



# GREEN INDUSTRIES

## **Global Water Market Briefs in 2009**

Briefs Compiled by CS' Environmental Team Leader Veronika Novakova, Czech Republic





## International Water and Waste Water Market Briefs

### Table of Contents

Australia 2009 .....	4
Australia 2010 .....	5
Austria 2009 .....	6
Austria 2010 .....	7
Belgium 2009 .....	8
Brazil 2008 .....	21
Bulgaria 2008 .....	22
Colombia 2008 .....	29
Czech Republic 2009 .....	30
Denmark 2009 .....	38
Egypt 2009 .....	39
Finland 2009 .....	40
Finland 2010 .....	41
France 2009 .....	42
Germany 2008 .....	43
Germany 2010 .....	44
Greece 2009 .....	45
Hungary 2009 .....	46
Indonesia 2008 .....	47
Italy 2009 .....	52
Mexico 2010 .....	53
The Netherlands 2009 .....	55
The Netherlands 2010 .....	56
Poland 2009 .....	57
Portugal 2009 .....	58



## International Water and Waste Water Market Briefs

<b>Romania 2008</b> .....	<b>59</b>
<b>Russia 2009</b> .....	<b>60</b>
<b>Saudi Arabia 2010</b> .....	<b>61</b>
<b>Singapore 2009</b> .....	<b>64</b>
<b>Slovakia 2008</b> .....	<b>65</b>
<b>Slovakia 2010</b> .....	<b>66</b>
<b>Sweden 2010</b> .....	<b>67</b>
<b>Switzerland 2009</b> .....	<b>68</b>
<b>United Kingdom 2009</b> .....	<b>69</b>
<b>United Kingdom 2010</b> .....	<b>70</b>



# AUSTRALIA

## Water & Waste Water Market Brief 2009

### Australia: Important Links & Contacts

Department of Environment - <http://www.environment.gov.au/>  
 Australian Water Association: <http://www.awa.asn.au>  
 Water Services Association of Australia: <https://www.wsaa.org.au>  
 Water Industry Operators Association: <http://www.wioa.org.au>



## Market Overview

Australia spends an estimated USD4.2 billion on the water and wastewater treatment sector. Direct purchases of capital equipment accounts for 30 percent of total spending.

A severe drought that began in 2002 has had the biggest impact on the Australian water and wastewater sector. Water storage levels remain critically low in many cities and regional areas. Governments at all levels are grappling with strategies and projects aimed at securing future water supply. The effects of the drought and population pressure are likely to be greater than the effects of the economic crisis.

Almost all of Australia's key industry sectors source water from the same catchment areas used to supply households. Some of these sectors are now developing a number of small water recycling projects. As the value of water increases, industries that are major users of water will find it more feasible to treat their own wastewater internally for re-use. Recycled water is also expected to affect households and a number of new housing developments are incorporating 3rd pipe reticulation to allow for recycled water.

Water authorities continue to spend significantly in the area of pipelines, storage, cleanup projects, pump stations and treatment plants. In addition, some water authorities servicing key cities such as Perth and Sydney have already commenced construction on major seawater desalination plants. Utilities are planning more large-scale desalination plants.

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### Best Prospects

- Desalination technology
- Trenchless technology
- Nondestructive technology
- Smart metering systems
- Bio-filtration systems
- Presses for conversion of water or sludge waste
- New oxidation systems
- Filtration equipment for industrial waste applications
- Flow-meters for wastewater measurement.

### Planned Projects

Company	Value USD millions	Project
SA State Government	\$1,190	Port Stanvac desalination plant
United Utilities	\$510	Esperance Goldfields desalination plant
Gold Coast City Council	\$365	Pimpama-Coomera water mgt. project
BHP Billion	\$250	Whyalla seawater desalination plant
Sydney Water	\$200	Glenfield sewage plant upgrade



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### Planned Projects

Company	Value USD\$	Project
Victorian State Government	2.7 billion	Wonthaggi desalination plant
Sydney Water	1.8 billion	Sydney desalination plant
SA State Government	1.1 billion	Port Stanvac desalination plant
Sydney Water	225 million	St Marys recycled water plant
Sydney Water	90 million	Rosehill recycled water plant



# Austria



## Water & Waste Water Market Brief 2009

### Austria: Important Links & Contacts



Ministry of Environment – <http://www.lebensministerium.at/>

Ministry of Agriculture – <http://www.lebensministerium.at/>

Federal Agency for Water Management – <http://www.baw.at/index.php?lang=en>

Austrian Association for Gas and Water – <http://www.ovgw.at/en>

Federal Chamber of Architects and Chartered Engineering Consultants –

<http://www.bsik.at/en/wasser/profil.html>

## Market Overview

In Austria, all tap water is potable. The average per capita water use is approximately 135 liters per day, and a 4-person household uses an average of around 200 m<sup>3</sup> of drinking water per year. The cost of drinking water is 1.07 Euros per cubic meter. According to the latest available figures, 90% of all Austrians purchase water from a provider. Considering the topography of Western Austria, this is considered to be very close to full water network expansion. The water delivery network is 59,000 km long, and includes 2,900 tanks with 4.2 million cubic meters of capacity. There are over 1.1 million building connections, and 2,630 spring taps.

Because of the high quality of Austria's water sources, drinking water disinfection and treatment is more the exception than the rule. Most disinfection systems are in a stand-by mode. The technology is chlorine or chlorine gas. There are also a handful of activated carbon facilities in areas where higher concentrations of pesticides are a problem.

In 2006, there were 1,508 sewage treatment plants in Austria with capacities over 50 PE (population equivalents). As is the case with the drinking water network, Austria's level of canalization is considered to be close to its full potential: according to figures from 2003, 88.9% of the population is connected to a sewage treatment plant with at least 50 PE. The state of the art technology in sewage treatment is organic activated sludge, whereby the sewage passes through holding areas that contain bacterial agents. At the end of the process, the sludge is collected and dehydrated, then in most cases burned. The large municipal plants in the major cities not only handle the largest flows, but are also the most modern facilities. Thus Austria's scores in removing pollutants from wastewater are, in comparison to other European countries, excellent.

### Did you know?

*Most Austrian drinking water is distributed without treatment or disinfection. While it is true that all of the larger water providers have a disinfection system installed, they are generally not in use.*

*90% of all Austrians purchase water from a provider.*

*90% of the population is connected to a sewage treatment plant with at least 50 PE.*



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# Austria

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## Market Overview

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Because of the high quality of Austria's water sources, drinking water treatment is more the exception than the rule. The disinfection technology employed in larger population centers is a combination of UV and chlorine or chlorine gas. There are also a handful of activated carbon facilities in areas where higher concentrations of pesticides are a problem.

In 2006, there were 1,508 sewage treatment plants in Austria with capacities over 50 PE (population equivalents). As is the case with the drinking water network, Austria's level of canalization is considered to be close to its full potential: according to figures from 2006, 91% of the population is connected to a sewage treatment plant with at least 50 PE. The state of the art technology in sewage treatment is organic activated sludge, whereby the sewage passes through holding areas that contain bacterial agents. At the end of the process, the sludge is collected and dehydrated, then in most cases burned. The large municipal plants in the major cities not only handle the largest flows, but are also the most modern facilities. Thus Austria's scores in removing pollutants from wastewater are, in comparison to other European countries, excellent.

### Did you know?

*...that Austria's water delivery network is 59,000 km long, and includes 2,900 tanks with 4.2 million cubic meters of capacity?*

*...that 90% of all Austrians purchase water from a provider?*

*...that 91% of the Austrian population is connected to a sewage treatment plant with at least 50 PE?*



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## BELGIUM

### Water and Waste Water Market Brief 2009

#### Summary

The Kingdom of Belgium is a federation of three Regions (Flanders, Wallonia and Brussels) with three national languages, of which Dutch and French are predominant. Flanders, in the north of the country, has many medieval art cities such as Antwerp, Bruges and Ghent. To the south, Wallonia's main cities are Liege, Namur, and Tournai, while the city of Brussels is one of the world's great cosmopolitan capitals and home to both the European Union and NATO, as well as a wealth of international trade and finance companies.

The country is densely populated and heavily industrialized. Roughly the area of Maryland, Belgium has a population of 10.5 million and a GDP (2008) of USD 450 billion. Belgium's economy has many small and medium enterprises, and is focused on the manufacturing and services sectors.

This small European nation ranks as the 12<sup>th</sup> largest market for U.S. exported goods and services, but rises to 11<sup>th</sup> position if transit goods are included, showing the relevance of Belgium as a transit country. Trade between the United States and Belgium is fairly balanced, with Belgian exports to the United States representing USD 22.7 billion in 2007, and U.S. exports to Belgium amounted to USD 20.2 billion in the same year. There has also been a tremendous increase in Belgian direct investment into the United States, at USD 19.5 billion in 2007 making it the tenth largest investor in the nation.

Many U.S. firms choose Belgium as the hub for their European distribution because of the access to a highly educated workforce and excellent transport infrastructure, including major port terminal facilities and a dense road network. In Flanders alone, 14% of all foreign firms are U.S. companies, mostly active in medium- to high technology sectors. Approximately 35,000 U.S. citizens have their residence in Belgium, and the country is host to 1,600 American companies employing 8% of the working population, that together are responsible for 6% of GDP, 14% of R&D expenditures and 15% of the country's exports. The cosmopolitan and international nature of Belgium and its position at the crossroads of different business cultures makes it an ideal European test market for American products and services. Additionally, it is at the geographical center of western Europe, located within a 375-mile radius of 70 percent of the EU's purchasing power.

The following provides an overview of the Belgian energy market. Currently, several shifting factors influence the rapidly changing Belgian energy market, among others the continuing EU-wide process of de-regulation and liberalization, the discussion on phasing or non-phasing out of nuclear energy, the incentives to develop renewable energy sources, the changing structure of the country's energy distribution and so forth. U.S. companies wanting to export to the Belgian energy market must be aware and take into account these uncertain or changing factors, which will determine the potential for exports of relevant goods and services to this market.

## Market overview

Except for coal and some renewable energy potential, Belgium has no natural energy sources. The coal mines that supported the country's industrial revolution in the 19<sup>th</sup> Century have become unprofitable and the last mine was closed in 1994. The country now imports all its coal, natural gas and petroleum requirements for its energy needs that amount to almost 42,000 ktoe (kilo-ton oil equivalent, or about 489 TWh).

Of this total consumption, 31% is used for residential needs, 30% by the industry and 23% for transport purposes. Because of various policies (among others, energy security and environmental considerations) there has been a slight shift in energy sources. Between 2000 and 2007, solid combustibles dropped from 13.9% to 7.8%, petroleum dropped from 40.7% to 39.2% while natural gas grew (22.3% to 25.4%), as did nuclear energy and renewables (20.8% to 21.4% and 1.6% to 5.0%, respectively).

Regarding electricity production, Belgium has an installed capacity of 104.600 GWh, but produces 88.800 GWh and imports a further 6.000 GWh. Of the national electricity production, 54% comes from nuclear energy, 39% from fossil fuel power plants, 5.4% from renewable energy sources and 1.5% from hydraulic pumping stations.

On the national level, energy policies in Belgium are guided by strategic and socio-economic interests. As with most western countries, strategic interests concern the security of supply and source diversification, especially in view of recent disruptions of gas deliveries by Russia to the EU. Recently two new supplier countries have emerged in 2006, Qatar and Libya, on top of the traditional gas-producing countries delivering to Belgium. This issue has led to a national (still ongoing) debate on the possible overruling of the decision to abandon nuclear energy in the country. Economic interests are largely the result of breaking up former national monopolies on energy production, transit and delivery as enforced by EU legislation. Social interests include environmental considerations and EU directives stemming from the Kyoto Protocol, and job retention and creation.

## I. The liberalization of the Belgian energy market

### I.1. Federal government and regional government regulatory commissions

The federal law of April 29, 1999 transposing the EU Directive 96/92 into Belgian law defined the first general framework for the opening of the Belgian electricity and gas market. This was put into effect in different phases through subsequent executive decrees on issues such as access conditions for third parties to the transmission network, and all regulatory aspects. The three regions of Flanders, Wallonia and Brussels have also transposed the European Directive for electricity and gas markets deregulation between 2000 and 2004. Under the special act of 8th August 1988, the federal government became responsible for "matters, which, owing to their technical and economic indivisibility, require equal treatment at national level". The new EU directives [2003/54/EG](#) of June 26 2003 on general rules of the internal market for electricity and [2003/55/EG](#) on general rules for the internal market for gas were transposed into Belgian federal law in the summer of 2005.

A federal regulatory commission CREG (Committee for Regulation of Electricity and Gas) had been set up in 2000 in order to monitor the electricity and gas markets. It advises the Belgian authorities on the structure and operation of the liberalized electricity and gas markets and monitors the application and efficiency of relevant laws and regulations. A General Council, consisting of representatives of the federal and regional governments and major trade associations, and of producers, distributors and consumers, monitors the CREG's operation in its turn. In the federal laws of 2005, CREG's mission became somewhat reduced in favor of the Federal Ministry's Energy Administration.

Each of the three regions has set up its respective regulatory commission, namely VREG in Flanders, CWAPE in Wallonia and BRUGEL in Brussels. In addition to supervising the operation of the electricity market, these institutions also play a central role in issuing supply licenses, authorizing cogeneration and power generating facilities, including renewable energy, and issuing and managing green power certificates.

The Federal Government is responsible for the overall tariffs, including for using the transmission and distribution networks, the production and the transmission of electricity at a voltage level above 70 kV, and classic and nuclear production of electricity, as well as all matters pertaining to Belgium's offshore exclusive economic zone.

The regional legislatures of Flanders, Wallonia and Brussels have the competency to regulate distribution and local transmission of electricity over networks with a voltage level less than or equal to 70 kV. They establish the technical legislation regulating the distribution networks up to 70 kV and define the eligibility conditions for customers connected to this grid, mostly SMEs and households. They are also responsible for policies on renewable energy (except for offshore wind farms) and on the rational use of energy.

All further information and most legal documents are available on the following websites:

- Federal government <http://mineco.fgov.be/>
- Federal Regulator [www.creg.be](http://www.creg.be)
- Regulator of the Flemish region [www.vreg.be](http://www.vreg.be)
- Regulator of the Walloon region [www.cwape.be](http://www.cwape.be)
- Regulator of the Brussels region [www.brugel.be/](http://www.brugel.be/)

## I.2. Electricity

### a.) Production

The production activity is now totally liberalized in Belgium. Nevertheless, the law of 29th April 1999 sets out an authorization procedure for new production units, adapted by the Law of 1 June 2005 where the Minister of Energy issues the final authorizations having taken advice from CREG. The phased liberalization of Belgium's electricity market from 1999 to 2005 has not yet triggered the expected competition between utilities and the arrival of new players capable of competing with the incumbent former monopolist, and also the anticipated investments in energy infrastructure have lagged.

According to CREG, this is because the EU policies implementing the liberalization process were based on considerations assimilating the power industry with the telecoms market. However, many economic factors lead to differences between both sectors. Among others, the fact that electricity as a commodity is very inelastic in the short and medium terms. Also, the differentiation in implementation of liberalization between EU countries and the earmarking of the electricity production as a "national interest" in some member states has led to some large European utilities being capable of expanding into new markets while their own domestic markets were being shielded against competition. As such, foreign players now control the majority of Belgium's electricity production capability, as Belgium was one of the first member states to open up its market. These main foreign actors are France's GDF/Suez (owners of Electrabel and Electrabel Customer Solutions), Germany's RWE and E.ON, and Spain's Centrica (owners of 51% of SPE).

One technical reason why the pan-European approach to liberalization has, for the moment, not attained its objectives is that the network infrastructure is still targeted at covering national territories, with insufficient transit capacity across borders. The resulting prospect of the difficulty of exporting excess electricity production may have deterred potential investors in this relatively small market. Finally, new investments are hampered indirectly by the particular position of the incumbent, former monopolistic utility Electrabel. Before the privatization of the firm, all investments in Belgian infrastructure have been written off under an accelerated scheme. While amortization is an important cost in price-setting for return on new investments, these costs do not have to be borne by Electrabel who, as a result, has the capacity to offer prices lower than newcomers could. The mere capacity of Electrabel to do so undermines the prospect of investments by new actors. Though no decision has been made on this yet, indications are that the federal government will "claw back" monies from Electrabel so to annul this advantage and level the playing field.

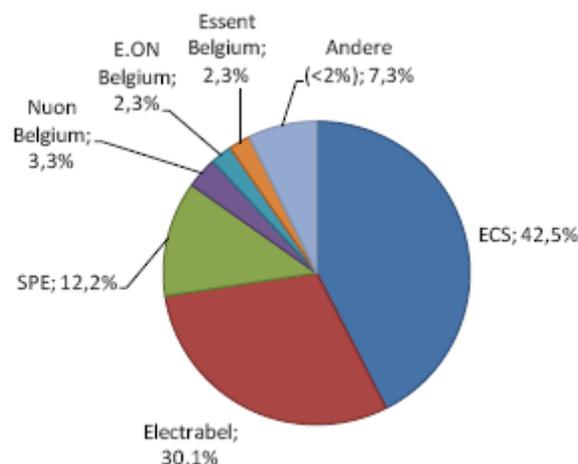
The limited amount of producers has led to the Belpex, Belgium's exchange for power and derivatives launched in November 2006 (more on this later), to have a sub-optimal operation whereas this institution should be the backbone supporting the liberalized trade in these commodities.

On the consumer side, a distinction can be made between private/residential consumers and industrial consumers. Residential consumers have had the freedom to choose their electricity provider since 2005- 2006. But few have actually changed providers, the vast majority keeping their contracts with their traditional utilities. For private users and small businesses, only 10% have shown the willingness to revoke their existing contracts to engage with a different provider. The large industrial consumers have

all renegotiated their contracts for electricity provisions on a bilateral, case-by-case basis. But this has not led to more competition and opportunities for newcomers, as only three industrial users connected directly to the national grid have actually changed suppliers.

CREG remarks, in a document from January 2009, that “if the proportion of consumers changing their electricity providers is a measure for the success of liberalization, then it is really difficult to talk of a success”.

The following graph by CREG shows the electricity players on the Belgian market, representing a total of 78.15 TWh (2008).



Electricity companies cover the vast majority the domestic production. The most important producers are Electrabel and SPE, who together generate almost 86% of national production. Some smaller units in the cogeneration and renewables sector are owned by “distributors” or newly founded companies such as Aspiravi, Ecopower, Electrabel Green Projects Flanders or Electrawinds.

The liberalization process has had the merit of opening up the production-side of the market, and while this did not lead to enough competition yet on the national level, it has allowed private actors to set up their own electricity production facilities on a smaller scale. Most notably SME’s and private individuals are scrambling to install photovoltaic cells on the roofs of their buildings or windturbines on their land. Also larger firms have now the possibility to invest in electric power generation.

So-called “Auto producers” generate electricity themselves to cover their own needs. They are mainly active in the chemical and metallurgic sector. For example, the major German chemical concern BASF is investing in a 400MW power plant on its site in the port of Antwerp to cover its own electricity needs and sell any excess capacity.

Finally, “Autonomous generators” produce electricity as a complementary activity, for example in the framework of waste incineration for resale to a third party. Generators of renewable power and cogeneration facilities can obtain approval from the regulators and receive green power certificates that they can sell to suppliers (that in turn have an obligation to purchase those certificates at pre-established prices). Electricity production by means of co-generation and renewable energy benefits from tariff measures and priority access to the transmission and distribution networks. For more information on renewable energies and support mechanisms in Belgium, please read the market report “Belgium’s Renewable Energy market” of May 2008.

#### b.) Transmission System Operator

Electricity is transmitted over the high-voltage grid from electricity generators to the distribution system operators and large industrial consumers. The law of April 29th 1999 defines the mission and general framework of the rules of access to the transmission network for customers in Belgium, and for the transit of electricity. The technical legislation regulating this access has been published by Royal decree of December 19th 2002. In the same year, the Belgian federal government appointed ELIA System Operator as the Transmission System Operator (TSO), authorizing Elia to retain a legal monopoly for 20 years.

