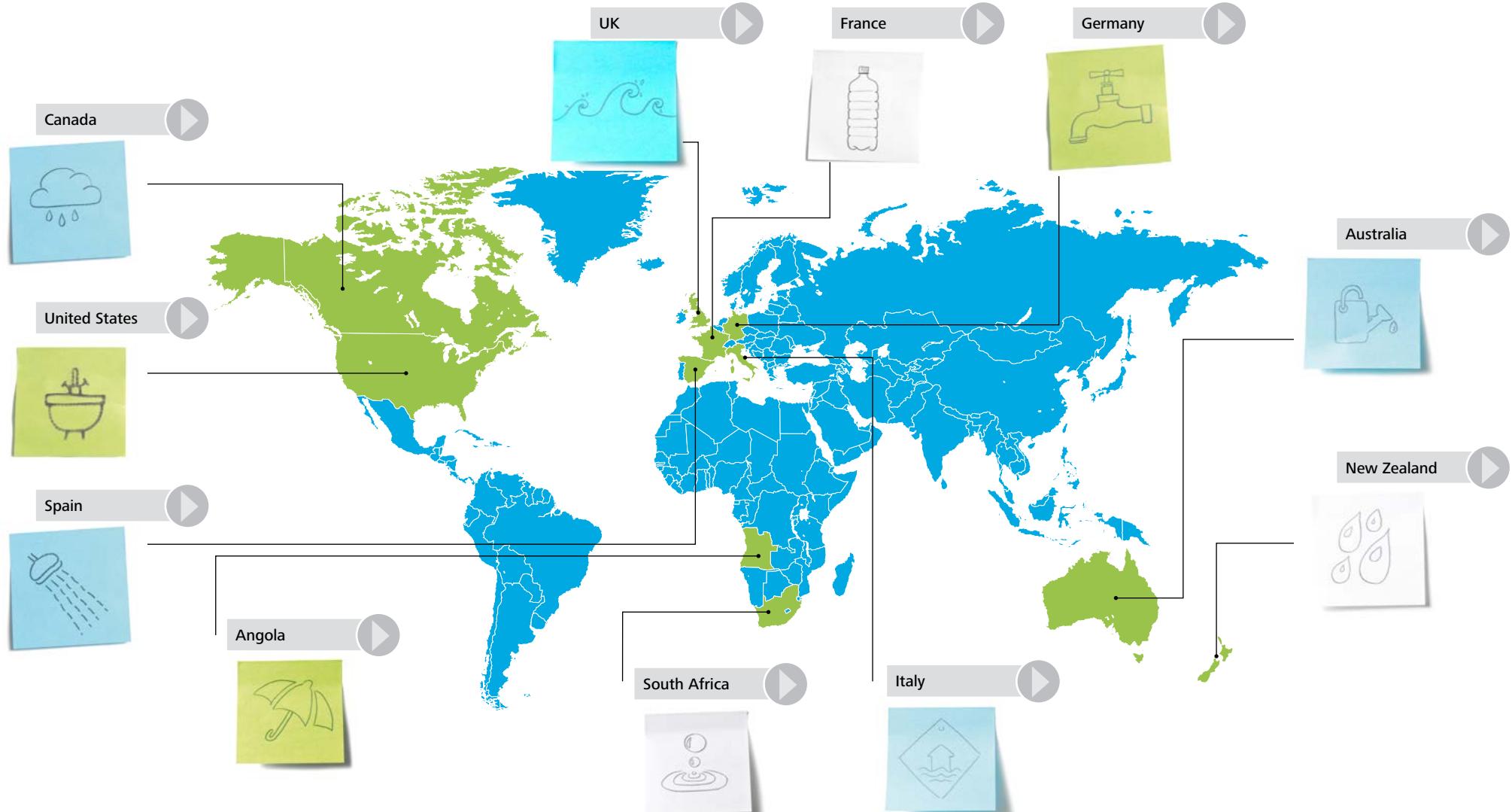


Water country profiles



Angola



Angola has a diverse hydrological network with considerable water availability (about 8600m³/ year.person). The country has 47 major river basins and rivers which are distributed across five principal drainage areas: the Atlantic Ocean (which includes Cuanza, Catumbela, Cunene, Chiloango, M'Bridge, Keve, Longa and other rivers), the Zaire basin (Congo), the Zambezi basin, the Cuvelai basin (that drains into Etosha Pan) and the Cubango river basin (that drains into the Okavango delta).

Angola also shares five international river basins (Congo, Cunene, Cuvelai, Cubango/Olavango and Zambezi). Angola is an upstream state for four international river basins, although in the case of the Zaire (Congo) river basin, the country is a downstream state.



Water and sanitation accessibility: current situation, achievements and goals

Although Angola is rich in water resources, they are unequally distributed in the country, as the south and coastal regions water flows are usually low whereas in the north and central regions the water flows are significantly higher.

In the short-term, water availability should not be a problem, however as the country develops, water shortages may occur in some regions.

Angola faces a severe shortage in the availability of sanitation services, with only 50% to 60% of the population served (2011 data). However, significant progress has been made, given that in 1990 these percentages were around 30% to 40%.

These positive developments will continue given the efforts being employed by the Government to improve the currently insufficient, destroyed and/or degraded water and sanitation infrastructure (mainly catchment facilities, distribution networks, treatment stations and sewerage systems).



Besides the operational infrastructure, both water management infrastructure (e.g. hydrometric stations) and monitoring and control systems (e.g. measuring and billing systems) are scarce, degraded or inefficient.



Institutional situation and prospects

The Angolan water sector management and operation is very centralized in the public sphere and under central administration.

