44,000	3

#### Contact Details

Name: Thames Water Plc  
 Address: 14 Cavendish Place, London, W1M 0NU, UK  
 Tel: +44 20 7636 8686  
 Fax: +44 20 7436 6755  
 Web: [www.thames-water.com](http://www.thames-water.com)

James Forbes (Chairman)  
 David Owens (CEO)  
 Steve Buck (Finance Director)  
 John Halsall (Director of Water Operations)

#### Contact Details

Name: Aquarion  
 Address: 835 Main Street, Bridgeport,  
 CT 06604, USA  
 Tel: +(203) 336-7626  
 Fax: +(203) 336-5639  
 Web: [www.aquarion.com](http://www.aquarion.com)  
 Web: [www.bhcco.com](http://www.bhcco.com)

Charles V Firlotte (President & CEO)  
 Donald J Morrissey (VP, Finance)

#### Contact Details

Name: Macquarie Bank  
 Address: No. 1 Martin Place, Sydney,  
 NSW, 2000, Australia  
 Tel: (61 2) 8232 3333  
 Fax: (61 2) 8232 7780  
 Web: [www.macquarie.com.au](http://www.macquarie.com.au)

Alan E Moss (MD & CEO, Macquarie Bank Group)  
 Martin Baggs (Division Director, Macquarie Bank Europe)

**AUSTRALIA****WESTPAC**

With its origins in the Bank of New South Wales, founded in Sydney in 1817, Westpac is the oldest Bank in Oceania. The bank manages a range of funds, including six dedicated utility funds such as the Utilities Trust of Australia and the Hastings Diversified Utilities Fund.

In March 2001, Swan Capital Group Ltd. launched a management buyout of Mid Kent Holdings (MKH) backed by West LB. The GBP106million offer was declared unconditional in May 2001 and the company was subsequently delisted and MKH was renamed Swan Group. In February 2005, Utilities Trust of Australia and the Hastings Diversified Utilities Fund, funds managed by Westpac, acquired Swan Group for GBP243.1million.

South East Water (SEW) was formed in 1996 when SAUR brought together its controlling interests in three statutory water companies operating in southern England: Mid Sussex Water, Eastbourne Water and West Kent Water. In 1999 Mid Southern Water, which was also owned by SAUR, was integrated into SEW. All four companies had been acquired by SAUR Water Services UK between 1988 and 1990. In September 2003, SEW was sold to Australia's Macquarie Bank for GBP386million plus GBP40million in assumed debt. SEW's assets were then transferred to the Macquarie European Infrastructure Fund. In October 2006, Hastings Diversified Utilities Fund and Utilities Trust of Australia, funds that are both managed by Westpac, acquired South East Water for GBP665.4million in debt and equity.

The two companies are adjacent to each other and Westpac intends to merge their activities, creating a company serving approximately 2.1million people. In May 2007, the Competition Commission agreed to this merger subject to a one-off transfer to their customers of GBP4million in 2008-09 and efficiency savings of GBP3.1million factored into the 2009 Periodic Review.

**South East Water**

SEW serves a total of 1.5million people, including 500,000 domestic and 45,000 commercial and industrial customers. Other activities include Pipeway, Dynamco (water engineering, consulting and testing) and Optimum Information Systems Limited.

In 2004-05, the company started a pilot desalination plant in Newhaven. This is designed to augment supplies during peak demand and will provide 9.5million L/day when fully operational from 2006. At the same time, GBP25million is being spent constructing a 29km transfer pipeline connecting the company's Darwell Reservoir to Southern Water's Bewl Reservoir. 13,500 meters were installed in six months during 2006-07, compared with an annual average of 3,500.

**South East Water Ltd, Regulatory Accounts**

Y/E 31/03 (GBPmillion)	2003	2004	2005	2006	2007
Turnover	93.89	95.60	94.89	112.56	113.92
Operating profit	30.84	25.59	16.81	51.90	42.23
Pre-tax profit	27.60	21.31	12.14	29.28	5.11
Net profit	22.42	20.44	7.31	22.84	-18.31

In 2004, the company was refinanced, including raising GBP366million in debt via a 15 year floating rate and a 25 year fixed rate bond issue.

