Public Water and Wastewater Services in France

Economic, Social and Environmental Data

6th edition
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Authors

Vianney DA COSTA
Etienne JOBARD
Jacques MARQUAY
Marie OLLAGNON
Béatrice PLAT
Stéphane RADUREAU

BIPE

LES ENTREPRISES DE L'EAU

This document is the translation of the sixth edition
of the BIPE-FP2E study
“Les Services publics d’eau et d’assainissement en France”
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Preliminary

This sixth edition of the BIPE-FP2E overview of public water and wastewater services in France is published as the country pursues two key policy objectives: to grow the circular economy through the more rational and efficient use of resources; and to redefine priorities for action in relation to water policy, with the aim of meeting water body status objectives for 2021.

This policy has already been implemented, but in the coming years some of the details will be fleshed out, in particular in relation to issues like financing efforts to combat non-point source pollution, rationalizing the organization of public water and wastewater services and improving citizens' access to reliable data about services.

The mechanisms which will ensure the success of this ecological transition are well known: technological innovation, research and development in new industrial processes, investment in and development of resource-efficient infrastructure, and cooperation between local economic actors.

The water companies have long sought to be more transparent about the routine course of their business, launching a number of initiatives over the years and in many cases staying ahead of new requirements regarding the provision of information.

It is in this context that, for the past decade, experts from the BIPE and the FP2E have come together to produce this overview of public water and wastewater services in France. Water availability in the future, the status of water resources, institutional structure and governance, service and system performances, wastewater recycling and reuse, water sector economics, actors and social data… this extensive compilation of data and objective analysis of the facts will give you the essentials you need to understand the workings of the French model of water management.

We hope it makes for interesting reading.

Bertrand Camus
President of the FP2E

Pascal Le Merrer
President of the BIPE

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Water and wastewater

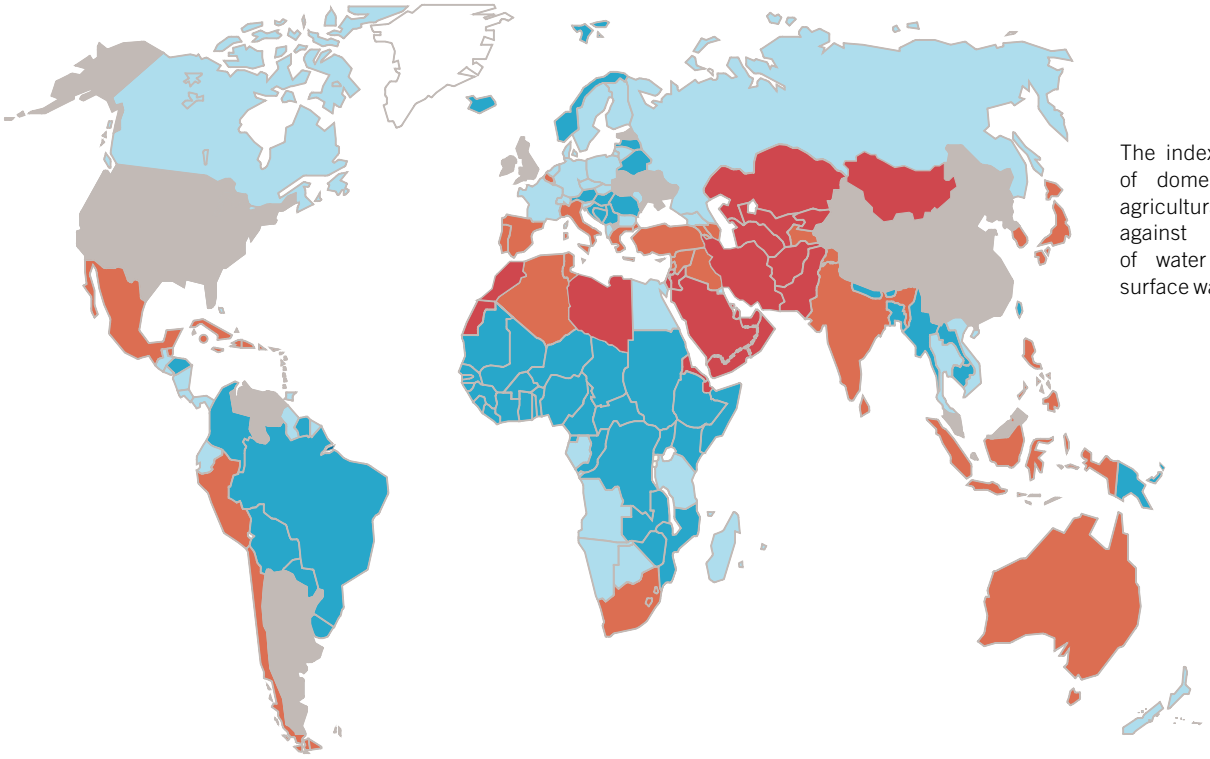
Availability and use of water resources

Water stress – state of play and future trends

Although the world has an abundance of water resources, they are unevenly distributed among countries. These disparities in the availability of water due to limited freshwater resources or recurring drought mean that that some countries are experiencing multiple problems, which collectively come under the heading of 'water stress'. The term water stress refers to the situation where annual water supplies drop below 1,700 m^3 per person. When the figure drops below 1,000 m^3 per person, the term water scarcity is used.

Water stress caused by a lack of freshwater availability or pressures on supply sources affects a significant part of the world's population and no continent escapes this trend. Among those countries affected are some of the major developed and emerging countries in the most populous parts of the world: the USA, China, India, South Africa, Mexico and the countries of the Mediterranean, for example.

WORLD MAP OF THE WATER STRESS INDEX



The index measures the ratio of domestic, industrial and agricultural water consumption against renewable supplies of water from precipitation, surface water and groundwater.

Water risk: 4-5 Extremely High (> 80%) | 3-4 High (40-80%) | 2-3 Medium to High (20-40%) | 1-2 Low to Medium (10-20%) | 0-1 Low (< 10%)

Source: Aqueduc, World Resource Institute, 2013

According to the European Commission, the European Union has suffered increasingly frequent and severe droughts over the past three decades. Indeed, between 1976 and 2006, the number of areas and people affected by drought went up by nearly 20%. One of the severest droughts – affecting over 100 million people across nearly a third of EU territory – occurred in 2003. But drought is not the only problem faced in the region: floods are the most common form of weather-related natural disasters in Europe and have increased in frequency from 6 a year in the 1980s to over 20 a year in the 2000s.

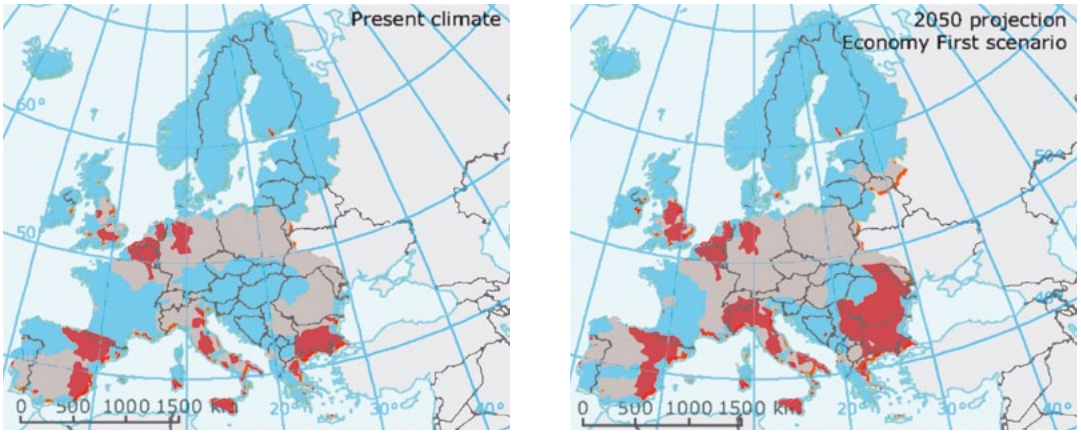
Today, at least 11% of the European population is experiencing year-round water scarcity and 23% of the population experiences scarcity in the summer. And if forecasts are correct, these figures could rise to 30% and 45% by 2030.

This pressure on resources can lead to conflicts over access to water. Such conflicts are already occurring in most of the major developing regions of the world and have grown in frequency over the past two decades. Indeed, the number of water-related conflicts between countries has risen from an average 1.5 a year between 1970 and 1990 to more than 9 a year in the past two decades.

If the trend is toward a situation in which economic considerations come first over environmental ones (see map below, right), **it is possible that water stress in Europe will increase significantly by 2050.**

Under the 'Present Climate' scenario (map below, left), most of Europe remains under moderate or low water stress. Under a scenario of strong economic growth (median of general circulation models and regional climate models), areas of moderate and high water stress will be in the majority by 2050 according to the IPPC. In contrast, under other scenarios in which the environment takes precedence, low water stress is the general trend.

WATER STRESS IN EUROPE: TWO PROJECTIONS FOR 2050



Low water stress

Moderate water stress

Severe water stress

Source: European Environment Agency, 2012
Copyright: ClimWatAdapt Kassen University

Water withdrawals and uses

In 2011, the total amount of water withdrawn for drinking water purposes in Metropolitan France was 5.4 billion m^3, representing an annual amount of just over 85 m^3 of water per person, or 234 liters per person per day.

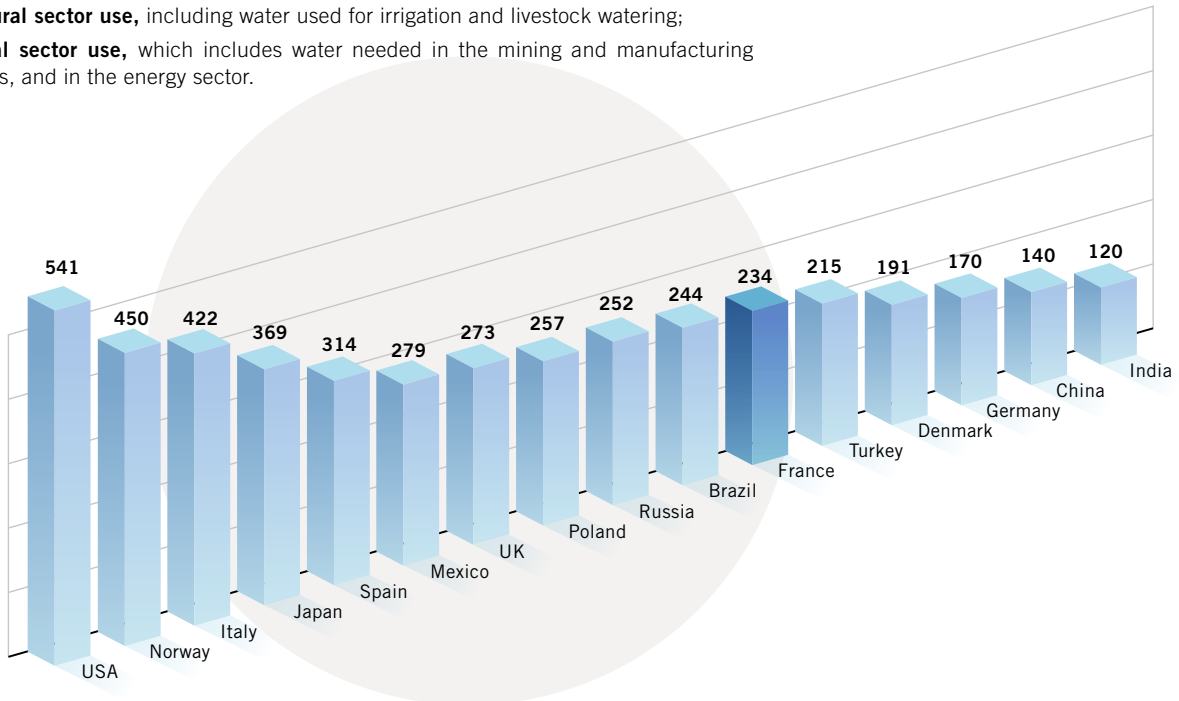
The amount of water withdrawn is not the same as the amount of water used however. Indeed, withdrawal volumes are measured ahead of the water treatment process and so are higher than the volumes of water used, the difference being attributable to the performance of the treatment plants and distribution systems involved.

In France, the amount of water withdrawn for drinking water is marginally smaller than the EU average but far smaller than average levels in other developed countries like the USA or Japan.

WATER WITHDRAWALS FOR DOMESTIC USES
(average number of liters per person per day)

Water use can be broadly divided into three categories:

- **domestic sector use,** which includes water used in the home and in the service sector (for the needs of shops, offices, hospitals, schools, etc.);
- **agricultural sector use,** including water used for irrigation and livestock watering;
- **industrial sector use,** which includes water needed in the mining and manufacturing industries, and in the energy sector.

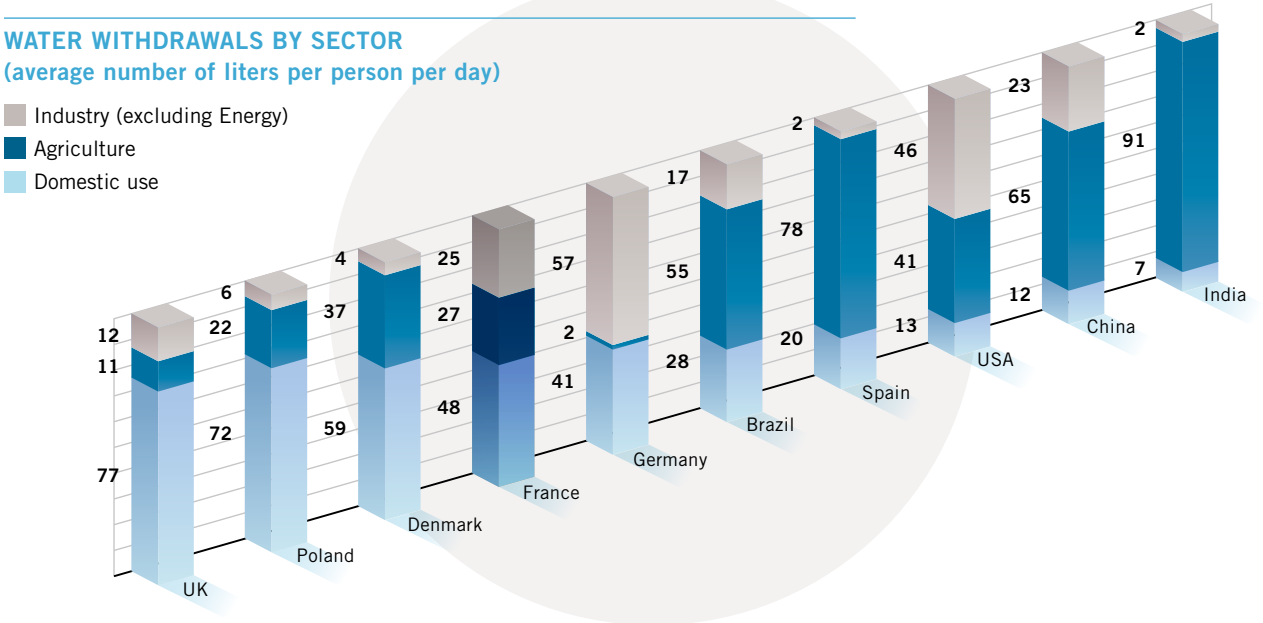


Source: BIPE, based on data from The World's Water, AQUASTAT, Eurostat and SOeS

The breakdown of water use by sector is particular to each country and more specifically the makeup of each country's economy. In France, excluding water used in power generation, withdrawals for domestic sector uses amounted to 48% of total withdrawals in 2011, while agricultural and industrial water use each accounted for a quarter of all withdrawals.

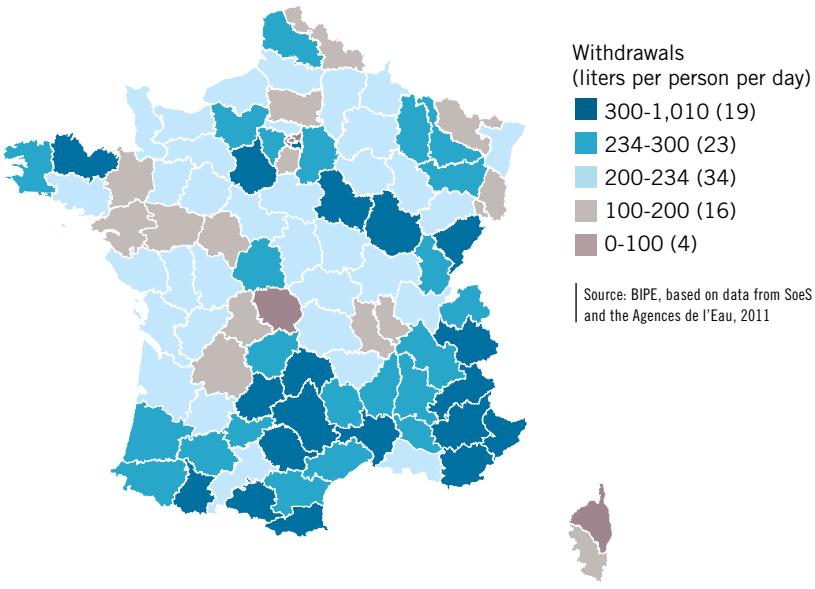
This sector breakdown depends on the structure of the revenue-generating activities of the country concerned. In the UK and Poland, domestic sector use accounts for the bulk of water withdrawals. In the USA and Germany, industrial uses predominate, while in Spain, China and India, the agricultural sector is the principal water user.

WATER WITHDRAWALS BY SECTOR
(average number of liters per person per day)



Source: BIPE, based on data from The World's Water, AQUASTAT, Eurostat, SOeS

DOMESTIC WATER WITHDRAWALS BY DÉPARTEMENT



Source: BIPE, based on data from SoeS and the Agences de l'Eau, 2011

In Metropolitan France, the average water withdrawal rate of 234 liters per person per day is unevenly distributed across the country. Per-person per-day withdrawals in a fifth of the départements of Metropolitan France are below 100 liters but above 300 liters in another fifth of départements.

These differences are due partly to local water usage and partly to the fact that some of this water usage relies on water imported from other regions. The Paris region is partly supplied from sources in Burgundy and the Centre region of France for example.