The Ministry of Energy and Water establishes water policies and strategies at a national level. Water resources are managed by the recently created, but not yet fully operational, *Instituto Nacional de Recursos Hídricos* (National Institute for Water Resources) at national level and by River Basin Management Cabinets (already in place or to be established) at river basin level. Water distribution and sanitation supervision are the responsibility of the *Direcção Nacional de Água* (National Directorate of Water).

In terms of water distribution, state owned enterprises operate in Luanda and the Benguela Provinces, and another seven provincial enterprises are under development. In the other provinces, services are assured by the Provincial Directorate for Water and Sanitation.

Private participation in the sector mainly occurs through operators working on relatively basic terms, for instance *cisternas* (water distribution by truck).

In Angola, a Water Sector Restructuring Program is underway, which will determine the new institutional model and the program contract, which will guide the gradual entry of future operators into the sector and clarify stakes and responsibilities, as well as establish rules to guide water sector participation by different stakeholders.

Angola (continued)



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Angolan water sector finance current situation

The water sector in Angola is heavily subsidized by the Government and there is no significant financial participation of the private sector both in terms of investment or operation and maintenance.

In respect of investment finance, the majority of the funds allocated come from the state annual investment budget. Additionally, development agencies (e.g. the World Bank) have established several commitments regarding water sector development (e.g. the *Water Sector Institutional Development Program* with a total investment amount of 230 million of USD).

Operations and maintenance costs are highly supported by the Government, given that the current tariffs are very low and don't cover operating costs. The Province of Benguela is the only exception, where rates are charged to the sewerage systems users.

The Water Sector Restructuring Program will also define a new finance model for water distribution and sewerage services. The reformulation of tariff policies in order to attain a higher coverage of operational costs is in the planning, which takes into account the social condition of the people and affordability of services (e.g. establishing social tariffs).



Regulatory framework

The Angolan water sector is not yet highly regulated, in particular in relation to water quality control, given that, tariffs are established by the Ministry of Finance of Angola

(for Luanda tariffs, however, other provinces usually follow those applied in Luanda).

In Angola there are no water quality monitoring systems and processes in place nor monitoring infrastructure and tools.

So, water quality control related activities take place on an occasional basis for specific research/ assignments. This situation should improve in the next few years, with the implementation of the proposed *Programa Nacional de Monitorização da Qualidade da Água* (National Monitoring Program for Water Quality), and after the implementation of the new institutional model for the Angolan water sector.



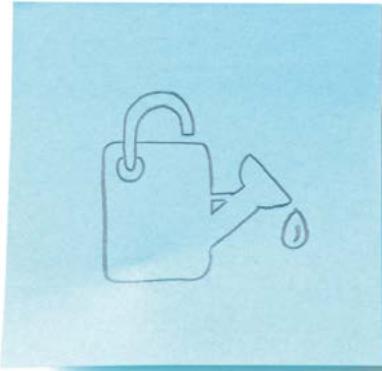
Challenges

Following the format outlined above, the Angolan water sector faces several challenges, namely the:

- gradual transition from an unregulated, centralized public management system towards a decentralized, public and private management system which is tightly regulated;
- promotion of financial sustainability for the sector, ensuring access to services and resources at prices which are affordable to the entire population;
- reduction of dependence on the State in respect of investments in the water and sanitation sector (e.g.promoting public-private partnerships);
- provision of clean drinking water and sewerage access for all according to the development goals established; and
- required efficiency of water and sanitation sector operators and water quality.



Australia



Australia accounts for 8.6% of the value of Asia-Pacific's water utilities sector.

The value of Australia's water industry has grown strongly in recent years, with a compound annual growth rate (CAGR) of 8% for 2007-2011, while water use has fallen at a rate of -2.4% for the same period. Agriculture is the largest segment, accounting for 75.2% of industry volume, while the domestic segment accounts for a further 14.7%.

The performance of the industry is expected to improve, with an anticipated CAGR of 8.3% for the five-year period between 2011-2016, which would increase the industry value to US\$19.5 billion.



Industry structure

The water industry consists mainly of 24 major urban utilities and 71 non-major urban utilities. The industry is partly dominated by conglomerates including SA Water, Sydney Water, Water Corporation, Yarra Valley Water, and Power and Water Corporation.

The 24 major urban utilities service more than 50,000 connections to households or commercial premises each. These companies serve about 13.3 million people (approximately 70% of the population) and are members of the Water Services Association of Australia (WSAA).

There are 71 non-major urban utilities serving between 10,000-50,000 connections each, a total of 3.2 million people (about 17% of the population). Around 200 authorities and/or utilities with less than 10,000 connections each serve the remaining population.



Infrastructure

Australia has 447 large dams that supply 79 million liters (ML) of water for urban, irrigation and hydroelectric power users, as well as providing flood mitigation.



The country also has several million farm dams providing water to 9% of the total irrigated area, as well as the world's largest aquifer system. Australia has 15 ML of groundwater available for extraction each year.



Finance

Water utilities are no longer subsidized by the Australian government, as they are independent and responsible for their own financial performance. Cross-subsidies between user groups have also been removed, so the full cost of service delivery is now passed on to consumers.

Tariffs for water vary between AU\$0.30-0.40 per kiloliter (kl) at the lowest end of the spectrum, to around AU\$0.90-0.95 per kl at the highest. Water Corporation of Western Australia (WCWA) is an exception, with tariffs as high as AU\$1-1.40 per kl for annual usage above 750 kl.

Average annual bills per customer range from approximately AU\$180 to AU\$450, with the norm being around AU\$200-300. For consumption of 200 kl, a typical annual bill would be between AU\$150-270.