**Mid Kent Water Plc****Mid Kent Water Company, regulatory accounts**

Y/E 31/03 (GBPmillion)	2003	2004	2005	2006	2007
Water supply	36.7	38.5	38.6	44.4	43.9
Other activities	4.4	4.5	4.6	3.5	2.7
Group turnover	41.1	43.0	43.2	47.8	46.6
Operating profit	11.5	14.2	14.1	16.5	16.0
Pre-tax profit	7.5	8.6	6.3	9.1	7.8

Mid Kent Water was founded in 1898, supplying 12 parishes in the mid Kent region. It became a Plc through the formation of Mid Kent Holdings Plc in 1989. The company has 218,820 household and 23,800 business connections, serving 594,000 people in total. Mid Kent Water supplies water to Maidstone and parts of Kent in South East England, with sewerage services being carried out by Southern Water (First Aqua). A bitterly contested bid in 1996 by SAUR Water Services (Bouygues) and the then called General Utilities Plc (Veolia

Environnement) was blocked by the Monopolies and Mergers Commission (MMC, now the Competition Commission) in January 1997. The two companies sought to acquire Mid Kent Water because of its relatively abundant water resources, which were adjacent to companies owned by them that have been facing long time water shortages.

Leakage fell from 44Ml/day in 1992 to 27Ml/day by 2007. There is a gradual shift towards measured water supplies, which accounted for 45% of water supply revenues in 2003-04 and 46% in 2004-05. During the summer of 2005, a hosepipe ban was brought into force due to resource depletion. The ban was only lifted in the summer of 2007.

Non-regulated activities include Halcrow Water Services (consulting), Eclipse (testing and analytical services), Inenco Group (utility consulting) and Waterlink Services (plumbing). Halcrow Water Services was formed in 1995 as a joint venture between the Halcrow Group and Mid Kent Water. The joint venture has carried out water projects in the UK (Scotland, Northern Ireland and southern England), leakage reduction projects in Venezuela and Cyprus and other projects in India, Ecuador, Poland and Indonesia.

#### **Contact Details**

Name: Swan Group Plc  
 Address: High Street,  
 Snodland, Kent, ME6 5AH  
 Tel: +44 1634 873 000  
 Fax: +44 1634 243 774  
 Web: [www.midkentwater.co.uk](http://www.midkentwater.co.uk)  
 Web: [www.swan-group.com](http://www.swan-group.com)

Mark Gomar (Chairman, Swan Group)  
 Richard Leigh (Finance Director)  
 Paul Seeley (MD, Mid Kent Water)  
 Graham Setterfird (Chairman, Mid Kent Water)

#### **Contact Details**

Name: South East Water Plc  
 Address: 3 Church Road, Haywards Heath,  
 West Sussex, RH16 3NY  
 Tel: 01444 448200  
 Fax: 01444 413200  
 Web: [www.southeastwater.co.uk](http://www.southeastwater.co.uk)

Gordon Maxwell (Chairman)  
 Paul Butler (Managing Director)  
 Joanne Stimpson (Finance Director)

#### **Contact Details**

Name: Hastings Funds Management  
 Address: Level 2, 63 St Mary's Axe,  
 London EC3A 8LE  
 Tel: +44 20 7337 6720  
 Fax: +44 20 7929 2502  
 Web: [www.hfm.com.au](http://www.hfm.com.au)

Victoria Duthy (CFO)  
 Peter Taylor (Director, Infrastructure)

**KUWAIT****UTILITIES DEVELOPMENT COMPANY HOLDINGS**

The Utilities Development Company (UDC) is 75% held by Mohamed Abdulmohsin Kharafi and Sons and 25% by Ionics (GE, USA). It is a privately held company set up to develop and operate the Sulaibiya wastewater treatment project. UDC was founded in 2002 in the wake of United Utilities (2001) leading a consortium to gain the original contract. With the project stage effectively completed, UU has decided to reduce its involvement in this contract and now plays a minor role in investment terms.

UDC is responsible for the build-operate-transfer deal. The project is expected to be worth more than USD2billion over its 27.5 year operating life, based on a tariff of USD0.47/m<sup>3</sup>, and aims to treat some 375,000m<sup>3</sup>/day of effluent in its first phase, with a total design capacity for 600,000m<sup>3</sup>/day. The first phase will see 311,000m<sup>3</sup>/day of non-potable water recovered for agricultural and other applications such as aquifer recharge and industrial water.

It involves USD430million in capex. The National Bank of Kuwait (NBK) arranged a USD377 million loan and Kharafi and Ionics put up the rest of the funds on a 85% debt 15% equity basis. The facility's capacity implies that it may be intended to serve the entire population of 1.9million. Construction work was completed in May 2005, with the facility having entered service in December 2005.

UDC is now seeking other contracts, and in 2006 bid for the Disi project in Jordan.