Founded in June 2001, Elia has a license as national TSO at the federal level, maintaining and developing grid infrastructure and connecting electrical installations to the grid. Elia also has licenses as distribution system operator in Flanders for networks with a voltage of 70 to 30 kV and is a local/regional transmission system operator in the Walloon and Brussels regions. Elia must provide smooth and transparent access to the grid, supplying all services to enable the transmission of electricity, monitoring electricity flows on the grid to ensure effective operation and constantly managing the balance between electricity consumption and generation. As market facilitator, Elia can take initiatives to improve the operation of the electricity market. Elia owns all of Belgium's 150 to 380 kV grid infrastructure and almost 94% of its 30 to 70 kV grid infrastructure. Its grid forms a key connection between France, Europe's largest electricity exporter, and the markets of Northern Europe. In 2005, as response to the strong ties between Electrabel, SPE and Elia, Elia's former shareholders Electrabel and SPE reduced their stockholder participation from 70 % to 30 % of the shares. The cooperative company representing the Belgian municipalities Publi-T has taken a 30 % stake. 40% of the shares were listed on the stock exchange.

#### c.) Distribution Grid Operators

The former distribution companies, mainly intermunicipal companies, have been appointed as operator of the distribution network for their respective territory. In other words, the distribution grid operators (DGO's) operate, maintain and develop lower-voltage networks - usually 15 kV and lower. The distribution system operators fall under the authority of Belgium's three regions. In order to comply with the regional legal requirements that prohibit combined interests in production / sale of electricity and its distribution, the DGO's have sold their production capacities to other stakeholders. For complete list of DGO's, visit the websites of VREG, CWAPE or BRUGEL (weblinks at the end of this report).

#### d.) Suppliers

Four different supply licenses are available in Belgium since there are four different authorities governing relationships between supplier and consumer. The competent authority is determined by the location and voltage at which the customer is connected to the electricity grid. According to the Royal Decree of April 2, 2003, a license is required for trading electricity and supplying it to end-users connected to the transmission grid (TSO). The application must be submitted to the CREG, the federal regulator, and is granted by ministerial decision for a period of five years. A licensee is also required to supply electricity to end users connected to distribution networks (DGO). The regional regulators deliver these licenses: VREG in Flanders, CWAPE in Wallonia and Brugel in Brussels. The list of holders of a supply license in Wallonia, Flanders and Brussels is available on the website of the respective regulators. Suppliers are required to submit to the regulators a number of green power certificates in proportion to their sales according to predetermined quotas. These quotas are expected to gradually increase so as to guarantee purchase of the more expensive green electricity, thus promoting investments in renewable energy infrastructure. Consequently, these suppliers are the main buyers of green power certificates.

### 1.3. Gas

Belgium derives 191 TWH, or almost 40% of its energy needs, from natural gas, all of which is imported. Consumption of this gas is spread between use by residential and equivalent consumers (46%), electricity generation (29%) and the industry (25%). Gas consumption has increased about 30% between 1998 and 2008, and a large portion of this increase is due to a sharp rise in gas utilization for electricity generation purposes (some 50% increase in the same period).

The country's import capacity has grown from about 3.45 million m<sup>3</sup>(n)/hour in 2004 to 3.84 million m<sup>3</sup>(n)/hour in 2008, mainly thanks to the expansion of the LNG terminal in the port of Zeebrugge. Three planned projects involving the installation of new compression modules and the expansion of the network connections with other countries will lead to an increased import capacity of 5.44 million m<sup>3</sup>(n)/hour by 2013.

The European Gas Directive 98/30/CE introduced a higher degree of competition in the European gas market in the field of transportation, storage, distribution and sales activities, with gas production being excluded from the scope of the Directive. The liberalization of the Belgian natural gas market was implemented between 2004 and 2007 for industrial and private consumers alike. As of July 1, 2004, a freely chosen supplier could meet 91.5% of Belgian demand for natural gas, approximately 11 % gas liberalization increase compared with the end of 2003 according to CREG. As has been seen for the electricity market, as a consequence of the new regulation, gas companies were divided so to avoid conflicts of interests, separating transport and distribution activities from sales.

#### a) Natural Gas Supply

In general, gas is mainly imported from Norway (via the Netherlands), Algeria, and Russia, with the remainder coming from gas hubs from various sources around the world.

#### b) Transport operator: Fluxys LNG terminal and storage

Fluxys is the independent operator for natural gas transmission in Belgium. Its network transports gas under high pressure (over 14,7 bar / 210 psi). The underground gas pipes cross the entire country. Fluxys transport services cover delivery of natural gas at any consumption point in Belgium.

Fluxys LNG offers from its LNG terminal in Zeebrugge the service of receiving and unloading LNG carriers, buffer storage of the unloaded LNG, regasification and dispatching of the natural gas into the Fluxys transmission grid. The Fluxys LNG terminal provides shippers with an import terminal that is a gateway to expanding markets across a major part of continental Europe and into the United Kingdom through the Bacton gas interconnector pipeline. The latter is of strategic importance to the so-called Zeebrugge hub as a major link between the U.K. and European gas transmission systems.

According to an analysis of the contracts between Fluxys and Distrigaz, CREG has required Fluxys to commercialize direct gas transportation services between the Zeebrugge hub and neighboring terminals. All transportation costs including transit contracts which give access to the Zeebrugge hub, should now conform to the tariffs and main conditions approved by the federal institution CREG. The motivation is that all network users have access to the hub, according to transparent and non-discriminatory conditions, favoring liquidity and the future development of the Zeebrugge LNG hub.

Belgium has 5 underground storage areas for gas:

- in liquid form in Zeebrugge Peak Shaving Facility and Dudzele
- in gas form in the Loenhout/Poederlee underground facility. Fluxys reached an agreement with Gazexport, a 100% subsidiary of Russia's Gazprom, in June 2006 to examine the technical and economic feasibility of increasing the capacities at this underground natural gas storage facility. Works have begun in 2007 to further increase underground storage capacity at the Loenhout facility by 15% to a workable volume of 700 million m<sup>3</sup>(n) to a total volume of 1,400 m<sup>3</sup>(n). The storage capacity will gradually be increased over a 4-year period from 2008 to 2011. In addition, send-out capacity will be boosted from 500,000 to 625,000 m<sup>3</sup>(n)/hour and injection capacity is to be enhanced from 250,000 to 325,000 m<sup>3</sup>(n)/hour.
- in gas form in the former coal mines of Anderlues en Péronnes near Charleroi in the south of the country..

#### c) Distribution

Transport of gas between the Fluxys-grid and the consumer under middle and low pressure travels via the pipelines of local distribution networks. Companies active in this area include Interelectra-Pligas, Intergas Netbeheer, IVEG, Sibelga, Iverlek, and WVEM among others. For a full list of local distributors, see CREG's website.

#### d) Suppliers

A license is also required to supply gas to end-users connected to distribution networks. The regional regulators deliver these licenses: VREG in Flanders, CWAPE in Wallonia and BRUGEL in Brussels. The Minister of Energy, on the basis of advice from CREG, issues these permits. There are currently 27 holders of supply licenses in Belgium, the most important ones being Distrigaz (72.4%), GDF/Suez (13%), WinGas GmbH (6.6%) and SPE (6%). BP Belgium retracted from the Belgian market in 2005.

## II. Phasing or non-phasing out of nuclear energy

Belgium's nuclear industry has a long-standing history, with the country's first prototype reactor commissioned in 1962. Although reactors supply more than half of Belgium's electricity output, the future of the nuclear industry remains uncertain due to unclear policy considerations.

In January 2003, an Act was passed barring the construction of any new nuclear plants in Belgium and establishing a limit of 40 years for the operating lives of Belgian reactors. The oldest reactors in Belgium (three units in Tihange) were completed in 1975,

the newest (four reactors in Doel near the port of Antwerp) in 1985. The law anticipates the closure all operating reactors by 2015-2025. The closure schedule appears impractical and expensive to achieve. Nuclear power now provides 54% of Belgium's electricity, thus a sizable share of generating capacity would need to be replaced during 2015-2025 under the law.

None of this replacement is related to the condition or safety of the plants, but rather due to the perceived negative public opinion against nuclear plants. The closure law was elaborated during Green Party participation in a coalition with socialist party that no longer exists, at a time when oil prices were low. Other parties in Belgium have mixed views on nuclear power with some favoring nuclear power – such as the important liberal and the catholic parties. The law includes force majeure clauses that allow operation beyond the nominal closure dates. Two reactors are allowed to operate beyond 2025.

No construction of new nuclear plants is yet projected, and the law of 2003 is still the formal stance of the government. Nevertheless, media information campaigns and other coverage seem to be aiming at preparing public opinion in favor of revoking that law, which would open the way to an extended operating life of the ageing reactors, and possibly the construction of new ones.

Then the Minister of Energy Marc Verwilghen (liberal party VLD) commissioned an intermediary report to review nuclear energy provision by 2030 called “Energy 2030”. Its findings are favoring continuation of the nuclear power plants. According to socialist party (that does not want to annul the closure of the nuclear plants) and the Flemish Greens, the Energy 2030 Commission was strongly politically biased, as it consisted of people with strong ties to the nuclear energy sector. The Energy Institute of the KUL, the research institute of the Energy 2030 Commission President William D’Haeseleer, was indeed largely financed by Electrabel, Tractebel Engineering and SPE, the main players in the nuclear energy sector in Belgium.

Industry heads in Belgium see nuclear energy as the only solution that guarantees energy provision at a reasonable price, as well as an effective means to bring CO<sub>2</sub>-emissions down. It also appears that investments are being made in the maintenance and refurbishing of the existing plants that would not be justified were the reactors to be shut down definitely by 2015.

### III. Renewable energy

As presented above, a collation of green and socialist parties passed a law enforcing the gradual phasing out of nuclear electricity production. Possibly the rationale for replacing the majority of electricity generation from this source was derived from expectations of immense growth in renewable energy sources. Many lucrative fiscal incentives have indeed been set in place to promote generating electricity from photovoltaic, wind and other renewable sources. Furthermore, the European Commission’s Renewables Directive 2001/77/EC establishes an EU-wide target of producing 21% of all EU electricity from renewable energy sources by the year 2010. Under a “burden sharing agreement”, this target differs among the various Member States, and for Belgium this target has been softened to a mere 6%. But despite these financial efforts and legislative obligations, Belgium only produced 3% of its electricity from renewable sources (including biomass) in 2006, and will probably face difficulties to meet its goals for 2010. Renewable energy still presents opportunities in Belgium and will continue to do so in the future, but it is clear that these green sources of energy will not replace the country’s nuclear production capacity in the foreseeable future.

Aware of this situation, a commission of experts called “Ampère” concluded already in October 2000 that phasing out of nuclear energy should be balanced by a mixture of other sources, including the commissioning of gas plants, the maximum exploitation of wind energy (including offshore), biomass, cogeneration and a reduction of electricity consumption or higher efficiency of electricity production.

Renewable energy sources therefore only play one part as the country is facing its future energy needs. On a large scale, a project called the Thornton Bank wind farm was launched by a consortium of private entities, with the installation of six windturbines of 5MW each on the Belgian continental shelf, while a further 54 units would follow in a second phase. The first six turbines have been successfully installed, but the second phase has been postponed, mainly due to the global economic recession strongly affecting one partner in the project (a Belgian dredging firm). Nevertheless, the federal government is pressing ahead with carving out offshore concessions, paving the way for the development of future windfarms.

All renewable energy sources combined, a study has estimated that Belgium has a maximum potential for 10.800 MW on installed capacity, and about 3.500 GWh/yr from biomass conversion. Most investments and incentives are aimed at promoting solar and wind technologies. For more information on renewable energy opportunities in Belgium, please read the market report “Belgium’s Renewable Energy market” of May 2008.

## IV. APX and the Belpex Power Exchange

The introduction of a power exchange in Belgium was a direct response to the opening up of the European electricity markets. The 1996 and 2003 European Directives (1996/92/EC & 2003/54/EC), applied into the Belgian Law (29 April 1999 and 1 June 2005) have created an opportunity to launch an organized electricity market in Belgium, named Belpex. Belpex is a short term, physical power exchange for the delivery and off-take of electricity on the Belgian hub. Belpex facilitates anonymous, cleared trading in 3 different market segments, namely a day-ahead market segment, a continuous day-ahead market segment and a continuous intraday market segment. Belpex' day-ahead market segment is coupled with its two neighbors, APX in the Netherlands and Powernext in France. Members at launch of the day-ahead market in November 2006 were Shell, Electrabel, Morgan Stanley, SPE (Luminus), CNR, EDF Trading, Anode, Essent, Nuon, EGL, Eneco, E.ON Benelux, and RWE Trading.

Belpex' shareholders are the Belgian transmission system operator Elia, Dutch energy exchange APX, French energy exchange Powernext, the Dutch transmission system operator TenneT and the French transmission system operator RTE. Elia is the majority shareholder with a participation of 60%. APX, Powernext, TenneT and RTE hold each 10%.

Both Electrabel and Distrigaz acted at first as the leading Belgian companies in the business, trading electricity and gas. Energy trading exchanges were created in London, Amsterdam, Frankfurt, Leipzig, Stockholm and Brussels. The APX Group launched a gas exchange at the Zeebrugge Hub in close cooperation with company Huberator, called APX Gas ZEE. APX Gas provides an integrated screen based trading platform as well as clearing, while Huberator facilitates the interfaces between the platform and the Huberator system for deliveries at the Zeebrugge Hub.

In March 2009, Belpex started the Green Certificates Exchange. This market trades green certificates, combined heat and power certificates with or without guarantees of origin. Over 6.300 certificates were traded in this first month of operation.

## V. Best prospects

As presented in the previous pages, several trends are still shaping the Belgian energy market, yielding opportunities for U.S. firms.

- 1) Electricity market
  - a) Market liberalization:

Deregulation has been set in place on a policy level, but this has not yet led to a satisfactory level of competition. The federal and regional governments will most likely continue to create incentives to improve the efficiency of market forces on the industry. While the various government bodies have persistently warned against a likely shortage of Belgian electricity production capacity, the industry itself seems reluctant to invest in relevant infrastructure at the moment. Key factors highlighted for this are the fear of a low electricity price in the long run (Belgium's electricity prices for residential and industrial users are on the EU-27 average, but relatively low for western-EU standards), limited cross-border network capacity impairing exports of excess production, and finally uncertainties with respect to environmental policies, the eventual re-instatement of the civil nuclear electricity program and the market behavior of the incumbent utility Electrabel. U.S. firms can therefore expect opportunities in those areas improving some of these bottlenecks.

- b) Production facilities:

CREG has highlighted the need for investments in power generation infrastructure in Belgium because of a perceived future shortage of electricity production. It also notes that investments are taking place in other EU countries with similar energy pricing levels, including by GDF/Suez, owner of the dominant provider Electrabel. Therefore, the lack of investments in Belgium cannot be based solely on economic factors, and investments with associated opportunities for U.S. firms, equipment providers and subcontractors alike, could appear in the near future.

The deregulation and opening of the energy market has allowed companies with no specific tradition in electricity production to invest in their own electricity generation plants. An example mentioned earlier is BASF that has commissioned a 400 MW plant to feed its own production processes.

## c) Nuclear energy:

The uncertainty around the abandonment of the nuclear energy industry in Belgium negatively affects the prospect of any investments in this sector. However, with 54% of Belgium's electricity coming from the seven ageing nuclear reactors, abandonment seems unlikely as no other source can easily replace that capacity before 2015, the date when the first decommissioning is due. One can therefore expect a decision on continuation of the nuclear energy program as this deadline approaches, with subsequent purchases of equipment and services for revamping and maintaining the country's nuclear reactors, if not the ordering of entirely new production plants.

## d) Emissions-controlling measures and renewable energies:

Belgium is committed to lowering its CO<sub>2</sub> output under the EU's adherence to the Kyoto Protocol. Several studies made specifically for the Belgian market have shown that a wide approach will be needed to attain the national emissions-reduction targets. These comprise a mixture of consumption reduction, green/ renewable technologies and investments in cleaner, more efficient production facilities.

Many power plants in Belgium consume a mixture of coal and natural gas, and are highly polluting. Some parties suggest their replacement with more modern versions, which would serve the purpose of capacity expansion as well as lowering the country's output of CO<sub>2</sub> and other pollutants. Possible indications of this trend may be found in the slow but steady progress of Belgium's thermal power stations, from 49.8% in 2001 to 50.4% in 2006. Retro-fitting these facilities with pollution-mitigating devices could also present opportunities for U.S. firms.

In this context, CREG submitted a proposal for an indicative power generation program in 2005-2014, stating that the capacities to be invested in the period 2005-2014 that amount to 1,729 MW in renewable energy sources and 1,749 MW in qualitative co-generation. In this same proposal, by 2014, decisions are recommended on investments in eight units using combined steam and gas cycles (CCGT plants) of 400 MW and four gas turbines with open cycles (GT) of 80 MW.

Further investments come from large industrial sites that focus on co-generation. For example, ExxonMobil has just commissioned co-generation facilities at its Antwerp refinery that generate 125 MW of power, reducing an estimated 200,000 tons of CO<sub>2</sub>. Given the importance of the (petro)chemical industry, the second industrial sector in Belgium with its many processing sites, similar investments can be expected from other companies.

Finally, many smaller businesses are investing in renewable energies given the advantages of using electricity from their own sources (i.e. not subject to a volatile market) and the generous incentives proposed by the government, often allowing for very short return on investments. Distribution centers and other businesses with large surface areas that allow the installation of windturbines and/or photovoltaic cells are driving this market.

## e) Maintenance and provision of spare parts:

Despite the current economic crisis, maintenance and repairs to facilities are still needed, in particular in the secondary (transforming) sector that is well represented in Belgium. Opportunities for small equipment manufacturers specializing in process control and similar equipment can find a market in Belgium, especially when working through an effective, well established distributor.

## 2) Gas market

Natural gas is seen as a key source in Belgium's future energy basket. First, because it is relatively clean. Second, because at least one key provider of gas in Belgium is a reliable partner (Norway), while new suppliers are appearing (Qatar and Libya), promoting the diversity of supply.

Expansion of the country's import and transit capacities are therefore anticipated for the near future. The planned expansion of Belgium's import capacity from 3.84 million m<sup>3</sup>(n)/hour today to 5.44 million m<sup>3</sup>(n)/hour by 2013 can present opportunities for U.S. firms active in provision of hardware (among others measurement devices) as well as service providers (flow management systems etc.).

Further expansion of LNG terminals is a clear possibility given the numerous LNG terminals being developed, or that have recently been commissioned in northwestern Europe. The CEO of GDF/Suez, owners of Belgium's largest utility Electrabel, has indicated that the group intends to create a European gas hub in Zeebrugge harbor. Furthermore, the owner of Zeebrugge's current LNG facilities Fluxys has issued a press release in April 2009 highlighting a cooperation agreement with Exmar to make a detailed assessment on the feasibility of a second LNG terminal jetty in the port of Zeebrugge, specifically aimed at allowing regasification ships to moor. This could provide opportunities for equipment providers and EPC contractors alike, as has been the case for a large U.S. firm for an LNG terminal in the United Kingdom.

## Market entry and barriers

European companies face strong competition from local Belgian firms, especially the incumbent Electrabel, for the reasons mentioned earlier. U.S. companies will face similar competition in this market that is still growing towards openness and maturity. Some U.S. firms have taken a long-term approach and have opened, or plan to open, an office in Belgium. Alternatively, firms may avoid the costs of establishing a subsidiary or opening a branch office by considering potential local partners within Belgium's well-developed business infrastructure. In addition to developing business within the country, Belgium offers an excellent central geographic position and favorable fiscal and infrastructure environments for U.S. companies interested in taking an active role in the de-regulation of the broader EU energy markets. The anticipated central role that Belgium will play in the EU's future energy market as a transit zone between larger consumer markets and as an import hub for natural gas will only highlight the relevance of this country within Europe's energy market.