Sewerage charges vary between AU\$180-400 annually. The total charge for sewerage services, based on a 200 kl annual consumption, varies from about AU\$330 (Goulburn Valley Water) to AU\$623 (WCWA). Given the manner in which water and sewerage charges are structured, halving water use would only impact a total bill by about 10%.



Regulation

Historically, in Australia water utilities were operated as government departments. Recent reforms undertaken have, however, established these entities as independent trading enterprises with a clear focus on the delivery of safe and secure water and wastewater services.

Australia (continued)



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Water in Australia is a national priority. Since 1994, all governments in Australia – federal, state, territory and local – have been working together to implement a far-reaching program of reform. The initiatives undertaken have rationalized water use, improved its management, made the sector profitable and fostered innovation.

Under the Australian Constitution, the provision of water is the responsibility of the state and territory governments. The central government's role is centered on policy development and, because it controls taxation, it also influences the industry through a combination of fiscal incentives and lobbying. States also play an important role in policy-making.

The National Competition Policy and the Council of Australian Governments' Water Reform Agenda are the two principal pillars of policy stimulating reform at a national level. The National Water Quality Management Strategy – which provides guidelines to regulate issues relating to public health and the environment – and the National Environment Protection Council are the two other main elements of the reform framework.

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Challenges

The main challenge is that Australia can be defined as a 'dry' country. Average rainfall at 469 millimeters per year (mm/yr) is not very low, but only 12% of it runs off to collect in rivers.

River flow is also highly variable, and these factors are exacerbated by an uncertain climate.

Resistance to the adoption of a diversified water supply regime is another industry challenge. Such resistance stems from the traditionally risk-averse nature of the water industry.

A recent survey of more than 1,000 public and private decision-makers and experts across the Australian water sector found that practitioners were reluctant to adopt diverse water supply technologies – particularly on-site and third-pipe technologies and potable reuse schemes. Responding to this challenge will require the cultivation of an innovative culture that supports increased use of technology and productivity improvement.

Finally, local governments typically manage storm water and road drainage issues. As a number of other bodies share responsibility for how relevant resources are managed, overlapping catchment issues continue to present a challenge to policy-makers and regulators.



Canada



Canada is seen as a water-rich nation. It has one of the largest renewable water supplies in the world and about 20% of the world's surface freshwater. Its average annual yield is 348 liters of renewable freshwater for every square meter of the country.

This yield is substantially higher than that in drier countries such as Australia and South Africa, which have one-fifth and one-eighth of that amount respectively. However, there is lot of regional disparity within Canada. Nearly 85% of Canadians live in the southern part of the country, which has only 38% of its renewable freshwater. There is also more water underground than on the surface.



Industry structure

In 2008, the Canadian water industry was valued at US\$7.8 billion.



Finance

Water pricing structures are very diverse in Canada. According to a 2004 report from Environment Canada, 37% of households pay a flat rate for water, irrespective of the quantity they use, while 62% have some kind of volumetric pricing.

Volumetric pricing breaks down into three main categories:

- 39% pay for the quantity of water they consume at a constant unit price.
- 13% pay for water at a rate that decreases as the volume they use rises.
- 10% pay at a rate that increases with the amount they use, promoting conservation.



Water pricing was traditionally used to promote water use rather than encouraging conservation, although this is starting to change. Notably, water use is 70% higher by consumers who pay a flat rate than by those who pay based on what they use.



Regulation

Water resources are managed by a range of organizations within Canada, each playing an important role in the control and conservation of water.

The government has responsibility for various aspects, including navigable waters, inland fisheries and federal waters, such as those at military bases. The government outlined its commitment to the sector through the Federal Water Policy, tabled in 1987, but only a few of its recommendations were implemented and interest has since waned.

Provincial governments are responsible for regulating and protecting water quality, regulating drinking water systems and making decisions about resources. They have also developed policies and frameworks, such as the Alberta Water for Life Strategy (2003), the Quebec National Water Strategy (2002), and the BC Living Water Smart Plan (2008). Ontario formulated a Clean Water Act in 2006, and Manitoba has created the only stand-alone water ministry in Canada.

Local governments protect local water sources and influence important areas such as wastewater infrastructure and city water supplies.

Canada (continued)



Challenges

Canada and the US share inter-connected water systems. In the past, there have been detailed proposals from both sides about exporting water from Manitoba and Quebec to the US. However, these projects would be tremendously costly, require vast amounts of energy, and pose great threats to watersheds. There is also a threat that such bulk water exports would leave Canada's water vulnerable to environmental depletion. Because of this, several organizations are pressing for a ban on bulk water exports.

Another big challenge for Canada is that water prices do not generate enough revenue to cover the capital and operating costs of water utility companies. Also, the costs accounted for in water pricing exclude the environmental and human health costs associated with diminished water quality.

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France



In France, virtually the entire population is connected to a water distribution system (99%). However, less people are connected to a wastewater collection system (80%), as on-site sanitation solutions tend to be used in low density rural areas.

On average, France gets 480 billion cubic meters (bcm) of rainfall each year (61% evaporates, 16% feeds its waterways and 23% replenishes groundwater reserves). With approximately 270,000 kilometers of permanent water courses and groundwater estimated at 2,000 bcm, water resources amount to 191 bcm per year, which is equivalent to 3,262 cubic meters per person. France only needs an estimated 32 bcm of water per year – just 17% of the water available.



Industry structure

The water industry in France is controlled by 37,000 local councils, which are responsible for the provision of water. Some councils set up and run their own public sector utilities, although the industry is still dominated by large international conglomerates, including Suez Group and Veolia Environnement.

In 2008, according to the Environment Ministry, the private sector was providing more than three-quarters of the water, and half of the sanitation, services in France. However, in late 2008, Paris' city council decided not to renew the city's water supply contract with Suez and Veolia. Instead, the council created Eau de Paris as a public company to supply the city's water under its direct supervision.