**Contact Details**

Name: Mohammed Abdulmohsin Al-Kharafi & Sons Company  
 Address: P.O. Box 886  
 Kuwait Safat 13009  
 Tel: +965 481-3622  
 Fax: +965 481-3339  
 Web: <http://www.makharafi.net>

Rafed Al Kharafi (Chairman)  
 Mohsen Kamel Mustafa (Managing Director)

**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<sup>3</sup>)

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<sup>3</sup> pa of water is taken up and returned through evapotranspiration and precipitation. While 430,000km<sup>3</sup> pa is removed through evaporation from oceans and 70,000km<sup>3</sup> pa in evapotranspiration from land, 110,000km<sup>3</sup> pa is returned to the land through precipitation against 390,000km<sup>3</sup> pa precipitation into the sea. This results in a net gain of 40,000km<sup>3</sup> 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 enjoys 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 <sup>3</sup> pa renewable resources	<10,952km <sup>3</sup> annual recharge
3,414km <sup>3</sup> pa withdrawn	760km <sup>3</sup> 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<sup>3</sup> in 1990, rising to 5.3km<sup>3</sup> 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<sup>3</sup> of freshwater per capita per annum, while water scarcity is where there is less than 1,000m<sup>3</sup> 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)

Million people	1995		2025	
	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	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.

Percentage with access to improved water supply and sanitation within regions, 2004:

	Water			Sanitation		
	Urban	Rural	Total	Urban	Rural	Total
Sub-Saharan Africa	80	42	56	53	28	37
North Africa	96	86	91	73	33	50
Middle East	97	79	91	96	59	84
South Asia	94	81	85	63	27	68
East Asia/Pacific	93	77	78	69	28	45
Latin America & Caribbean	96	73	91	86	77	49
CEE/CIS & Baltic States	99	80	92	92	67	83
Developed Countries	100	95	100	100	98	99
World	95	73	83	80	39	59

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
<b>Water</b>				
Served	4,092	5,320	6,425	6,300
Unserved	1,187	1,069	794	919
Unserved – urban	107	170	N/A	240
<b>Sanitation</b>				
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

Then 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

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<sup>3</sup> annual net gains through precipitation on to land, 24,000km<sup>3</sup> is lost as surface run-off in floods, leaving a net 16,000km<sup>3</sup> of useable water input. Approximately 9,000km<sup>3</sup> pa is readily accessible, with an annual abstraction of 3,414km<sup>3</sup> 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.