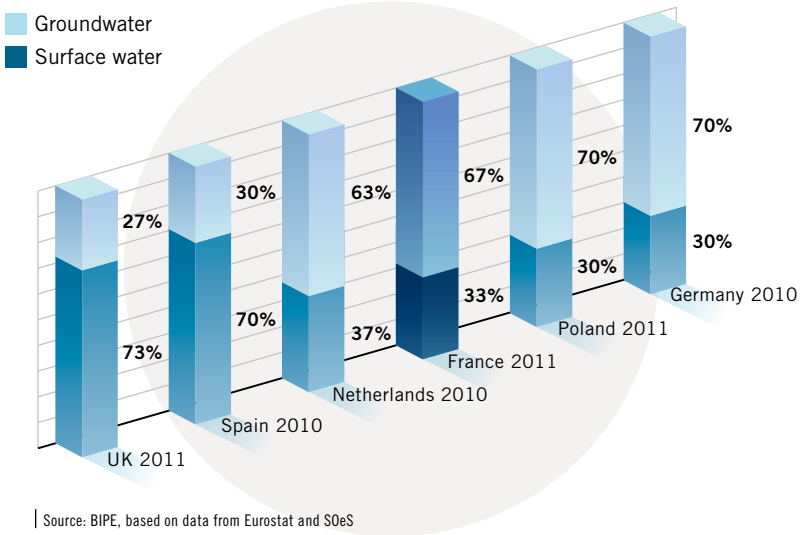
Groundwater: the main source of drinking water

The breakdown between ground and surface water usage depends on the location and the quality of the surface water source. Where available, groundwater tends to be used more for human consumption. **Two-thirds of water withdrawals for drinking water in Metropolitan France are from groundwater obtained from springs or aquifers.** The other third comes from surface water sources such as rivers or lakes. Surface sources provide most of the water used in irrigation and industrial processes. France is among countries like the Netherlands and Germany that have good-quality water resources for the needs of public water services as most of this water is supplied from groundwater sources.

In some départements however, mostly in western and overseas France, the bulk of the water withdrawn for domestic needs comes from surface water sources.

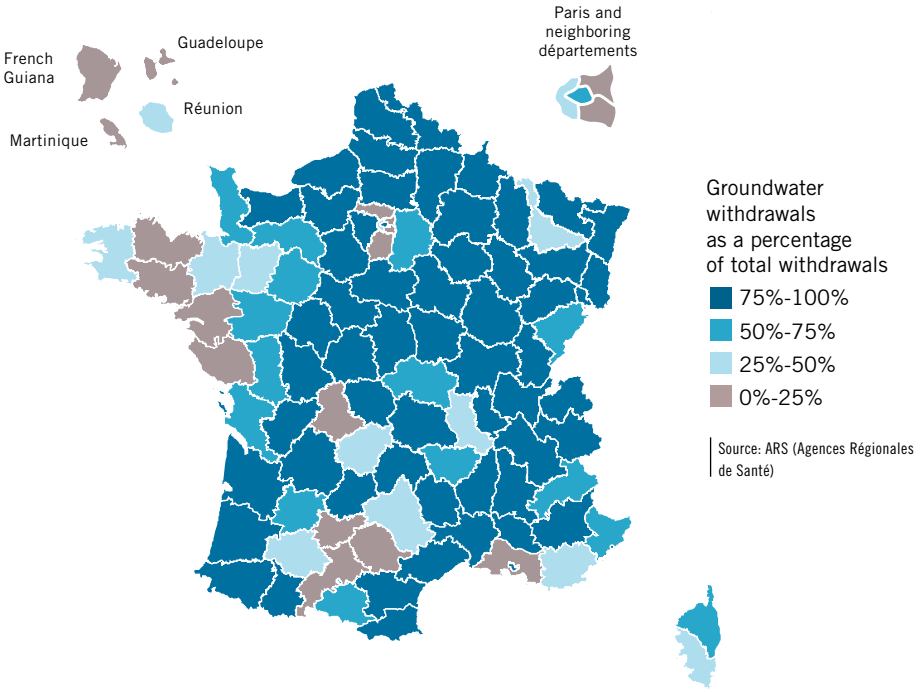
Where freshwater sources are in short supply, seawater may be treated to potable standards by desalination. Unlike water-stressed countries like Spain, Israel, the Gulf states and Australia, (Metropolitan) France has very few desalination facilities.

SOURCES OF RAW WATER FOR THE SUPPLY OF DRINKING WATER



Source: BIPE, based on data from Eurostat and SOeS

GROUNDWATER WITHDRAWALS FOR THE SUPPLY OF DRINKING WATER

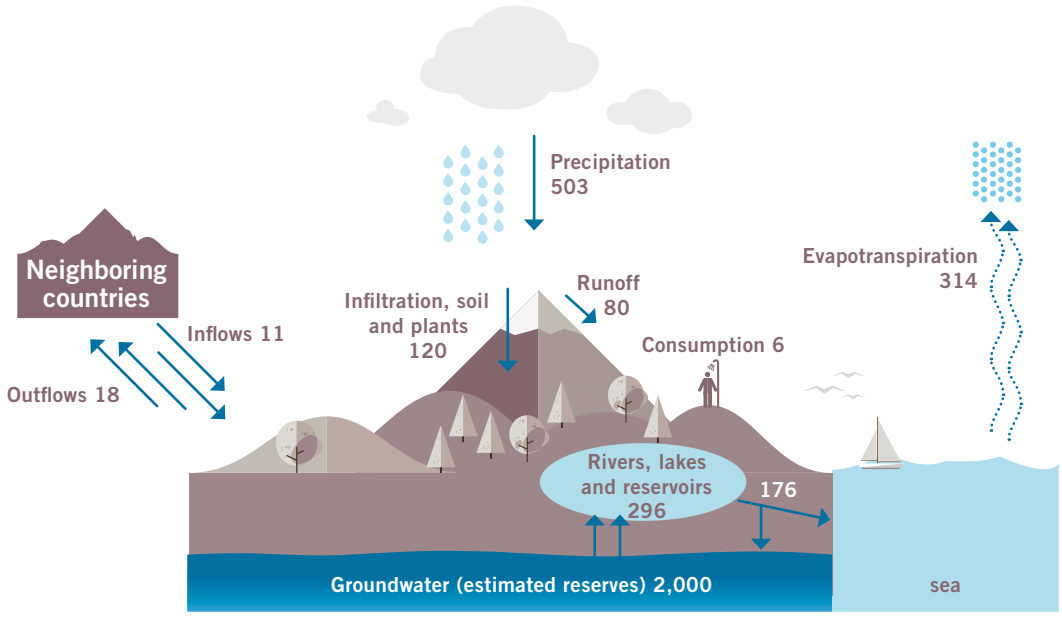


Source: ARS (Agences Régionales de Santé)

Groundwater is found in porous and fissured rocks and in sub-surface geological formations. These underground reservoirs or 'aquifers' are supplied by rainwater seeping in from the surface through distances of varying length.

France is estimated to have 2,000 billion m^3 of groundwater reserves, and an annual rainfall of 503 billion m^3 which provides the bulk of the country's 200 billion m^3 of renewable water resources. These figures should be seen in the light of regional disparities in water resources, however, as well as the annual variations in rainfall that the country experiences.

AVERAGE VALUES OF WATER CYCLE COMPONENTS (billion m^3/year)



Source: BIPE, based on data from the 2010 annual report of the Conseil d'Etat «L'hydrosystème et son droit» and BRGM, 2008 (2001 data)

Quantitative management of water resources: a major challenge

Each part of the country can be characterized by the quantity of water available and the different purposes for which the water is used. In the event of a mismatch between the amount of water available and the amount of water needed, shortages may occur. One of the goals of the Grenelle de l'Environnement talks was to reduce the number of areas experiencing chronic shortages of water.

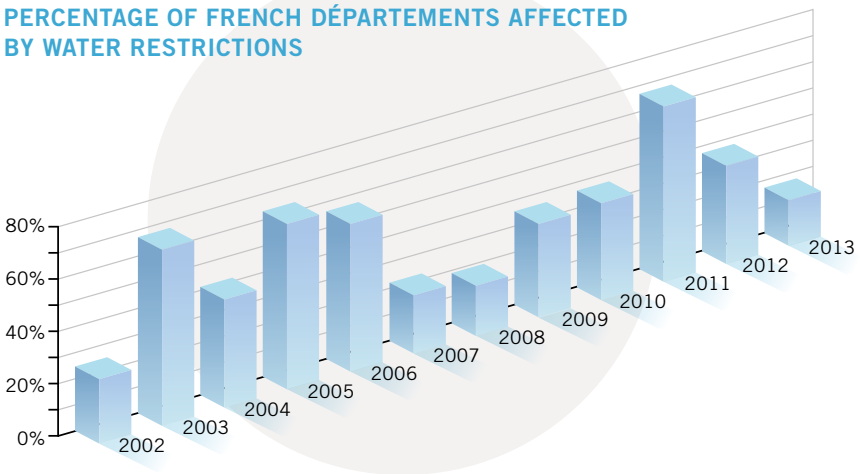
Although France has more than enough water overall, geographical and seasonal variations are such that a more or less sizeable chunk of the country is affected by restrictions on water usage in some years. Over the past 15 years, orders restricting water usage have been issued in at least five départements (Charente, Charente-Maritime, Deux-Sèvres, Tarn-et-Garonne and Vienne among others). These orders are simply **preventive measures:** the supply of water to homes is unaffected.

The drought of 2003 was so severe that regulatory provisions were reviewed to allow for the introduction of drought preparedness plans. In the drought-stricken years of 2003 through to 2006, and in 2011 when the country was struck by drought fairly early on in the year, water usage restrictions were imposed on a large number of départements in the summer months. The water companies are involved in preparing for these situations locally, participating in the programs implemented by the authorities tasked with monitoring water stress.

Conflicts over the use of water are likely to intensify in the future. Indeed, climate change will affect the amount of precipitation and may therefore drive up the demand for irrigation water. At the same time, extreme climate events are set to increase in severity and frequency, a factor that will only exacerbate the likelihood of flooding.

Regional disparities concern both surface water sources and groundwater sources. Some water bodies exhibit chronic shortages in relation to needs. Local authorities in the so-called water allocation areas (ZRE - Zones de Répartition des Eaux), have the possibility of introducing stricter measures to manage water, like for example lowering maximum permissible groundwater withdrawal levels.

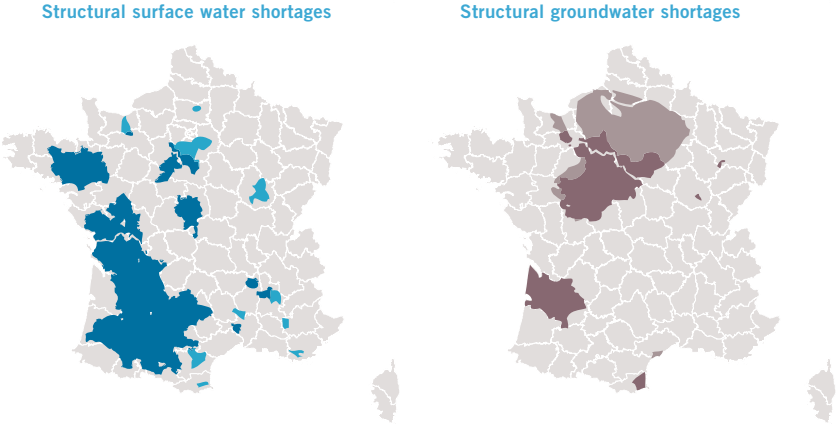
PERCENTAGE OF FRENCH DÉPARTEMENTS AFFECTED BY WATER RESTRICTIONS



Source: BIPE, based on data from the MEDDE–Eau France-PROPLUVIA website, 2014

AREAS CHARACTERIZED BY STRUCTURAL SHORTAGES IN SURFACE AND GROUNDWATER SOURCES

Dark shading: areas identified in 2009; light shading: areas identified in 2010



Source: CGDD (Commissariat Général au Développement Durable), 2013, «La sécurité liée à l'eau»

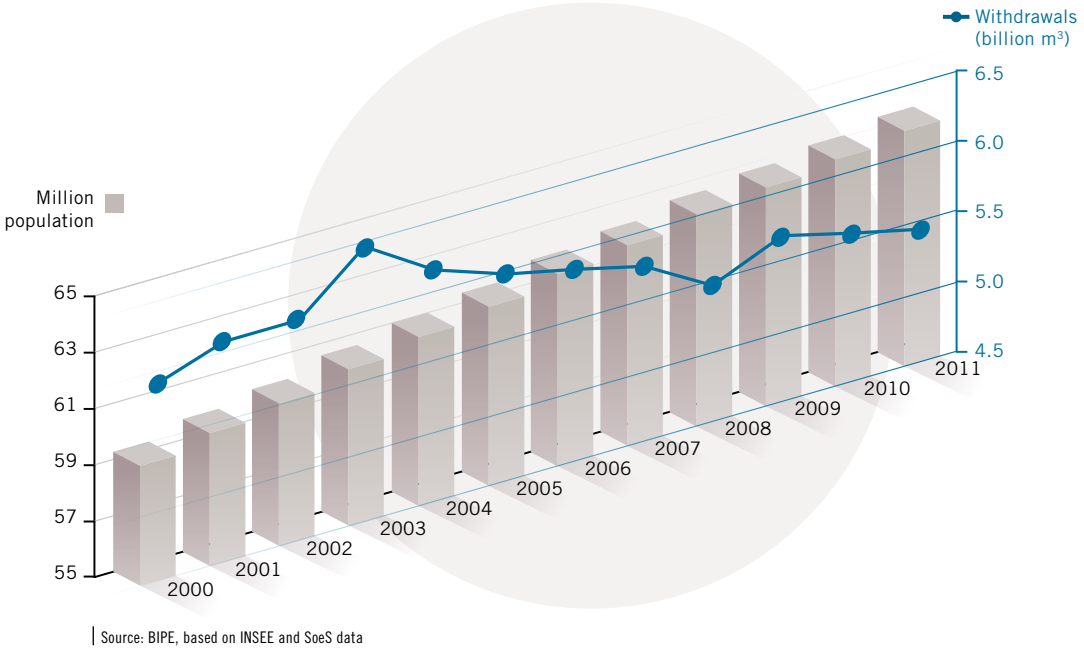
Trends in water withdrawals

The 5.4 billion m³ of water withdrawn in 2011 in France for domestic consumption is the lowest amount on record in nearly two decades. The trend is toward a reduction in withdrawals as well as (in some cases significant) annual variations like the spike in 2003 a year which saw a severe drought and a protracted heatwave. Average annual withdrawals since 2008 have been in the 5.5 billion m³ range, 400 million lower than those recorded between 2000 and 2007.

This decline in withdrawals even as the population has increased, reflects a number of trends:

- **behavioral changes on the part of water users** driven by greater awareness of environmental issues or the wish to save money in more straightened times;
- **advances in water-saving technologies and devices** used in homes, offices, schools, hospitals, etc. but also in industrial processes;
- **changes in the country's production structure,** with a decline in industry which, in just 10 years, has seen 780,000 job losses and a 14.8% to 13.6% drop in its share of domestic value added;
- **more efficient water distribution systems:** water withdrawals are down thanks to fewer leaks.

TRENDS IN WITHDRAWALS FOR DOMESTIC USE
Metropolitan France
Domestic use: water for homes and the service sector

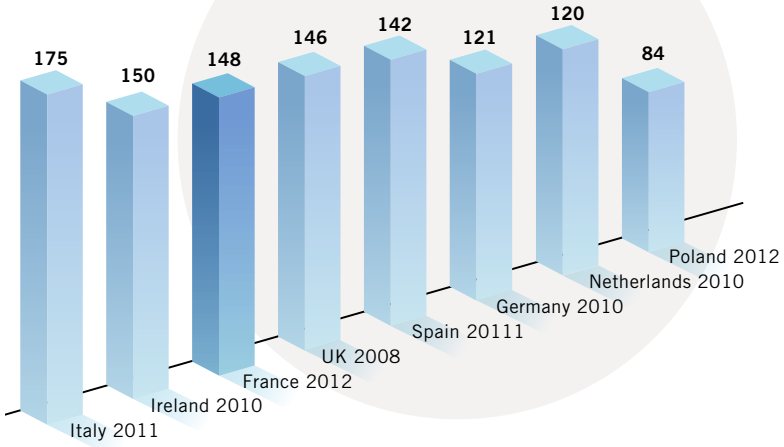


Source: BIPE, based on INSEE and SoeS data

Water use

At 148 liters per person per day, domestic use in France is close to average European levels. Consumption levels vary from area to area however: in 2011, domestic water use in the Alpes Maritimes département was three times higher than that in the Côtes d'Armor (324 liters per day compared to 103 liters per day).

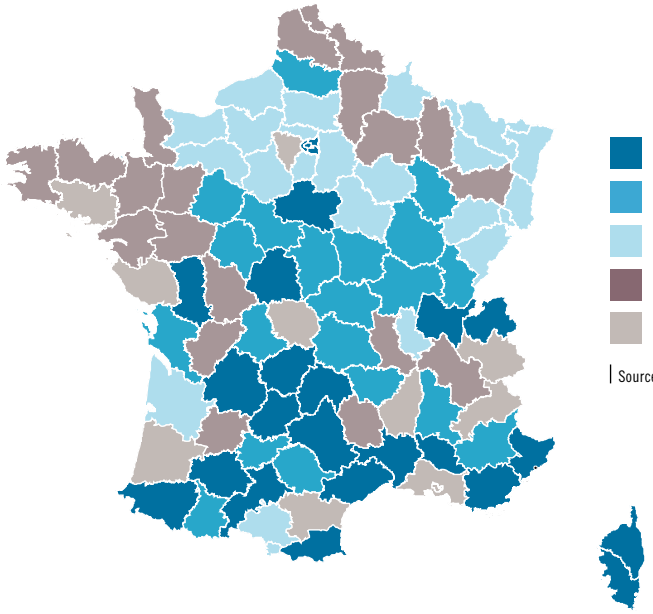
DOMESTIC WATER USE IN EUROPE
(liters per person per day)



Sources: BIPE, based on data from Istat, INE, SISPEA, Ofwat, DeStatis, Vewin, GU and CSO

Domestic water use includes water use by households and (essentially service-sector) economic activities. The difference compared to withdrawals for domestic use is attributable to the performance of treatment plants and distribution systems.