This seems to signal a new trend. Forty other municipalities, including those for large cities such as Bordeaux and Brest, have decided to bring water services back under public control in the near future.



Infrastructure

In 2011, France had 19,300 water treatment plants.



Finance

In France, 95% of operating costs are covered by consumers, while 30% of capital investments are financed by subsidies, two-thirds of which come from water users' mutual funding systems and one-third from tax payers.

The government finances public sector water services with taxes included in water tariffs paid by customers. The government generated €8.3 billion in this way between 2007-12. As well as supplying water and wastewater services, revenues are used to equalize affordability between urban and rural areas and achieve environmental objectives.



Regulation

Many regulations affecting the water industry derive from EU directives – notably those regarding drinking water, urban wastewater treatment, water frameworks, groundwater protection, sewerage sludge, and health and safety at work.

In terms of regulations specific to France, there is the Conseil de la Concurrence et DGCCRF for competition issues, Cour des Comptes for public finance and accounting issues, DGS for quality standards and health-related issues, and DRASS for local inspections. This raises the need to ensure co-ordination across such entities and reduce the complexity of regulatory requirements.

France (continued)



Challenges

Climate change is the biggest threat to the long-term sustainability of water services in France. Water company operations and assets are among the most vulnerable to a more volatile climate and many are already feeling the pressure. More frequent droughts, more intense rainfall and more flooding are all going to influence investment planning for all aspects of water services. Although France has more than enough water resources at the moment, industry analysts and environmentalists are still concerned about the future.

According to a recent Organization for Economic Co-operation report, France will be spending US\$25.84 billion on infrastructure relating to water.

However, with limited government investment on the horizon, water companies will need to generate significant revenues/debt, which will put pressure on their already-stretched balance sheets.

Increasing water productivity and efficiency, and improving conservation, could reduce the need for new and expensive water projects. The cheapest new source of water is often water gained through conservation and improved management – something that is sorely needed in France, where approximately 30% of water is lost before it reaches the end user.

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Germany



Germany has abundant surface and groundwater resources and, according to recent climate change studies, this is not expected to change.

Ninety-nine per cent of the population has access to drinking water and 96% is connected to the public sewerage system.

Drinking water is high-quality in Germany. In 99% of cases it meets EU requirements, and 97% of wastewater is treated to highest European Commission standards. The results of a 2011 survey showed high customer satisfaction rates with both water supply and wastewater disposal services.



Industry structure

The German water market consists of a large number of medium-sized private and public utilities, and water and wastewater companies. This is in contrast with other European markets, which are dominated by a small number of large, often private international companies.

Germany has a federal structure where the responsibilities of government are divided among national, state and local authorities. The government defines all aspects of national policy for water management. The state governments regulate water supply and disposal. Local authorities are responsible for the provision of water supply and wastewater disposal.

Due to the decentralized decision-making process, the water sector is very diverse. For example, local authorities can delegate the provision of water services, and they can choose the degree to which they privatize their services.

Special-purpose vehicles also play an important role in the water sector. They are usually formed by local authorities on a voluntary basis or because of legal requirements to jointly supply water or sanitation. These vehicles provided 17% of Germany's water supply in 2008.



There are more than 6,200 utilities and water supply companies in Germany. In 2008, 56% of these were public entities providing 36% of the water supply, while 44% were private companies providing 64% of the water supply. The last 15 years has seen the number of private companies double and the proportion of water they supply increase by 13%. In addition, around 100 larger utilities (less than 2% of the total) provide almost half of the total water output.

In contrast, sanitation is considered the core responsibility of local authorities and around 90% of services across the country are run as part of routine local government administration.



Infrastructure

Since the reunification of Germany in 1990, water and wastewater utilities have invested more than €110 billion in infrastructure. As a result, the country has extensive and highly-efficient supply and sanitation networks. The water supply network is 530,000km long, the sewerage network is 540,000km long, and there are close to 10,000 wastewater treatment plants in the country.

Water losses in supply networks have been decreasing and currently stand at approximately 6.5% – by far the lowest in Europe.



Finance

Water prices are set by water suppliers and audited by local authorities. They are based on the cost recovery principle. This means that prices cover both the fixed and variable costs of water supply and sanitation, and reflect the amount used.

German water prices are competitive compared to other European countries. According to a 2010 survey, on average each consumer pays €82 a year for water and €116 a year for sewerage. Of the countries surveyed, only consumers in Poland paid less for their services. Water prices have also risen below the level of inflation for at least a decade.

Germany (continued)



Regulation

EU legislation provides the framework for German policy-makers in the water sector. The most significant EU legislation is the 2000 Water Framework Directive (WFD), which governs the use of European water resources. Other European directives provide guidelines for areas such as handling wastewater, groundwater, drinking water and pollution.

The WFD's over-arching objectives are implemented in Germany via the Water Resources Management Act. The act defines public water supply and wastewater disposal as public duties, assigning them significant importance.

Further regulations at a state level reflect the circumstances and political objectives of each state.

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Challenges

Falling water demand creates operational and financial challenges for the water sector. Government studies in the 1970s warned that growing demand would ultimately result in water shortages, so water-saving campaigns throughout the 1980s and 1990s established a water-saving culture. The installation of water-saving devices in households and businesses also led to the reduction of water use from 147 liters per day per person in 1990, to 122 liters in 2009.

In addition to falling demand, the population is decreasing, as well as ageing. According to government statistics, the population will fall from 82 million today to 65-70 million by 2060.