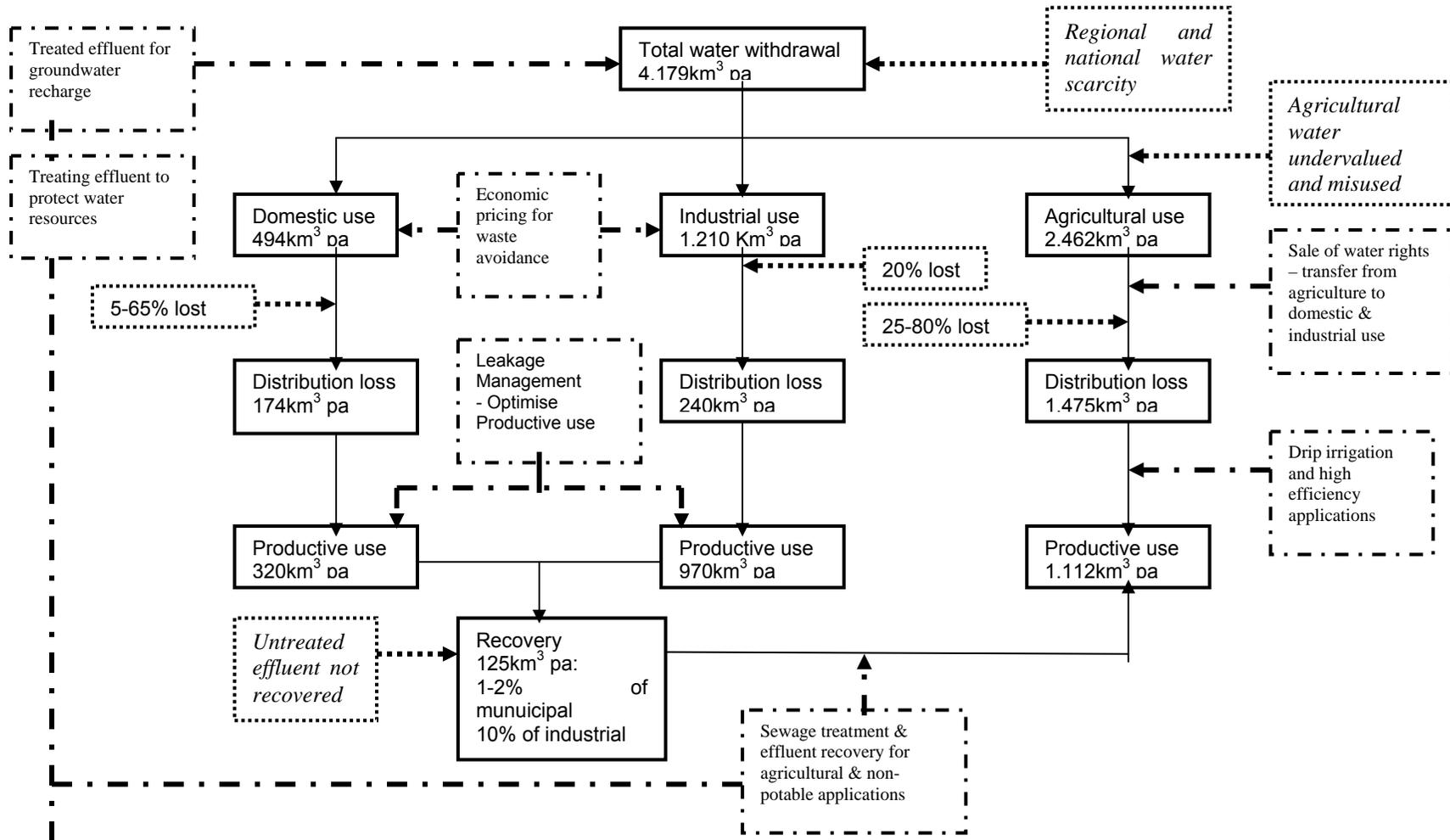
### **Optimising the water cycle**

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<sup>3</sup> pa for productive use. Assuming that industrial leakage can be reduced to 10%, this releases 120km<sup>3</sup> pa for productive use. Improving irrigation efficiency to 50% releases 244km<sup>3</sup> pa for productive use, along with a further 325km<sup>3</sup> 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, economics 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 Philippines 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 in 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
<b>Local / Single site</b>	USA	France	UK PFI & inset appointments	USA
<b>Town / Small city</b>	USA Kazakhstan	Germany Czech Towns	Germany	Czech Republic USA
<b>City</b>	Mexico City	Atlanta Budapest	Manila Jakarta	Chile UK WOCs
<b>River Basin / Region</b>	Greater Amman	Czech Regions	Argentina Italy	UK WASCs Chile
<b>Country</b>	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)

<b>Time horizon</b>	2-5 years, up to 10	<b>Ownership</b>	Public
<b>Customer</b>	Government / Municipality	<b>Investment</b>	Public
<b>Cash flow profile</b>	Fixed fee for service	<b>Operation</b>	Public
<b>Construction risk</b>	None	<b>Tariff collection</b>	Public / Private
<b>Regulatory risk</b>	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

<b>Time horizon</b>	10-15 years, up to 25	<b>Ownership</b>	Public
<b>Customer</b>	Retail Customer	<b>Investment</b>	Public
<b>Cash flow profile</b>	Subject to market risk	<b>Operation</b>	Private
<b>Construction risk</b>	None	<b>Tariff collection</b>	Private
<b>Regulatory risk</b>	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

<b>Time horizon</b>	10-30 years, up to 95	<b>Ownership</b>	Public
<b>Customer</b>	Govt /Municipal	<b>Investment</b>	Private
<b>Cash flow profile</b>	Pay on completion	<b>Operation</b>	Private
<b>Construction risk</b>	High	<b>Tariff collection</b>	Public
<b>Regulatory risk</b>	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

<b>Time horizon</b>	20-30 years	<b>Ownership</b>	Public
<b>Customer</b>	Retail Customer	<b>Investment</b>	Private
<b>Cash flow profile</b>	Subject to market risk	<b>Operation</b>	Private
<b>Construction risk</b>	Low	<b>Tariff collection</b>	Private
<b>Regulatory risk</b>	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

<b>Time horizon</b>	In perpetuity	<b>Ownership</b>	Private
<b>Customer</b>	Retail Customer	<b>Investment</b>	Private
<b>Cash flow profile</b>	Subject to market risk	<b>Operation</b>	Private
<b>Construction risk</b>	Very low	<b>Tariff collection</b>	Private
<b>Regulatory risk</b>	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 'Beterbermodell', 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	Kooperationmodell	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 2005.