## Trade events

PowerGen Europe (every year); this year in Cologne, Germany, 26-28 May 2009. The European regional equivalent of the PowerGen fair in the United States. See [www.powergeneurope.com](http://www.powergeneurope.com)

EMART Energy: this year in Barcelona, Spain, 18&19 November 2009. This is the leading energy trading sector forum for the in Europe, normally a two-day conference & exhibition, for European wholesale suppliers of electricity, gas and associated products. See <http://www.emart-energy.com>

## Resources and key contacts / associations

CREG – Committee for Regulation of Gas and Electricity

The CREG is an independent Belgian organization established in 1999, in order to organize the liberalization of the electricity and gas markets. The CREG is the federal regulator, which has four missions: counselor to the federal government, regulator, controller, and dispute settlement. CREG carries out studies and conducts research, formulates recommendations and proposals for the attention of the Minister, evaluates the requests for authorization of production and transport, and monitors the protection of economic competition.

Rue de l'Industrie, 26-38  
B-1040 – Brussels  
Tel: +32 (0)2/289.76.11  
Fax: +32 (0)2/289.76.09  
Website: <http://www.creg.be>  
E-mail: [info@creg.be](mailto:info@creg.be)

VREG - Flemish Regulation Authority for the Electricity and Gas Markets  
Flemish regional Regulation Authority, created in 2000

North Plaza B – Boulevard du Roi Albert II, 7  
B-1210 – Brussels  
Tel: +32 (0)2/775.75.11  
Fax: +32 (0)2/775.76.79  
Website: <http://www.ort.be/vreg/vreg/index.htm>

CWAPE - Wallonia Energy Commission  
Regional Regulation authority for Wallonia

Avenue Gouverneur Bovesse, 103-106  
B-5100 Jambes (Namur)  
Tel: +32 (0)81/33.08.10  
Fax: +32 (0)81/33.08.11  
E-mail: [cwape@cwape.be](mailto:cwape@cwape.be)  
Website: <http://www.cwape.be>

BRUGEL – Brussels Region Commission for Gas and Electricity

Gulledelle, 92  
B-1200 Brussels  
Tel: +32 (0)800 97198  
Website: [www.brugel.be](http://www.brugel.be)

BERT - Brussels Energy Round Table

The BERT is an informal group of companies, associations, governmental institutions and foreign representations interested in energy in Belgium. Presently, BERT's main activity is the organization of lunch conferences with speakers on key national and international energy issues. Attendance, which is broadly based, averages 30 to 100 persons.

Electriciteitsstraat, 35/1404  
B- 2800 – Mechelen  
Fax: +32 (0)1/520.48.57

FEPEG – Federation of Belgian Electricity and Gas companies

FEPEG is the Belgian federation for electricity and gas companies has been created out of BFE and Figaz. BFE was the federation of electricity generators and distributors in Belgium (defends the interests of the electricity companies, as they relate to production, distribution and supply. They represent the sector in safety, standardization and regulation. Figaz was the Belgian Gas federation defending common interest of members in the gas market for import, transport, storage and distribution

Ravensteingalerij 3 bus 9  
1000 Brussel  
Tel.: +32 (0)2 500.85.85  
Fax: +32 (0)2 500.85.86  
Email: [info@febeg.be](mailto:info@febeg.be)  
Website: [www.febeg.be](http://www.febeg.be)

#### Inter-Regies

Inter-Regies is an association, which coordinates the electricity, gas and cable-distribution public sector. It represents the interests of its members and represents them before the regulation authorities.

Rue Royale, 55 box10  
B-1000 – Brussels  
Tel: +32 (0)2/217.81.17  
Fax: +32 (0)2/219.20.56  
Website: <http://www.inter-regies.be>  
E-Mail: [ir@inter-regies.be](mailto:ir@inter-regies.be)

#### APERe (Association pour la Promotion des Energies Renouvelables)

The purpose of APERe is to promote renewable energies and the thoughtful use of energy in the framework of sustainable development. APERe was created in 1991 as a non profit-making organization by several associations and research centers. Nowadays APERe exists with its own "effective members" and backed up by individuals, "sympathizers" and firms from the renewable sector, "associated members". Through its realizations, APERe has acquired a large expertise in the sector of renewable energies. It is now at the center of a substantial network of Belgian and European governmental agencies and firms.

Rue de la Révolution, 7  
B-1000 Brussels  
Tel: +32 (0)2/218 78 99  
Fax: +32 (0)2/219 21 51  
Web Site: <http://www.apere.org>  
E-mail: [info@apere.org](mailto:info@apere.org)

#### Cogen Europe - The European Association for the Promotion of Cogeneration

COGEN Europe was created in 1993. It is a not-for-profit organization and functions as the European Trade Association for the Promotion of cogeneration in Europe and worldwide for a sustainable energy in the future. To achieve this goal, COGEN Europe is working at the EU level and with Member States to develop sustainable energy policies and remove unnecessary barriers to its implementation. Its membership includes more than 160 power companies, power authorities and companies involved in cogeneration in 30 countries. It is a member of the World Alliance for Decentralized Energy (WADE). The COGEN Europe network covers the whole of the European Union, Central and Eastern Europe, and includes also Japan, Australia and the United States.

Gulledelle, 98  
B-1200 – Brussels  
Tel: +32 (0)2/772.82.90  
Fax: +32 (0)2/772.50.44  
Web Site: <http://www.cogen.org>  
E-Mail: [info@cogen.org](mailto:info@cogen.org)

#### EPPSA – European Power Plant Suppliers Association

EPPSA promotes the exchange of experience between the multipliers and the EU, leading to the establishment of European technical rules and standards and participation in their international equivalents. Likewise EPPSA manages the exchange of information and handles queries related to these technologies.

Avenue de l'Opale, 80  
B-1030 Brussels  
Tel: +32 (0)2 743 2986  
Fax: +32 (0)2 743 2990  
Website: [www.eppsa.eu](http://www.eppsa.eu)

**FEBELIEC – Federation of the Belgian Large Industrial Energy Consumers**

Febeliec represents the interests of its members, which are large industrial energy consumers. Together, they represent 90% of the industrial electricity and gas consumption in Belgium. Febeliec is part of IFIECEurope (International Federation of Industrial Energy Consumption).

Square Marie-Louise, 49  
B-1000 – Brussels  
Tel: +32 (0)2/238.97.11  
Fax: +32 (0)2/231.13.01  
E-Mail: [febелieс@fedіchem.be](mailto:febелieс@fedіchem.be)

**For More Information**

The U.S. Commercial Service in Brussels, Belgium can be contacted via e-mail at [thomas.happel@mail.doc.gov](mailto:thomas.happel@mail.doc.gov); Phone +32 (0)2 508 2450; Fax +32 (0)2 508 3644 or visit our website: [www.buyusa.gov/your\\_office](http://www.buyusa.gov/your_office).

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# BRAZIL

## Water and Waste Water Industry 2008

### Brazil: Important Links & Contacts

National Secretariat of Environmental Sanitation of the Ministry of the Cities: [www.cidades.gov.br](http://www.cidades.gov.br)

Brazilian Association of State-owned Environmental Sanitation Companies: [www.aesbe.org.br](http://www.aesbe.org.br)

Brazilian Association of Private Water and Wastewater Concessionaires: [www.abcon.com.br](http://www.abcon.com.br)

Brazilian Association of Infra Structure Industries- [www.abdib.org.br](http://www.abdib.org.br)



### Market Overview

Brazil's population is 183.9 million inhabitants and is expected to reach 228 million by 2025. Water distribution is currently available for 93% of the Brazilian urban population, whereas only 48.3% of Brazil's inhabitants have access to sewage collection services, of which only 32.2% is treated. As a result of the low treatment rate, most of the rivers and beaches at Brazil's largest cities are highly polluted.

The water utility sector in Brazil consists of 27 state owned companies, plus a number of autonomous municipal firms and municipal water departments. The private sector participates in this market through concession contracts, private-public partnerships or joint management contracts with the municipal or state water utilities. The private participation is still quite limited, but increasing. Of the 5,562 municipalities in Brazil, private firms provide sanitation services to only 202.

Recent events had a positive impact in the sanitation sector and increased investments in the business. Law 11455 of January 2007 established the regulations, defined the national policy for the sector, enabled states and municipalities to make their sanitation plans, to create consortiums and establish private-public partnerships. A Federal Government social program, known as the *Economic Acceleration Program* (PAC), attracted R\$40 billion (US\$18.4 billion) to the sanitation sector from 2007 to 2010, using funds from the federal government, state, municipal and private investors. The sector's major challenge is the expansion of sewage collection and treatment which is expected to attract most of the investments.

### Private Sector Investments

As a result of Law 11455, the private sector is increasing its direct participation in the business by operating water and wastewater utilities. The entrance of private companies in the business is expected to increase the demand for higher technology equipment used in the water and wastewater utilities. According to industry specialists, Law 866 of June 1993, which disciplines and regulates procurements of public sector companies in Brazil, determines that the purchase criteria be the lower bid. This legislation discouraged local water / wastewater product manufacturers and exporters to offer sophisticated technologies, thus more expensive products.

*Business opportunities for international companies in Brazil's market are mostly for innovative solutions and technologies, instead of supplies. Some of the critical segments in Brazil's water industry that offer potential for international technologies are in the areas of water loss and water reuse.*

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Emily Taneva  
June 09

## Summary

Bulgaria exhibits a fairly diverse energy mix with an average dependency on imported fuels (oil and natural gas from Russia and also solid fuels). Domestic production includes nuclear energy and solid fuels which are also the main fuels for electricity generation. Bulgaria's role as electricity exporter in the region is changed following the closure of two additional nuclear reactors as part of an agreement for EU accession. There are plans to restore nuclear capacity through construction of a new plant. Renewable energy contribution (biomass and hydro) has been increasing in recent years, although is still below EU average. Final energy consumption has decreased considerably in recent years and the industry is still the most energy-consuming sector. Bulgaria exhibits the highest energy intensity within the EU.

### Statistical Information (Mtoe)

	Primary Energy Supply	Domestic production	Energy Consumption
<b>Solid Fuels</b>	<b>7.2</b>	<b>4.5</b>	<b>1.0</b>
<b>Oil</b>	<b>4.3</b>		<b>3.4</b>
<b>Gas</b>	<b>2.5</b>	<b>0.3</b>	<b>0.9</b>
<b>Nuclear</b>	<b>4.3</b>	<b>4.3</b>	
<b>Electricity</b>			<b>2.1</b>
<b>Renewables</b>	<b>1.0</b>	<b>1.0</b>	<b>0.7</b>
<b>Other</b>	<b>-0.5</b>		<b>0.9</b>
<b>Total</b>	<b>18.9</b>	<b>10.2</b>	<b>9.0</b>

## II. Evaluation of Sector

Electrical Power Systems, Oil and Gas Field Machinery and Services, and Renewable Energy Equipment

- A) On a scale of 1 (low) to 5 (high), evaluate the priority given by the host government to energy development: **(5)**
- B) On a scale of 1 (low) to 5 (high), evaluate country's receptivity to U.S. products & services: **(4)**
- C) On a scale of 1 (heavy) to 5 (little), evaluate competition for U.S. exporters from local domestic suppliers: **(5)**
- D) On a scale of 1 (heavy) to 5 (little), evaluate competition for U.S. exporters from third-country suppliers: **(1)**
- E) On a scale of 1 (severe) to 5 (little), evaluate overall effect of trade barriers on U.S. exports of products and services: **(3)**

### III. Narrative Information

#### Energy Overview

Bulgaria's energy sector is growing but the country is far from its goal of becoming a regional hub linking the European Union with the Black Sea rim. Bulgaria is strategically located for energy transit routes to Western Europe and there are many opportunities in the sector. The country's immediate priority is to recover its former role as a leading exporter of electricity to most of its Balkan neighbors, following the shutdown of Soviet-era four units at the Kozloduy nuclear plant as a precondition for EU accession in Jan 2007. The government is committed to joining three international pipeline projects, Nabucco and South Stream for gas and the trans-Balkan oil pipeline from Bulgaria to Greece. All three projects are in the early stage of development.

Bulgaria is dependent on imports for 70% of its primary energy consumption. Bulgaria's energy provision is based on imported oil and gas, and on electricity generated from a combination of domestic coal, nuclear and, to a much smaller extent, hydroelectric plants. Obsolescence and shortage of capacity appears to be the most obvious problems in the medium term. The electricity sector is now undergoing a long overdue reform. Foreign companies and investors are currently involved in the construction and rehabilitation of the most important conventional facilities.

#### Power Generation and Transmission

Electricity generation in Bulgaria is largely based on coal and nuclear energy (total 81% share). The share of gas and oil in electricity generation is steadily decreasing, whereas the share of renewable sources has been increasing. Electricity in Bulgaria is produced largely by condensing-type thermal plants with poor conversion efficiencies. Losses in transmission and distribution are presently around 20 %, resulting in only 25-30% of the primary fuel actually being available for use by the end-user.

As a new EU member state, Bulgaria's objectives are to ensure lowest cost energy supply to the country. The GOB' plans are for minimization of the dependence on imported energy resources, while meeting its national and international environmental commitments.

Electricity consumption in Bulgaria has grown slowly since 1980 and was a significant exporter of power. In 2006 Bulgaria's National Electricity Company (NEK) produced 46 billion kWh gross and exported 7.8 of these (net) to Greece, Turkey, Serbia and Macedonia. Bulgaria was vital in supplying power for the Athens Olympic games. However, with the closure of two older nuclear units at the end of 2006, no significant surplus is likely to remain. Over 90% of the country's gas supply comes from Russia.

Bulgaria, Europe and the Balkans Power Generation mix 2006:

	UCTE		Bulgaria		Balkan region	
TPP	1 360.2	52.6%	18.84	45.3%	148.7	62.1%
NPP	801.9	31.0%	18.13	43.6%	30.5	12.7%
HPP	305.8	11.9%	4.55	11.0%	59.1	24.7%
Other RES	16.7	4.5%	0.02	0.1%	1.3	0.5%
Net output	<b>2 584.6 TWh</b>		<b>41.54 TWh</b>		<b>239.6 TWh</b>	

## Power Distribution

In 2004 Bulgaria reached a milestone in its power sector reform with the successful privatization of the electricity distribution companies. The first stage in the GOB's restructuring program was the privatization of the seven state owned regional electricity distribution companies. NEK (dominant electricity supplier/operator) and traders such as E.ON, CEZ, EVN are the most active firms in the country.

Currently the companies responsible for the electricity distribution in the respective regions are:

- CEZ (Czech Republic) --Sofia (Sofia city, Sofia region and Pleven)
- E.ON( Germany ) --Gorna Oryahovitsa and Varna
- EVN (Austria ) --Plovdiv and Stara Zagora))

## Nuclear Power

Nuclear power currently accounts for 35% of the country's electrical production. Two PWR model V-320 units still operate at the Kozloduy Nuclear Power Plant while four other Soviet era reactors were shutdown as part of the country's EU (European Union) accession agreement. There are proposals to restart two others, shut down under duress as a condition of EU entry. Its first commercial nuclear power reactor began operating in 1974. The GOB commitment to the future of nuclear energy is strong and the new nuclear plant is scheduled to come on line in 2014.

Since 1956 the Bulgarian government has favored the use of nuclear power for electricity. Initially a research reactor, the IRT-2000, was constructed and then in 1966 an agreement was signed with the Soviet Union for commercial units and providing the basis of the country's power program. In the absence of Bulgarian safety and regulatory bodies at that stage, these functions defaulted to Soviet standards.

The first pair of reactors was VVER-440/230 models, built and commissioned in less than 5 years. The second VVER-440 pair incorporated many of the much-improved safety features of the 213 model. The third pair was the larger VVER-1000 units, 320 models. All these were part of the Kozloduy plant, close to the Danube River border with Romania.

Early in 2005 the government approved the construction of Belene as a 2000 MWe plant. Parsons E&C Europe was appointed architect-engineer for the project to oversee redesigning it. In a tender NEK chose Atomstroyexport (ASE) to build the plant comprising two 1060-MWe AES-92 VVER units with third-generation reactors. Russia's ASE leads a consortium including Areva NP and Bulgarian enterprises in the project. The EUR 4 billion contract was signed in January 2008. In December 2008 the Belene Power Company (BPC) was set up as a joint venture between NEK (51%) and RWE Power (49%) to manage the work.

## Thermal Power and Coal

Approximately 45% of Bulgaria's electricity comes from solid fuels and thermal power. Bulgaria's thermal power plants have installed capacity of 5150 MW (46 % of the total installed capacity in the country in 2006). Currently the country's thermal power generation sub-sector is no longer state-controlled and the privatization process is completed. Most of Bulgaria's thermal power generation assets are obsolete and need to be upgraded or replaced. All local thermal plants have outdated equipment and lack of funding for upgrades.

Now in private hands are the big thermal power generating utilities in Varna, Russe and Bobov Dol. The new owners are European firms with plans for upgrading the coal-fired power plants and developed a strategy to be compliant with the strict environmental requirements and standards.

Some other major strategic investors are already firmly involved in the generation sector. Italy's Enel is the majority shareholder in the lignite-fired Maritza East 3 TPP, where a rehabilitation and desulphurization EUR900 million project kicked off in 2004, while the American AES, started 670MW new build project on the site of Maritza East 1 TPP, estimated at USD 1,876 billion (EUR1.4-billion).

Besides the fossil-fuel power plants Maritza East 1,2 and 3, Bobov Dol, Russe and Varna, there are 21 towns in Bulgaria that have smaller district heating power plants. 30% of those smaller plants are coal-fired and these facilities provide 22 % of the total public and residential heating.

### **Hydroelectric Energy**

There are currently 87 hydro power plants with a combined capacity of 1,980 MW, most of them being located in the southern and southwestern mountainous parts of Bulgaria. The 14 largest of these plants operate within four cascades: Belmeken-Sestrimo-Chaira, Batak, Vacha and Arda, and are all used to generate electricity, cover peak loads and regulate the parameters of the electric power system.

Three major hydroelectric power plants are currently under construction: "Gorna Arda" - 160 MW; "Sreden Iskar" - 93MW, EUR60 million; "Tsankov Kamak"-90MW, EUR220 million.

### **Oil & Gas Industry**

Bulgaria has a 2,200-kilometer gas pipeline network operated by the state-owned company Bulgargaz to carry Russian gas supplied by Gazprom throughout the country, with connections from Romania and to Greece and Turkey. Since 1975 the pipeline has been owned, operated and maintained by the large state-owned gas utility Bulgargaz EAD. The gas firm long had a monopoly over gas distribution to customers and resale of natural gas to neighboring countries such as Turkey, as well as gas transmission. Bulgaria's annual consumption of gas is around 3 bln cu m; almost half of that volume comes from gas deliveries made instead of cash transit charges.

With 92 percent of Bulgaria's gas supplies coming from Russia through Ukraine's pipelines and only 8 percent from a local source in the Black Sea, Bulgaria needs to diversify its gas supplies very soon. Gas is pumped from the country's only gas storage facility in the northern village of Chiren at a daily rate of 4.2 million cubic meters. Bulgaria's minimal oil and gas reserves, poor production outlook, and limited competitive landscape work against the country, are making the country vulnerable. With particularly modest gas consumption, Bulgaria need EUR125 million (\$165 million) in EU aid to build a 184-mile (115-kilometer) link to an existing Turkey-Greece pipeline that would let it import 1 billion cubic meters of gas from Azerbaijan a year. Bulgaria also wants to build separate links to connect its network with Romania's grid. Another USD330 million (EUR250 million) would be needed to expand the storage facility in Chiren.

While Bulgaria currently has no oil pipelines, there are plans to develop new cross-border pipelines to connect Bulgaria with FYROM (Macedonia) and/or with Greece, both to originate at the Lukoil/Neftochim oil refinery in Burgas, one of the largest refineries on the Balkan Peninsula.