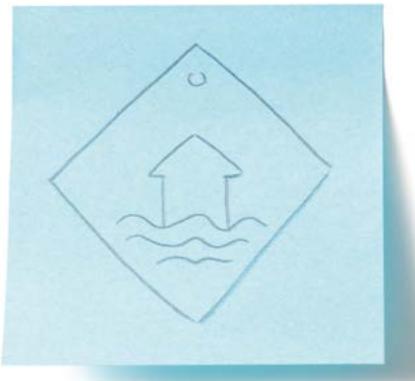
Supplying decreasing volumes of water means that water stays in the supply network longer, which can have a negative impact in terms of hygiene and corrosion. Disinfecting or flushing water through the network can increase costs, as can the need for more monitoring and inspection. Therefore, this means that utilities are selling less water, while their costs are increasing.

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Italy



Italy accounts for 7.4% of the value of Europe's water utilities sector. Italy also uses the most water per person in Europe.

According to Utilitatis and ANEA (2009), more than 57.7 million inhabitants (almost 96% of the population) are covered by water services. Water connections amount to 22.2 million and nearly all are metered (95%). Agriculture is the largest segment of the industry in Italy, accounting for 45.1%, while the industrial segment accounts for a further 34.4%.

Evaporation from the Mediterranean, coupled with a lot of mountainous terrain in Italy, produces an average rainfall of 832 mm/yr, which is higher than most other EU countries. However, rainfall varies widely around the country, with abundant rainfall along the Alps and Apennines, and far lower levels towards the southern coasts and plains.

The total water supply in Italy amounts to 8.1 cubic kilometers per year (km^3/yr), and the operational capacity of Italy's water treatment plants is approximately 8 million cubic meters per day (m^3/d).

The fact that most of Italy's water comes from groundwater reserves, which are usually of better quality and need less treatment than surface waters, helps explain the low percentage of treated water used compared to 'raw' water.



Industry structure

The value of the Italian water industry has increased in recent years, but its performance is now expected to remain static until the end of 2016.



The industry had revenues of US\$19.3 billion in 2011, representing a CAGR of 5.5% between 2007-2011. The performance of the industry is forecast to decelerate, with an anticipated CAGR of 4.8% for 2011-2016, which is expected to take the industry to a value of US\$24.4 billion.

Water consumption has increased in recent years, with a CAGR of 0.1% between 2007-2011 taking the total to 44.9 billion cubic meters. Consumption is expected to rise to 45.1 bcm by the end of 2016, again representing a CAGR of 0.1% between 2011-2016.



Finance

Italy's water sector previously had a traditional financial model, almost completely based on public funding. Water assets were typically started through local public finance and complemented by long-term cheap loans allowed by the National Investment Bank (Cassa Depositi e Prestiti). Water utilities supplied services without needing to cover their costs – even including operational costs. This situation started to change in the 1980s when laws increasingly required utilities to at least balance the books while investment was being provided by the state.

Today, the Italian water industry is under-financed. Investment in infrastructure decreased from €2.4 billion per year in the 1980s to €0.8 billion in 2000, and has remained low ever since.

Investment is needed, especially in the south, to overhaul the outdated water distribution and sewerage networks, increase wastewater treatment capacity and improve drinking water quality in some areas. However, since water tariffs remain extremely low in comparison with other European Union countries, it is unclear how the utilities will fill this financial gap.

Italy (continued)



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Regulation

As an EU member state, Italy is required to adhere to EU water supply regulations such as the EU Urban Waste Water Directive. This covers issues such as setting of tariff rules and approving increases; setting standards for quality of service and environmental protection; and benchmarking performance.

However, that is not enough and Italy lacks a strong, national regulator to monitor the performance of water utilities and stimulate competition.

The legal framework for water services is also fragmented and inadequate. Frequent, and at times contradictory, laws have been created at a national level, and confusion between national and regional jurisdictions persists. The Italian Constitutional Court's slowness to rule on such controversies compounds the issue.



Challenges

The institutional framework can be seen as the primary challenge for Italy's water industry.

Another issue is that, while most people are connected to a water supply, it does not guarantee high levels of service. In fact, from 1995 to 2008, irregularities in water supply affected 15% of the national population. Regions in the south faced the most irregularities, at 23%.

There remain problems caused by drought, unequal distribution of resources, and inequality of access to supply, again for people in the south in particular. Those who live in areas with lower supply also suffer in terms of high tariffs, because the cost of bringing water to the area is added to their tariffs.

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New Zealand



New Zealand has both an abundant supply of fresh water – due to high levels of precipitation, around 600,000 million cubic meters a year and a relatively small population. New Zealand has the 4th largest per-capita renewable freshwater resource out of 30 OECD countries.

Agriculture is the largest segment of the water utilities industry in the New Zealand, accounting for more than 70% of the industry's total volume.

Industry structure



New Zealand's water and wastewater industry are dominated by local government owned monopolies with minimal private sector involvement aside from asset construction and maintenance.

In New Zealand, water has historically been managed by local councils, with most councils providing a vertically integrated service to the households and businesses in their districts. However, major metropolitan arrangements differ. The Wellington Regional Council collects and treats raw water and then provides it to the city councils in the area. Auckland previously used a similar system, with Watercare being the bulk water provider. Now Watercare is an Auckland Council controlled organisation (CCO) and manages the water and wastewater in the Auckland region. It is the only fully integrated utility operator in the country.

Local authorities are responsible for most potable water supplies in New Zealand. Water systems take water from rivers or underground aquifers, treat it, pump it to reservoirs and then distribute it through a network to consumers. Metropolitan Auckland's supply is sourced from nine dams, the Waikato River and a groundwater source in Onehunga, and treated at six plants across the region. Territorial authorities provide urban stormwater drainage through piped networks and open drains.