DOMESTIC WATER USE IN FRANCE IN 2011
(liters per person per day)



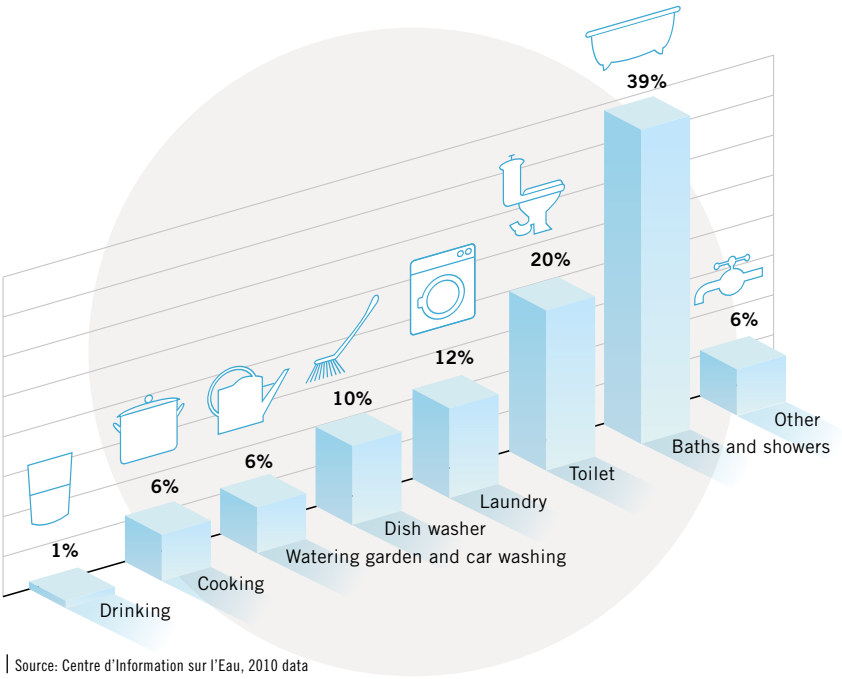
Source: BIPE, based on data from the performance monitoring system SISPEA

Only one-quarter of domestic uses (including toilet flushing and car washing) do not require drinking water.

In 2013, more than 9 out of 10 people in France said they were aware that rainwater was suitable for flushing the toilet, washing the car and watering the plants. This view is compatible with French regulations introduced in 2008, which restrict the use of rainwater.

At a countrywide level, the trend has been a decline in water use. As a general rule, the decline in domestic water usage is due to a fall in household consumption but in some cases it is attributable to falling industrial consumption, particularly as a result of deindustrialization.

BREAKDOWN OF DOMESTIC WATER CONSUMPTION BY USE



Source: Centre d'Information sur l'Eau, 2010 data

Future trends in demand for water resources

In the BIPE's estimation, by 2070, water withdrawals in France for domestic use will fall by between 7% and 12% below 2006 levels under two future scenarios: one in which multi-family housing increases and another in which single-family housing increases, with no change in climate in both cases.

This decline in withdrawals is attributable to:

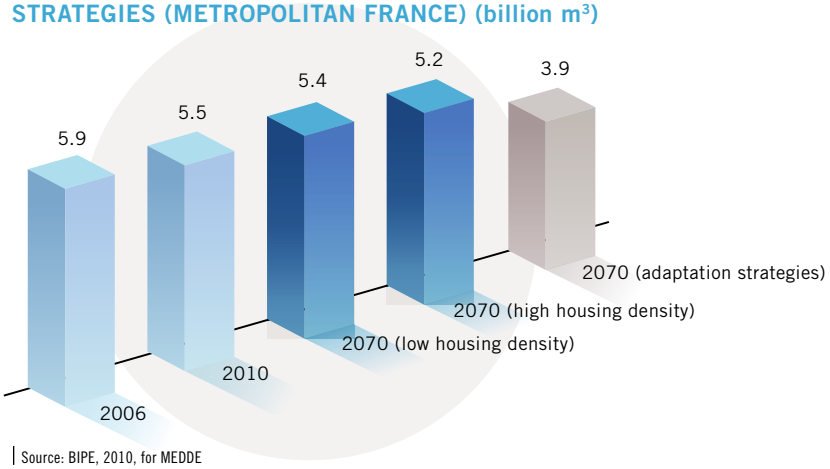
- the fall in per-household water use (down by 25% to 29%);
- fewer leakages on water distribution systems (down 11% under both scenarios).

As a function of housing density scenarios, the combination of two adaptation strategies would result in an even bigger drop in withdrawals (a fall of 33% compared to 2006 levels), reducing these by an additional 1.4 million m^3:

- a strategy involving a 40% reduction of per-household use, 15% more on average than under the business-as-usual scenarios;
- a strategy involving a 16% to 20% reduction of distribution system leakage (as opposed to 11%), with leakage reduced to 15% in all catchment areas with a leakage rate of above 15%.

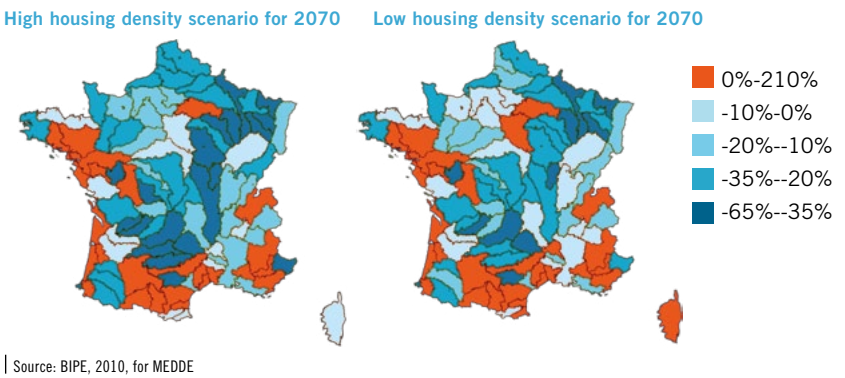
While these scenarios should result **in less overall pressure on drinking water resources in the long term in Metropolitan France,** BIPE models also flag up **potential pressures at a catchment-wide level.** Indeed not all catchment areas would see a reduction in withdrawals for domestic use.

WATER WITHDRAWALS FOR DOMESTIC USE IN 2070 UNDER LOW AND HIGH HOUSING DENSITY SCENARIOS, AND WITH ADAPTATION STRATEGIES (METROPOLITAN FRANCE) (billion m^3)



Source: BIPE, 2010, for MEDDE

SCENARIOS FOR TRENDS IN WITHDRAWALS BY CATCHMENT AREA BETWEEN 2006 AND 2070



Source: BIPE, 2010, for MEDDE

Demand would increase considerably in the regions along the Atlantic coast and in the south and south-east of the country. Demographic growth, a sharp rise in the number of households and an ageing population would result in some regions attracting more and more people and these regions would be using more water in a trend accentuated by the growth in single-family housing.

The objective of 'good status of water bodies'

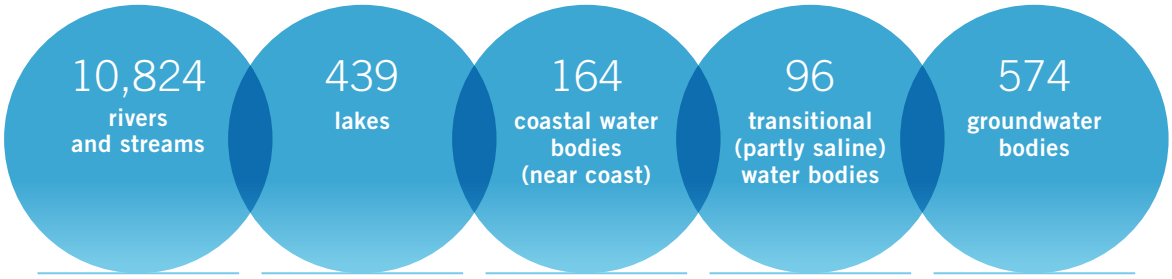
The 2000 Water Framework Directive (WFD) commits European Union countries to a single policy to attain **a common objective of 'good status' of groundwater and surface waters** by 2015.

With specific regard to surface waters, the two components of 'good overall status' are good ecological status and good chemical status:

- Ecological status is assessed according to biological criteria (macrophytes, fish life and other forms of aquatic life) and physical-chemical criteria (nitrogen, phosphorus, temperature, pH, etc.). Good ecological status is generally achieved if the water body has not been significantly altered by human activity.
- Chemical status is assessed based on concentrations of 41 priority chemicals (as identified at EU level). Good chemical status is achieved if these concentrations are below specific limits.

With regard to groundwater, 'good overall status' means good chemical status combined with good quantitative status. Chemical status hinges on concentrations of substances identified at the national level (heavy metals like lead, cadmium and arsenic) and at EU level (nitrates, ammonium, pesticides, etc.). Good quantitative status is achieved if the natural rate of replenishment of groundwater is not exceeded by the rate of withdrawal.

WATER BODIES IN FRANCE



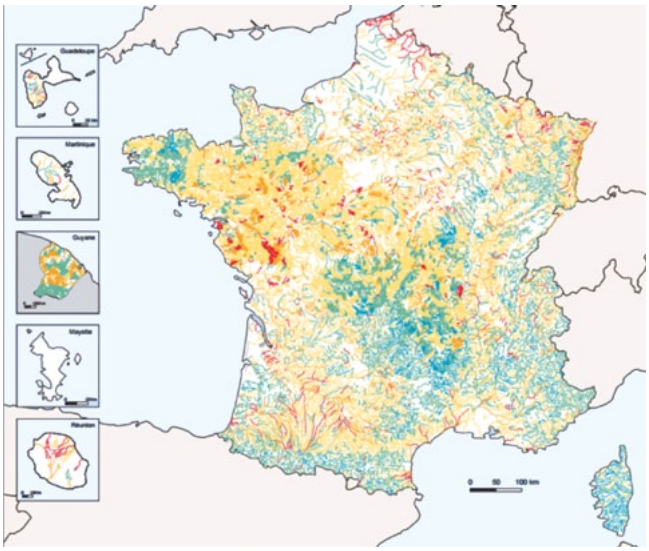
Source: Eaufrance - Metropolitan France and overseas départements

Monitoring programs have been set up in each catchment area in France with the aim of assessing water body status and ensuring the achievement of WFD objectives.

11,523 surface water bodies and 574 groundwater bodies have been identified. Surface water bodies are monitored from more than 4,300 monitoring stations and groundwater from close on 4,700 stations.

In implementing the WFD, France's aim is to move incrementally toward achieving good ecological status over the period 2015 to 2027. Targets for good ecological status for surface waters have been set at the ambitious levels of 64.3%, 87.6% and 99.5% for 2015, 2021 and 2027 respectively.

A failure to achieve good ecological status in 2009

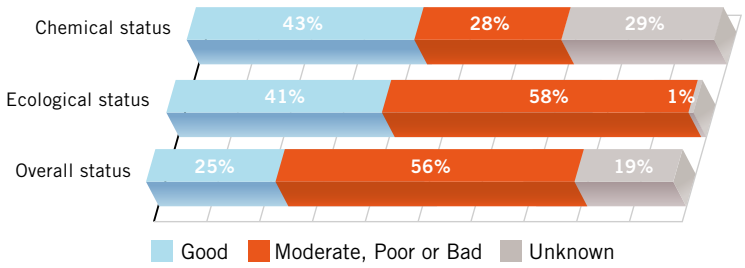


Source: Agences de l'Eau - Délégations de Bassin (findings based on monitoring data collected in 2006 and 2007, as reported to the European Commission on October 15, 2010 in accordance with the Water Framework Directive) - Base maps: ONEMA - Produced by: A. Claverolas (International Office for Water) © ONEMA, 2010

In 2009, the quality of water sampled in France failed to achieve good status overall from an ecological standpoint.

For the subsequent sampling program from 2009 onwards, the aim is to achieve good overall status for 39% of surface water bodies (compared to 25% in 2009) and 63% of groundwater bodies (compared to 55% in 2009) by 2015. The efforts required to meet these targets are more significant in some catchment areas than in others.

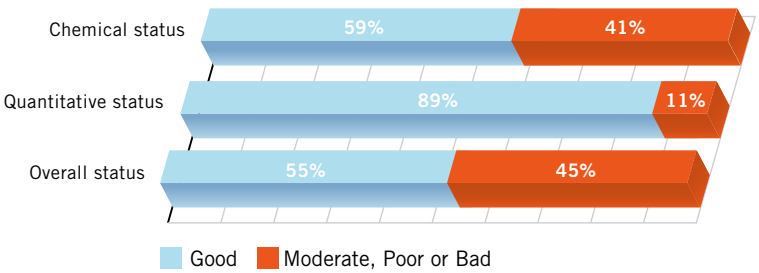
2009 FINDINGS ON SURFACE WATER STATUS IN FRANCE



Source: BIPE, based on MEDDE data

41% and 43% of surface water bodies achieved good ecological status and good chemical status respectively, but in 29% of cases the chemical status was unknown. Good overall status was achieved in only 25% of water bodies, with a high percentage of unknowns for this criterion too. And in some catchment areas (Sambre, Réunion) good overall status was achieved by fewer than 20% of water bodies.

2009 FINDINGS ON GROUNDWATER STATUS IN FRANCE



Source: BIPE, based on MEDDE data

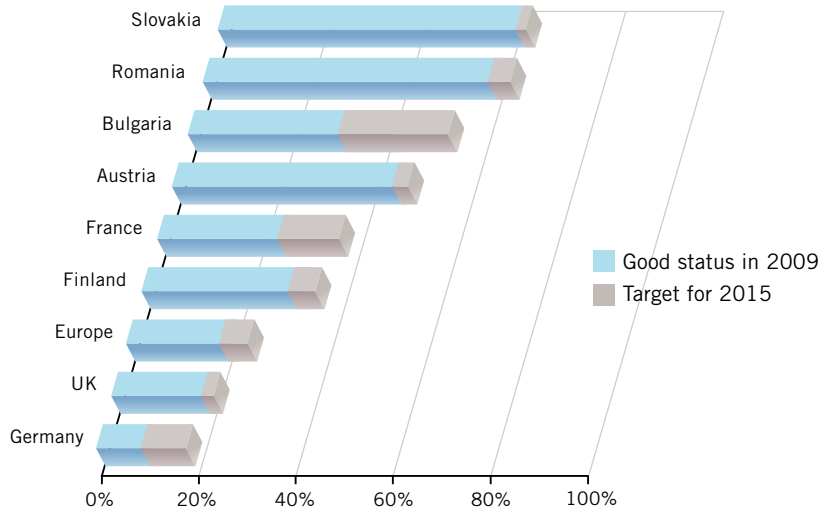
55% of groundwater bodies achieved good overall status, i.e. both good chemical and quantitative status, with the findings for chemical status exerting a downward influence. With the exception of catchment areas in Adour-Garonne and Réunion, all catchments achieved high percentages for good quantitative status. The percentage of water bodies achieving good chemical status was fewer than 50% in only a handful of catchment areas (Seine-Normandie, Rhin and Réunion).

Ambitious targets for 2015

With the aim of achieving good overall status of 39% of its surface water bodies by 2015, **France set itself progress targets that were stiffer than the average in Europe.** Given results for ecological and chemical status that were in line with the European average in 2009, the ground that France had to make up was significant.

Whereas results for ecological and chemical status are relatively similar in France, this is not the case in other EU countries. Indeed the comparisons can be quite startling. On good ecological status, at 41%, France fared far better than Germany and was on a par with Spain in 2009. With a score of 43% for good chemical status, France came far behind these two countries however.

RESULTS AND TARGETS FOR GOOD STATUS OF SURFACE WATER BODIES IN EU COUNTRIES

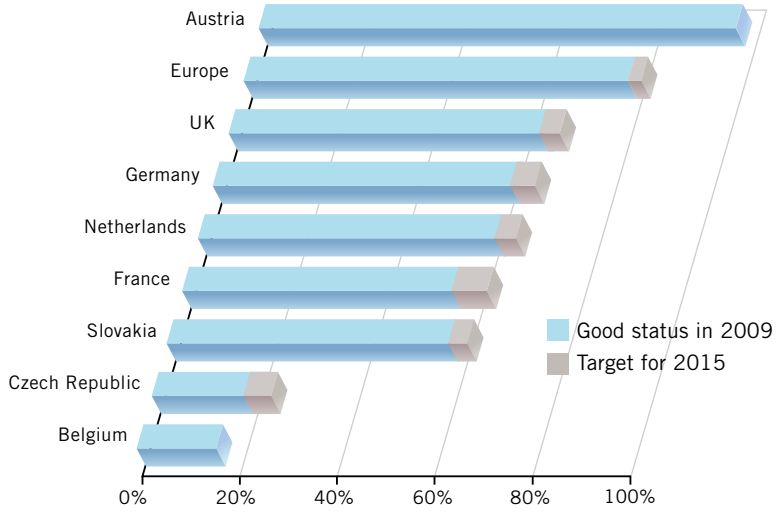


Source: BIPE, based on data from the strategic plan for the development and management of water (SDAGE),and Rapportage DCE, 2012

With regard to groundwater, having set itself a target of 63% for good overall status in 2015, France has a gap of seven percentage points to make up (compared to the European average of three percentage points), making its targets in terms of the ground to be covered among the most ambitious in Europe.

On good quantitative status, with 89% of its groundwater bodies achieving this criterion, France was in line with the European average. With a score of 59% for good chemical status, it performed well below the European average (79%) however, faring worse than its major EU neighbors like Germany, the UK and Spain.