## Renewable Energy

In 2008 the renewable sources accounted for 7.3% of the overall energy consumption in Bulgaria. In 2010 11% of the gross domestic consumption will be from renewable sources, according to Bulgaria's EU Accession Treaty. Last year nearly 96% of the green energy was produced in water power plants. The share of renewable energy sources is due to increase in the years to come.

The main driving forces for the growth of the market for renewable energy equipment in Bulgaria are the EU accession of the country and the necessity to cover part of its energy needs after the decommissioning of four units of the only nuclear power plant. The diversification of energy supplies is the reason for the GOB to promote the use of renewable energy sources. The government has elaborated a national long-term program for RES in accordance with the EU legislation and its objectives are:

- Reach the target of 2000 MW installed capacity of solar, wind and biomass by 2020
- Focus on the use of biomass and solar energy
- Achieve 5,75% of biofuels in the total consumption of fuels by 2010 and 10% by 2020

In the EU Accession Treaty Bulgaria has undertaken the commitment to achieve 11% share of the electricity produced by RES in the gross domestic consumption by 2010 and 16% share by 2020. The estimates indicate that the current share of renewables in Bulgaria is 7% and the country is approaching its 2010 target.

In order to support the development of renewable energy sources in Bulgaria, the new Law on Renewable Energy introduced a twelve-year period for mandatory purchase of the generated electricity at feed-in tariffs. As a result, demand for renewable energy equipment and technologies have grown significantly.

## IV. Major Project Opportunities

### Belene Nuclear Power plant

Despite the current financial situation, the Belene nuclear project is moving forward but encountering some difficulties. In April 2009 Russia's Atomstroyexport (ASE) has signed a deal with France's Areva on the construction of the country's second largest nuclear power plant (NPP) in the Danube town of Belene. The consortium was established to deliver two 1,000 MWe VVER-type Pressurized Water Reactors to the Bulgaria's national power grid operator NEK. Siemens, which is amid negotiation talks with Rosatom, will be sub-contractor to Areva for the Belene project. Earlier in the year, the GOB approved a EUR 600 million loan guarantee for NEK by the European Atomic Energy Community (Euratom) and the European Investment Bank (EIB). The government is seeking alternative sources of financing for Belene, following RWE's decision to participate in the project only after it is completely structured.

The energy giant RWE is the plant's strategic investor and shareholder with 49% interest. The German company initially said that it would finance the EUR 4 billion project as soon as the joint venture with NEK was founded. Later RWE declared to delay the financing due to the global financial crisis. The construction works of the 2.000- megawatt plant are scheduled to begin by the summer of 2009 and end in 2010.

### **Melrose will turn Galata gasfield into Repository**

Scottish company Melrose Resources will pump over USD 20 million into the construction of an eight-km underwater gas pipeline linking the gasfield near Kavarna with the depleted field near Galata cape, on Bulgaria's northern Black Sea coast. The move will transform the Galata gasfield into a storage facility by the end of the year outfitting Bulgaria with another repository along with the one in Chiren. The work on the project has been underway since early 2009 and Melrose will invest a total USD 30 million by early 2010 having so far spent USD 6 million on the transformation. Melrose, which was awarded a 25-year concession contract to develop the Galata field in 2001, will start gas production from the Kavarna block in early June at the latest. The block has a bottom capacity of 670 million cu m of gas which could reach up to 1.4 bcm. The gas output from the Galata field dried up in January over exhausted reserves. The residual 250 million cu m of gas in the field will be used as buffers, experts forecast.

The project for a second gas depository came to the spotlight after the country's sole storage capacity in Chiren failed to meet domestic demand amid the January gas crisis triggered by Russian-Ukrainian pricing row.

The transformation will be done in several stages. The facility will initially store 450 million cu m of gas, which will grow to 850 million cu m in 2011. The company will carry gas from the Kavarna block via a pipe running along the sea bottom to the Galata area. Next, it will flow into the national gas grid at Provadia.

In late 2008, Melrose announced it might team up with Bulgarian gas major Bulgargaz for the project, estimated at USD 95.54 million (EUR 71.3 million). The company then said it could set up a joint venture with Bulgargaz with the latter holding up to a 40% stake. To join the project, Melrose needs a gas storage license from the energy regulator. Russian gas monopoly Gazprom has also shown interest in the storage unit having declared readiness to bankroll the project.

Melrose will spend over USD 43 million on drilling and exploration of the Bulgarian Black Sea shelf in 2009, corporate plans show.

### **NABUCCO gas pipeline**

The Nabucco project represents a new gas pipeline connecting the Caspian region, Middle East and Egypt via Turkey, Bulgaria, Romania, Hungary with Austria and further on with the Central and Western European gas markets. The pipeline length is approximately 3,300 km, starting at the Georgian/Turkish and/or Iranian/Turkish border respectively, leading to Baumgarten in Austria.

According to market studies the pipeline has been designed to transport a maximum amount of 31 bcm/per year. Estimated investment costs including financing costs for a complete new pipeline system amount to approximately EUR7.9 billion. The Nabucco gas pipeline is a key alternative of Russian-backed South Stream project. European governments and gas consumers should vow full support to the project to lessen Europe's reliance on Russian gas. The gas fields in Turkmenistan are possible solution for Nabucco pipeline. Azerbaijan also is viewed as a potential gas source for Nabucco, South Stream and South Corridor projects, needs the EU's and Turkey's backing to develop its second large field Shah Deniz 2.

### **Burgas-Alexandropolis gas pipeline**

The Russian, Greek, and Bulgarian leaders signed in 2007 an intergovernmental agreement on the construction of 280-kilometer pipeline transporting Russian oil to Greek port Alexandroupolis via Bulgaria's Burgas port. The aim of the Burgas-Alexandroupolis pipeline is to bypass the Black Sea and reduce the volume of oil being shipped through the Bosphorus Straits and the Dardanelles. The 285-kilometer-long pipeline could initially carry 35 million tons of crude oil annually, but its handling capacity could be later increased to 50 million tons. The project is valued at approximately USD1, 2 billion

( EUR900 million) and it could begin in 2010, adhering to timetables set for construction.

Burgas-Alexandroupolis pipeline would not compete with any other project and a construction of that gas pipeline is aiming to strengthen the security and independence of European consumers. Russian firms will control a 51 percent stake in the venture, including infrastructure like pumping stations, storage facilities, while Bulgaria and Greece will share the rest of 49 percent stake.

## V. Major Trade Events/Fairs and Conferences

April 24-25, 2009	Natural Gas for Europe - Energy Summit	and conference	Sofia
May 19, 2009	Renewable Energy Conference		Sofia
June 17-20, 2009	Energy Forum		Varna
June 6-8, 2009	Bulatom – International Nuclear Forum		Varna
April 15-16, 2010	Annual Conference - Balkan & Black Sea Petroleum Association		Vienna

## VI. Country's Method of procurement

Participation in tender procedures for purchase of services, goods and works are carried out on the basis of Council Regulation (EC) No 1605/2002 of 25 June 2002; Council Regulation (EEC) No 3906/89 of 18 December 1989 as amended; Council Regulation (EC) No 2500/2001 of 17 December 2001), Council Regulation 769/2004 of 21 April 2004<sup>1</sup>.

Tenders are open to all Bulgarian natural and legal persons, as well as those of the EU Member States, Albania, Bosnia-Herzegovina, Croatia, Former Yugoslav Republic of Macedonia, Romania, Serbia-Montenegro and Turkey. **U.S. companies** can bid on these tenders via their Bulgarian or European subsidiaries.

## VII. Point of Contact

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Or visit our website: [www.buyusa.gov/bulgaria](http://www.buyusa.gov/bulgaria)

## VIII. Additional Sources of Information

Bulgargaz EAD	<a href="http://www.bulgargaz.bg">www.bulgargaz.bg</a>
National Electric Company	<a href="http://www.nek.bg">www.nek.bg</a>
Sofia District Heating Company	<a href="http://www.toplo.bg">www.toplo.bg</a>
Kozloduy NPP	<a href="http://www.kznpp.org">www.kznpp.org</a>
Ministry of Economy and Energy	<a href="http://www.mi.government.bg/">www.mi.government.bg/</a>
State Energy and Water Regulatory Commission	<a href="http://www.dker.bg">www.dker.bg</a>
Energy Efficiency Agency	<a href="http://www.SEEA.government.bg">www.SEEA.government.bg</a>
Bulgarian Energy Holding EAD	<a href="http://www.bgenh.com">www.bgenh.com</a>

<sup>1</sup> [http://europa.eu.int/comm/enlargement/pac/phare/publist.htm#legal\\_text](http://europa.eu.int/comm/enlargement/pac/phare/publist.htm#legal_text)



# COLOMBIA

## Water & Waste Water Market Brief 2008

### Colombia: Important Links & Contacts

- Ministry of Environment – [www.minambiente.gov.co](http://www.minambiente.gov.co)
- Ministry of Agriculture and Rural Development – [www.minagricultura.gov.co](http://www.minagricultura.gov.co)
- Water Regulatory and Basic Sanitation Commission – [www.cra.gov.co](http://www.cra.gov.co)
- Water Supply and Sewerage Association (ACODAL) – [www.acodal.org](http://www.acodal.org)
- Superintendency of Residential Municipal Services (SSPD) – [www.superservicios.gov.co](http://www.superservicios.gov.co)



## Market Overview

The Colombian water sector is fully decentralized since the approval of Law 142 of 1994 the Colombian government enacted the Residential Municipal Services Law and it is constantly improved by the Water Regulatory Commission with complementing regulations, allowing private operators and the government has embarked in an ambitious program (Planes Departamentales de Agua) to allow States (Departamentos) to improve existing water treatment infrastructures to increase the current nationwide aqueduct coverage of 83.6 percent (sewerage systems reached 73.4 percent coverage). Urban areas aqueduct coverage reached 94.5 percent and 90.1 percent in sewerage.

The Ministry of the Environment assumes that close to 80 percent of Colombia's municipal entities to dispose of untreated wastewater into rivers or lakes. Colombia is a regional leader in the development and implementation of a wastewater pollution "tax" (*tasa retributiva*). However, only a few environmental agencies have established regional funds to finance wastewater treatment facilities. Cities such as Bogotá and Medellín own wastewater treatment plants, and other cities such as Cartagena are developing an underwater outfall system with World Bank funding or are developing plans for other treatment systems. Nevertheless, funding remains a central concern. Medellín is developing the Bello wastewater treatment plant with an estimated cost of US \$320 million and capable of treating up to 6.5 m<sup>3</sup> per second which complements the 1.8 m<sup>3</sup> per second San Fernando facility, in operation since 2000.

During 2008, imports of water and wastewater treatment equipment reached US \$315.9 million, up 38.4 percent from 2007.

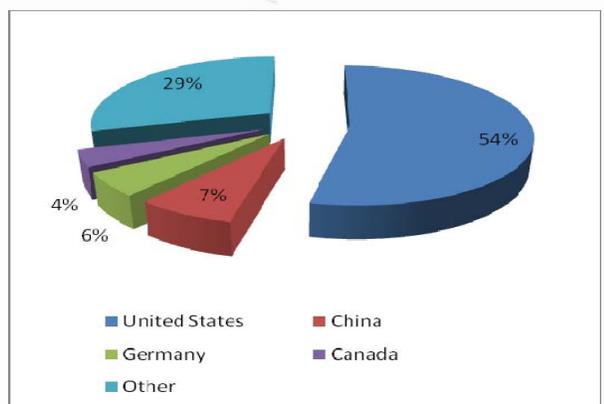
*Further information:* Mr. Julio Carbó, Commercial Specialist  
U.S. Commercial Service, American Embassy  
Carrera 45 # 24B-27, Bogotá, Colombia  
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Tel: +571 383-25-19 / 383-27-23, Fax: +571 315-21-90

### Market Highlights

Upon the approval of the US-Colombia Trade Promotion Agreement, 79 percent of U.S. environmental goods and equipment will receive duty-free treatment immediately. The remaining equipment tariffs will be eliminated in a period of between five to 11 years.

Best prospects include water and wastewater treatment plants, water pollution monitoring and control equipment, pipes, pumps, valves, and environmental services (consulting).

2008 Colombian Imports (by Source Country)





## CZECH REPUBLIC Water and Waste Water Market Brief 2009

### Summary:

With the Czech economy growing at a healthy clip of 6 percent until 2008, demand for energy has been increasing rapidly. However, the life span for many of the existing coal-fired power plants will expire in less than 10 years. The bottom line is that by the year 2020, Czech power plants will be unable to produce a sufficient amount of electricity to supply domestic consumption needs (currently 60 TWh). During the period 2020-2025, the Czech Republic's energy requirements are forecasted to increase by another 15-17 TWh.

It is widely expected that the Czech electricity generation system will continue to rely primarily on two energy sources, lignite coal reserves and nuclear power plants. Renewable sources such as wind farms and biomass burning power plants will not be able to cover the forecasted future shortfall of energy production. Renewable energy sources currently supply 4.7% of the Czech Republic's primary energy needs. This share has been mandated to rise to 8% by 2010. Biomass is considered the most important potential source of renewable energy while wind; solar and hydro sources are limited due to the country's natural conditions. Hydro energy is already being utilized at a very high rate of its potential capacity.

The Czech government is currently reviewing its energy policy as it seeks a balance between environmental protection, energy security, and economic competitiveness. Clearly, it needs to find some kind of combination of nuclear, coal-fired, and renewable energy sources to meet these objectives. The Ministry of Industry and Trade, together with a commission of experts headed by the President of the Czech Academy of Sciences, will be submitting a national energy strategy proposal to the Government in June 2008.

The proposed energy strategy will also reflect measures recently proposed by the European Commission on January 23, 2008. From 2013, power generators will receive fewer permits allowing them to emit carbon dioxide (CO<sub>2</sub>) and they will have to buy purchase any extra credits they need. Presently, carbon permits are distributed free of charge to European utilities under the EU Emissions Trading Scheme (ETS) and the utilities can then sell any credits they don't use. The new policy on carbon credits is designed to encourage investment in renewables and nuclear power. The revamped policy will also discourage the building of new coal plants without carbon capture and storage capacity. The European Commission will also make legislative changes that will allow the energy industry to capture CO<sub>2</sub> from its plants and store it underground. CO<sub>2</sub> captured and stored would not be treated as emitted under the new emissions-trading system. The downside for consumers of energy is that the utilities will be passed along these extra production costs as the supply of carbon permits is tightened.

## Market Overview:

### Electricity:

The Czech Republic has an installed capacity of 17.3 GW. State-owned Czech Energy Works (CEZ) produces 12.1 GW, independent generators 3.4 GW and industrial companies and municipalities 1.8 GW. The majority of installed power generation capacity is based on coal (57%). The shares of nuclear and hydro production are 30% and 10%, respectively.

CEZ ([www.cez.cz](http://www.cez.cz)) is the dominant player in the Czech energy market. It owns and operates the majority of coal-fired power plants and both Czech nuclear power plants. CEZ generates 59.5 TWh, which represents a 72% share of total power generation. CEZ also has a 93% stake in the largest Czech mining company Severoceske doly (North Bohemia Mines) producing 22 million tons of lignite, representing 45% of total lignite mining in the Czech Republic. In 2007, CEZ generated 59.5 TWh of which it exported 28.4 TWh to Germany, Austria and Slovakia.

At present, CEZ is 60.7% state-owned and it has launched a plan for the retrofitting and expansion of its existing coal-fired power generation units. Despite this initiative, projections show that increasing energy needs will create an energy deficit in 2015. With limitations on the amount of coal mining that can be done, there exists only one other option to sharply increase energy generation - nuclear energy. CEZ plans to expand the capacity of its two existing nuclear power plants.

The carbon credit measures proposed by the European Commission on January 2008 are forcing ČEZ to reconsider its future plans and may cause the state-run power giant to delay construction of new power stations. The move may also provoke a new debate on the necessity for additional nuclear power capacity.

### Renewable Energy:

The natural environment of the Czech Republic offers limited possibilities for alternative energy sources with the exception of biomass. A large expansion of wind power generation is planned with a target of 500 MW by 2010. The Czech government currently subsidizes both power and heat generation from alternative energy sources, particularly from biomass, but the previously generous subsidies offered through power redemption prices are gradually diminishing. However, smaller communities remain interested in using biomass for their heat supply.

Renewable energy sources currently supply 4.7% of Czech Republic's primary needs in contrast with an EU-wide average of 6 percent. According to the Czech Government's energy policy, the share of renewable energy should rise to 8% by 2010. An increase of this proportion for renewable sources to supply 8% of energy needs would require approximately \$4 billion in capital expenditures by the year 2010, plus another \$1 billion in maintenance costs. This funding would involve both special-purpose subsidies and other non-budgetary sources such as EU structural funds.

CEZ plans to invest up to \$1.8 billion in renewable resources in the years to come, of which two-thirds will go into the construction of new wind farms. CEZ is considering building 30 to 50 unit wind farms in northern Bohemia and eastern Bohemia. The private company KV Venti has already built a wind farm with 5.7 MW of installed capacity in the Bohemia-Moravian Highlands and has plans to build new wind power plants in Southern Moravia. On the local level, several municipalities have built smaller biomass power units co-generating electricity and heat.

In the past, entrepreneurs were not attracted to developing renewable sources of energy because distribution companies were not willing to pay them what it cost to generate the energy. However, this obstacle has been removed by a decree that, since January 1, 2002, requires compulsory purchase of energy from renewable sources. The Energy Regulatory Office has also mandated a marked increase in the purchase price of electricity from renewable energy sources.

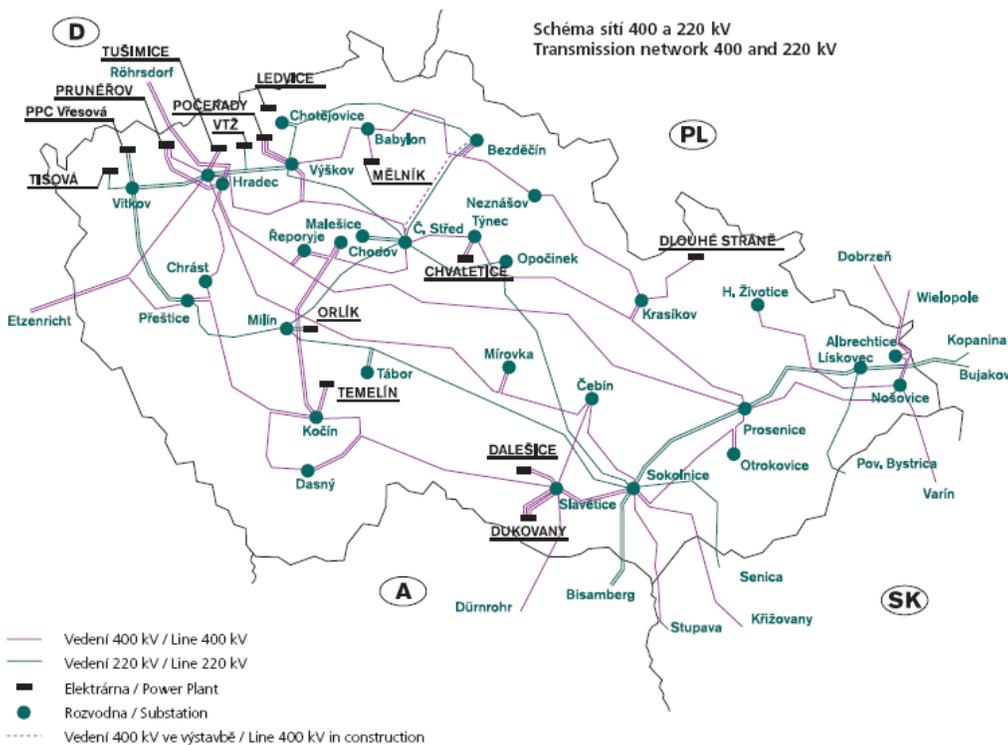
Note:

Although the Czech Republic is not known for its sunshine, it ranks among Europe's largest producers of solar panels. Currently, foreign producers, including Japan's Kaneka and Germany's Schott Solar, are market leaders in the solar business. Czech firms are also looking to position themselves to capture part of the market as demand from local consumers increases.