While ultimate responsibility for water provision is retained by state agencies, private entities, such as, Veolia, Downer NZ and others are often used to help deliver services. In New Zealand, private companies commonly provide capital expenditure, asset management, operations and maintenance services.

Low participation of private companies in New Zealand is primarily due to the country's regulatory framework. Prior to November 2010, the Local Government Act 2002 stipulated that a council could not enter into a joint arrangement with an organisation for the purpose of providing water services for a term longer than 15 years, which was too short for investment in long-term infrastructure assets. However, a recent amendment to the Act has increased this limit to 35 years.

Infrastructure

New Zealand is a long and narrow country with over 18,252 kilometres of coastline. New Zealand administers a large portion of water around the country, with an exclusive economic zone of over 4,300,000 square kilometres, an area that is nearly 15 times larger than the landmass of the country. New Zealand's waters are rich in natural and mineral resources, such as marine life and oil reserves.

The water distribution system comprises of 960,000 households and buildings that are connected to a centralised water supply. However, only 527,000 or 55% of these connections are metered. Further, not all metered properties are charged for water by volume.

Irrigation infrastructure includes the assets required for flood, spray and micro-irrigation systems. 620,000 hectares (1.5%) of New Zealand's land by area is equipped for irrigation, 84% of which are in the South Island.



New Zealand (continued)



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Finance

The water account in the country is self-funding. This means that water sales must pay for the costs of providing water.

Most of the costs for supplying water to the community are fixed (around 90%). The basis for calculating water charges was set by Council on the recommendation of a working party (including Council, business and community representatives).

Current production uses of water, such as agriculture, were metered and users had to pay volumetric fees, whereas water and wastewater services to households cost US\$542 as a standard annual charge.

In urban areas such as Auckland, the tariff for water is US\$1.30 per 1,000 liters, along with a charge of US\$1.34 for waste water.



Regulation

In New Zealand there is no coordinated national framework, no national ministry responsible for water and wastewater provision, and a large number of state agencies regulate the sector to varying degrees (including: MfE, MED, MoH, DHBs, DoC, NZTA, MPI, MAF, regional councils). Operators often receive inconsistent or contradictory directives from the different agencies which they have to reconcile.

Economic regulation is only used informally via the Local Government Act 2002. There is no regulator who ensures operators do not collect revenues over and above prudent cost levels.



Challenges

Given the current public sentiment in New Zealand about private involvement in public assets, it seems unlikely that private companies will be operating large-scale full concessions or private utilities in New Zealand in the near future.

Water allocation regulatory frameworks provide insufficient incentives for long-term investors in large water infrastructure projects – particularly in the rural irrigation and hydro-generation sectors of the country. Existing poor investment incentives and limited appreciation of the risks and opportunities in the country's water sector is a major challenge that New Zealand is facing.

The country's water sector faces huge financial challenges. Long-Term Council Community Plans completed over the summer identified a deficit of US\$20.5 billion in long-term water infrastructure spending over the next 10 years, US\$8.5 billion of capital expenditure.

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South Africa



South Africa is classified as semi-arid. While there are significant variations in climate and topography, it is water-poor, with rainfall levels at 58% of the world mean.

Both the value and size of South Africa's water utilities industry have grown since 2010. The industry had total revenues of US\$3.5 billion in 2011, representing a CAGR of 8.1% between 2007-2011. The performance of the industry is forecast to decelerate, with an anticipated CAGR of 7.2% between 2011-2016, taking the industry value to US\$4.9 billion.

Agriculture is the largest segment of the industry, accounting for more than 60% of industry volume.

In much of South Africa, water demand exceeds supply, so water needs to be brought in from other areas; water prices are high compared to other African countries.



Industry structure

All of South Africa's urban areas have water and wastewater treatment infrastructure in place, while in rural areas, infrastructure is generally less well-developed.

In 2000, democratic local government elections were held to implement a new local government system, which included the creation of municipalities – local administrative divisions that are scheduled to take on full responsibility for water and sanitation, amongst other things.



Infrastructure

South Africa represents the largest water industry – in terms of water and wastewater treatment equipment sales – in Africa. Its water infrastructure has a replacement value of several hundred billion Rand.



Nevertheless, deteriorating infrastructure is leading to poor service delivery and even water shortages in extreme cases. Also, studies have shown that a large percentage of rural water treatment plants do not comply with required drinking water quality standards.

South Africa's biggest water consumer is Eskom, which generates about 95% of the country's power. Eskom has started a R500 billion expansion to avoid blackouts, placing pressure on resources as it has been given top priority.



Finance

In South Africa, central government funding comes mainly through unconditional equitable share grants, water service subsidies, and infrastructure grants.

There are considerable variations in the running costs for water treatment plants. For example, plants with low capacity and high-technology processes might cost R6000/cubic meter per day to run, whereas larger capacity or lower-technology plants might cost R200/cubic meter per day.

Recent political developments suggest that the first 6kl of water is going to start being delivered to households free of charge.



Regulation

Regulation 2834 of the Water Act has been revised, with a significant change concerning the qualifications that managers need to have. This is mandatory and should ensure that water companies build their capacity and improve the skills levels of those overseeing operations, to ensure that water treatment is managed with greater professionalism and responsibility.

South Africa (continued)



Challenges

In a recent study to identify operational and maintenance challenges at small water treatment plants in South Africa, the problems generally focused on staffing, documentation, operations, maintenance, monitoring, and health and safety. There were also issues identified around local authorities getting involved in managing plants.

The sewerage system requires development; a 2009 government report stated that only 7% of wastewater treatment systems comply with international standards.

Only 45% of the systems assessed scored over 50%, which means that lots of insufficiently-treated water is being discharged into local river systems. Blame is generally attributed to lack of finance and maintenance, coupled with a shortage of skilled workers in the sector.