RESULTS FOR GOOD STATUS OF GROUNDWATER BODIES IN EU COUNTRIES, 2009



Source: BIPE, based on data from the strategic plan for the development and management of water (SDAGE),and Rapportage DCE, 2012

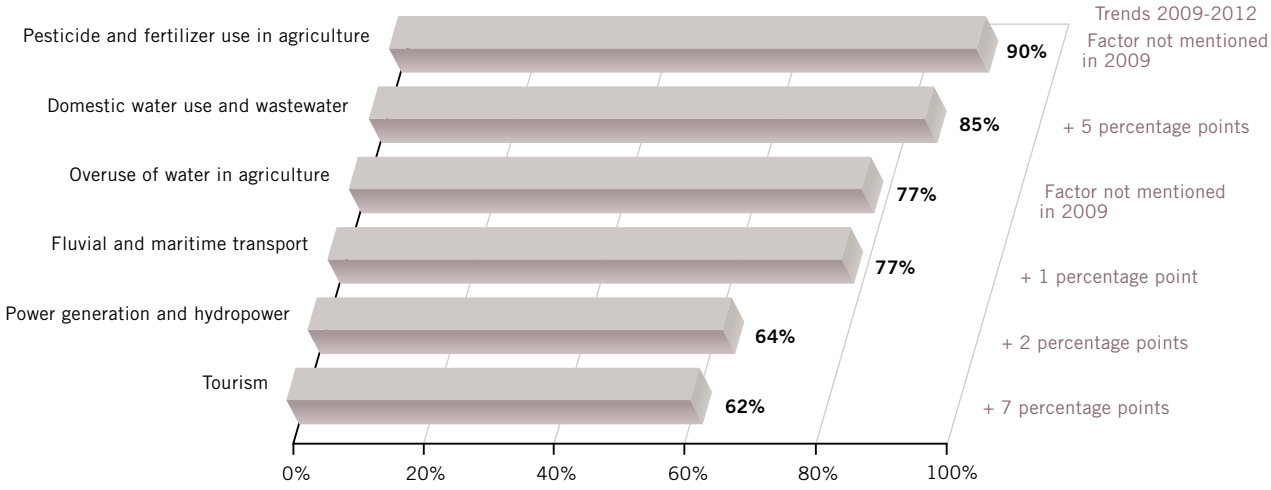
Groundwater is prone to contamination from urban, industrial and agricultural pollutants. Pesticides and nitrates used in intensive farming are the main culprits but groundwater supplies are also at risk from contaminated industrial sites or toxics in subsurface environments. Pollution is an even greater threat where the natural process of groundwater replenishment is slow and aquifers may take many years to cleanse themselves.

Good user awareness of factors impacting water resources

Based on the findings of the European Eurobarometer survey, farming is seen by the French as the activity having the biggest impact on water quality and quantity – mainly on account of fertilizer and pesticide inputs, but also due to what are deemed to be excessive withdrawals of water.

French people are also very aware of the impact of their water usage and the wastewater this generates. Indeed these were the two factors over which concerns grew most among people in France between 2009 and 2012.

THE FACTORS THAT FRENCH PEOPLE SEE AS HAVING AN IMPACT ON WATER QUALITY AND QUANTITY IN FRANCE



Source : BIPE, based on the findings of Eurobarometer surveys, March 2012 and January 2009

The SDAGE: a tool used to manage and achieve good status of water bodies

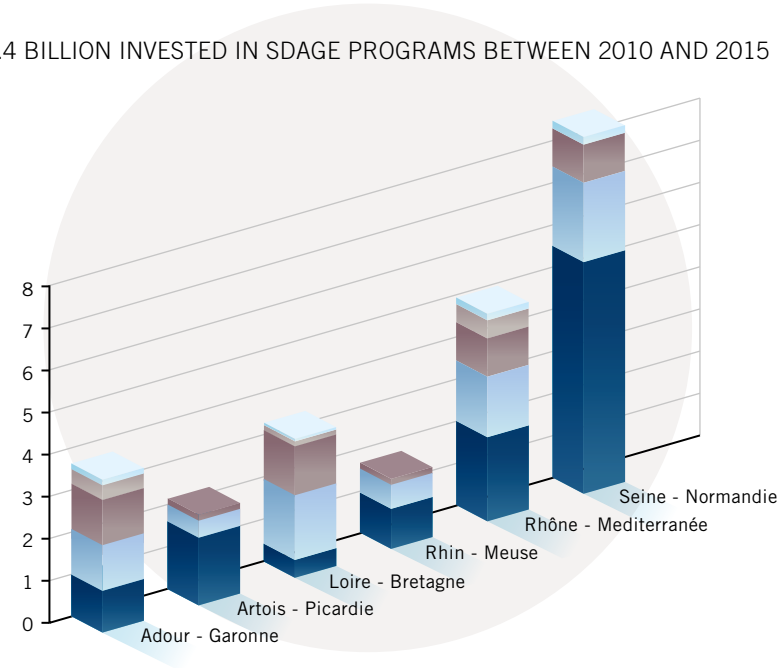
To achieve the good status targets for water bodies, each river basin prepares and adopts a strategic plan for the development and management of water (SDAGE). These programs cover a period of six years, the current six-year plan ending in 2015 and the next one running to 2021.

The SDAGE is a three-stage strategic plan:

- It gives guidance on how to meet the fundamental requirements for achieving the balanced and sustainable management of water resources (a process that involves conducting a baseline assessment and public consultation process to identify key issues).
- It sets quality and quantity targets for each water body (rivers, lakes, aquifers, estuarine and coastal waters) in the river basin, based on the key issues and priorities identified during the previous stage.
- It determines the program of action needed to meet targets in respect of preventing the deterioration of water resources and improving the overall status of water bodies. This last stage, which follows a second public consultation process, culminates in the adoption of the SADGE.

The actions identified in the SDAGE are transposed and implemented by means of a water resources development and management plan (SAGE).

€24.4 BILLION INVESTED IN SDAGE PROGRAMS BETWEEN 2010 AND 2015



Governance and knowledge acquisition

Water resources
(including quantitative management). Source protection

Aquatic environment – Hydromorphology
Improving freshwater environments and biodiversity

Water in agriculture
(excluding quantitative management).
Control of non-point source pollution

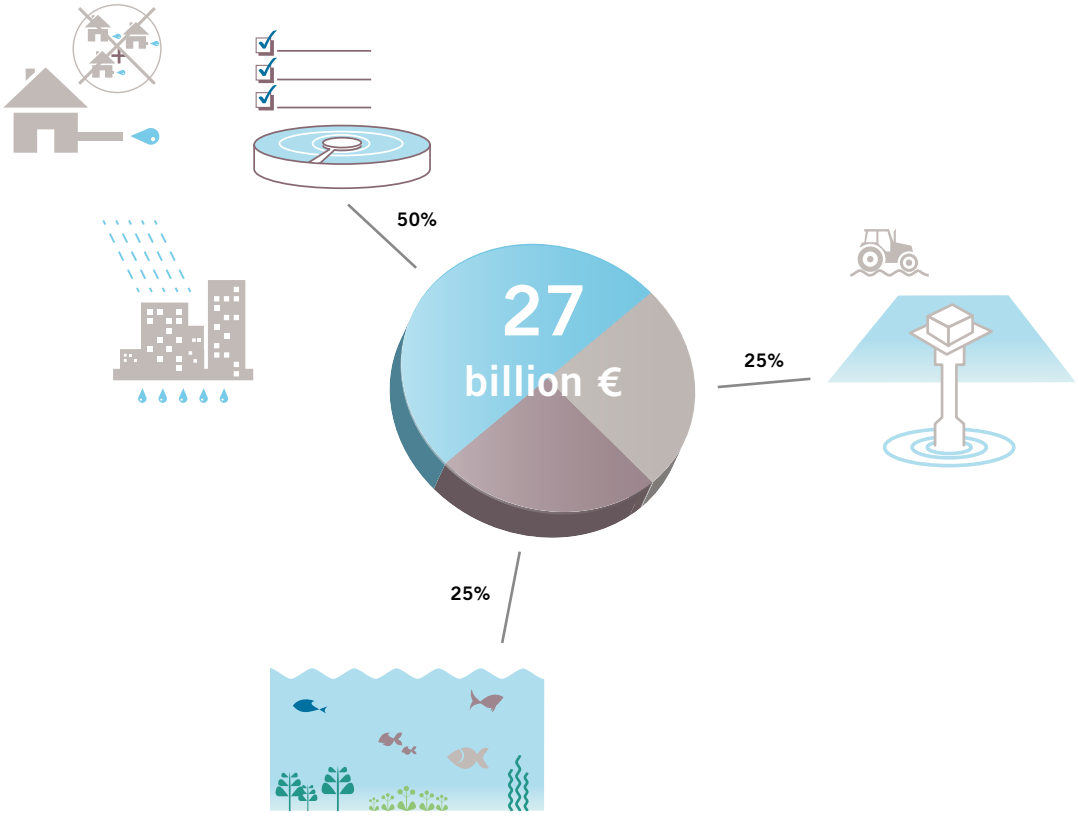
Control of point-source pollution
Improving wastewater treatment

Sources: MEDDTL, Agences de l'Eau, Offices de l'Eau

Mid-term SDAGE reviews were prepared in 2013. These show findings similar to those obtained in 2009 assessments (both for surface and groundwater bodies) with the result that 2015 targets are unlikely to be met. The reviews do show that monitoring systems are improving, however, thereby reducing gaps in knowledge about ecological status and improving the accuracy of ecological and chemical status assessments.

Of the €27 billion earmarked for SDAGE programs between 2010 and 2015:

- half was allocated to improving sewage treatment through measures such as upgrading wastewater treatment plants, improving on-site sewage treatment and tackling combined sewer overflows;
- one quarter was allocated to tackling non-point source organic and chemical pollution from farming practices, including the introduction of agroenvironmental measures and actions targeting source protection zones;
- the remaining quarter was allocated to improving aquatic environments and biodiversity.



The budgets handled by the Agences de l'Eau

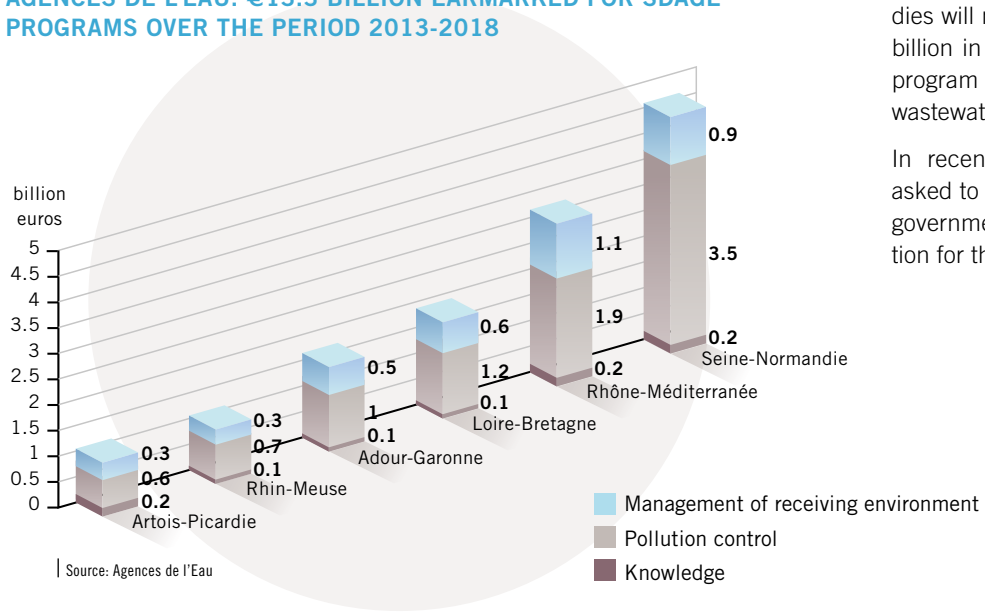
Since they were established in 1964, the six basin water boards, the Agences de l'Eau, have been tasked with preparing multiyear action plans for the implementation of national water policy in each of the country's main river basins.

The financing mechanism used by the Agences de l'Eau is the 'user/polluter pays' principle. The multiyear action plans are financed wholly through a fee paid by water users, the amount of which depends on the amount of water withdrawn and used, and the amount of pollution generated. An order issued by the environment and finance ministries sets a limit on Agence de l'Eau spending under the multiyear program and determines the level of funding to be allocated to each key area of action.

The 10th program of action provides for a total €13.3 billion of investment between 2013 and 2018 – a program that will translate into €25 billion in works by Agence de l'Eau estimates. And Agence de l'Eau subsidies will make up €7 billion of the total €15 billion in investment provided for under the program for the delivery of water and wastewater services.

In recent years, the Agences have been asked to contribute to the effort to tackle the government budget deficit. Their contribution for the year 2015 was €175 million.

AGENCES DE L'EAU: €13.3 BILLION EARMARKED FOR SDAGE PROGRAMS OVER THE PERIOD 2013-2018



Source: Agences de l'Eau

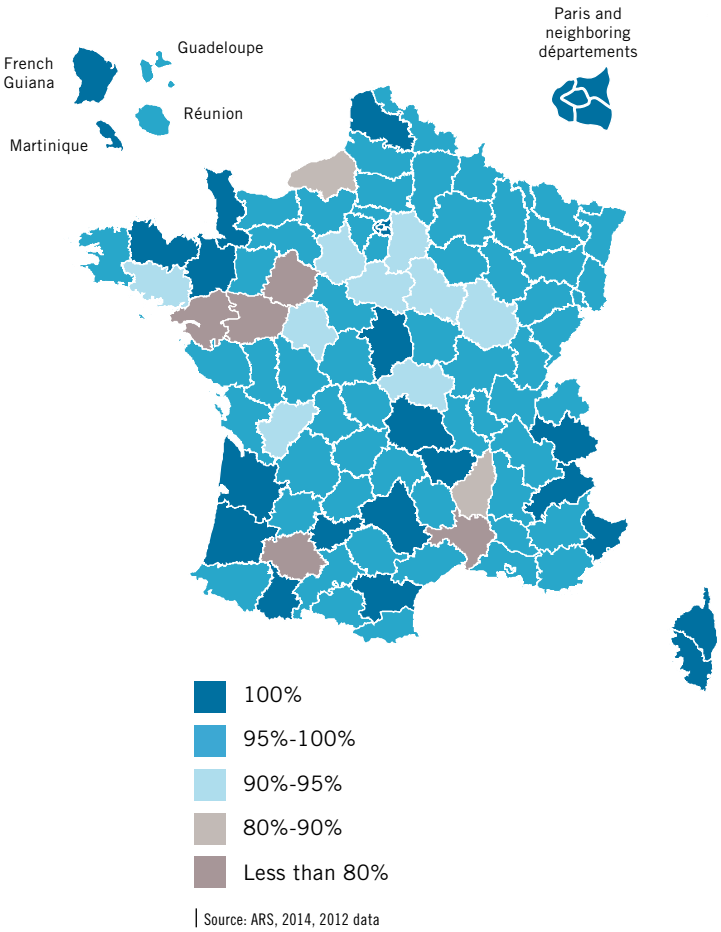
The quality of water at the tap

A high standard of tap water

According to the French Ministry of Health and the regional health agencies, the Agences Régionales de Santé (ARS), considerable efforts were made to improve tap water quality in the 2000s. The percentage of the population supplied by water that failed to meet the applicable microbiological standards at least once, fell from 8.8% in 2000 to 3.3% in 2012.

Further, the population supplied by water that does not comply with pesticide limits has fallen by 43% since 2003, with a 16% drop between 2010 and 2012 with respect to nitrate limits. Those cases where water quality limits were exceeded were mostly in rural areas. Overall in 2012, 99.1% of the population were supplied by water that consistently complied with nitrate limits and 95.5% of the population were supplied by water that consistently complied with pesticide limits.

PERCENTAGE OF THE POPULATION SUPPLIED BY WATER THAT CONSISTENTLY COMPLIES WITH WATER QUALITY STANDARDS FOR PESTICIDES



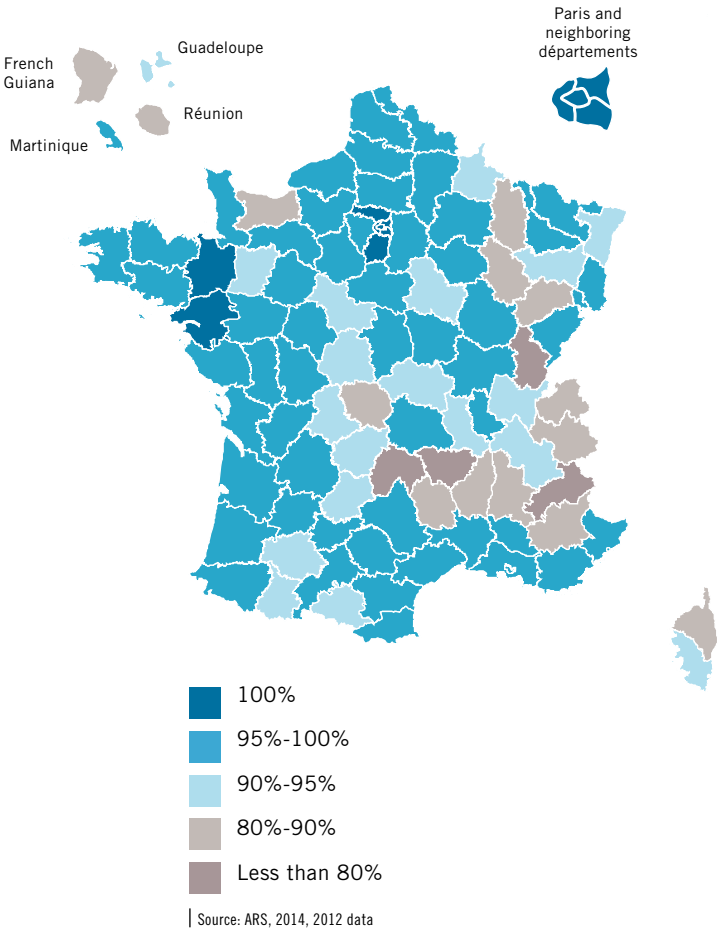
Source: ARS, 2014, 2012 data

Issues with arsenic and selenium linked to geological conditions, are confined to just a few départements. Although major efforts have been made to meet the applicable standards in recent years, the small size of the utilities concerned means that they have limited possibilities for implementing remedial measures.

The results shows that, although tap water quality has considerably improved, in some parts of the country, there is still a need to continue efforts to upgrade water sourcing and distribution facilities, improve water disinfection processes and install source protection zones.

The Ministry of Health and the French Agency for Food, Environmental and Occupational Health & Safety, ANSES, have also launched programs to investigate drug residues and Bisphenol A (BPA). These have shown that concentrations in tap water are 1,000 to 1 million times lower than the amounts used in therapeutic doses and that tap water does not play any significant role in exposing people to BPA.

