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# A look at infrastructure-asset management of public water and sanitation services

Given the vast diversity of public water and sanitation services, the 2006 law on water and aquatic environments<sup>1</sup> assigned to Onema, the French national agency for water and aquatic environments, the task of creating an observatory on public water and sanitation services. This initial panorama, using data drawn from the observatory, provides essential information on the organisation, performance levels and prices of water and collective-sanitation services. It also looks at the issues involved in sustainable management of system infrastructure assets.

## The observatory on public water and sanitation services

The observatory was launched in 2009 and provides internet access ([www.services.eaufrance.fr](http://www.services.eaufrance.fr)) to public data on service organisation, management and performance levels. This information serves to assess the economic, technical, social and environmental performance of the services on an objective basis, acknowledged by all the stakeholders in the sector. In a few years, the observatory will offer a complete panorama of the situation in France thanks to a series of interannual indicators.

The observatory is intended to assist local governments and utilities in:

- > **managing their services** based on the notion of performance governance;
- > **calculating indicators** and **filing an annual report** on the price and quality of services;
- > **widely** and **transparently disseminating** performance data on their services, thus improving the information available to consumers.

It will thus be possible to go beyond a simple comparison of prices and to apprehend the technical and financial issues confronting public services.

In 2009, 4 214 services input data to the observatory for water and 4 281 for sanitation, representing 70% of the population for water and 59% for sanitation, respectively. It follows that it was above all the very large services (serving over 10 000 inhabitants) that supplied their data to the observatory.

February 2012

## Over 31 000 public water and collective-sanitation services in France

In 2009, there were 31 445 public water and collective-sanitation services in France.

	Total number of services	Population (million)
Drinking water	14 217	60,9
Collective sanitation	17 228	57,3

Data source: SISPEA (Onema) - DDT(M) - 2009

Drinking-water services comprise a number of steps, from production and, if applicable, transport, to storage and distribution. Of the 14 217 public drinking-water services, over 88% manage the entire process from production to distribution. Fragmentation of responsibilities for drinking water is therefore relatively limited. Over 90% of the French population must deal with a single service for all drinking-water issues, from production to distribution.

Collective sanitation also comprises several steps, e.g. wastewater collection and transport in the sewer system to a wastewater-treatment plant where the water is treated before being discharged back to the aquatic environment. Almost 80% of public collective-sanitation services manage the entire sanitation process from collection to treatment and discharge of the wastewater. As a result, 70% of the public served by a collective-sanitation service deal with a single service.

**Nota bene:** in the observatory database, the population connected to water services is estimated to 60.9 million inhabitants. This figure does not match the entire French population. There are several reasons for this data gap. Firstly, three overseas departments are not registered in the database (1.3 million inhabitants). Moreover, 73 towns are not associated with any water or sanitation service (400 thousand inhabitants). Finally, the population data is not registered for 1 123 services of the database.

## Two general types of management for water and sanitation services

Towns are the competent authorities for all water and sanitation services. They may however transfer their responsibilities to intercommunal structures, i.e. groups of towns. In 2009, 3 481 intercommunal

structures produced and supplied drinking water to two-thirds of the French population, and 1 780 collected and treated the wastewater of the two-thirds of the population connected to a collective-sanitation system.

There are two general types of management for water and sanitation services. The local government may manage one and/or the other of the services itself or delegate management to a utility, i.e. in general a

private company. In all cases, the local government retains its responsibility concerning the organisation and governance of the services.

Almost 70% of public drinking-water services (41% of the population) and over three-quarters of collective-sanitation services (58% of the connected population) are directly managed by the local government. Over half of all intercommunal structures manage their water and sanitation services directly.

The above figures emphasise the fact that small services (serving less than 3 000 inhabitants) tend to manage their system directly. Larger services, on the contrary, delegate the management of their systems more frequently.