The new local government structure for the water industry faces lots of challenges, including the amalgamation of old administration systems, and issues posed by rural areas. The division of powers and functions between district and local councils is also an issue, and the government is intervening to help.

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Spain



Spain accounts for 4.7% of the value of Europe's water utilities industry.

The value of the Spanish water industry has grown strongly in recent years, while water consumption has fallen. Industry performance is expected to slow down, although it should remain at a good level, with an anticipated CAGR of 9.6% for 2011-2016, which would increase the industry value to US\$19.4 billion.

Agriculture is the largest segment, accounting for 58.9% of industry volume, while the industrial segment accounts for 21.8%.



Industry structure

The water utilities industry has long been dominated by public companies. Local authorities have a 54% market share, private companies (including conglomerates such as Veolia Environnement and Suez, and domestic players including Grupo Agbar, Canal de Isabel II and Aqualia) have a 33% share, while public-private partnerships have 13%.

For the period from 2009 to 2015, local authorities are expected to handle 80% of the total water and wastewater treatment in Spain.



Infrastructure

Although water resources are under-used at a national level, there are large regional disparities. To alleviate water scarcity, Spain has built a large number of dams – in fact, it has the highest number of dams per person in the world.



Finance

The average price of water in Spain is €1.5 per cubic meter. The agriculture sector had the highest water consumption in 2011, with total sales of 18.5 bcm. The industrial sector used 6.8 bcm of water during the same period.



Public sector funds for infrastructure repair work are in short supply. So far, the private sector has not proved willing or able to step into the breach. However, some regions are overcoming such problems and are managing to make plans and launch schemes for saving money. While government funding is hard to come by, soil remediation and certain elements of water distribution infrastructure may be eligible for government grants.

While Spain has benefited from EU financing in the past, it is now increasingly looking for private investors for the wastewater sector.



Regulation

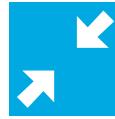
Several ministries share responsibilities for water supply, including setting policies and regulations. Spain has historically focused on maintaining water supplies, but going forward, water policy will focus on online planning and protecting the environment.

As an EU member state, Spain needs to adhere to EU water supply regulations such as the Urban Waste Water Directive. This covers issues such as setting of tariff rules and approving increases; setting standards for quality of service and environmental protection; and benchmarking performance.

Spain's government has recently been restructured, giving local authorities a large degree of control. They can draw up laws and regulations, and manage the water sector to a certain extent. They also have legal control if a water basin lies within their jurisdiction.

The Ministry of the Environment has long been in overall charge of Spain's water sector. It is responsible for strategic planning and coordination of water standard controls, as well as the organization of some major water supply infrastructure. However, this responsibility is likely to be handed over to local authorities under the new structure.

Spain (continued)



Challenges

Climate change is the biggest threat to the long-term sustainability of water services in Spain. Water company operations and assets are among the most vulnerable to a more volatile climate and many are already feeling the pressure. More frequent droughts, more intense rainfall and more flooding are all going to influence investment planning for all aspects of water services. Even though droughts affect all regions in Spain, territories where annual rainfall does not exceed 600mm are those suffering the greatest consequences.

One major issue is that water is used inefficiently in Spain: around 30% is lost before it reaches the consumer.

Other challenges include the need to improve the standard of water that is being supplied; adapt facilities; and reform and improve the water network, incorporating technology into the process.

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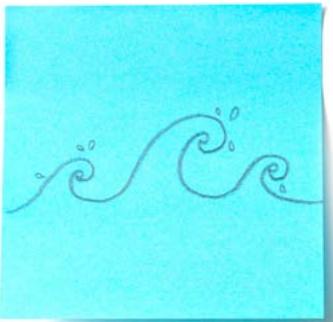
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Industry structure

The industry is made up of 12 water and sewerage service providers and 14 water suppliers. In England and Wales the companies are privately owned. Welsh Water, which supplies services in Wales, is a not-for-profit company. Scotland and Northern Ireland each have a single water and sewage service provider (Scottish Water and Northern Ireland Water) that are in public ownership but rely upon private companies for delivery of many of their services.

The industry is a legacy of UK privatisations in the 1980s and 1990s, as a result of which the 10 large water and sewerage companies were privatised through the sale of shares to the public. Subsequently, many of these companies, together with the smaller water suppliers, have been acquired, typically by groupings of infrastructure funds and pension funds.

Each day the UK water industry collects, treats and then supplies more than 17 billion litres of high quality water to domestic and commercial customers and then collects and treats over 16 billion litres of the resulting wastewater, returning it to the environment.



Infrastructure

The collection, treatment and distribution of water all uses physical assets. Reservoirs, mains, sewers and treatment works are the most obvious and represent around three-quarters of all assets. However, companies also use pumps, vehicles, I.T., remote monitoring, control systems and other equipment. All are essential water industry infrastructure.

The repair and replacement of the underground assets – the mains and sewers, which for decades were fixed only when necessary – is a major challenge and takes a large share of investment.



Finance

The water industry in England and Wales is financed by customer bills and by outside investment. In England and Wales the amount of extra funding needed has been as much as £1 billion a year since 1990. This is why water companies are described as "cash negative".

Companies obtain much of the extra capital they need as long-term loans. This helps to spread investment costs over long periods and to keep customer bills down.

For much of the 20th century investment in water supply and sewerage, like other essential services, was the minimum necessary to avoid service failure. In the past 20 years changing priorities about health and the environment, reflected in European Union directives, have led to urgent demands for improvement.

These priorities and the threat of prosecution by the European Commission led to major investment in the quality of drinking water and wastewater treatment. There was also investment in maintaining plant and pipe networks and ensuring a reliable supply, but these were given a lower priority.