PERCENTAGE OF THE POPULATION SUPPLIED BY WATER OF GOOD MICROBIOLOGICAL QUALITY



Source: ARS, 2014, 2012 data

Protection of drinking water sources

Two main types of source protection systems

Around 33,000 sources have been identified in France. Most of these (96%) are groundwater sources – wells, boreholes or springs which provide two-thirds of the country's drinking water supplies, the remaining third being supplied from surface water intakes. And in 2012 in Metropolitan France, four seawater intakes for the supply of drinking water were identified, with a total capacity of 25,000 m³/day.

With the aim of protecting these facilities against point-source, accidental and non-point source pollution, two different systems are provided to delineate and classify the areas around source works.

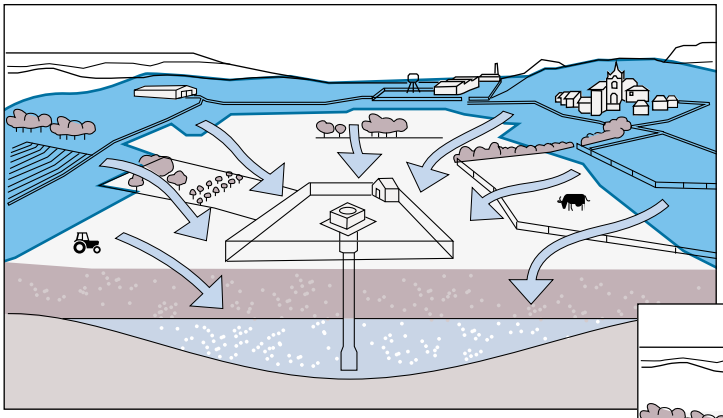
The first mechanism is the creation of source protection zones whose role is to protect sources from point-source and accidental pollution. The French Water Act of 1992 has made these mandatory for all source works. Three concentric protection zones are provided for, each delineated according to the risk of pollution and vulnerability of the source:

- **an inner protection zone** around the source, comprising land which must be closed off and purchased by the water supplier, and within which all activities are prohibited;
- **an intermediate protection zone** in which all activities and installations with the potential to directly or indirectly impair water quality are prohibited or regulated;
- if necessary, **an outer protection zone,** within which activities and installations may be regulated.

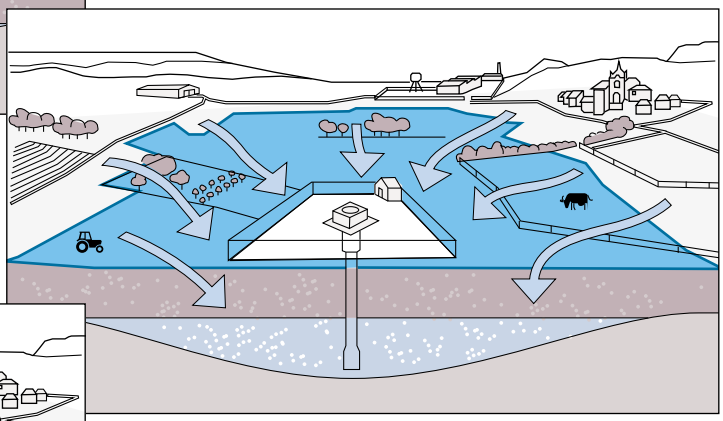
The delineation of these protection zones and applicable restrictions are governed by a prefectural order granting a right of eminent domain in the form of the Déclaration d'Utilité Publique (DUP).

By the end of 2013, 69% of all sources had protection governed by a DUP, representing 80% of the water withdrawn at a countrywide level. In the space of two years, this form of regulatory protection has increased by six percentage points in terms of the number of sources covered and seven percentage points in terms of the volume of water withdrawn.

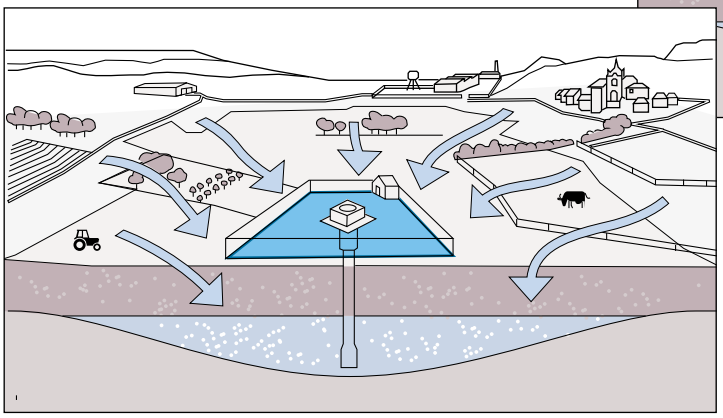
SOURCE PROTECTION ZONES



Outer protection zone
Zone of contribution



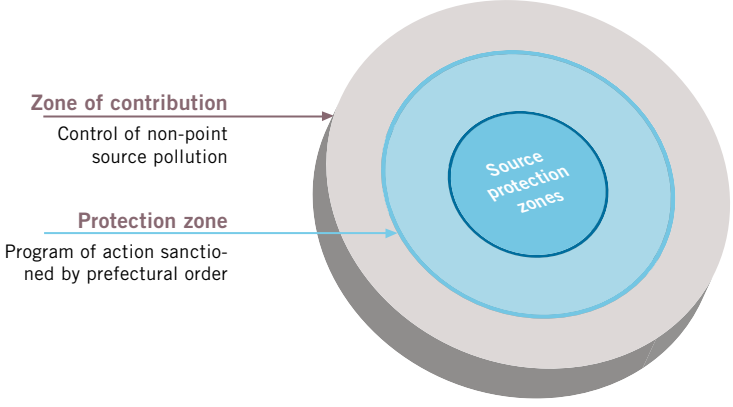
Intermediate protection zone
Capture zone
Several hectares



Inner protection zone
Area fenced off and purchased by the water supplier
A few hundred meters square

Source: French Ministry of Health

PROTECTION OF ZONES OF CONTRIBUTION AGAINST NON-POINT SOURCE POLLUTION



Source: BIPE, based on French Ministry of Environment data

In addition to the source protection zones, a second measure is provided under the Water Act of December 2006 and the requirement for 'zones subject to environmental constraints' (ZSCE), which is an outgrowth of the Act. This last measure provides for measures to protect against non-point pollution sources within zones of contribution. These zones are generally larger than source protection zones, extending to the area in which any drop of water falling on the ground will eventually reach the source via infiltration or runoff. Programs of action sanctioned by prefectural order may be implemented across all or part of the zone of contribution.

Protection of priority water sources

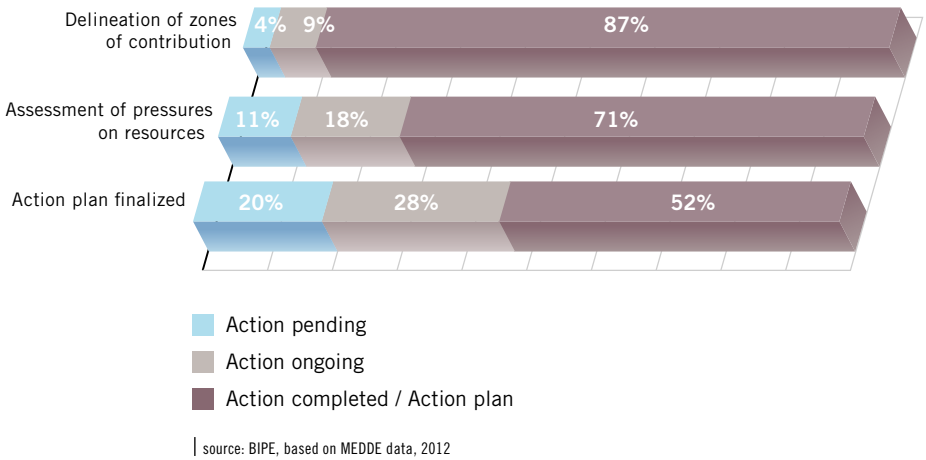
In 2009, as part of the effort by public authorities to protect water sources, priority sources were identified under the Grenelle de l'Environnement initiative. Initially 507 in number, the so-called Grenelle sources numbered 532 in 2011 and 1,000 by the time of France's second Environmental Conference in 2013.

Priority sources are determined according to three criteria:

- the quality of the water in relation to pollution by nitrates and pesticides;
- the strategic importance of the source in relation to the population supplied from it;
- the importance given to reactivating abandoned sources.

A plan of action involving all stakeholders is implemented after studies to delineate zones of contribution and investigate pressures on source waters. By 2012, 52% of Grenelle sources were covered by a plan of action that had been finalized but only 17% were covered by an order sanctioning the plan.

STATUS OF THE INITIATIVE TO PROTECT GRENELLE SOURCES



source: BIPE, based on MEDDE data, 2012

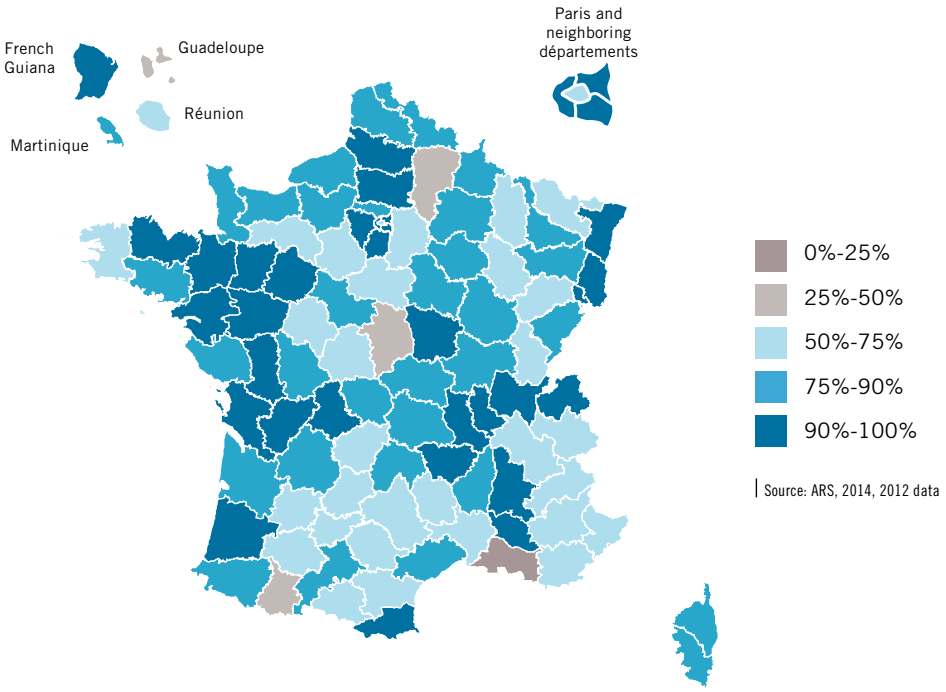
Many other at-risk sources

Aside from the Grenelle sources, by Ministry of Health estimates, in 2014, another 3,000 sources were in a condition that was cause for concern, i.e. they exceeded applicable nitrate or pesticide limits. These sources account for only a small part (8%) of total sources, but it is difficult to determine whether the situation is getting better or worse for two reasons:

- no measures were put in place for as many as 40% of sources between 2008 and 2012;
- the most polluted sources have been completely abandoned and are not subject to quality controls.

An interministerial report published in 2014 suggests that the most effective solutions for addressing source water quality issues, are often never adopted because of the complexity and unsuitability of the measures implemented. From a technical standpoint, several mechanisms have been identified for more effective action, such as involving farmers in the action plans, combining different sources of expertise, and the development of capacities to manage procedures and coordinate stakeholders.

LEVELS OF PROTECTION THAT VARY CONSIDERABLY FROM DÉPARTEMENT TO DÉPARTEMENT (percentage of pumped volumes protected)



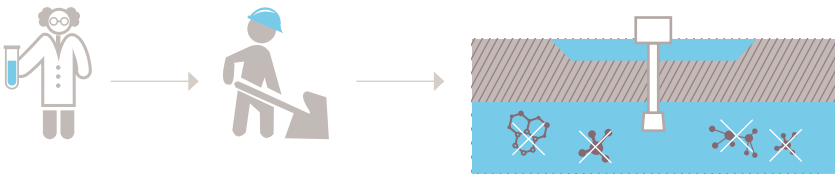
Source: ARS, 2014, 2012 data

The chambers of agriculture as partners to the water companies for the purposes of protecting sources

The water companies (under the umbrella of the FP2E) and the farmers' association, the Assemblée Permanente des Chambres d'Agriculture, have been working together to implement measures to protect drinking water sources.

In 2014, in the wake of the second Environmental Conference when the number of sources given priority status was increased to 1,000, the two organizations signed an agreement to step up their collaboration.

A prime example of territorial cooperation, the agreement seeks to foster the dissemination of experience in managing priority sources by increasing the number of local partnerships. It is also intended to promote the development of more innovative solutions for authorities and farmers.



In the case of the Orléans pilot site for example, the local council, Loiret chamber of agriculture and local operator entered into a three-way agreement with the aim of protecting the quality of the water supplied to the city, while allowing the 50 or so farms around the city to carry on business as usual.

The initiative focused on three wells listed as Grenelle priority sources, that provide 90% of the city's water supply to over 150,000 people.

Under the agreement, random water quality tests were carried out, followed by €180,000 in work to protect the wells and make other improvements such as the rehabilitation of fertilizer storage areas.

The main outcome of the initiative was to remove all traces of pesticides and other agrochemicals in a groundwater source that once contained traces of atrazine and its metabolites.

The results of this partnership are encouraging, and similar initiatives have been taken at pilot sites in Calais (62), Oursbelille (65), Montet Chambon (36), Carcès (83), Pesmes (70), Asnans (39), Jaunay (85) and Sainteny (50).

Tap water of a continually high standard

To be safe to drink, water must meet very stringent quality criteria. Tests are carried out under the auspices of the regional health agencies, the Agences Régionales de Santé (ARS), and cover the entire supply system including source works, treatment plants, storage facilities and distribution systems.

300,000 samples are tested each year. Indeed tap water is one of the most strictly controlled foodstuffs.

The results of the tests are published regularly and made available to the public on the Ministry of Health website (www.sante.gouv.fr/qualite-de-l-eau-potable).

Each year, the health agencies carry out close on 12.3 million tests covering all of the country's public water and wastewater services (both publicly and privately managed). And the private-sector water companies also do their own whole-system monitoring. In 2013, more than 8.1 million tests were carried out on services managed by private water companies in France – 20% more than in 2010.

According to the regional health agencies, in 2012, **96.7% of the microbiological tests carried out at a countrywide level complied with the applicable standards.** But this average conceals regional disparities. Indeed microbiological problems are more often than not an issue for small rural distribution systems, many of which exceed pesticide and nitrate limits too.

For services managed by private water companies, **compliance levels stood at 99.5% in 2013** (Source: BIPE, based on a survey of French water companies).

WATER COMPANY PERFORMANCE INDICATORS

	2006	2008	2010	2013
Compliance rates for microbiological parameters	99.7%	99.6%	99.7%	99.5%
Compliance rates for physical-chemical parameters	98.6%	98.7%	98.6%	98.0%

Source: BIPE, based on water company survey findings, 2011 - 2013

ARS (REGIONAL HEALTH AGENCY) SANITARY QUALITY FINDINGS

	2006	2008	2010	2013
Percentage of the population supplied by water that consistently complies with the applicable microbiological standards	95.6%	96.2%	96.8%	96.7

Sources: SISE-Eaux, ARS, French Ministry of Health, 2011 – 2013

A vast majority of users who are satisfied with tap water quality

According to the 2015 **TNS Sofrès survey for the Centre d'Information sur l'Eau**, the vast majority (84%) of French people are satisfied with and trust their water supply service.

Four in five French people (81%) say they trust their tap water. This belief that tap water is safe stems mainly from **the standards and tests** to which tap water is subjected. 97% of survey respondents were aware that water must comply with certain standards and 96% knew that tap water quality underwent testing. One-third of all respondents said they would like to see more tests carried out however.

So the vast majority of French people trust their water... and are drinking it – **even if they typically consume both tap and bottled water** (as did 75% of survey respondents). **The preference appears to be for tap water** however, with 65% of respondents saying they drank tap water every day as compared to 48% who drank bottled water every day. 60% of respondents said their preference for tap water was based on quality and convenience, although 56% also said they drunk tap water because it was cheaper. Seven in ten people (71% of respondents) also said they liked the taste of tap water.

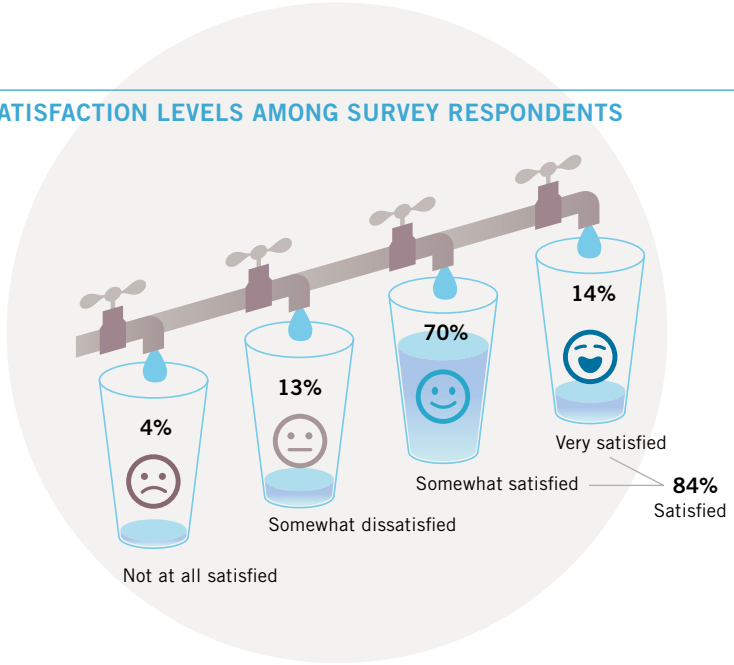
Regardless of what the water was used for (drinking, bathing, cleaning, etc.) three out of four respondents (72%) said they were generally happy with their tap water. Those who expressed dissatisfaction did so for reasons of taste or hardness.