		Direct management <sup>2</sup>	Delegated management <sup>3</sup>
Drinking water	Number of services	9 809	4 408
	Population (million)	24,8	36,1
Collective sanitation	Number of services	13 320	3 908
	Population (million)	33,2	24,1

Data source: SISPEA (Onema) - DDT(M) - 2009

## Improving system management

In a context where drinking-water consumption is dropping (1% on average since 2000), national and European health and environmental standards are becoming stricter and system infrastructure is ageing, knowledge and management of systems lie at the heart of current efforts on the part of public water and sanitation services.

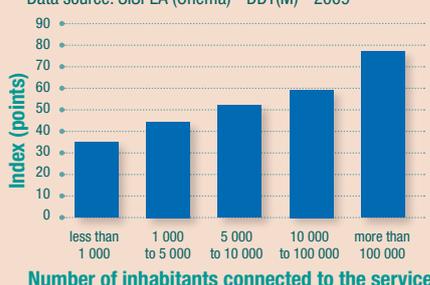
The *asset-management index*, which evaluates the available information on system status and the quality of management, shows that there is ample room for progress. The index, on a scale of 100, currently stands at 57

for drinking-water services and 56 for collective-sanitation services. Results improve with the size of services, probably because larger services have

the human and financial resources that can be devoted to monitoring and managing their systems.

### Asset-management index of drinking-water services according to population

Data source: SISPEA (Onema) - DDT(M) - 2009



- > Up to 20 points for the existence of a system map updated annually.
- > Up to 40 points for the information on system components (age of pipes, location of branch lines, etc.).
- > Up to 40 points for information on system maintenance (identification of maintenance operations, implementation of a multi-year schedule to renew branch lines, mains, etc.).

<sup>2</sup> Forms of direct management include direct control, management agreements and public companies providing services.  
<sup>3</sup> The main types of delegation are a lease, a concession and a public-service franchise.



According to observatory data, the average efficiency of drinking-water distribution systems, which comprise over 850 000 kilometres of pipes, is 76%. That means that the volume of water not distributed is 24%, i.e. one out of every four litres put into the distribution system leaks out. The efficiency of rural systems is lower (75%) than that of urban systems (79%). Efficiencies are generally higher in the western sections of France because raw water comes primarily from surface waters that are more costly to treat. Efforts to reduce leaks are therefore an economic and environmental imperative in those areas.

There are many different causes of leaks, including:

- > corrosion of pipes caused by the water transported and the surrounding terrain;
- > shifts in the terrain, vibrations and deformations;
- > ageing of joints between pipes;
- > fragile tap-off points where building pipes connect to water mains.

By reducing leaks, it is possible to reduce the quantities of water drawn from aquatic environments, to save energy (pumping of water, treatments) and to reduce the consumption of chemical products. These improvements should be achievable given the stipulations of the Law 2010-788 (12 July 2010), which requires that a detailed inventory of each system be drawn up by the end of 2013 and that system efficiencies be improved to at least 85% (systems having very low consumption levels are exempted).

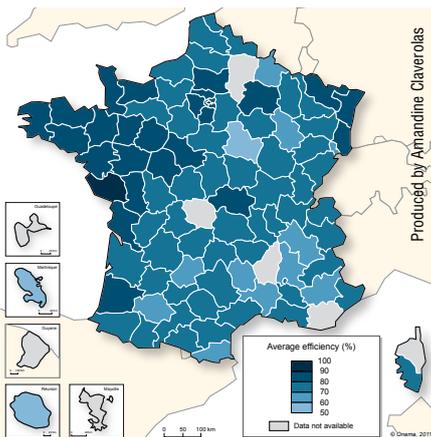
In addition to efforts to improve system performance levels, there is also the issue of system maintenance and renewal. Over the past five years, the average annual renewal rate has been estimated at 0.61% for drinking-water systems and 0.71% for collective-sanitation systems. At those rates, it would take 160 years to completely renew drinking-water networks and 150 years to replace sewer networks.

The quality of water delivered to each home is excellent because its **microbiological conformity is 98%** and its **physico-chemical conformity is 97%**. Those percentages correspond to the samples collected for microbiological and physico-chemical analysis that complied with applicable regulations.