## Transmission and Distribution

The transmission grid is owned and operated by the Czech Energy Transmission System (CEPS), which is 100% owned by the Czech government ([www.ceps.cz](http://www.ceps.cz)). CEPS is engaged in the EU structures through its membership in the Union for the Co-ordination of Transmission of Electricity (UCTE) since 1995 and at present it participates in the work of many other European energy bodies. CEPS is not limited to serving the Czech power market, it also plays a significant role in power transmission between countries. The geographical position of the Czech Republic in the center of Europe makes this a key function.

EU regulations require that every country should free up a minimum of 10 % of its overall transmission capacity for international trade. The capacity available from the Czech Republic is already at 20 percent and it is fully utilized. There are certain technical problems associated with the cross border transmission due to large volumes of electrical power that are traded internationally. To maintain the internal stability and integrity of the distribution network, CEPS has been investing approximately \$450 million annually to strengthen both cross border transmission capabilities and their own internal networks.



source: CEPS Annual Report 2006

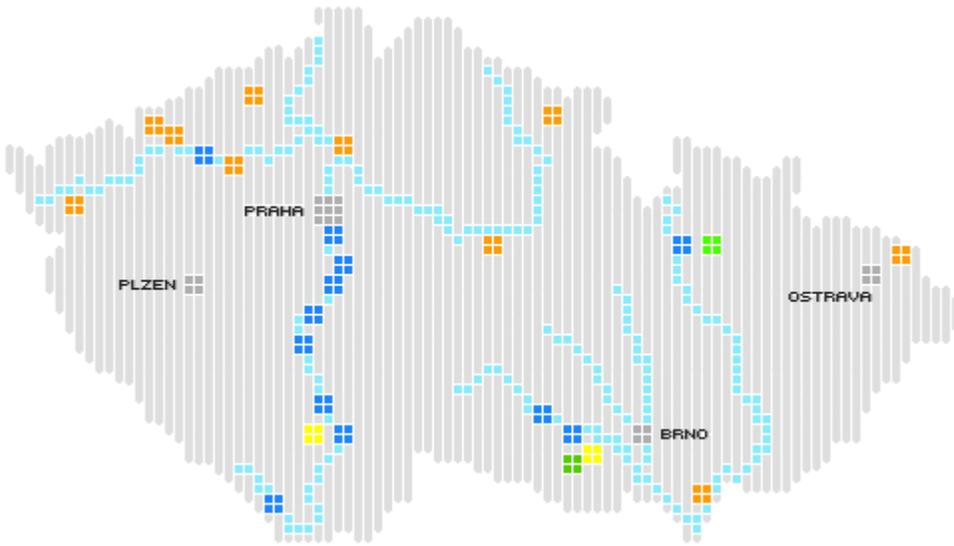
Five (out of the eight) of the previously existing power distribution companies were consolidated into CEZ several years ago. The German firm E.ON bought two of the remaining distribution companies (in South Moravia and South Bohemia). Prague's energy distribution company is jointly owned by the City of Prague and German firm RWE (note: RWE has bought the gas transmission company Transgas and six of the eight gas distribution companies). Since July 1, 2007, all metered customers have had the option of choosing their own power supplier as a means to strengthen competition in the energy sector.

### CEZ Group:

The dominant position of CEZ in the Czech market requires a special section. CEZ is 67% government-owned. It is the most profitable company in the country and it controls nearly two-thirds of the Czech energy market. CEZ is also seeking to become a dominant energy company in East Central Europe, concentrating on the markets in Eastern and Southeastern Europe. In 2004, CEZ acquired three distribution companies in Bulgaria and it now sells electricity to 1.9 million customers there. Through the acquisition of the Romanian distribution company Electrica Oltenia in 2005, CEZ is providing electricity to 1.4 million people in Romania. CEZ has successfully bid for three Polish power producers and has established a joint venture with the American firm AES to upgrade and expand a power plant in the Republic of Serbia in Bosnia and Herzegovina. CEZ plans to become the sixth largest energy supplier in Europe within the next two years. As a result of its successful acquisitions, CEZ provides electricity to 6.6 million customers in Central and Southeastern Europe.

Czech power plants operated and owned by CEZ:

Nuclear	coal	water	wind	solar	
	 Jaderné	 Uhelné	 Vodní	 Větrné	 Sluneční
	<a href="#">Dukovany</a>	<a href="#">Dětmárovice</a>	<a href="#">Dalešice</a>	<a href="#">Mravenečník</a>	<a href="#">Dukovany</a>
	<a href="#">Temelín</a>	<a href="#">Hodonín</a>	<a href="#">Dlouhé Stráně</a>		
		<a href="#">Chvaletice</a>	<a href="#">Hněvkovice</a>		
		<a href="#">Ledvice</a>	<a href="#">Kamýk</a>		
		<a href="#">Mělník</a>	<a href="#">Kořensko</a>		
		<a href="#">Počeradý</a>	<a href="#">Lipno</a>		
		<a href="#">Poříčí</a>	<a href="#">Mohelno</a>		
		<a href="#">Prunéřov</a>	<a href="#">Orlík</a>		
		<a href="#">Tisová</a>	<a href="#">Slapy</a>		
		<a href="#">Tušimice</a>	<a href="#">Štechovice</a>		
			<a href="#">Vrané</a>		
			<a href="#">Želina</a>		



Source: CEZ 2006 Annual Report

Coal-fired plants owned by CEZ will reach the end of their working life within the next six years. The company expects to invest over \$ 4.5 billion in the modernization of these aging facilities.

Power Plant	Project	Dates (estim.)
Tusimice II	Retrofit of four 200 MW units	2008-2010
Ledvice	New 656 MW unit	2008-2011
Prunerov	Retrofit of five 200 MW units	2010-2013
Pocerady	New 660MW unit	2010-2015

The modernized plants will be able to operate for another 25 years. Experts estimate that coal deposits within the mining limits currently in force will be exhausted in 2054. If the coal mining limits are lifted, CEZ would spend another \$2 billion in the construction of new coal-fired plants.

CEZ publishes its tenders in English at [www.cez.cz](http://www.cez.cz) or at [www.centralniadresa.cz](http://www.centralniadresa.cz)

The CEZ Group is active in a variety of industrial areas ranging from the extraction of raw materials and electricity generation to electricity distribution and trading. At the end of 2004, the Group was comprised of 97 companies, of which, 34 were included in the CEZ Group's consolidated financial statements.

## Mining:

Total production of brown coal in 2006 was 49 million metric tons. Brown coal is extracted in coal deposits located in northwestern Bohemia near the border with Germany. Black coal mining is concentrated in Northern Moravia along the border with Poland (Silesia coal base). In 2006, over 11 million tons of black coal was extracted. Of this total, 6.5 million tons was exported. Black coal is mainly used for coke production and in the chemical industry.

### Brown Coal Mines:

Severoceske doly ([www.sdas.cz](http://www.sdas.cz)) belongs to the CEZ Group. In 2006, it extracted 23 million tons of brown coal. This accounts for 45% of total brown coal extraction nationwide.

Mostecka uhelna ([www.czechcoal.cz](http://www.czechcoal.cz)) is the second largest coal-mining company with a 33% market share. MUS is 51% majority-owned by the private group Czech Coal. Cyprus-based Indoverse Czech Coal Investments Limited owns the remaining 49 percent share. MUS has nearly completed the renewal and modernization of its extraction technology, investing more than \$84 million since August 2003. MUS plans to build a new thermal plant in cooperation with the German energy concern E.ON.

Sokolovska uhelna ([www.suas.cz](http://www.suas.cz)) is a private company owned by its management team. The company's share of the brown coal market is approximately 22 percent. Coal is combusted in its own power plant equipped with fluid-based coal gasification technology.

### Black Coal Mines:

OKD (Ostravsko-Karvinske doly, [www.okd.cz](http://www.okd.cz)) is the only producer of black coal in the country.

## Best Prospects:

Equipment for the retrofit of coal plants, including boilers, pumps, piping, control systems

Control systems and software services for power distribution networks

Equipment/services for nuclear reactors

Renewable energy equipment

Control systems, pipeline reconstruction for natural gas

## Market Issues & Obstacles:

The Czech Republic is committed to a free market and generally maintains an open economy, with few barriers to trade and investment. Membership in the European Union means that tariffs and standards, as well as most procedures, must conform to EU norms. The importer usually handles customs formalities. Tariff rates on U.S.-origin goods are contained in the EU's Common External Tariff schedule. Details are available through the EU or through the Czech Directorate of Customs/Ministry of Finance web page: [www.mfcr.cz](http://www.mfcr.cz).

VAT and excise taxes are payable by the recipient of goods on the basis of Czech regulations. The value-added tax (VAT)

applies to all goods, both domestic and foreign, sold within the Czech Republic. The VAT rate is generally 19%, although a lower VAT rate of 9% is charged for selected goods, such as food and services. VAT on imports is calculated on the declared customs value plus applicable duty and excise tax.

Excise taxes are imposed on fuels and lubricants. The rate is determined by the type and quantity of the product and must be paid within ten days after being notified by the Customs Office of the tax amount due.

*As a member of the European Union, the Czech Republic implements the Common External Tariff on Imports from non-EU and non-EFTA countries by charging 10% on CIF. [www.ita.doc.gov/td/tic/tariff/calculate\\_duty.htm](http://www.ita.doc.gov/td/tic/tariff/calculate_duty.htm)*

U.S. companies exporting into the Czech Republic from outside the European Union are required to present:

A commercial invoice

A bill of lading

A shipper's export declaration for items requiring an export license or valued above \$2,500) and a declaration of conformity (issued by importer)

## **Resources & Key Contacts:**

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Phone: +420 257 022 436; Fax: +420 257 022 810 or visit our website: [www.buyusa.gov/czechrepublic](http://www.buyusa.gov/czechrepublic)

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# Denmark

## Water & Waste Water Market Brief 2009

### Denmark: Important Links & Contacts

Ministry of Environment – <http://www.mim.dk/eng>

Ministry of climate and energy – <http://www.kemin.dk>

Danish environmental protection agency – <http://glwww.mst.dk/homepage>

The Danish water works association – <http://www.fvd.dk>



## Market Overview

Danish Drinking water is unique in its almost exclusive use of virgin groundwater for drinking water. Overall the Danish water and waste water market is dominated by domestic suppliers which hold strong positions in the international market. This can be attributed to cooperation between public institutions and private firms, combined with an aggressive environmental policy that has helped push forward the Danish industry in the market. However, Denmark is very open to U.S. imports and if U.S. firms sell competitive products of high quality, they might benefit from entering the Danish market for water services. The Danish water sector itself is, however, a non-profit line of business.

The virgin groundwater accounts for 99 percent of the water extracted in the production of water services. It is unnecessary to cleanse the water with carbon filters or add chloride; only oxidation and cleansing in a sand filter is required before it is drinkable. Because of this, the Danish water service industry distinguishes itself from most of its European counterparts by its high degree of decentralization; around 2700 water works supply the Danish population of 5.6 million. A municipally (150) operated water work extracts 24 times the amount of privately (2550) operated water works on average. Consequently, the treatment of water waste is relatively concentrated; 90 percent of the aggregate water waste is treated in 216 plants – mainly municipally operated water works.

The market for water treatment equipment in Denmark is very mature and dominated by domestic suppliers. The sewer business could be a potential market; the municipalities are preparing to upgrade the sewer systems. Another movement in the industry is an increased focus on energy saving improvements. Both of these market trends can potentially lead to profits for American firms entering the Danish market for in high-quality equipment for use in new installations and for replacement of old equipment

### Highlight Box

- The market for water treatment equipment in Denmark is very mature and dominated by domestic suppliers
- Of the water suppliers' expenses, new investments account for 9 percent, reinvestments 27 percent and operative expenses 64 percent

EU has granted €100 million for 41 projects across EU. Denmark participates in 4 of these:  
**CLIWAT:** prevention of flooding and decreased water quality in the cities.

**WATERPRAXIS:** Countries around the Baltic sea, should share best practice cases, and studies should lead to concrete investments in the Baltic region.

**Ballast Water:** Deals with protection of Sea water. Law will be passed in 2016.

**Aquarius:** The project will focus on agriculture and prevention of water supply. As a result of climate change, agriculture changes – how will this affect the prevention of our water supply.



# Egypt

## Egypt: Important Links & Contacts

Ministry of Water resources and Irrigation – [http://www.mwri.gov.eg/english/english\\_home.asp](http://www.mwri.gov.eg/english/english_home.asp)

Ministry of State for Environmental Affairs- <http://www.eeaa.gov.eg/>

## Market Overview

Egypt lies at the downstream end of the Nile River basin. The country receives hardly any rainfall, and therefore depends on the Nile for almost all its direct water requirements, including agriculture, domestic and industrial supplies, navigation, and tourism. The Ministry of Water Resources and Irrigation is the main body responsible for water resources, charged to protect, develop, control, and allocate water to different uses.

The Ministry of Water Resources is offering a unique opportunity for a Public-Private Partnership in irrigation. The partnership in irrigation is part of the continuing effort by the Ministry to improve water management, increase water productivity, and encourage water conservation and sustainable development. The West Delta Water Conservation and Irrigation Rehabilitation Project is part of a much larger plan to improve and extend irrigation to new lands along the western fringes of the Nile Delta.

The project will provide surface water to the southern part of the west delta where agriculture is flourishing to produce high value crops for the domestic and foreign markets. Huge investments by farmers and private sector were made over the past two decades to introduce modern agriculture and agri-business in the area. As demands are fast growing for surface water to replace declining ground water which is currently the sole source for irrigation, a private operator will be selected on competitive basis to design, build and operate a surface irrigation system. The proposed public-private partnership provides incentives and includes measures that makes the project a unique opportunity.

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### Highlight Box

- **The Egyptian government is considering alternative solutions to overcome water shortages.**
- **Public-Private Partnership in the irrigation sector is on the GOE priority list.**
- **U.S. companies can provide advanced technology equipment in the irrigation field.**



# FINLAND

## Water & Waste Water Market Brief 2009

### Finland: Important Links & Contacts

Finland's Environmental Administration – [www.ymparisto.fi](http://www.ymparisto.fi)

Ministry of Agriculture and Forestry – [www.mmm.fi](http://www.mmm.fi)

Finnish Water and Waste Water Works Association (VVY) – [www.vvy.fi](http://www.vvy.fi)

Finnish Water Association – [www.vesiyhdistys.fi](http://www.vesiyhdistys.fi)



## Market Overview

Water supply plants deliver high quality drinking water to the majority of Finns, over 90 percent of the population, while most of the waste water is purified. The largest cities and towns use surface water as raw water. In the whole country two-thirds of the public water service is based on natural and artificial ground water supplies, and the share is growing. The plants extract groundwater about seven million cubic meters of ground water a day. People who live in the more sparsely populated regions use mainly well water and ground water from natural springs.

Water services infrastructure is relatively new and well maintained. The quality of water in piped water supply systems meets European Union norms, but in rural areas many wells fail to meet the criteria. Waste water treatment in population centers and by industry are of a high European standard, and over 80 percent of the population is connected to centralized sewage systems.

Watercourses in Finland are very sensitive; lakes are shallow, and coastal areas are fragmented into thousands of islands. Thus, very effective waste water treatment is required to preserve water quality, and increased nitrogen removal is widely necessary. Discharges of phosphorus and nitrogen from agriculture are considered a great risk for Finnish watercourses. Services and sophisticated equipment to reduce discharges of phosphorus, nitrogen, and fluoride, in some cases, are considered best prospects for the Finnish market.

Waste water treatment systems for buildings outside municipal sewerage systems, including about million holiday homes, must be brought in line with the revised legislation on waste water treatment by 2014. This is likely to offer market opportunities for U.S. companies offering underground greywater filtering systems and surface level on-site treatment plants designed for easy installation.

### Water Usage

- Amount of water pumped by water works: 408 mill.m<sup>3</sup>/year.
- Water consumption of communities per hook-up: 242 l/day.
- Water abstraction by the industrial sector: 9 500 mill.m<sup>3</sup>/year.
- Domestic water consumption in Helsinki (capital city): 160 l/person/day.
- Water consumption according to consumer group in Helsinki: Domestic 76%, Industry 6%, Public services 17%, Other 1%.

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# FINLAND

## Water & Wastewater Market Brief 2010

### Finland: Important Links & Contacts

Finland's Environmental Administration – [www.ymparisto.fi](http://www.ymparisto.fi)

Ministry of Agriculture and Forestry – [www.mmm.fi](http://www.mmm.fi)

Finnish Water and Waste Water Works Association (VVY) – [www.vvy.fi](http://www.vvy.fi)

Finnish Water Association – [www.vesiyhdistys.fi](http://www.vesiyhdistys.fi)



### Market Overview

Water supply plants deliver high quality drinking water to the majority of Finns, over 90 percent of the population, while most of the wastewater is purified. The largest cities and towns use surface water as raw water feeds to their water systems. In the whole country, two-thirds of the public water service is based on natural and artificial groundwater supplies, and the share is growing. The plants extract groundwater about 0.7 million cubic meters a day. People who live in the more sparsely populated regions use mainly well water and groundwater from natural springs.

Water services infrastructure is relatively new and well maintained. The quality of water in piped water supply systems meets European Union norms, but in rural areas many wells fail to meet the criteria. Wastewater treatment in population centers and by industry are of a high European standard, and over 80 percent of the population is connected to centralized sewage systems. Finland's 13 regional environment centers supervise the water supply and sewerage systems in their respective regions.

Watercourses in Finland are very sensitive; lakes are shallow, and coastal areas are fragmented into thousands of islands. Thus, very effective wastewater treatment is required to preserve water quality, and increased nitrogen removal is widely necessary. Discharges of phosphorus and nitrogen from agriculture are considered a great risk for Finnish watercourses. Services and sophisticated equipment to reduce discharges of phosphorus, nitrogen, and fluoride, in some cases, are considered best prospects for the Finnish market.

Wastewater treatment systems for buildings outside municipal sewerage systems, including about million holiday homes, must be brought in line with the revised legislation on wastewater treatment by 2014. This is likely to offer market opportunities for U.S. companies offering underground grey water filtering systems and surface level on-site treatment plants designed for easy installation.

### Water Usage

- Amount of water pumped by water works: 408 mill.m<sup>3</sup>/year (estimate).
- Water consumption of communities per hook-up: 242 l/day (estimate).
- Domestic water consumption in capital region: 158 l/person/day
- Water consumption according to consumer group in capital region: households 76%, Industry 6%, Public services 17%, Other 1%.

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### France: Important Links & Contacts

French Environment and Energy Management Agency [www.ademe.fr](http://www.ademe.fr)  
French Water and Environmental Industries Federation, [www.french-water.com](http://www.french-water.com)  
French Waterline Constructors Association, [www.canalisateurs.com](http://www.canalisateurs.com)  
French Water Quality Association [www.french-water.com](http://www.french-water.com)

## Market Overview

The total French market for water treatment equipment and related services is estimated to be worth USD 23 billion. A stable economy and financial institutions, stronger European Union (E.U.) regulations, greater public awareness and the increasing costs associated with polluting have played a major role in an expanding market for water treatment equipment and services. In addition, greater interest in complying with environmental regulations by national and local government officials has stimulated this market.

Urban development, environmental concerns and water quality have brought non point source water and rainwater management to the fore in France. Consequently, progressive storm water management policies have been implemented to mitigate the environmental impact of urban development. This is driving the market for rainwater capture, storage and reutilization technologies. Moreover, a growing interest and acceptance in reclaimed water has been driving the market for disinfection technologies such as UV, ozone and chlorination as well as other membrane technologies including nanofiltration, microfiltration, ultrafiltration and reverse osmosis.

Wastewater sludge treatment has remained a hot topic in France. Given the increase in wastewater, effluents and sludge generation, the government and industry have been moving towards "zero sludge discharge and zero waste generation" and membrane bioreactor techniques.