Maintaining the quality of tap water also means protecting the quality of the supply source and accepting to use water responsibly. **89% of French people said they paid attention to how much water they used** and 53% said they feared water shortages in their area in the coming years. Another **62% thought that the quality of water resources would deteriorate in the future.**

Despite the need for many different skills in ensuring good quality tap water, 73% of French people still think that drinking water can be found in nature. And that is very rarely the case.

74% and 76% of people respectively, however, said they were aware of **the substantial capital costs of water and wastewater treatment facilities.**

SATISFACTION LEVELS AMONG SURVEY RESPONDENTS



Source: TNS Sofrès survey for the Centre d'Information sur l'Eau, 2015

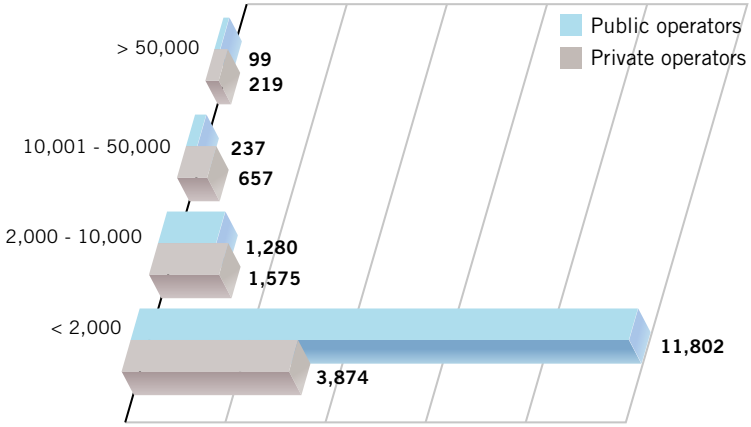
Wastewater treatment

A majority of wastewater treatment plants operated by the water companies

There are 19,750 wastewater treatment plants in France, providing a total treatment capacity of 99 million population equivalent (PE). Nearly 80% of the treatment plants in operation are of low capacity (< 2,000 PE) and the treatment they provide accounts for only a small part (8%) of the total installed capacity.

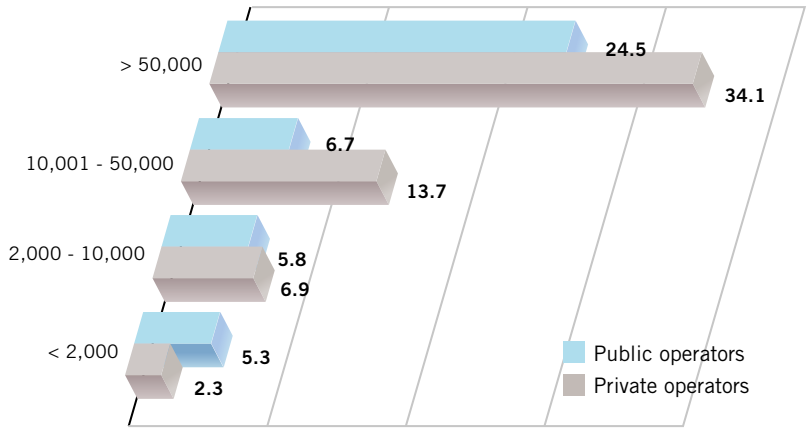
Around 6,300 plants (one-third of all treatment plants in France) are operated with the involvement of the private companies. The private operators run nearly three-quarters of the country's large plants (876 plants with a total capacity of over 10,000 PE) and nearly 60% of the total treatment capacity (57 million PE). They also operate nearly half of the sewer system, proper maintenance of which is critical to prevent the discharge of untreated sewage to the natural environment.

NUMBER OF WASTEWATER TREATMENT PLANTS BY PE CAPACITY AND TYPE OF OPERATOR



Sources: BIPE, based on water company survey findings and data from the MEDDE BDERU wastewater database, 2012

TOTAL RATED CAPACITIES OF PLANTS BY PE CAPACITY AND TYPE OF OPERATOR (million PE)



Sources: BIPE, based on water company survey findings and data from the MEDDE BDERU wastewater database, 2012

Improvements in upgrading facilities

As part of the process of pursuing water body quality targets, wastewater treatment facilities must comply with particular standards regarding the level of treatment of organic matter and nutrients.

The regulatory frameworks fixing the applicable levels of treatment cover the entire sewage collection, conveyance and treatment system.

Levels of treatment vary depending on the size of the community sewered and the sensitivity of the receiving waters. The issue of compliance is critical for the large facilities, as in 2012, 79% of all sewage was treated in treatment plants of capacities of 10,000 PE or more.

COMPLIANCE OF WASTEWATER TREATMENT PLANTS > 2,000 PE

	2010	2011	2013
Plants run by the water companies (own requirements pursuant to water policing provisions*)	86%	94%	95%
Plants run by all utilities (national requirements, UWWTD Directive**)	80%	80%	na

Sources: water company survey findings and data from the MEDDE BDERU wastewater database, 2012; na: not available

Under a first plan of action, implemented over the period 2007-2011, 146 major treatment plants were to be upgraded. Under a second plan up to 2018, the process of compliance with the Urban Waste Water Treatment Directive (UWWTD) must be completed and the plants must comply with new requirements governing the quality of water bodies and the sustainability of sludge management processes.

Under the second plan of action, nearly 300 treatment plants and sewer systems must achieve compliance. 60% of the 74 facilities given priority status in 2011 had already been upgraded to UWWTD standards by 2014. The 200 or so facilities identified as non-compliant in 2013 in terms of equipment, performance or overloading issues must start the upgrading process by mid-2017 at the latest.

Given that the overall service life of a wastewater treatment plant is 30 to 40 years, the replacement rate for plants of more than 2,000 PE in capacity, replaced for reasons of obsolescence or capacity shortfalls, is estimated at 3%, or around 100 plants a year.

* requirements complying with the Urban Waste Water Treatment Directive

** Urban Waste Water Treatment Directive

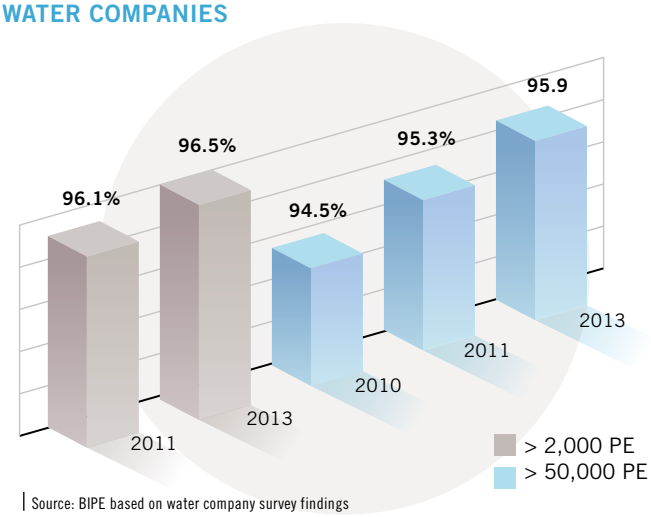
Ongoing improvements in wastewater treatment efficiency

Wastewater treatment efficiency is the ratio of pollutants removed by the treatment plant to pollutants entering the plant. It is thus an indicator of the performance of the treatment plant. Biological Oxygen Demand (BOD) is the amount of oxygen used by micro-organisms when they bio-degrade organic material in a water sample.

The water companies are constantly improving their performance in terms of wastewater treatment efficiency. In 2013, they handled 2.7 billion m³ of wastewater, 28% more than in 2010.

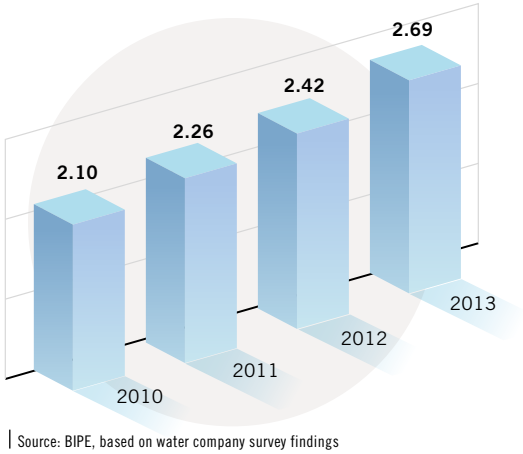
This trend is partly down to the pro-active approach of water companies when it comes to treating wastewater.

PERCENTAGE BOD REMOVAL EFFICIENCY OF WASTEWATER TREATMENT PLANTS RUN BY THE WATER COMPANIES



Source: BIPE based on water company survey findings

VOLUMES OF WASTEWATER TREATED BY THE WATER COMPANIES (billion m³)



Source: BIPE, based on water company survey findings

The growth of the circular economy: a key challenge for public water services

Most sewage sludge reused in agriculture

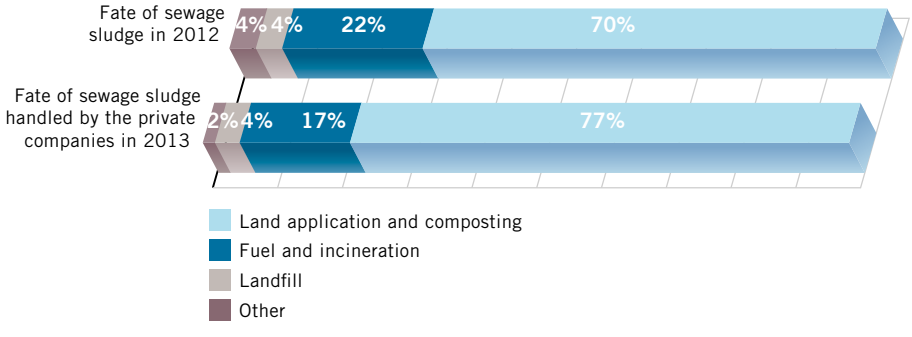
The sound management of sewage sludge is a key environmental challenge for public wastewater services.

All told, over 1 million tonnes of dry solids were produced in wastewater treatment plants in 2012, more than half of which (52%) was generated in facilities operated by the water companies. Nearly all (97%) of this amount is treated or reused in a process that complies with the applicable regulations and is therefore considered as sustainable. The agricultural sector is key when it comes to the reuse of sewage sludge: mineral salts and organic matter concentrations in sludge make it suitable for **land application** and **composting**, which together account for nearly **70% of all sludge reuse.** The percentage of sewage sludge sent to landfill continued to fall between 2008 and 2012 (dropping from 8% to 4% over that period) with more and more sludge being reused in agriculture. **Such reuse rates in agriculture are 77% in the case of sewage sludge handled by the water companies – a figure that far exceeds the national average.** Most of this sludge (15 percentage points more than the national average) is used in composting. This trend reflects the efforts expended by the water companies to find solutions which have minimal environmental impacts.

At the same time, the use of anaerobic digestion (or production of biogas) is expanding. Anaerobic digestion makes it possible not only to reduce and stabilize sludge but also to reduce greenhouse gas emissions, while at the same time exploiting the energy potential of organic matter by providing a renewable energy source. Between 2010 and 2012, an additional 15% of sewage sludge was treated thanks to this process (425,000 tonnes of sewage sludge generating more than 100 GWh of electricity).

80% **of sludge use in compost meets the applicable French standard, up by 20 percentage points between 2011 and 2013.** The use of this sludge in agriculture has the advantage of costing less than incineration and avoiding the landfill disposal of sludge (either directly or indirectly, as the fly ash from sludge incineration also ends up in landfill).

FATE OF SEWAGE SLUDGE
Percentage of tonnes of dry solids produced



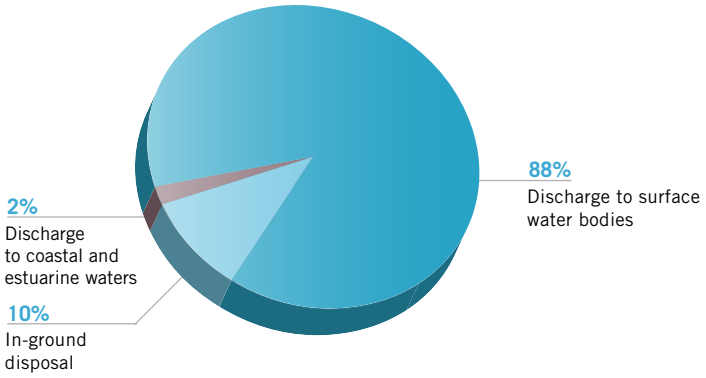
Source: top: BIPE based on MEDDE data 2012; bottom: water company survey findings

* The following requirements apply for compatibility with sustainability standards:
- land application: land application plan and declaration regarding the transport of the effluent;
- landfill: dry solid content of 30% or more, and transport declaration;
- incineration: operating permit and declaration regarding the transport of effluent;
- composting: operating declaration or permit in the case of production levels of more than 10,000 tonnes per year.

The discharge and reuse of treated effluent

Because proper treatment of effluent reduces the impact on the receiving environment, the urban water cycle as the focus of water and wastewater services is inextricably linked with the natural water cycle. In France, the bulk (88%) of wastewater treated in wastewater treatment plants is discharged to surface waters such as rivers, lakes and ponds. Other receiving environments are the soil (in-ground disposal) and coastal and estuarine waters, which receive 10% and 2% of the treated effluent respectively.

PERCENTAGE BREAKDOWN OF RECEIVING ENVIRONMENTS FOR TREATED WASTEWATER DISCHARGES



Source: BIPE, 2015

Whatever the nature of the receiving environment, EU legislation requires each Member State to identify water bodies prone to eutrophication (the alteration and degradation of freshwater environments as a result of excessive nutrient inputs in the form of nitrogen and phosphorus). As a result, all treated domestic and industrial effluent discharges to sensitive waters must meet strict nitrogen and phosphorus limits.

In 2013, the water companies took steps to protect local biodiversity by rolling out nearly 200 action plans at sensitive sites.

Although the reuse of treated effluent for crop irrigation is permitted by law, this practice is seldom used in France. On certain islands off the Atlantic coast, however, the reuse of wastewater has made it possible to continue or expand farming in an island setting where water resources are at a premium. Some industrial facilities also recycle their process water.

In 2013, the water companies reused 10% of the wastewater they had treated.

The regulations identify several different categories of treated effluent. The irrigation of fresh vegetable crops in particular is governed by the most stringent standards. The irrigation of forests is governed by the least stringent standards. The stricter the standards, the more complicated the treatment processes required and the higher the cost of production. In countries like Spain and Israel, the additional cost of local wastewater reuse programs is generally shared among all water users in the area concerned.

Whether fit-for-purpose water technologies developed by water companies actually see the light of day will depend on the regulatory framework (be that national or European) – a key factor in the take-up of any innovation. Though lawmakers will inevitably be bound by the precautionary principle, they must nevertheless provide an incentive to innovate and encourage the implementation of technological advances.

Governance of public water and wastewater services

Institutional structure

A multiplicity of bodies involved in the financing, regulation and monitoring of services

Water policy covers all water cycle components and water uses, including water bodies, precipitation, infiltration and runoff, withdrawals for human activities, the sourcing, treatment, storage and distribution of water, the collection of stormwater and wastewater and their treatment and discharge to the natural environment.

Water and wastewater operations are performed within the framework of an extensive system of governance which operates on three levels:

- **the EU level,** which sets objectives to be achieved and thereby creates a need for economic and environmental assessment;
- **the national level,** at which national policy is rolled out, assessed and monitored in accordance with EU directives and regulations;
- **the local level,** where incentive mechanisms and constraints come into play in the operation and monitoring of services.

Aside from the authority that organizes the services and the service operators, a number of other players, mostly public, also have a role to play:

- **The European Union** issues framework directives that apply to Member States. The Directorate-General (DG) for Competition for the European Commission ensures that the market operates in a way that ensures fair and equitable competition.
- **The state** sets policy objectives for the water sector, both at the national and local levels (in the first case through ministers and central government and in the second case through the préfets and local state administrations). The Mission Interservices sur l'Eau (MISE) coordinates the work of local state administrations and public autonomous bodies at the département-wide level, ensuring that water issues are addressed in a holistic manner.
- **The French National Agency for Water and Aquatic Environments** (ONEMA) is the leading French agency tasked with monitoring the status of water bodies and the performance of public water and wastewater services.
- **The Agences de l'Eau,** in each of France's six main river basins, help finance services and municipal investment.
- **The départements and régions** have the power to grant financial aid for investment and are involved in social policy decisions.
- The state and regional auditors, **the Cour des Comptes** and the Chambres Régionales et Territoriales des Comptes, are responsible for budgetary control and ensuring that public services are efficiently managed.
- **The Direction Générale de la Concurrence,** de la Consommation et de la Répression des Fraudes (DGCRF) and Autorité de la Concurrence are the competition watchdogs for the sector at a national level.

At the same time, representatives of users and the agricultural and economic sectors are consulted through the Comité National de l'Eau, the Comités de Bassin and the Commissions Locales de l'Eau, as well as the Commissions Consultatives des Services Publics Locaux which are mandatory in communes of more than 10,000 people and EPCIs covering more than 50,000 people.