Private participation in water and sewerage in developing countries, by contract type, 1990–05:

Investment in projects by type (USDmillion)

	Water Only	Sewerage Only	Water & Sewerage
Concession	6,537	2,764	20,448
Divestiture	293	0	5,787
Greenfield project	5,664	2,605	51
Management & lease contract	295	142	548
<b>Total</b>	<b>12,789</b>	<b>5,511</b>	<b>26,834</b>

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 expediciencies 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**

<b>USD per m<sup>3</sup></b>	<b>Household tap</b>	<b>Public tap</b>	<b>Water vendor</b>
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.

#### What is it?

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

#### When does it take place?

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**

<b>Contract Stage</b>	<b>Information placed in the public domain</b>
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 in 3.3–3.5 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 to regard 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.

**2000-02: The World Water Vision**

The World Water Vision 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:

USDbillion 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
<b>Total</b>	<b>600-800</b>	<b>310-500</b>

The World Water Vision 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 as to the best way to address water problems by 2025. 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 (USDbillion pa)	70-80	180

Water and sewerage spending, 1995 to 2025

USDbillion 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

USDbillion	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
<b>Water &amp; sanitation</b>	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
<b>Total wastewater</b>	N/A	75	N/A	N/A	21	100
<b>Total</b>	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 is seeking to create a European Water Fund of €1billion 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 €0.005 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 appear to 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

% served	Water		Sanitation	
	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	84%	+13%	37%	+17%
Sub-Saharan Africa	58%	+9%	36%	+4%

#### Sanitation coverage, interim progress and targets

% served	2002	2015	Urban coverage
	WRT target	Target	2002
Western Asia	-5%	90%	95%
Latin America & Caribbean	-2%	84%	84%
Northern Africa	-1%	82%	89%
South Eastern Asia	0%	74%	79%
Oceania	-13%	79%	84%
Eastern Asia	+2%	62%	69%
South Asia	-3%	60%	66%
Sub-Saharan Africa	-13%	66%	55%

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	263
South-Eastern Asia	115	208
Latin America & Caribbean	121	132
Former Soviet Union	27	24
<b>Total</b>	<b>961</b>	<b>1,032</b>

Source: UN Millennium Project Task Force on Water & Sanitation, Interim Report, 2005

#### 2005: The UN 'Water for Life' decade

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 UNICEF and the WHO. Again, the UN explicitly recognises the contribution needed from the private sector to attain these goals. The Fourth World Water Forum, to be held in Mexico City in March 2006, is set to be a crucial 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 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.*

*WBCSD (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*

*WBCSD (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](http://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 Water 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**

This Year's 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.

### **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 disbursements, the USD2bn 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 2002–04	Commitments		Disbursements	
	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%
<b>Total</b>	<b>6,198</b>		<b>2,530</b>	

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 make 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
<b>Water</b>			
Served	2,172	2,933	3,648
Unserved	107	170	240
<b>Sanitation</b>			
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)

	<b>Water</b>	<b>Sanitation</b>
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
<b>Total</b>	<b>961</b>	<b>1,032</b>

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:

<b>WHO 2004 Report</b>	<b>1990</b>	<b>2002</b>
Urban drinking water access	88%	96%
Household connections	51%	51%
<b>WHO 2006 Report</b>	<b>1990</b>	<b>2004</b>
Urban drinking water access	89%	95%
Household connections	53%	47%

These 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

<b>% Household connection</b>	<b>1990</b>	<b>2004</b>
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

### 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 Hyderabad 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 USD 0.1–100million. 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 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 Rs 69million;
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 Rs 304.1million 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:

<b>New service connection</b>	<b>USD per person</b>
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:

<b>USD per capita</b>		<b>Africa</b>	<b>Asia</b>	<b>Latin America</b>
<b>Water</b>	House connection	102	92	144
	Standpipe	31	64	41
<b>Sanitation</b>	Sewer connection	120	154	160
	Small bore sewer	52	60	112
	Septic tank	115	104	160

NGO estimates for connecting urban watsan projects

<b>USD per capita</b>	<b>Mali</b>	<b>Burkina Faso</b>	<b>Niger</b>	<b>Nepal</b>	<b>Tanzania</b>
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) USD2billion 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).

<b>Treatment facilities (USD per capita)</b>	<b>Range</b>
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**

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**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 MI (1,482 m<sup>3</sup>)

**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<sub>3</sub>).** 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 expediciencies 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.

**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°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 Develop. 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 Ofwat 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 joints 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<sup>3</sup>.** Cubic metre, or 1,000 litres. Measure of water volume. One cubic km is 1million m<sup>3</sup>.

**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.

**MI/day.** Megalitres per day (1,000m<sup>3</sup> 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<sub>3</sub>).** 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°C 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	Trithiopl, 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, 22<sup>nd</sup> 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' (3<sup>rd</sup> 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.

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### **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.

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### **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.

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