In 2009, the average annual consumption per inhabitant amounted to **54.7 cubic metres**, i.e. 150 litres per day. These data confirm the trend toward reduced household consumption. The annual average consumption amounts to 198 euros (incl. VAT) per inhabitant, i.e. slightly more than 0.5 euros per day.

## Average efficiency of drinking-water distribution systems in each department in 2009

Data source: SISPEA (Onema) - DDT(M) - 2009



Nota bene: Data not available for Mayotte in 2009 because the island was not yet an overseas department.

## An average monthly budget of 36 euros per household for water and sanitation

In 2009, the average price<sup>5</sup> for water and collective sanitation was 3.62 euros per cubic metre (incl. VAT). That represents an average annual budget of 434.40 euros (incl. VAT) for 120 cubic metres or 36.20 euros (incl. VAT) per month per household. Water and sanitation services thus represent 1.25% of average household available income. As a comparison, budget for the telephone bill amounts to 426 euros per year<sup>6</sup>.

The average price consists of 85% for

the actual service and 15% for VAT and fees for the water agency and, when applicable, for Voies navigables de France (VNF, French waterways).

### Breakdown in price<sup>5</sup> of one cubic metre of water

- 1.55 euros for drinking water
- 1.54 euros for collective sanitation
- 0.53 euros for VAT and fees (water agencies and VNF)

The water agencies (water offices in the French overseas departments) use part of the funds raised to finance projects by local governments, industrial companies and farmers to preserve and restore water resources and aquatic environments, and to fight against pollution. The funds

raised by VNF are used to manage and to expand the network of navigable waterways in France.

### For an annual consumption of 120 cubic metres

	Average price (in euros incl. VAT)	Annual invoice (in euros incl. VAT)
Drinking water	1,9	228
Collective sanitation	1,72	206,40

Data source: SISPEA (Onema) - DDT(M) - 2009

The average price for drinking water is 1.90 euros per cubic metre (incl. VAT), i.e. 228 euros for an annual consumption of 120 cubic metres. The average price for collective sanitation is 1.72 euros per cubic metre (incl. VAT), i.e. 206.40 euros for the same annual consumption.

<sup>4</sup> Law 2010-788 (12 July 2010)

<sup>5</sup> This price is an average weighed by the number of inhabitants connected to the service. It is calculated on the basis of a sample of 3 200 services, representing 62% of the population connected to a water service and 41% of the population connected to collective sanitation. The difference between the price from the observatory and the price from the 2008 SOeS study is partly due to the over representation of large services in the SOeS study. Indeed, for those services, the price is less expensive because of economies of scale.

<sup>6</sup> Data provided by the Telecom observatory (January 2011).

The overall price includes a variable part corresponding to the quantity of water consumed by the customer. The price may also include a set fee to cover part of the overhead costs of the service. It must be paid whatever the consumption. The set fee may not exceed 30% or 40% of the total annual bill for 120 cubic metres (these limits do not apply to towns in tourist areas<sup>7</sup>). In 2009, two-thirds of the French population paid a set fee in their bill for drinking water and the average amount represented 21% of the annual bill (incl. VAT), i.e. 45.58 euros on average. But only one-third of the population connected to a collective-sanitation system paid a set fee in their bill for sanitation and the average amount represented 21% of the annual bill (incl. VAT), i.e. 42.66 euros on average.

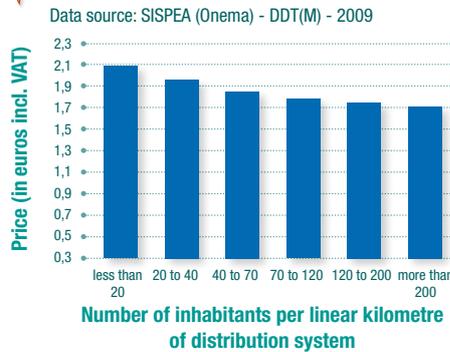
Water prices vary depending on a number of different factors.