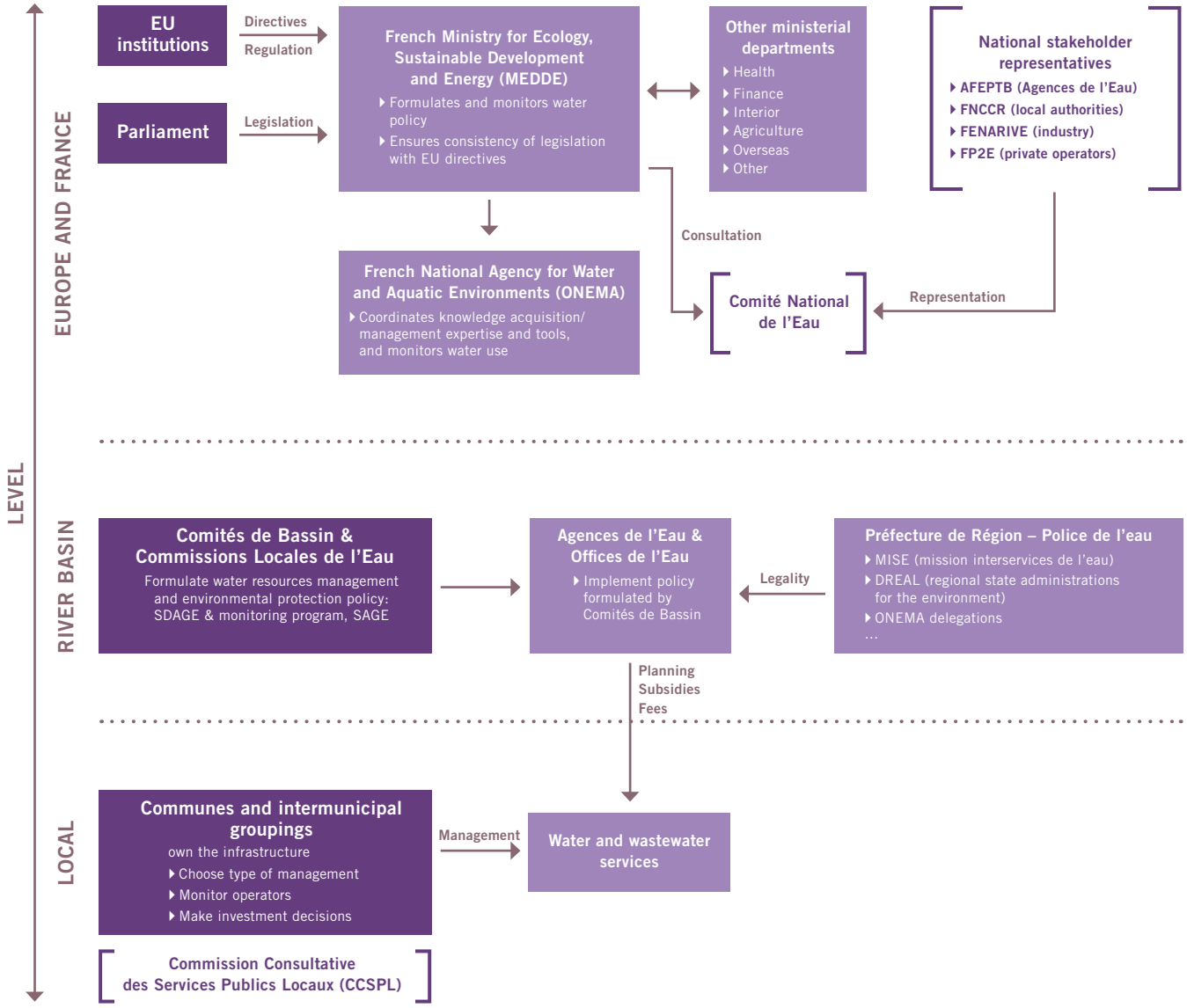
Given the multiplicity of organizations involved, water governance and policy demand good coordination of water sector players and a clear division of responsibilities.

When it comes to water policy, the issues at stake are local but the regulatory frameworks are national and European:

Deliberative body

[ ] Advisory body

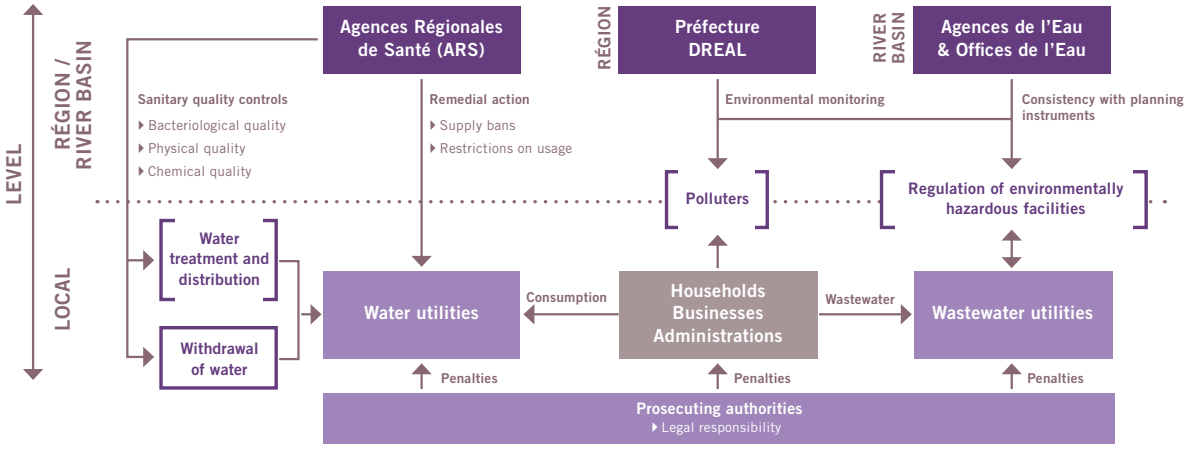
Executive body



The following table lists the tasks involved in regulating public water services, as defined by the OECD and as performed in France by a range of public bodies:

Task	Responsible entity
Definition of treated wastewater quality standards	• European Union • Ministry for Ecology • Parliament
Definition of drinking water quality standards	• European Union • Parliament • Verification by the Ministry of Health and the regional health agencies
Supervision of the financing of services	• Ministry for Ecology (partially)
Supervision of contracts with water companies	• Local regulation • Préfecture (legality) • DGCCRF (competition) • Cour des Comptes and the regional auditors
Auditing of the management of public services	• Authorities tasked with organizing local services
Pre-qualification of public and private operators	• Eligible tenderers selected by the organizing authority under the authority of the Autorité de Concurrence (competition authority) and the administrative court
Promotion of technological innovation	• Ministry of Finance and Ministry for Ecology (through the industry committee and the Contrat Stratégique de Filière Eau)
Definition of public service obligations	• Ministry for Ecology • Ministry of Health • Ministry of Economy and Finance
Incentives to use water resources efficiently	• Ministry for Ecology • ONEMA • Agences de l'Eau
Protection of customers and out-of-court settlement of disputes	• DGCCRF • Médiation de l'Eau
Harmonization of accounting data	• Ministry of Economy and Finance • Ministry of Interior
Provision of information and data collection	• Ministry for Ecology • Ministry of Health • ONEMA
Analysis of public investment	
Performance monitoring of public services	• ONEMA
Price regulation	• Ministry for Ecology • Parliament • Authorities tasked with organizing local services • Certain Agences de l'Eau

Consumer health is the prime concern when it comes to implementing sanitary and pollution controls:



Local governance of services

Water and wastewater services are public services of an industrial and commercial nature placed under the responsibility of local authorities (communes or groupings of communes). As the authorities responsible for organizing services, local authorities may commission a private or public operator to run the services under a management model of the authority's choosing.

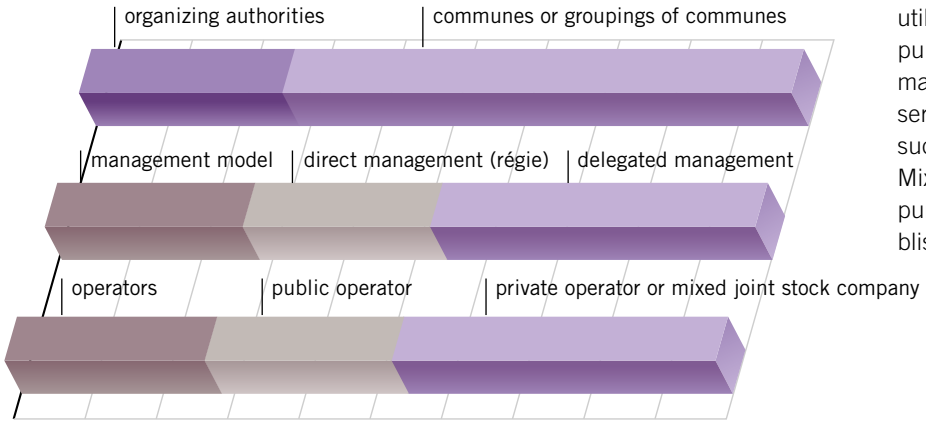
The services cover:

- in respect of water supply, the sourcing, treatment, and distribution of water, and customer management;
- in respect of sewerage and sewage treatment (piped sewage treatment plants and on-site treatment systems): the collection and treatment of sewage and the discharge of treated effluent, as well as the management of customers and service connections.

It is the local authority that chooses the way the water and wastewater services are managed. It may opt to either manage the services itself (régie, or direct management model) or commission this task from a private company (delegated management model). The direct management option does not rule out the use of a private operator to handle all or part of the operations under a contract for the provision of services.

In the vast majority of cases, public water and wastewater services are organized as shown in the schematic opposite.

Looking beyond this organizational structure, the trend is towards water companies becoming involved in services in more and more ways, both as all-round operators providing services extending to activities like monitoring supply sources and bathing water quality, but also as service providers for utilities under direct management or local public companies. The water companies may also participate in the provision of services within mixed joint stock companies such as the SEMOP (Société d'Economie Mixte à Opération Unique), the single-purpose semi-public company model established by law in July 2014.



35,000 utilities providing public services locally

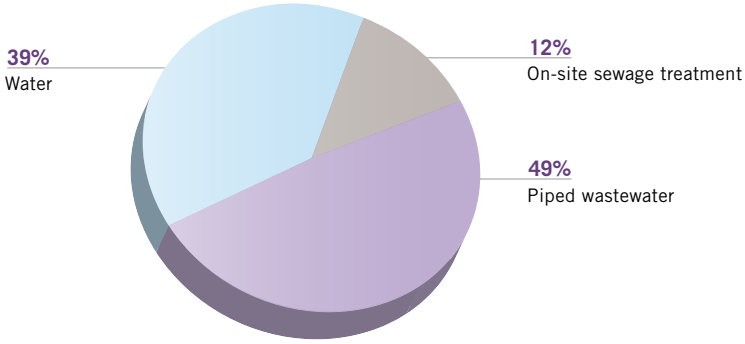
The number of utilities recorded in 2012 was 35,000, this huge number being attributable to the management of services at the level of the commune or grouping of communes. More specifically, ONEMA has 31,000 water and wastewater utilities on its records, as well as 4,100 entities responsible for the inspection of on-site sewage treatment systems.

Indeed many new entities have emerged as a result of the new regulations on on-site sewage treatment. In contrast, the number of water utilities is falling on account of a gradual process of concentration which is likely to intensify as a result of the redrawing of France's territorial borders under the so-called NOTRe Act of August 7, 2015.

The utilities may handle only part of the services:

- 86% of water utilities handle all three primary water supply services, namely the sourcing, transmission and distribution of water (management of networks and customers).
- 80% of wastewater utilities (piped systems) handle all three primary wastewater services, namely the collection and transfer of wastewater in the sewer system and the treatment of wastewater in treatment plants.

WATER/WASTEWATER UTILITY BREAKDOWN IN FRANCE IN 2012



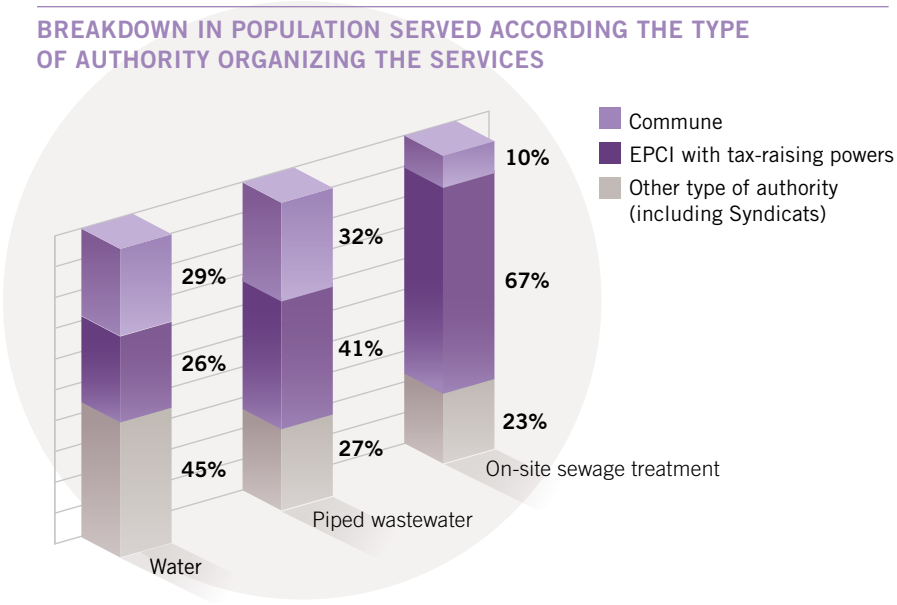
Source: Performance monitoring system SISPEA, 2014

The authorities tasked with organizing services

The vast majority of water and wastewater services are organized by local public authorities grouped into intermunicipal entities. Indeed 71% of French people are supplied by water through services organized jointly with other communes, while nearly two-thirds of the population receive piped wastewater services organized by groupings of this type. The tendency is even more pronounced when it comes to the inspection of on-site sewage treatment systems, with 90% of such services being organized by intermunicipal authorities due to the dispersion of the service.

This trend is set to accelerate going forward as new territorial reforms designed to encourage intermunicipal groupings are introduced and services are grouped together into entities having an even broader reach.

BREAKDOWN IN POPULATION SERVED ACCORDING THE TYPE OF AUTHORITY ORGANIZING THE SERVICES



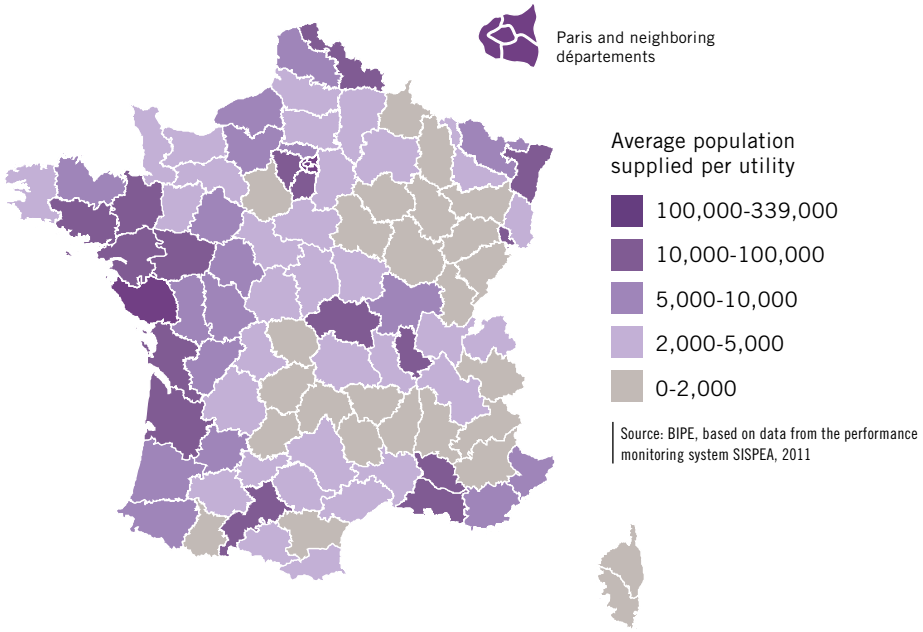
Source: BIPE, based on 2011 data from the performance monitoring system SISPEA, 2012 and the Banatic database, 2014

The geographic fragmentation of services

Many of the entities providing services are small. Utilities providing water and wastewater services for fewer than 5,000 people are found in most départements.

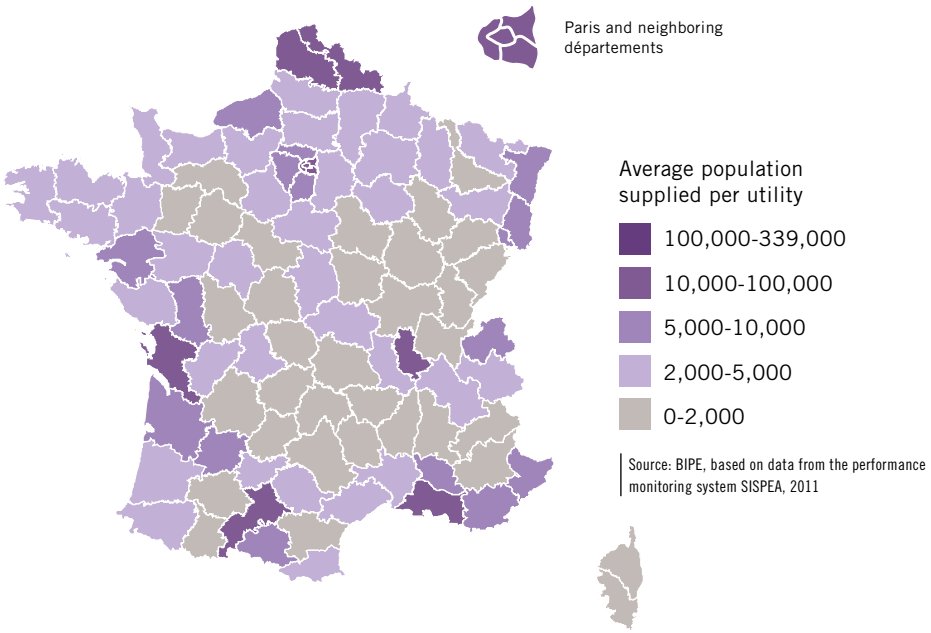
Water utility size can vary considerably, the number of people supplied ranging from a few hundred to several million. Many of the bigger water utilities in terms of the number of people covered are found along the Atlantic flank of the country. When it comes to wastewater, utilities serving fewer than 10,000 people are found in 9 out of 10 départements.