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### Highlight Box

- Despite the current financial and economic challenges, the water sector is still expected to grow at a stable rate and provide continued market opportunities in a number of areas.
- New types of contaminants from pharmaceuticals, hormones and pesticides entering the wastewater stream have increased demand for membrane bioreactor technologies.
- Membranes capable of treating wastewater discharged into sensitive ecological systems are also in high demand.

## Water & Waste Water Market Brief 2008

### Federal Republic of Germany: Important Links & Contacts

Ministry of Environment – [www.bmu.de](http://www.bmu.de)

Ministry of Agriculture – [www.bmelv.de](http://www.bmelv.de)

German Association of Energy and Water Industries – BDEW - [www.bdew.de](http://www.bdew.de)

German Association for Water, Wastewater and Waste – DWA) - [www.dwa.de](http://www.dwa.de)

Association of Local Utilities – VKU) - [www.vku.de](http://www.vku.de)

German Technical and Scientific Association for Gas and Water – DVGW) - [www.dvgw.de](http://www.dvgw.de)



## Market Overview

The German water supply and wastewater disposal industry has to adhere to stringent standards in terms of efficiency, security, quality of supply and disposal, and sustainability. While water supply and wastewater disposal are considered to be of general interest and as such are at the core of municipalities' public services, Germany has a pluralistic supply and disposal structure with public and private companies active in this sector. In total, there are approximately 6,400 water supply utilities in Germany. However, more than half of the drinking water is supplied by only about 100 large corporations (about 1.6% of the total number of companies) mainly serving major metropolitan areas.

In contrast to drinking water supply, wastewater disposal is dominated by public enterprises: wastewater disposal is seen as an obligation of municipalities. In total, there are more than 6,900 wastewater disposal enterprises in Germany.

The degree of connection of private households and industry to the public water supply is above 99 percent. The total length of the drinking water network in Germany is estimated at 500,000 km (not taking into account the actual house connections). 90 percent of the population are connected to sewage treatment plants meeting highest EU standards (biological wastewater treatment with nutrient elimination, "3rd purification stage".)

Wastewater of households which are not connected to central wastewater systems is treated by decentralized sewage purification plants, so that the degree of connection to wastewater treatment plants comes up to almost 100 %. The length of the German public sewage network totals approximately 515,000 km. In addition, there are about 63,000 storm water drainage systems. The volume of sewage sludge amounts to around 2 million tons. Stagnating or slightly decreasing volumes are expected for the future.

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### Highlight Box

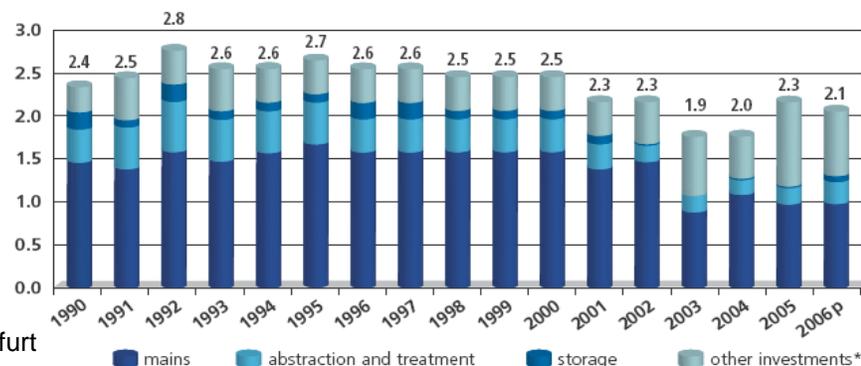
The German water and wastewater industry is well developed and of very high standards.

The quality of tap drinking water is high. However, Germans prefer to drink bottled water. The use of home filtration systems is also growing slowly.

Sales opportunities include energy saving and environmental technologies (e.g., testing and measuring equipment, energy efficiency enhancing or chemical treatment technologies).

### Development of investments from 1990 to 2006 in public water supply

according to asset areas in billion Euro



Source: BDEW Water Statistics; p = provisional

\* other investments = meters and measuring devices and investments, for which a distinction into asset areas is not available

## Water & Waste Water Market Brief 2010

### Federal Republic of Germany: Important Links & Contacts

German Association of Energy and Water Industries – BDEW - [www.bdew.de](http://www.bdew.de)

German Technical & Scientific Association for Gas & Water – DWA - [www.dwa.de](http://www.dwa.de)

Association of Local Utilities – VKU - [www.vku.de/Wasser](http://www.vku.de/Wasser)

Association of Drinking Water from Reservoirs- [www.trinkwassertalsperren.de](http://www.trinkwassertalsperren.de)



## Market Overview

Excellent future prospects for Germany exist in the market for membrane technologies. Especially in the field of water purification and drinking water production there is a wide range of possible applications for filtration membranes.

The world market for sustainable water management is currently estimated at around EUR 190 billion. By 2020, it is expected to grow by to EUR 480 billion. The World Water Council sees a need for capital investment of USD 180 billion per year in water infrastructure in developing countries.

Within the EU, capital of between EUR 170 and EUR 230 billion will be needed to comply with the wastewater directives already in force. By 2020, growth is expected to be fastest in the field of decentralized water management, followed by wastewater treatment and products for efficient use of water. At present, the growing sales markets are primarily the EU Central and East European member states, which still have to bring their dilapidated wastewater infrastructures into line with the stringent EU standards.

### Market Shares

Germany currently has a five percent share of the world market for sustainable water management. In decentralized water management, German companies are world leaders. Germany has occupied the leading position in sustainable water management products for some years now, ahead of Italy and the United States, which is particularly successful in products for water analysis.

When it comes to patent applications in the field of sustainable water management, Germany takes second place behind the United States. With an annual export volume of USD 13 billion, water and wastewater technology is one of the Germany's strongest environmental technology exports.

### Prospects

Domestic demand for innovative solutions is relatively slack in the field of wastewater disposal. Most of the wastewater disposal operations of municipal authorities focus primarily on safety and reliability when buying their plant. It is expected, however, that purchasing decisions in future will also be based on measures of cost effectiveness and innovation.

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### Sustainable water management

#### Size of world market

2005	190 billion euro
2020	480 billion euro

#### Germany's share of world market

2005	~ 5 percent
------	-------------

#### Sales growth

2004 to 2006	12 percent
2007 to 2009	15 percent



# Greece

## Water & Waste Water Market Brief 2009

### Greece: Important Links & Contacts

Ministry of Environment – [www.minenv.gr](http://www.minenv.gr)

Ministry of Agriculture – [www.minagric.gr](http://www.minagric.gr)

Ministry of Merchant Marine, the Aegean and Island Policy – [www.yen.gr](http://www.yen.gr)

Hellenic Union of Municipal Enterprises for Water Supply and Sewerage – [www.edeya.gr](http://www.edeya.gr)

Athens Water Supply and Sewerage Company (EYDAP) – [www.eydap.gr](http://www.eydap.gr)

Thessaloniki Water Supply and Sewerage Company (EYATH) – [www.eyath.gr](http://www.eyath.gr)

National Center for the Environment and Sustainable Development – [www.ekpaa.gr](http://www.ekpaa.gr)

Public & Private Partnerships – [www.sdit.mnec.gr](http://www.sdit.mnec.gr)



## Market Overview

Water management in Greece is, in general terms, satisfactory. Any problems related to water management focus on quantity issues, as water quality in Greece is considered to be high and water borne diseases are virtually non-existent. The uneven distribution of water resources and amount of rainfall creates water availability problems. Agricultural needs account for the most significant water consumption, and demand for irrigation has doubled in the past twenty years.

It is estimated that 98.8% of households have continuous access to an improved water supply and 94.6% of households are connected to a sewage system. The Athens Water Supply and Sewerage Company (EYDAP SA), is the largest company in Greece operating in the water market. EYDAP SA supplies approximately 4,000,000 inhabitants of Attica with potable water through an extensive network that includes 1,796,500 metered connections and a total length of 7,940 km. The sewerage sector similarly serves 3,300,000 inhabitants, with a total network length of 5,800 km.

Large-scale sewage treatment plants have been constructed in recent years. The most significant among them are the Wastewater Treatment Plant in Psittalia, in order to prevent the pollution of the Saronic Gulf by industrial and residential sewage from Athens and Piraeus, and a second wastewater treatment plant in Thessaloniki, northern Greece.

Since December 2003, a new legislative and institutional framework has been put into force in Greece with an emphasis on managing water levels and innovative approaches concerning the protection of water quantity, as well as actions for joint measures to confront transboundary water problems, since 30% of surface waters come from, or pass through, neighboring countries (Albania, FYROM, Bulgaria and Turkey).

In a report revealed in March 2008 by the Ministry of Environment, the largest water surplus in Greece is in the western mainland, and the highest deficit is in Thessaly. Supply concerns are greater on islands that have limited fresh water resources and must rely on transported water. Innovative desalination projects using technologies based on Renewable Energy Sources (RES) are currently being planned for implementation. Candidates for the program include 13 islands, while some smaller islands will receive water from larger islands nearby. The RES plants and facilities will be self-funded, on plots of land granted for this purpose by municipalities, according to the ministry.

Greece's Investment Incentives Law regarding water resource management provides aid of up to 40% of the project cost for water recycling and desalination, and up to 35% for the desalination and production of potable water. Investors may take advantage of: cash grants and/or leasing subsidies, wage subsidies for new employment created by an investment, or tax allowances through the creation of a tax reserve.

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# HUNGARY

## Water & Waste Water Market Brief 2009

### Hungary: Important Links & Contacts

Association of Environmental Service Providers and Manufacturers:

<http://www.kszgysz.hu>

Development Directorate of the Ministry of Environment and Water:

<http://www.fi.kvvm.hu>

Hungarian Water Utility Association: <http://www.maviz.org>

Ministry of Environment and Water: [www.kvvm.hu](http://www.kvvm.hu)

National Development Agency: <http://www.nfu.hu>



## Market Overview

In Hungary public water services are provided by state-, municipality- and jointly-owned water utilities. There are currently five large regional water works companies and more than 300 small municipality-owned ones. Water supply and sewage services are provided often by the same company.

About 97 percent of Hungary's water supply comes from underground sources. All of Hungary's prospective and 600 operating water bases are located in ecologically and geographically vulnerable areas.

Drinking water is available in every town, with 93.7 percent of households connected to drinking water supply. The total pipe network is 64,400 kilometers; the annual public utility drinking water supply is close to 560 million m<sup>3</sup>. A considerable proportion of the network does not meet EU or Hungarian standards.

The public utility gap – sewer length per one kilometer of water supply pipe – is still over 30 percent; only 44.3 percent of settlements are connected to wastewater collection systems. And only 66.5 percent of collected wastewater is biologically treated.

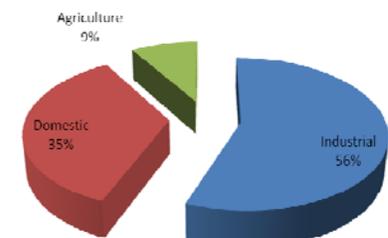
The EU requires that Hungary improve its drinking water and waste water infrastructure. The following technologies and equipment are expected to offer best sales prospects in the coming years: (1) technologies to improve the quality of drinking water; (2) alternative wastewater treatment solutions (“close-to-nature” wastewater treatment, individual wastewater disposal); and (3) monitoring devices and systems.

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### Highlight Box

- From 2007-13, 200 billion HUF (USD 1.2 billion) and 1,000 billion HUF (USD 5.8 billion) is projected to be spent on water and wastewater projects respectively, as part of the New Hungary Development Plan.
- About 2.5 million people – 25.1 percent of Hungary's population – in 873 municipalities are supplied by “unsatisfactory” water (i.e., water contaminated with unacceptably high levels of arsenic, nitrite, boron, fluoride or ammonium).

Water Utility Industry Segmentation: Share by Value



Source: Datamonitor, 2006



# Indonesia: Water Resources Equipment and Services Industry

Aulia Rochaini  
June, 2008

## Summary

Indonesia market of water resources equipment and service currently is estimated at \$122 million, with an average growth rate of about 5% per year. U.S. has the fifth largest market share at 12 percent. Japanese products dominate the sector, with a market share of almost 35 percent.

Opportunities abound in water resources equipment and services for the commercial and industrial sector. The primary end-users of water resources equipment in Indonesia market are: government agencies, environmental engineering companies, industrial parks, food processing companies, pharmaceuticals, industrial chemicals and electronic components industries. Expected growth in the best prospects section of these industries include aeration equipment, filter and filter presses, screens, sludge treatment equipment, pumps, oil separators, liquid-solid separators and biological & chemical products.

U.S. products and engineering services have a good reputation in Indonesia for their quality and advanced technology in the field of water and wastewater treatment. U.S. products such water filtration, water purification equipment & control systems, and water treatment chemicals enjoy a good reputation among local buyers. In general, products from the U.S. are highly regarded for their quality. The major hurdle to overcome in this market, however, is the initial cost of the product and service.

## Market Demand

Indonesia's water resources sector faces increasingly complex long-term investment challenges and management problems, which, unless effectively addressed, will increasingly constrain the country's economic development and lead to a deterioration of food security, public health and irreversible damage to the environment exacerbated by inappropriate and ineffective legal structures, regulations, policies and institutions.

The key environmental problems in Indonesia are as follows:

- An insufficient supply of safe drinking water;
- The scarcity and pollution of water resources;
- Land salting and swamping of the land;
- Pollution in the largest cities and industrial centers;
- The accumulation of solid wastes;
- The contamination of food products.

## Market Data

	2006	2007	2008 (estimated)
Total Market Size	115	119	122
Total Local Production	10	11	12
Total Exports	53	54	55
Total Imports	158	162	165
Imports from the U.S.	19	21	22

Figures given in U.S. dollars in millions.

Note: The above statistics are unofficial estimates

Source: Indonesian Central of Bureau of Statistics

## Best Prospects

Best prospects for U.S. companies are advanced technology and high value-added equipment and components across the entire sub-sector (please refer to the H.S. codes below). U.S. products such water filtration, water purification equipment & control systems, and water treatment chemicals enjoy a good reputation among local buyers. In general, products from the U.S. are highly regarded for their quality. The major hurdle to overcome in this market, however, is the initial cost of the product and service.

- 39.17.29 PVC pipe
- 73.03.00 Tubes, pipes, of ductile iron
- 73.06.90 Tubes, pipes, of steel
- 73.07.21 Flanges
- 73.07.22 Elbows, bends and sleeves
- 84.13.60 Pumps for liquids, other rotary positive displacement pumps
- 84.13.70 Other Centrifugal Pumps
- 84.21.21 Water filtering and purification equipment
- 84.21.29 Other filtering or purifying machinery & apparatus
- 84.79.82 Mixing, Kneading or Stirring machines
- 84.81.10 Water pressure-reducing valves
- 84.81.30 Gate and check valves
- 84.13.30 Pumps, fuel-injection, other
- 84.81.10 Valves, pressure-reducing
- 84.81.30 Valves, check
- 84.81.40 Relief valves
- 84.81.80 Valves, control
- 84.81.90 Valves, parts
- 90.26.10 Water flow/level instrumentation
- 90.26.90 Parts and accessories of water instrumentation
- 90.28.20 Water production and metering instruments

## Key Suppliers

The water resources equipment market in Indonesia is competitive, with an increasing number of international suppliers trying to win projects. Japan, China and Korea dominate the machinery and equipment market. Local companies control the construction services market. Japanese suppliers lead the engineering consultant service market with an estimated share of almost 40 percent, followed by suppliers from other Asian countries e.g. China, Taiwan and Korea and European union countries.

Japanese suppliers have had a strong presence market for years. They provide high-quality machines at very competitive prices compared to their counterparts in Europe and U.S. In addition, due to the geographical proximity to Indonesia, Japanese manufacturers have easier access to the market. They are well versed in Indonesian culture and customs and understand the buyers' needs.

European machinery manufacturers are export oriented and open to the Indonesian customer's requirements and will accept smaller orders. Indonesian end-users look for machinery that is very adaptable, with the ability to adjust to different applications.

## Prospective Buyers

The primary end-users of water resources equipment in Indonesia market are: government agencies, environmental engineering companies, industrial parks, food processing companies, pharmaceuticals, industrial chemicals and electronic components industries.

The municipal water treatment market is split evenly between the government and private industry. The government sector treats water and raw sewage. The private sector supplies equipment for aeration, clarification, disinfection, filtration and sludge treatment. The conventional method of using demineralizers for treatment is being replaced with reverse osmosis and newer technologies such as ultra-filtration and electro-dialysis.

The government makes purchase decisions through a standard tendering process. The overriding consideration in government purchases is cost. However, the private sector is increasingly adopting lifecycle cost analysis for procurement decisions, especially in service-oriented industries such as healthcare and hotels. In the wastewater treatment market, procurement decisions are primarily focused on the minimum standards required to meet government regulations. State governments have the primary responsibility for water use and control. The administrative control and responsibility for development of water rests with the various state departments and corporations.

## Market Entry

There are two main ways in which foreign suppliers distribute their products in Indonesia. Companies which to seek to enter the Indonesian market on a large scale usually establish an exclusive sole agency with a knowledgeable local partner. These local firms are large, offering a professional and complete range of products and services, and are often the winning tenders for large-scale pollution treatment plants. Since this kind of an arrangement requires substantial capital, a number of foreign companies sometimes team in pursuing these tenders.

Although a foreign equipment supplier is technically permitted to trade in Indonesia without a local partner, in practice, this is rarely done because the local counterpart plays a vital role in establishing and maintaining connections to essential government and private contracts.

Another distribution scheme, and the primary channel most foreign firms use to market their products in Indonesia, is through an agency arrangement whereby an independent local distributor acts as the "sole agent" for many foreign companies.

Besides selling the products to other distributors, wastewater treatment contractors and end users, some agents also offer related services such as consultancy, design, installation and after sales service. This kind of a contract provides greater flexibility and does not involve as much capital and risk. However, with this arrangement, it is more difficult to get established in the market and obtain a high-sales volume due to competition from other brands.

Payment practice for ready-stock products: immediate cash payments are required, while for an advanced orders (2-3 months delivery after order), down payments of 40 – 60 percent with the balance due on delivery is common. The average delivery time ranges between three to five months.

### **Market Issues & Obstacles**

Most foreign firms market their products in Indonesia through an agency arrangement, whereby an independent local company is appointed as the sole agent, in most cases representing several related foreign principals simultaneously. Companies, which intend to enter the market on a large scale usually establish an exclusive sole agency with an experienced and active local partner.

The Government of Indonesia (GOI) upon request can grant import duty exemptions on pollution control equipment. However, since the procedures for obtaining this incentive are known to be bureaucratic and time consuming, most companies prefer to import the equipment directly at import duties ranging between zero and five percent. A uniform 10 percent value-added tax is also applied.

### **Trade Events**

Environment Technology Indonesia 2008

The 16th International Exhibition on Equipment and Systems for Pollution Control and Environmental Improvement. Incorporating with Watertech Indonesia.