Since 2005 the upgrading of old assets has become the top priority, but investment in all aspects is likely to be needed for the foreseeable future. Managing the impact of climate change will be an important consideration.

UK (continued)



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Regulation

The water industry's operations are underpinned by strong regulation that covers all aspects of the industry's core business – drinking water quality, wastewater quality, environmental improvement and price control.

Many regulations that directly affect the water industry are derived from EU directives – notably drinking water, urban wastewater treatment, water framework, groundwater protection, sewage sludge and health and safety at work. Others, for example economic regulation, are UK specific.

Company priorities are decided through a process of price regulation based on consultation with the public, customers, and other groups with wide interests. The process is known as the 'Price Review' and is led by the water regulator Ofwat and the companies themselves. Its most visible outputs are limits on the prices companies can charge for the 5 years following a review, based on an assumed rate of return on a national asset base, termed the Regulatory Capital Value (RCV).



Challenges

Climate change is the biggest threat to the long term sustainability of water services. Water company operations and assets are among the most vulnerable to a more volatile climate and are already feeling the pressure. More frequent droughts, more intense rainfall and flooding are all going to influence investment planning for all aspects of water services.

The economic regulator, Ofwat, is supportive of increased competition for non-household water users, most notably in pursuing retail competition initially. Ofwat is however also supportive of greater upstream competition, such as bulk water trading. Price limits may be split in the future across various activities of the companies.

The UK regulatory environment is incentives-based, meaning that outperformance against assumed cost is a benefit for the company for a period of time, whether capex savings, opex savings or financing efficiencies.

The significant investment requirements noted above mean that the companies have to raise significant debt. This has been more difficult since 2008, but the companies are viewed as low risk and stable, and have managed to raise adequate funding.



United States



The US is among the highest water consumers in the world, with a daily consumption of 160 gallons per person per day.

The water industry was estimated to be worth US\$107 billion in 2010, and it is expected to grow at a Compound Annual Growth Rate (CAGR) of more than 10% between 2010-2016.¹



Industry structure

The US water industry is highly fragmented and publicly owned systems dominate the water and wastewater segments, accounting for approximately 84% of community water systems and 98% of community wastewater systems.²

The fragmented US water market is in need for consolidation in the wake of limited access to financing. Moreover, the fragmented structure of the industry has negatively impacted the quality of customer service and the ability to raise capital for infrastructure upgrades.³

Service providers can be categorized into four main types: public service providers, private utilities, multi-utilities (which provide a range of broader utilities) and bulk water suppliers (which manage supplies and sell water to utilities).

The largest private water company is American Water, which serves almost 15 million people across more than 30 states and two Canadian provinces. United Water is a close competitor, serving almost 7 million people across 21 states.⁴



Infrastructure

The industry is currently suffering from ageing infrastructure and a shortfall in public sector funding to address capital and maintenance requirements. The state of the aging infrastructure is reflected in the fact that the US loses around 1.7 trillion gallons of water per year due to water mains breaking, at a cost of almost US\$2.8 billion.



According to the US Environmental Protection Agency (USEPA), a capital investment of around US\$633 billion is required to improve water and sewerage services over the next 20 years.⁵

The USEPA has developed several programs – including the Clean Water State Revolving Fund, the Drinking Water State Revolving Fund, and Financing for Environmental Compliance – to help communities and states finance water infrastructure investments.



Finance

The water industry is largely financed by water tariffs, as well as connection fees, fines and other fixed charges. Water tariffs vary from one state to another and in the majority are decided by each state's public utility commission.

Water prices in the US have consistently risen over the past 12 years, despite a decline in usage per person resulting from conservation efforts. For example, prices increased by 7% in 2012 across 30 major cities⁶. While consumers currently pay 75% more for water than they did in 2000, a typical household bill still only represents 0.5-1.0% of disposable income, so cost increases have not so far faced significant regulatory or political resistance.⁷

Price increases have been driven by the need to upgrade ageing systems; increases in the cost of electricity, chemicals and fuel used to supply and treat water; compliance with government clean-water mandates; and increased safeguards for water systems.



Regulation

Public drinking water systems serve approximately 90% of the US population and are regulated by the USEPA and individual states.⁸ Approximately 15% of the US population relies on private drinking water supplies that are not subjected to USEPA standards.⁹ However, some state and local governments do set water quality rules to protect users of these supplies.

United States (continued)



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Responsibility for the environment and safe drinking water regulations is collectively shared by the USEPA, state environmental agencies and water companies. Water prices are regulated by state public utilities commissions and are dependent on the real costs of treatment and delivery of water to customers along with the subsidies provided by the governments.



Challenges

A major challenge is that the water industry needs substantial investment in infrastructure – while steadily declining government funding has left a significant funding gap.

For example, the funding allocation for clean water fell from US\$2.1 billion in 2010 to US\$689 million in 2013.¹⁰ In early 2012, legislation was introduced to remove the cap on private activity bonds for water projects to encourage private investment. However, the bill has not been enacted into law.¹¹

Historically, the water industry is not an overly attractive investment as it is very capital-intensive compared to power and gas utilities. An investment of around US\$7 in the water sector results in US\$1 of revenue, compared to electric power, where it takes US\$1.6 to generate US\$1. Added to this, capital costs in the water sector are rising at twice the rate of inflation.¹²

Water usage in the US is increasing every year, in line with the increasing population which is expected to reach 328 million by 2017.¹³ As a result, almost every US region has experienced water shortages.¹⁴

Finally, 37% of water utility workers and 31% of wastewater utility workers will be eligible for retirement by 2018 according to the US Department of Labor – creating a manpower gap that may prove difficult to fill.¹⁵

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