- > **geographic situation:** the farther the wells and the treatment plants are from customers, the more it costs to transport the water (networks, pumps, etc.);
- > **distances between homes:** water transport in rural areas, where houses are located far apart from each other, incurs more costs per customer than in urban areas;
- > **quality of untreated water:** depending on the quality of the water drawn from the natural environment, the treatment required to turn it into drinking water is more or less complex, and more or less expensive;

- > **tourism:** additional investments may be required to handle temporary increases in demand, for example during periods when tourists are present;
- > **environmental regulations:** the complexity and cost of treatment depends on the sensitivity of the environment receiving the treated wastewater.

For example, the price of drinking water is influenced by the density of the population: it drops as the density increases due to the scale economies.

**Price of drinking water as a function of population per linear kilometre of distribution system**



Technical and physical factors being equal, the results show that the average price charged by delegated-management services is 15% higher for drinking water and 4% for collective sanitation. However, there is great diversity in average prices

for both types of management, both direct and delegated. A number of factors may explain this situation. For example, local governments often delegate the public service when the production of drinking water or wastewater treatment are more difficult and complex due to the poor quality of untreated water (e.g. pesticides or abstractions from surface waters<sup>8</sup>) or regulations impose major environmental constraints (e.g. the European directive on the quality of bathing water). In addition, private companies have specific expenses (corporation tax, R&D costs) that services under direct management do not incur.

**Note on methods**

The information summarised here is drawn from a report that may be found at [www.services.eaufrance.fr](http://www.services.eaufrance.fr). The report implemented a method developed jointly by Onema and the Water and biodiversity department of the Ecology ministry.

In this document, the numerical data are drawn exclusively from the national database of the observatory on public water and sanitation services administered by Onema, which contains the data provided by local governments and the departmental services for territories. The data was extracted from the database in October 2011.

**Interannual monitoring of services**

This first panorama of water and sanitation services, produced following processing of the 2009 data from the observatory, will be repeated in the future to provide interannual monitoring of services and the corresponding indicators. The observatory will thus become an operational component

in the performance governance of services. This approach, new in both France and Europe, will be truly effective only if it is actively adopted by the local governments in charge of water and sanitation services, such that they set their own performance goals and modify their management and investment decisions to meet those goals. A further objective of the observatory is to provide consumers and citizens with clear information on the quality and prices of the 31 000 water and sanitation services.

<sup>7</sup> Decision (6 August 2007) on calculation of the part of water bills not proportional to consumption.  
<sup>8</sup> Directive 76/160/CEE (8 december 1975).

**Publisher:** Patrick Lavarde (Onema)  
**Editor:** Christian Jourdan, WIS-FR coordinator (Onema)  
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This document was drafted in accordance with the national framework for water data and was submitted to the concerned WIS-FR partners.

**For more information...**

See the data on public water and sanitation services at: [www.services.eaufrance.fr](http://www.services.eaufrance.fr)

Find this document on the internet at: [www.services.eaufrance.fr](http://www.services.eaufrance.fr) or [www.documentation.eaufrance.fr](http://www.documentation.eaufrance.fr) or [www.eaufrance.fr/IMG/PDF/spea2009\\_201202\\_synthese\\_EN.pdf](http://www.eaufrance.fr/IMG/PDF/spea2009_201202_synthese_EN.pdf)

Find the complete report on the observatory on public water and sanitation services in 2009 at: [www.services.eaufrance.fr](http://www.services.eaufrance.fr) or [www.documentation.eaufrance.fr](http://www.documentation.eaufrance.fr) or [www.eaufrance.fr/IMG/PDF/spea2009\\_201202\\_EN.pdf](http://www.eaufrance.fr/IMG/PDF/spea2009_201202_EN.pdf)

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Communication department, Onema, 5 Square Félix Nadar, 94300 Vincennes. Layout design: Ecarts Graphiques. Production: Blueille. Printed on paper from sustainably managed forests: Panopy.