Held in Jakarta International Expo, Kemayoran on December 3-6, 2008

For further information on the above trade show, please contact the organizer:

P.T. Pamerindo Buana Abadi  
Deutsche Bank Building, 13th Floor  
Jl. Imam Bonjol 80  
Jakarta 10310  
Indonesia  
Tel: (62-21) 316-2001  
Fax: (62-21) 316-1981, 316-1982

E-mail: [pamindo@rad.net.id](mailto:pamindo@rad.net.id)

Website: <http://www.pamerindo.com>

## Resources & Contacts

### Ministry of Environment

Address:

Kantor Menteri Negara Lingkungan Hidup  
B Building, 2<sup>nd</sup> Fl., Jl. D.I. Panjaitan, Kebon Nanas,  
Jakarta Timur, 13410, Indonesia  
Phone: (62-21) 8580103, 8580102  
Fax: (62-21) 8580101  
Website: <http://www.menlh.go.id>

### Ministry of Public Works

Address:

Jl. Pattimura 20, Building B-1c, 7th floor, Kebayoran Baru, Jakarta Selatan, 12110, Indonesia  
Phone: (62 -21) 7279175; 7279 176; 7279178  
Fax: (62-21) 7261939  
Website: <http://www.pu.go.id>

## For More Information

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Phone: 62-21-5262850; Fax: 62-21-5262855; or visit our website: <http://www.buyusa.gov/indonesia>

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# ITALY

## Water & Waste Water Market Brief 2009

### Italy: Important Links & Contacts

Ministry of Environment – <http://www.minambiente.it/>  
Ministry of Agriculture – <http://www.politicheagricole.it/Ministero/default>  
ISPRA - Institute for Environmental Protection and Research -  
<http://www.apat.gov.it/site/en-GB/default.html>  
Federutility – Federation of water, gas and energy utilities -  
<http://www.federutility.it/memo/inglese.html>  
ANIMA Association of Mechanical and Engineering Industries -  
[http://www.anima-it.com/servizi/acqua/acqua\\_2008\\_completa.pdf](http://www.anima-it.com/servizi/acqua/acqua_2008_completa.pdf)

## Market Overview

Italy transposed the European Union Water Framework Directive (WFD), which extends protection to all water, including the inland and coastal waters and groundwater, into national legislation through Decree 152 of April 2006 - "Rules on Environmental Protection". The decree sets water quality objectives based on preventing pollution and protecting water from dangerous chemical substances, and introduces broader ecological objectives designed to protect and restore the structure and function of aquatic ecosystems by 2015.

The Italian water collection and distribution systems, as well as its urban wastewater sewage and purification systems, are still inadequate and the total investment to implement an integrated water system, comprising aqueducts, sewage systems and treatment services, may reach as much as \$55 billion countrywide in the next ten years.

The loss from aqueducts is estimated at about 40%, especially in Southern Italy, and there is a strong need for infrastructure improvement. In addition, a serious water crisis, endemic in Southern Italy, has recently occurred also in Northern-Central Italy, caused by a sharp reduction in rainfall and snowfall, with serious repercussions on the availability of water for drinking, industrial and agricultural use. Measures to encourage more rational, sustainable use of this resource are being taken, including new legislation for water reuse and investments in innovative technologies to prevent and detect water losses.

Competition is strong and European companies dominate the market. However, U.S. technologies are well regarded and there is potential for American companies offering innovative water treatment technologies.



### Highlight Box

- Italy may spend as much as \$55 billion in the next ten years to implement an integrated water system, comprising aqueducts, sewage systems and treatment services.
- About one sixth of the water used for drinking in Italy is bottled mineral water, one of the highest consumption rates in the world.

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# Mexico Water Industry 2010

Author Name: Francisco Ceron  
Date (March 31/2010)

## Summary

Water projects remain a priority in the Mexico's National Infrastructure Program 2007-2012. Mexico continues to bid wastewater treatment plants with a view to meeting its goal of 100% water treatment by 2012 (current wastewater treatment level nation-wide is about 50% and 10% in Mexico City). The National Water Commission, together with state and municipal environmental authorities, have multiple plans to implement water supply and wastewater projects that have been postponed during the last two years due to adverse effects of economic crisis.

## Projects and Equipment in demand

Projects that are considered to be bid during the period 2010-2012 are: Falcon Matamoros 260 km Aqueduct for water supply to nine localities situated along the Bravo River Basin, State of Tamaulipas; Zapotillo 140 km Aqueduct, State of Guadalajara and State of Jalisco; Desalination Plants in Ensenada, Puerto Penasco and La Paz; Construction of Atotonilco Wastewater Treatment Plant (already awarded but equipment is needed), etc. The equipment in demand includes: blowers, diffusers, air filters, check valves, mixers, repair clamps, saddles, submersible pumps, valves, cartridge filters, reverse osmosis membranes, etc.

## U.S. Companies in the market:

Black and Veach, Earthtech, CH2MHill, HACH, Bio Microbics, Miox, GE Osmonics, Aqua-Aerobic Systems, Gorman-Rupp Company, Severn Trent Services, Calgon Carbon Corporation, Headworks, Inc. etc

## Resources and Key contacts

Secretariat for the Environment and Natural Resources: <http://www.semarnat.gob.mx>

National Water Commission: <http://www.cna.gob.mx>

National Institute of Ecology: <http://www.ine.gob.mx>

Attorney General for Environmental Protection: <http://www.profepa.gob.mx>

Mexican Institute for Water Technology: <http://www.imta.mx>

National Council of Environmental Executives: <http://www.conieco.org>

## For More information

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# The Netherlands

## Water & Waste Water Market Brief 2009

### The Netherlands: Important Links & Contacts

Ministry of Traffic and Water Works: <http://www.verkeerenwaterstaat.nl/english/>

Ministry of Housing, Spatial Planning and the Environment: <http://www.vrom.nl/>

Water Information Network: <http://www.waterland.net/>

The Association of Dutch Water Companies: <http://www.vewin.nl/english/Pages/default.aspx>

Association of Suppliers of Environmental Equipment and Technology (VLM): <http://www.vlm.fme.nl>

## Market Overview

The Netherlands is known for its excellent know-how in the water industry. Dredging and draining are two areas in which the Dutch are famous for their state of the art technologies. Distribution over water is important, and often takes place through Europe's largest port in Rotterdam.

Even though the Netherlands has known so many successes working with and protecting the citizens against water, it also has its problems. The biggest struggles at this point are the consequences of the climate changes and the pollution of ground and surface waters. In the next ten years the Netherlands will have to invest at least \$ 6.2 billion in order to live up to the safety and environmental standards set both by the Dutch and the European government. The Dutch water market exists of a mixture between different public sources, the biggest being the Polder Boards and the Ministry of Traffic and Water Works and an energetic private sector with many SME's focusing on water purification systems, dredging and draining.

Opportunities for American companies can be found in the following fields: water purification systems, measuring & analysis instruments, and water defense construction technology.

The Dutch are the forerunners in technology and know-how in the water industry. Good opportunities can be found for U.S and Dutch water technology companies interested in joining forces through joint ventures. This would connect the know-how with the means to produce.

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### Highlight Box

- In the next ten years the Netherlands will have to invest at least \$ 6,2 billion in order to live up to the safety and environmental standards set by both the Dutch and European Governments.
- Although the Netherlands has a lot of know-how it depends greatly on countries like the United States for innovation projects since regulations slowdown the innovation processes.

Measurement & Analysis Instruments and Parts

Year	Imports from the U.S.
2006	\$823,771
2007	\$811,778
2008 (Jan-Nov)	\$785,501

x 1000

Year	Exports to the U.S.
2006	\$243,271
2007	\$238,341
2008 (Jan.-Nov)	\$291,734

x 1000

1 USD = 0.74 EUR

Source: Central Bureau of Statistics Netherlands



# The Netherlands

## Water & Waste Water Market Brief 2010

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Ministry of Traffic and Water Works: <http://www.verkeerenwaterstaat.nl/english/>

Ministry of Housing, Spatial Planning and the Environment: <http://www.vrom.nl/>

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- Although the Netherlands has a lot of know-how it depends greatly on countries like the United States for innovation projects since regulations slowdown the innovation processes.

### Import and export of water purification systems from and to the U.S.

Year	Import	Export
2006	14,917	5,877
2007	8,645	14,122
2008	11,963	23,114
2009	11,391 (Est)	23,525 (Est)

(x 1000, \$1 = Euro 0.73)

Source: Central Bureau of Statistics Netherlands



# POLAND

## Water & Waste Water Market Brief 2009

### Poland: Important Links & Contacts

Ministry of Environment – <http://www.mos.gov.pl>

Ministry of Agriculture – <http://www.minrol.gov.pl>

National Fund for Environmental Protection – <http://www.nfosig.gov.pl>

Water Supply and Sewerage Association – <http://www.igwp.org.pl>

Institute of Meteorology and Water Management (IMGW) – <http://www.igmw.pl>

Main Inspectorate for Environmental Protection - <http://www.gios.gov.pl>



## Market Overview

According to OECD assessments, Poland has made remarkable environmental progress in recent years, meeting most of its environmental objectives to date. Nevertheless, the road to environmental convergence within the EU will be a long one. As stated by the Polish Ministry of Environment, Poland will have to invest 2.3 – 2.8 billion Euro annually until 2015 to meet remaining EU environmental standards.

Water abstraction has decreased over the past decade and there has been significant progress to connect both rural and urban populations to water supply and sewage systems. While the introduction of water metering, reduction of leakage, charging for water abstraction and wastewater discharges show signs of progress, surface water quality is still unsatisfactory and large investments in wastewater treatment plants have not lead to corresponding improvements in surface water quality. Major expenditures for water management infrastructure are necessary to ensure that water supply and wastewater related infrastructure comply with European directives. Under EU regulations, all towns with populations over 2,000 must have such facilities.

Municipal wastewater treatment plants are slated for construction, extension and modernization. According to the National Wastewater Treatment Plan until 2015, \$8 billion is to be spent for modernization and construction of wastewater treatment facilities and piping systems. Currently almost 200 new wastewater treatment plants are under construction or modernization. Most in demand are wastewater treatment facilities for regions inhabited by less than 15 thousand citizens.

Poland has full access to structural funds from the European Union that are available to finance the rehabilitation of the water/wastewater treatment infrastructure in Poland. Access to EU funding may be subject to substantial EU content proportions, which may require U.S. suppliers to partner or sub-supply. Starting from January 1, 2007 capital for financing water/ wastewater projects can be sourced from the 2007 – 2013 Structural Funds, within framework of Operational Program Infrastructure and Environment. Total amount of funds designated for environmental infrastructure will reach 4.2 billion Euro.

Market demand for advanced technologies is mostly satisfied by imports. European companies dominate the market.

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# Portugal

## Water & Waste Water Market Brief 2009

### Portugal: Important Links & Contacts

Ministry of Environment  
Institute for the Regulation of Water and Solid Waste  
Portuguese Environment Agency  
Institute of Water  
AdP – Águas de Portugal

<http://www.maotdr.gov.pt>  
<http://www.irar.pt>  
<http://www.apambiente.pt>  
<http://www.inag.pt>  
<http://www.adp.pt>



## Market Overview

Environmental management and pollution control is an increasingly important and prominent sector nowadays, particularly in light of global attention to issues of resource sustainability and protection. Over the years, Portugal has made progress with respect to a number of international environmental issues. Although Portugal still lags in terms of tackling some environmental problems in the EU, the Portuguese Government continues to improve and highlight the importance of progress to promote a cleaner and sustainable environment in Portugal. The Portuguese demand for innovative environmental equipment and services is expected to continue to be high during the next three to five years.

The consolidated environmental protection expenditure (EPE) of the Portuguese Government in 2007 was around \$1.32 billion, a growth of 7% compared with previous year. The sales volume for producers of environmental goods and services reached \$5.79 billion in 2007, of which about 19% was under "Collection, Purification and Distribution of Water".

Investments in environmental infrastructure through EU and national programs have been the centerpieces of environmental progress in Portugal. In 2007, the Portuguese Government approved the following programs:

- PERSU II - Plano Estratégico para os Resíduos Sólidos Urbanos (National Strategic Plan for Urban Solid Waste) 2007/2016 - with an investment of \$2.74 billion focusing in areas such as valorization of organic waste and improvement of the selective collection systems.
- PEAASAR II - Plano Estratégico de Abastecimento de Água e Saneamento de Águas Residuais (National Strategic Plan for Water Supply and WasteWater Systems) 2007/2013 – with an investment of \$5.48 billion used for project development, infrastructure, setup and equipment supply and construction supervision and management of related projects.
- ENEAPAI - Estratégia para Efluentes Agro-Pecuários e Agro-Industriais (Strategy for Agro-Industrial and Pig Farming Effluents) 2007/2013 – with an investment of \$794 million.

Other programs are currently being developed and are expected to be approved soon, such as:

- Estratégia Nacional de Resíduos Industriais (National Strategy for Industrial Waste)
- Plano Estratégico de Resíduos Hospitalares (Strategic Plan for Hospital Waste)
- Plano Nacional de Resíduos (National Plan for Waste)
- Estratégia Nacional de Prevenção de Resíduos Sólidos Urbanos (National Strategy to Avoid Urban Solid Waste)

As these efforts continue, the Portuguese market for environmental equipment, technology and services will have strong growth potential over the next several years.

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## Water & Waste Water Market Brief 2008

### Romania: Important Links & Contacts

Ministry of Environment – [www.mmediu.ro](http://www.mmediu.ro)  
 Romanian Water Association – [www.ara.ro](http://www.ara.ro)  
 Electronic System for Public Procurement – [www.e-licitatie.ro](http://www.e-licitatie.ro)

## Market Overview

Romania entered the European Union (EU) in January 2007 and to a large degree, both the now-completed EU ascension process and current membership have been driving Romania's program of reform, modernization and investment. More significantly, Romania is now benefiting from EU funding to be able to align its economy with the rest of the EU. Under this general framework, Romania is planning significant investments to implement the EU environmental standards, including in the water and wastewater industry.

Currently, only 52% of Romania's population is connected to water supply and sewerage systems, while 79% of wastewaters are either inadequately treated or not treated at all. The Romanian Ministry of Environment is preparing an extensive portfolio of projects aimed at accessing the EU Funds. This portfolio includes some 80 major projects for investment in water infrastructure with a value of over 4 billion euros.

The beneficiaries of almost all these projects are the water and wastewater utilities, which are commercial companies owned by municipalities. The water utilities are required to purchase goods, works and services by using an electronic system for public acquisitions in an effort to provide a fully transparent procurement process.

### Key Projects in the Water and Wastewater Industries:

- Construction/rehabilitation of water treatment plants;
- Extension/rehabilitation of water and sewerage networks;
- Construction/upgrading of wastewater treatment plants;
- Construction/rehabilitation of sludge treatment facilities;
- Purchase of metering, laboratory equipment, leakage detection equipment, etc.



### Romania Compliance Timeline

**2015** is the target year for complying with the EU drinking water quality standards.

**2018** is the target year for complying with the EU standards regarding municipal wastewater collection, discharge and treatment.



#### Further inquiries:

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# RUSSIA

## Water & Waste Water Market Brief 2009

### Russia: Important Links & Contacts

Ministry of Natural Resources of the Russian Federation – <http://www.mnr.gov.ru/>

Russian Association of Water Supply and Water Disposal – <http://www.raww.ru/>

Mosvodokanal – <http://www.mosvodokanal.ru/>

Vodokanal of Saint-Petersburg - <http://www.vodokanal.spb.ru>



## Market Overview

The water utilities sector is one of the largest industries in Russia serving the entire Russian population. There are over 25,000 municipalities in Russia and virtually all have a local water utility. The key role is played by 5,000 utilities located in cities and towns. The Russian municipal water supply system includes water inlets, pumping stations, water preparation and purification stations, water supply networks and water sanitation stations. There are approximately 50,000 water supply stations and 20,000 water sanitation stations. In addition, there are 4,876 local water supply networks with a total length of 463,000 kilometers.

The main asset owners (water utility owners) are local governments. Although there are a few cases where the federal government owns water supply and sanitation systems (including the cities of Moscow and St. Petersburg as well as in the water scarce regions of Primorye, Stavropol, and Krasnodar), in the majority of locations (95 percent) municipalities own both the water supply and sanitation properties and manage them as municipal unitary enterprises, or “vodokanals.” Vodokanals are responsible for supplying drinking water and cleaning wastewater.

According to expert estimates, due to lack of financing and a slow replacement rate, the share of domestically made water treatment equipment remains high, around 70 percent. Often U.S. companies cannot promote their water control or other types of water and wastewater treatment equipment into the Russian market because vodokanals and state water control laboratories will only buy products approved by the appropriate government agencies included in the recommended lists and methodological instructions. It is recommended that U.S. companies work directly with authorized representatives of design institutes and government agencies to include their products and technologies on the lists of equipment and supplies approved by the government.

Major domestic producers of water treatment equipment and products include Maxmir ([www.maxmir.ru](http://www.maxmir.ru)), Gelios Star ([www.geliosco.ru](http://www.geliosco.ru)), VGUP NII Vodgeo ([www.watergeo.ru](http://www.watergeo.ru)), and the Group of Companies “Topol-Eco.”

U.S. companies are represented by the following brands: GE Water, GE Infrastructure, Millipore, US Filter, Honeywell, Atoll, Dow Chemical, Ditch Witch, Sterillight, and Aquafilter.

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<http://www.export.gov> or [www.buyusa.gov/russia/en](http://www.buyusa.gov/russia/en)



# Saudi Arabia

## *Water & Waste Water Market Brief 2010*

### **Saudi Arabia: Important Links**

Ministry of Water & Electricity (MOWE)- [www.mowe.gov.sa](http://www.mowe.gov.sa)  
Saline Water Conversion Corporation (SWCC)- [www.swcc.gov.sa](http://www.swcc.gov.sa)  
Royal Commission for Jubail & Yanbu- [www.rcjy.gov.sa/](http://www.rcjy.gov.sa/)  
Water & Electric Company (WEC)- [www.wec.com.sa](http://www.wec.com.sa)  
National Water Company (NWC)- [www.nwc.com.sa/](http://www.nwc.com.sa/)

## Market Overview

Saudi Arabia lies in an arid area of the world with severe climate conditions, and an absence of permanent natural surface water resources such as rivers and lakes. In addition, Saudi Arabia's high population growth, rapid urbanization, industrialization and agricultural development make water one of the most precious resources in the Kingdom. In order to meet expected demand growth for water, the Kingdom will have to invest \$4.5 billion a year in infrastructure development over the next 20 years.

According to Business Monitor International (BMI), Saudi Arabia is the third largest consumer of water per capita in the world, but has limited groundwater to tap. With consumption rising on the back of a growing population and economic growth set to soar, desalination forms the backbone of the government's water strategy. Some 30 desalination plants have already been built and BMI now expects desalinated water to reach 1.298bn m<sup>3</sup> in 2014.

Saudi Arabia's regulatory system for the power and water sectors has been revamped to make it more investor-friendly and to enable the creation of bodies such as the Water and Electricity Company (WEC) and the National Water Company (NWC) to manage the transition and provide state partners for investors. The main vehicles are independent power and water projects (IWPPs) in which the private sector can take stakes of up to 60%. Over US\$15bn worth of IWPPs have been sanctioned since the program started in 2004. They will add over 1bn m<sup>3</sup> per day to the country's water supply and nearly 10GW of power capacity.

The country is rapidly depleting its 2.2 billion cubic meters of proven groundwater. 23% of water comes from aquifers, 70% from desalination and 7% from wastewater reclamation. 80% of water has been used in questionable agriculture projects, such as the world's most heavily subsidized wheat production. 30% of household water comes from desalinating. Saudi Arabia is the biggest user of desalinated water in the world (36% of world's total), and demand is growing by at least 3.4% year. While the cost of desalination is falling, it still costs \$1.33 to process, deliver and remove the waste from one cubic meter of such water, while a Saudi consumer pays only 4 cents. The Ministry of Water and Electricity (MOWE) announces study after study to rationalize water tariffs and privatize the state owned Saline Water Conversation Corporation (SWCC).

With its budget surplus, the Saudi Government is working on a number of large projects, primarily in the water and sewage system, in an attempt to meet the needs posed by population growth and industrial growth. Major infrastructure projects include the construction of a 20 new water distribution network, 20 new the desalination plants, the refurbishment of the Jeddah desalination Plant-5, the expansion of Asir II desalination plant, Yanbu/Medina III desalination plants, and the expansion of wastewater treatment plants in Jeddah, Riyadh, and Dammam. In 2003, the Saudi Government brought the Kingdom's water and power sectors under a single authority, the Ministry of Water and Electricity (MOWE). The governing body sets forth general policies and strategies that aim to expand and improve Saudi Arabia's basic utilities. More specifically, the Ministry has issued guidelines for the operation of Saudi Arabia's Independent Water and Power Projects (IWPPs).

Further, MOWE has established a regulatory authority to help implement its policies, as well as corporations to develop new power and water projects. Also in 2001, the [Royal Commission for Jubail and Yanbu](#) founded the [Power & Water Utility Company for Jubail and Yanbu](#) known as (Marafiq). This company is responsible for planning and developing power and water utilities in Jubail and Yanbu industrial cities.

Another major development took place in May 2003 with the establishment of a new company, [Water & Electricity Company](#) (WEC), between the Saline Water Conversion Corp. (SWCC) and Saudi Electricity Co. (SEC) to carry out the independent Water and Power Project (IWPP) in partnership with the developer. There are three IWPP projects under bidding: at Shuqaiq (Phase 2), Ras Al-Zour, and Jubail (Phase 3). The three projects will have desalination water capacity of 1870 million cubic meters of desalinated water per day.

In 2006, the new National Water Company (NWC) was founded. It will facilitate privatization process and oversee the regional operations under PPP contracts. In the long term, NWC will oversee most water and wastewater operations in the Kingdom. The National Water Company will include regional business units and a core to manage and provide strategic guidance.

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#### **Saline Water Conversion Corporation (SWCC):**

Established in 1965, the Saline Water Conversion Corporation (SWCC) is the entity responsible for operating the country's 30 desalination plants and providing fresh water for the entire country. It is also the country's second largest supplier of power with 12 plants generating 3,426 MW. In 2007, the SWCC spent \$1.04 billion (SR3.9 billion) to develop its activities, a 24% increase from 2006. In recent years, the SWCC has embarked upon a privatization plan, which established the National Water Company (NWC).

The state-owned desalination plant operator will be a holding company with separate production and transmission subsidiaries. As of November 2008, the SWCC had completed five of seven stages that will result in the company's privatization. The SWCC is currently awaiting approval of the final two stages by the Supreme Economic Council. Based on the IWPP model, the private sector will be able to participate and contracts may begin in August 2009. With the privatization of the SWCC and the creation of the National Water Company, the water sector is expected to be under full private control by the end of the decade.

#### **Independent Water Projects (IPPs):**

Private sector investment is emerging as a key component in the upgrading and expansion of Saudi Arabia's water infrastructure. The IPP concept is also gaining ground among Saudi Arabia's leading organizations, including the Ministry of Commerce & Industry, Ministry of Water & Electricity, PCA, and Saudi Aramco, which are contracting local and international private companies to build desalination plants for their mega projects.

#### **Saudi Aramco IWP:**

In June 2003, a consortium, led by the U.S. company Aquatech and including the local Rabigh Desalination Co., was awarded a \$20 million contract to build a desalination plant for Saudi Aramco's Rabigh refinery complex. The project, which stipulates a 20-year water conversion agreement, is expected to come on stream by 2006. In August 2005, a consortium led by Marubeni and Itochu, and including the local ACWA Power Projects, was awarded a \$1.1 billion contract to build a co-generation and desalination plant for the Rabigh integrated petrochemical and refining complex jointly owned by Saudi Aramco and Sumitomo Chemical. An engineering, procurement, and construction (EPC) contract for the co-generation and desalination plant was also awarded to Mitsubishi Heavy Industries Ltd. on a turn-key basis. The project, which stipulates a 25-year water and energy conversion agreement, is expected to come on stream by 2008.

#### **Water & Electricity Company (WEC):**

In October 2005, the Shuaiba IWPP was awarded to a Saudi Malaysian consortium: The \$2.4 billion project involves a 20-year power and water purchase agreement to produce 900 MW of electricity and 880 cubic meters of desalinated water per day. The Shuaiba IWPP is expected to come on stream by the third quarter of 2006.

### **Power & Water Utility Co. for Jubail & Yanbu "MARAFIQ":**

On January 1, 2003, the Power and Water Utility Company for Jubail and Yanbu (MARAFIQ) was established to undertake the operation, management, expansion and construction of seawater cooling systems, water desalination plants, sanitary and industrial wastewater systems and electric power systems, thus providing essential utility services to industrial, commercial and residential customers in the industrial cities of Jubail and Yanbu. In December 2006, Marafiq Jubail was awarded to French-Belgian Utility consortium: The \$3.3 billion project involves a 20-year power and water purchase agreement to produce 2,800 MW, and 800,000 cubic meters of desalinated water per day. The project would start production in the second half of 2009.

### **Best Prospects:**

The Saline Water Conversion Corp. (SWCC) continues to study the introduction of 20 new saline water conversion projects to be implemented in the near future to meet the demand increase for drinking and civil used water. The 20 new projects will include constructing new plants and expanding existing ones. SWAC would like to see more American companies involved in those projects due to their high tech and good reputation in this market. Also, there are several large opportunities in the wastewater treatment sector. Several major projects are under tendering, such as North Jeddah wastewater treatment, Lake Musk Sewerage Treatment Project, Hair wastewater treatment in Riyadh, Medina wastewater treatment, and Dammam wastewater treatment.

The following are a list of services and products will be required for future desalination, and wastewater projects to be undertaken in Saudi Arabia.

- Consulting and engineering services
- Anti-scaling Chemicals
- Operations and Maintenance services
- Ro Membranes
- Filters
- Steam & Gas Turbines
- Boilers
- Wastewater Treatment Equipment
- Treatment Chemicals
- Pumps

### **Opportunities:**

The government now has more resources to embark on long-planned improvements and a long awaited expansion of water infrastructure, transport and wastewater treatment plants. Over the next five years 2010-2015, Saudi Arabia will require 7,500 km of new pipeline for freshwater transport and over 28,000 km for wastewater disposal pipes. Also, major business opportunities will be forthcoming as the sector opens up for privatization. Industry sources expect that the Government will build more new desalination plants, water pipelines, and wastewater treatment plants on a BOO/BOT basis with the Water & Electricity Company taking the lead. Initially, WEC plans to set up the second group of three IWPP projects with an investment potential of \$6.12 billion. These IWPP projects will provide desalinated water and power to their respective regions.



# SINGAPORE

## Water & Waste Water Market Brief 2009

### Singapore: Important Links & Contacts

Ministry of The Environment & Water Resources – <http://www.mewr.gov.sg>

Public Utilities Board - <http://www.pub.gov.sg>

Singapore Water Association - <http://www.swa.org.sg>

Waste Mgmt & Recycling Association of Singapore - <http://www.wmras.org.sg>



## Market Overview

Singapore has greatly advanced from its early days following independence when water challenges such as water shortages, pollution and flooding were common. Over the past 40 years, the city-state has successfully turned this vulnerability into its strength by investing in research and technology to develop water management and treatment capabilities.

With the growing global emphasis on water and the environment, in 2006, the Singapore Government committed US\$219 million over five years to promote R&D to sustain the Republic's competitive edge in the global market, and to position Singapore as an R&D base for environment and water solutions.

Beyond opportunities for R&D collaborations, Singapore's attractive location in the heart of Asia allows major global water and environment players to use the city-state as a test-bedding and piloting base for new environment and water technologies, and as a launch-pad to expand into the region. The Republic is already home to over 50 water companies including major international players like GE Water, Siemens Water, Nitto Denko, and Black & Veatch. Homegrown firms such as Hyflux, Keppel and SemCorp have also set up water treatment plants in many overseas markets including China and the Middle East.

With the development of major national water projects such as NEWater (recycled water), the Deep Tunnel Sewerage System (DTSS), desalination and rainfall storage like the Marina Barrage, Singapore is becoming increasingly independent when it comes to water. The aim of the Singapore Government is to increase value-added contribution from the water sector from US\$0.3 billion (0.3% of GDP) in 2003 to US\$1.1 billion (0.6% of GDP) by 2015.

The water conservation and recycling equipment market is growing in tandem with the flourishing water sector. The current size of the market for water conservation and recycling systems is estimated at US\$950 million. The size of the market for water conservation and recycling systems is projected to expand by 10%-15% annually over the next three years. This growth will emanate from a strong demand for government projects including the construction of new desalination plants and NEWater facilities. Market prospects for industrial users are also good and future demand could be greater as Singapore's economy is expected to continue with its new phase of growth once the financial tsunami is blown away.

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<http://www.export.gov> or [www.buyusa.gov/singapore](http://www.buyusa.gov/singapore)



# SLOVAKIA

## Water & Waste Water Market Brief 2008

### SLOVAKIA: Important Links & Contacts

Ministry of Environment – [www.enviro.gov.sk](http://www.enviro.gov.sk)

Ministry of Agriculture – [www.land.gov.sk](http://www.land.gov.sk)

State Environmental Fund – [www.envirofond.sk](http://www.envirofond.sk)

Water Companies Association (AVS) – [www.avs.sk](http://www.avs.sk)



## Market Overview

In 2007 the revenues collected by water management and treatment facilities amounted to USD 1.3 billion. That represents an increase of USD 135 million over the 2006 amount.

Slovakia's water and sewage infrastructure is owned by municipalities and operated by water companies, which are owned in turn by municipalities or private companies. Slovakia has 17 municipal water companies that drive this sector's growth. Fifteen companies are operated directly by municipalities and two water companies, located in Poprad and Banska Bystrica, rent their pipeline networks to the French utility company Veolia.

Servicing water and sewage networks in Slovakia presents long term business opportunities for American companies. Other opportunities are selling water treatment plants, water and sewage equipment and technology for pipeline networks. The construction and reconstruction of wastewater treatment facilities and pipeline networks is a high priority in Slovakia.

In addition, there are a number of medium and small sized construction projects that have water treatment needs, such as water treatment plants or water purification technologies for new factories and recreational or urban areas not connected to the public water network. These small projects are usually covered by local companies that are potential U.S. buyers.

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### Highlight Box

- The Concept for Water Utility Development, approved by the government, states that further investments of USD 7.6 million will be made for water treatment projects through 2015.
- Approximately 80 % of water treatment equipment and technology is imported. About 70% of engineering work is done by local companies.



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## Water & Waste Water Market Brief 2010

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State Environmental Fund – [www.envirofond.sk](http://www.envirofond.sk)

Water Companies Association (AVS) – [www.avs.sk](http://www.avs.sk)



## Market Overview

In 2009 the revenues collected by water management and treatment facilities amounted to USD 1.42 billion. That represents an increase of USD 113 million over the 2008 amount.

Slovakia's water and sewage infrastructure is owned by municipalities and operated by water companies, which are owned in turn by municipalities or private companies. Slovakia has 17 municipal water companies that drive this sector's growth. Fifteen companies are operated directly by municipalities and two water companies, located in Poprad and Banska Bystrica, rent their pipeline networks to the French utility company Veolia.

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# SWEDEN

## Water & Waste Water Market Brief 2010

### Sweden: Important Links & Contacts

Ministry of Environment - [www.sweden.gov.se](http://www.sweden.gov.se)

Ministry of Agriculture - [www.sweden.gov.se](http://www.sweden.gov.se)

National Food Administration - [www.slv.se](http://www.slv.se)

Swedish Environmental Protection Agency - [www.naturvardsverket.se/en/In-English](http://www.naturvardsverket.se/en/In-English)

The Swedish Water & Wastewater Association (SWWA) - [www.svensktvatten.se](http://www.svensktvatten.se)

Varim - Swedish Association of Suppliers of Effluent and Water Treatment Equipment - [www.varim](http://www.varim)



### Market Overview

In Sweden, with the approx. size of California and with 9.3 million inhabitants, water supply and water treatment are by law the responsibility of the municipalities. Today there are some 2,000 water works, 67,000 kilometers of water pipes, some 2,000 sewage treatment plants and 92,000 kilometers of sewers. Total water production is estimated at 330 liters/person and day with 200 liters for household consumption. The remaining 130 liters are used in industries and for use in official premises, and also includes leakage in the distribution network.

Most of the municipal wastewater treatment plants were not built until the late 1960s. As late as 1965, wastewater from some 60 percent of the urban population was discharged untreated or after sedimentation only. Today no water is discharged without pre treatment. Almost all households in urban areas are connected to municipal sewer networks, and some 95 percent of urban wastewater is treated biologically or chemically. Airports, mines and major industrial facilities handle their own wastewater treatment. The market for water treatment equipment is mature and dominated by domestic suppliers. Increase in local demand is only expected in replacement equipment.

The Ministry of Environment has formulated 16 environmental quality objectives to be met by 2020. Good-quality groundwater is one of those objectives. Authorities, municipalities and county administrative boards cooperate to achieve the objectives.

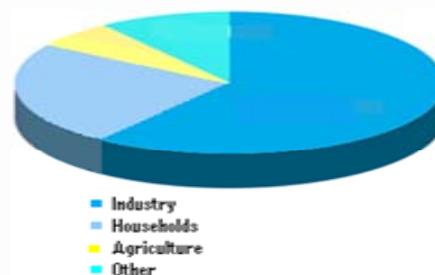
Stockholm, the capital of Sweden, is the first city to be selected for the European Green Capital Award by the European Commission. The Award has been conceived as an initiative to promote and reward the role that local authorities play in improving the environment, and their high level of commitment to genuine progress. Starting in 2010, one European city will be selected each year as the European Green Capital of the Year. During 2010, Stockholm will be the first European Green Capital.

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**One liter of Swedish tap water cost an average of USD 0.003. One liter of bottled water cost an average of USD 3.12 which is about one thousand times more expensive than tap water.**

**About nine percent of Sweden's area is covered by water. But the amount of water used is only a half percent of what technically could be used.**

Water use by sectors





# SWITZERLAND

## Water & Waste Water Market Brief 2009

### Switzerland: Important Links & Contacts

Federal Office for the Environment (FOEN) – <http://www.bafu.admin.ch>  
Federal Office for Agriculture (FOAG) – <http://www.blw.admin.ch>  
Swiss National Science Foundation – <http://www.snf.ch>  
Swiss Water Management Association – <http://www.swv.ch>  
Swiss Water Pollution Control Association – <http://www.vsa.ch>  
Swiss Federal Institute of Aquatic Science and Technology – <http://www.eawag.ch>



## Market Overview

The water sector in Switzerland is organized as a local monopoly, with the most common organizational structure being the municipal water service for drinking water supply and the municipal management for sanitation services. The cantons (counties) are responsible for enforcement of the Water Protection Act, e.g. specifying conditions for discharges, monitoring wastewater, treatment works and implementing the polluter-pays principle. The federal authorities oversee the enforcement efforts by preparing recommendations and guidance, implement international resolutions and agreements, and promote the development of systems and procedures ensuring the application of the best available techniques.

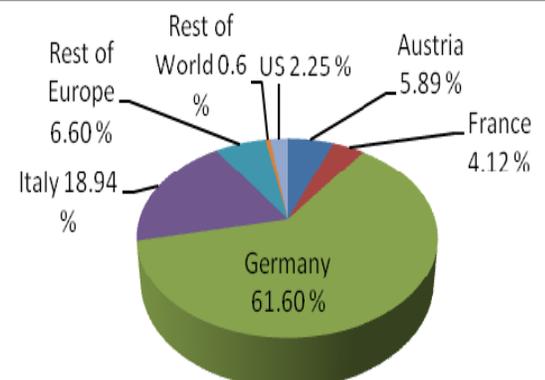
In Switzerland more than 80% of all drinking and process water comes from ground water springs. According to the latest findings the quality of groundwater is generally so high that in many places it can be used directly as drinking water without costly purification, thus meeting the legally required ideal conditions. However, particularly in conurbations and in areas of intensive agriculture with arable farming, vineyards, orchards and vegetable crops the major use of substances hazardous to water and the soil disturbance leave readily detectable residues in the groundwater, which give some cause for concern.

Products and services with good prospects include: consulting services for advanced wastewater treatment, filtration systems, analytical instruments, analyzers, special pumps, innovative computer software.

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### Highlight Box

- Even though the use of atrazine and simazine will be banned from 2011, groundwater contamination caused by these substances may still persist for years to come.
- As data on pesticide contamination at the monitoring stations has only been available since 2002, it is not yet possible to make any general assessment of longer-term trends.



Import Pumps (HS 841360)

Source: Swiss Customs Statistics



# United Kingdom

## Water & Waste Water Market Brief 2009

### United Kingdom: Important Links & Contacts

Department for Environment, Food and Rural Affairs - [www.defra.gov.uk](http://www.defra.gov.uk)

Environment Agency - [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

British Water - [www.britishwater.co.uk](http://www.britishwater.co.uk)

Water UK - [www.water.org.uk](http://www.water.org.uk)

The Society of British Water and Wastewater Industries - [www.sbwwi.co.uk](http://www.sbwwi.co.uk)

International Water Association - [www.iwahq.org.uk](http://www.iwahq.org.uk)



## Market Overview

In 2007/2008, the value of the regulated UK water supply and sewerage services market was estimated at \$14.32 b. Each day the UK water industry collects, treats and supplies more than 16 billion liters of water to domestic and commercial consumers, and collects and treats over 10 billion liters of the resulting wastewaters. The industry comprises 12 water and sewerage service providers and 13 water suppliers, several of which are subsidiaries of international enterprises. The waste and waste water network includes more than 700,000 kilometers (km) of water mains and sewers, of which 640,026km are located in England and Wales, and nearly 670 reservoirs. In order to continue to provide good water and wastewater service the UK will need to make significant investment in infrastructure maintenance, particularly with regard to old pipe works and water-treatment facilities in large urban centers. Climate change is the biggest threat to the sustainability of water services. More frequent droughts, intense rainfall and flooding influence investment planning in all aspects of water services.

Several regulations affecting 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.

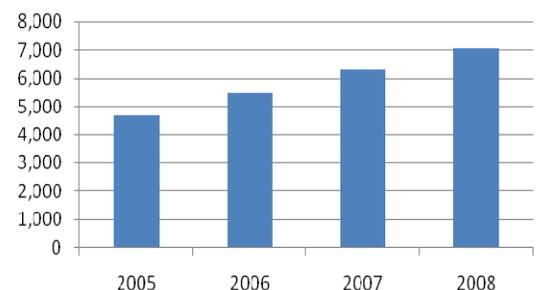
Opportunities exist for products and services related to water conservation, as well as technologies for improving water treatment methods, metering and waste treatment.

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### Highlight Box

- If Government plans for substantial house building materialize, the distribution network will also have to be expanded; the same applies to the London 2012 Olympic.
- Sewage treatment and disposal presents long-term challenges and there is scope here for innovative technological solutions.

U.S. Imports of Taps, Cocks, and Valves for Pipes and Tanks (\$M)



Source: USA Trade Statistics



# United Kingdom

## Water & Waste Water Market Brief 2010

### United Kingdom: Important Links & Contacts

Department for Environment, Food and Rural Affairs - [www.defra.gov.uk](http://www.defra.gov.uk)

Environment Agency - [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

British Water - [www.britishwater.co.uk](http://www.britishwater.co.uk)

Water UK - [www.water.org.uk](http://www.water.org.uk)

The Society of British Water and Wastewater Industries - [www.sbwwi.co.uk](http://www.sbwwi.co.uk)

International Water Association - [www.iwahq.org.uk](http://www.iwahq.org.uk)



## Market Overview

Each day the UK water industry collects, treats and supplies more than 17 billion liters of water to domestic and commercial consumers, and collects and treats over 10 billion liters of the resulting wastewaters. UK firms invest approximately \$5.5 billion each year to improve water supplies and sewerage services and UK government sources forecast a 33% growth in the demand for water/wastewater management products and services from 2010 to 2025. There are 12 water and sewerage service providers and 14 water suppliers in the UK, several of which are subsidiaries of international companies. The UK water supply and infrastructure includes more than 412,052 km of water mains, and wastewater services include 386,658 km of sewers. Climate change is cited as one of the biggest threats to the sustainability of water services, with more frequent droughts, intense rainfall and flooding influencing water services investment planning. To continue to provide high-quality water and wastewater service the UK will need to make significant investment in infrastructure maintenance, particularly with regard to old pipe works and water-treatment facilities in large urban centers.

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, such as economic regulation, are UK specific.

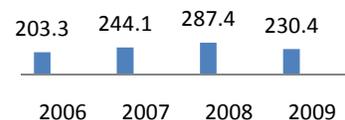
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**U.S. Imports of Taps, Cocks, and Valves for Pipes and Tanks (value \$M)**



Source: USA Trade Statistics