AVERAGE POPULATIONS SUPPLIED BY WATER UTILITIES



Source: BIPE, based on data from the performance monitoring system SISPEA, 2011

AVERAGE POPULATIONS SUPPLIED BY WASTEWATER UTILITIES (piped systems)



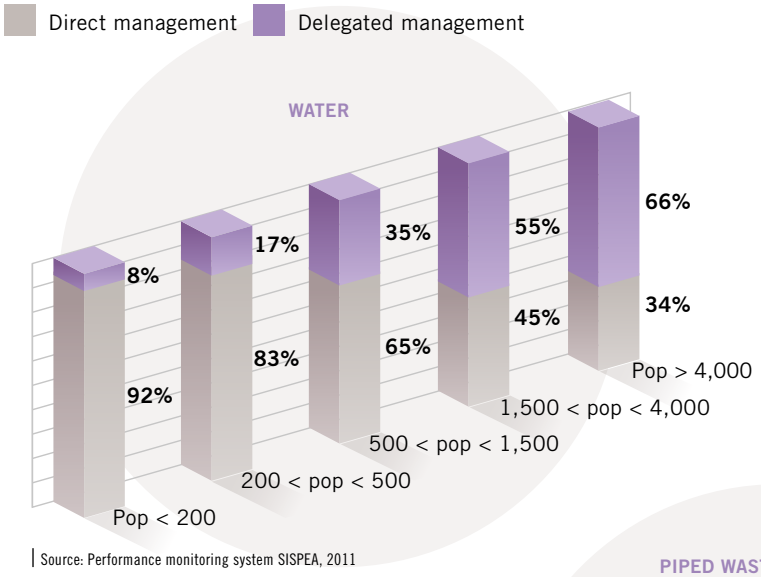
Source: BIPE, based on data from the performance monitoring system SISPEA, 2011

Delegated management: the preferred option for communities of 1,500 people or more

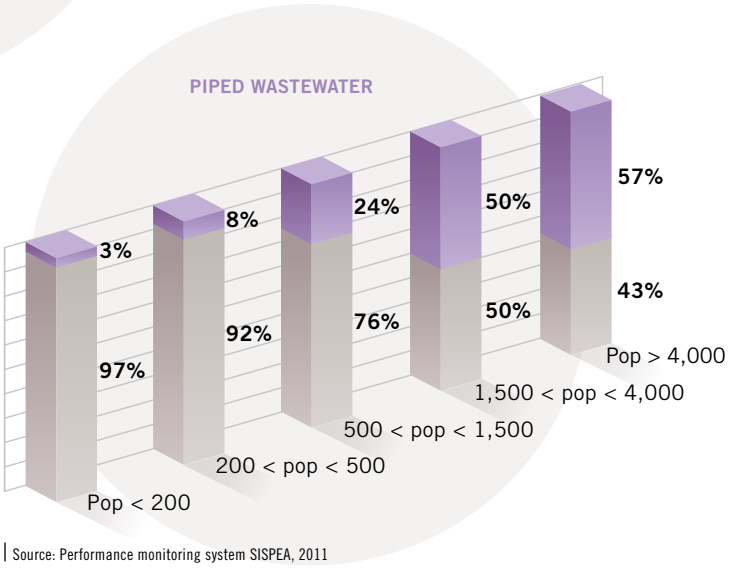
According to the report released by the water and wastewater service performance monitoring system SISPEA in 2014, 69% of all water utilities and 77% of all wastewater utilities are operated under the direct management model (régie). But the percentages in terms of population served differ quite considerably: 61% of the population is supplied by a water utility under delegated management and 53% of the population is served by a wastewater utility under delegated management.

The direct management model is more common in small local authority areas, whereas delegated management is the option most often selected for larger populations, of 1,500 people or more.

SERVICE MANAGEMENT MODELS ACCORDING TO SIZE OF POPULATION SERVED



Source: Performance monitoring system SISPEA, 2011



Source: Performance monitoring system SISPEA, 2011

On-site sewage treatment: the province of services under direct management

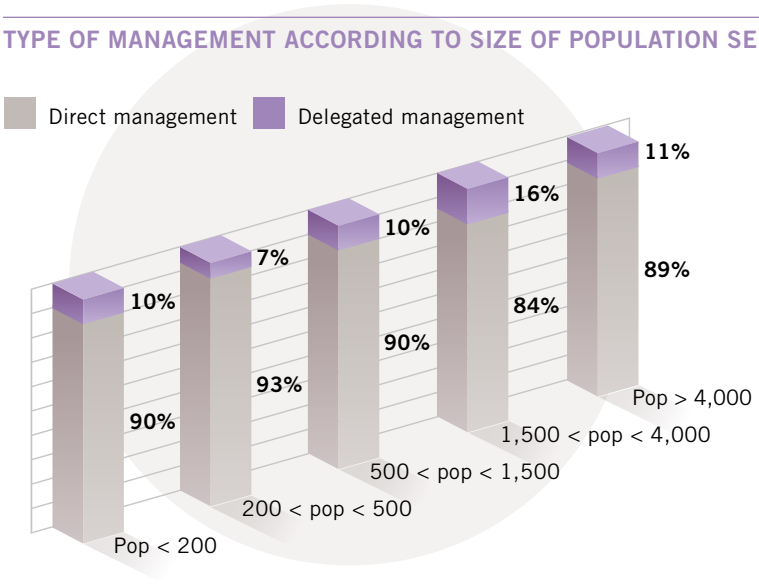
By 2005, communes and intermunicipal groupings were required to set up a service to ensure the inspection of on-site sewage treatment systems. The Service Public d'Assainissement Non Collectif (SPANC) is intended to help people install their septic tanks. In 2011, The SPANC provided services to some 12 million people in 5 million homes.

The services that the SPANC has an obligation to provide include identifying those areas where on-site sewage treatment systems are required, inspecting these systems and giving instructions as regards the works needed to ensure compliance with the applicable regulations. Under the Aquatic Environments Act, local authorities were required to inspect all such installations by December 31, 2012, and then at least every 10 years thereafter.

The SPANC are governed by the same legal and financial framework as piped wastewater utilities. They are financed by a fee paid by users and, in the case of communities of 3,000 people or under, the budget may be supplemented by the main local authority budget. Local authorities operating a SPANC service may also be entitled to subsidies from the Agences de l'Eau and the Conseils Généraux (councils at departément level).

As septic tanks are particularly prevalent in rural areas, most SPANCs serve small populations. Direct management is the model adopted in 9 out of 10 cases regardless of the size of the population covered. Indeed, in 2013, only 4% of all such contracts were managed by private water companies.

TYPE OF MANAGEMENT ACCORDING TO SIZE OF POPULATION SERVED



Source: BIPE, based on data from the performance monitoring system SISPEA, 2011

The impact of territorial reform: a trend towards the grouping of services

Local authorities that are grouping together and expanding their powers

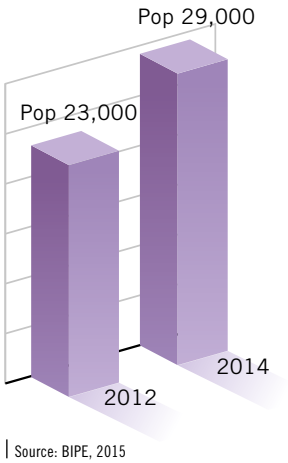
As at January 1st, 2014, there were 2,145 Etablissements Publics de Coopération Intercommunale (EPCI) with tax-raising powers in France, covering 62.6 million people. The trend is towards fewer EPCIs but a broader geographical coverage by each EPCI. In 2014, each EPCI covered 17 communes and 29,000 people on average (compared to 23,000 people in 2012).

The number of EPCIs continues to fall. There are fewer and fewer syndicats managing just one municipal public service (SIVU) as compared to other types of syndicats which have remained constant in number. These two trends reflect the expanding jurisdictions of intermunicipal groupings with regard to their water service remit.

The two trends are set to continue. Indeed the new legislation on territorial reform (NOTRe Act of August 7, 2015) is leading to a reduction in the number of syndicats organizing water and wastewater services as these are progressively abolished and their powers transferred to EPCIs with tax-levying powers. The trend toward the amalgamation of existing groupings of communes is set to accelerate, with the minimum size of these new EPCIs increasing from 5,000 to 15,000 inhabitants.

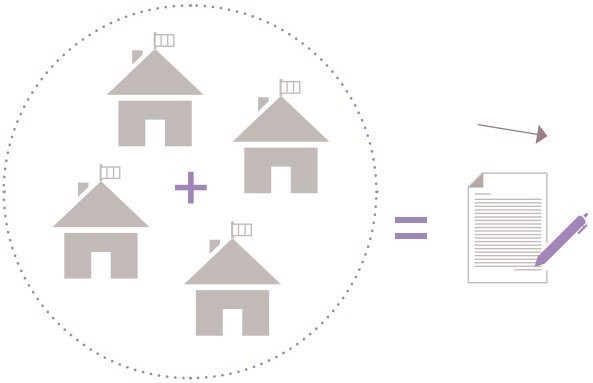
These trends tend to work in favor of the sharing of powers when it comes to operating water and wastewater services. The attainment of critical mass is a good prerequisite for having the administrative, financial and technical skills required to organize an efficient service and properly assess the performance of the service operator (whether public or private). This being the case, the territorial reform act requires the transfer of responsibility for water and wastewater services to the EPCIs. Further to the January 2014 MAPTAM Act on the modernization of decentralized public action, local authorities are now also responsible for managing freshwater bodies and flood prevention. These new powers are enacted through the creation of local government groupings for cooperation on issues like flood protection and water resource management at the river basin level – the Etablissements Publics Territoriaux de Bassin (EPTB), as well as the Etablissements Publics d'Aménagement et de Gestion de l'Eau (EPAGE), whose remit includes river and wetland management at the river basin level. These measures should allow more integrated management of water quality and quantity, and greater cooperation on issues like the sizing of networks and treatment of pollution.

SIZE OF EPCIS WITH TAX-RAISING POWERS



Source: BIPE, 2015

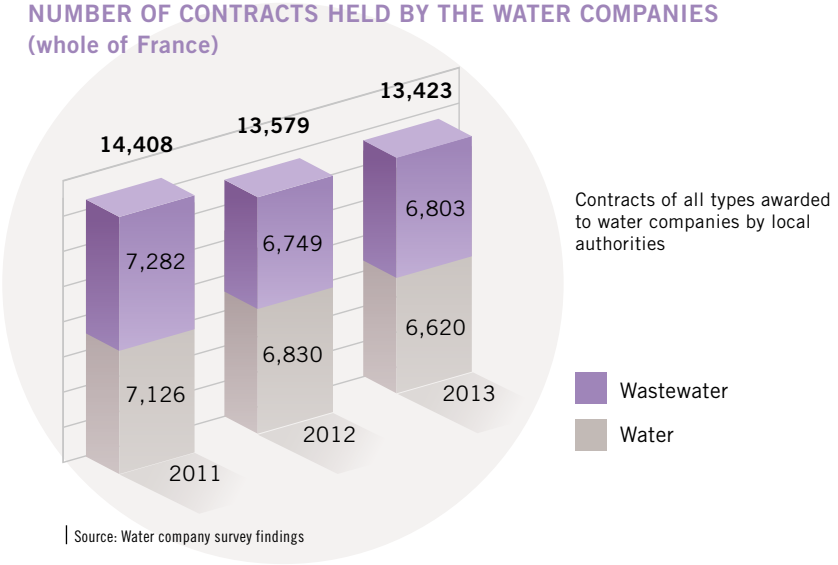
A trend toward the concentration of services



In 2013, the water companies were operating under more than 13,400 contracts. Half of these were delegated management contracts and the other half, contracts for the provision of specific services.

In recent years the number of contracts has declined, mainly on account of the trend in favor of intermunicipal groupings and contracts being grouped together within larger intermunicipal authorities when they come up for renewal.

NUMBER OF CONTRACTS HELD BY THE WATER COMPANIES (whole of France)



Source: Water company survey findings

These patterns of intermunicipal groupings have not resulted in any major shift from one type of management to another. That said, the new 'métropoles', which have wider jurisdiction than the communes or groupings of communes, are still in the process of being established.

The trend is thus towards local authorities harmonizing prices by adjusting their share of the receipts.

Service performance

A system to monitor performance

Along with a regulatory framework that provides for competition among service providers, comes a strong demand for information about the performance of water and wastewater services, in particular so that users can judge whether they are getting value for money from the services they pay for.

Since 1995, French mayors have had to make available to the public an annual report on the price and quality of water and wastewater services. These reports contain information about how services are organized and plans for the service, as well as costs, prices and investment.

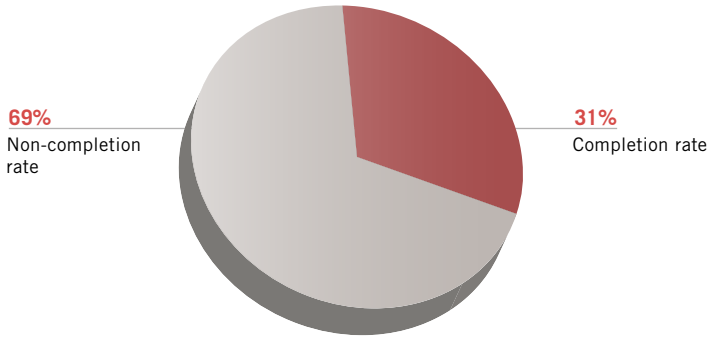
Since 2009, the French National Agency for Water and Aquatic Environments, ONEMA, through its performance monitoring system SISPEA, has been tasked with collecting data used to assess national performances and compare local services. For all that, local authorities do not have an obligation to pass on technical and financial information to SISPEA although they do have an obligation to produce such data and furnish it to the local council. In 2014, the national database still contained large gaps in data. Only 31% of authorities had supplied water distribution system efficiency information for 2011, for example.

The nature of the information provided may change in the future to factor in contextual information in the indicators.

When it comes to a more complete indicator-based assessment of the performance of public services, there is clearly room for improvement therefore – particular in respect of the need for regularity in reporting information to ONEMA and the planned new Biodiversity Agency.

Each year and for all of the utilities they operate, the water companies now submit an annual report to the authority tasked with organizing the services. They are accordingly regular contributors to the process of feeding the national database.

DATA COMPLETION RATE FOR SISPEA IN 2011



Source: BIPE, based on data from the performance monitoring system SISPEA

A good knowledge of the assets as a prerequisite for sound investment planning

The requirements imposed on facilities as a result of sanitary and environmental standards, ageing networks and falling revenues mean that networks must be managed more efficiently, which in turn requires a good knowledge of the infrastructure.

To encourage local authorities to improve the efficiency of their water distribution systems, they were required, under the Grenelle 2 Act, to produce by 2013 a detailed description of their distribution systems, including data on the length of pipework, materials used and installation dates. The idea was that a better knowledge of these assets should enable them to develop an effective maintenance strategy and improve the planning of investment for modernization purposes.

The 2011 assessment revealed that as many as one-third of water utilities and one-half of all wastewater utilities had a knowledge index of below 40%.

The implications for local authorities are potentially significant, since if water distribution system efficiency is below the minimum levels set by decree (between 65% in rural areas and 85% in urban areas), they will be required to prepare a plan of action, failing which they will have to pay twice the amount in water withdrawal fees and then finance the requisite infrastructure investments.

Knowledge and management of water supply assets	2009	2010	2011	2013*
Services run by the water companies	54%	55%	59%	71%

Knowledge and management of sewerage assets	2009	2010	2011	2013*
Services run by the water companies	51%	50%	54%	54%

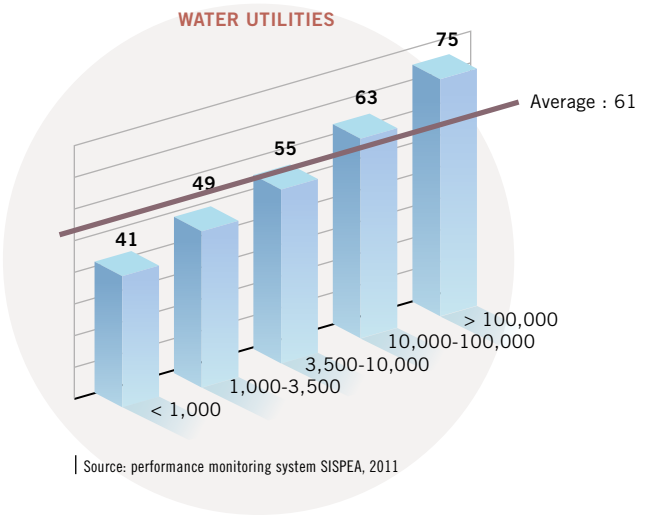
Sources: Water company survey findings

*The regulations changed in 2013. The new formula for calculating the index factors in compliance with the regulatory requirement to produce a detailed description of the network. Index values for 2013 are therefore not comparable with those obtained in previous years.

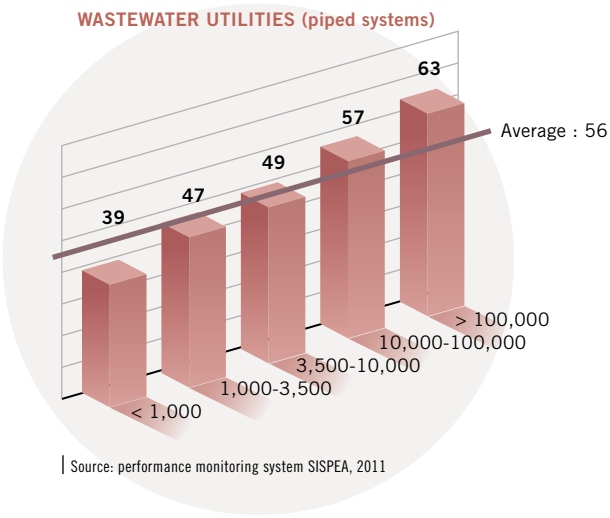
A better knowledge of infrastructure in the larger utilities

The knowledge and asset management index improves with size of the utility. Among smaller utilities – whether water or wastewater utilities – there is significant room for improvement. This can be explained by the fact that the larger utilities are more able to draw on the requisite human and material resources and so manage the facilities better.

KNOWLEDGE AND NETWORK ASSET MANAGEMENT INDICES ACCORDING TO NUMBER OF PEOPLE SERVED



Source: performance monitoring system SISPEA, 2011



Source: performance monitoring system SISPEA, 2011

A high level of debt among wastewater utilities

Water utilities are carrying a 2.7 year debt load on average, a load that is fairly low and fairly uniform across utilities, regardless of the size (with the exception of small utilities, as this indicator was only available for utilities in communes with populations of 10,000 or more and for the EPCIs serving more than 50,000 people). The debt indicator may in some cases be skewed if the utility externalizes some of its investment by joining a syndicat that is responsible for the infrastructure. More generally, the debt load is lower where part of the cost of renewing the infrastructure is borne by a private company operating under a concession arrangement.

At 7.1 years on average, the debt load carried by the wastewater utilities is much higher than that carried by the water utilities (utilities in communes with populations of 10,000 or more and for the EPCIs serving more than 50,000 people). This can be explained by a number of factors: the fact that wastewater treatment plants tend to be newer than water treatment plants; recent investment in projects to ensure compliance of wastewater treatment plants; and to a lesser extent, investment in projects to extend sewer systems into new areas.

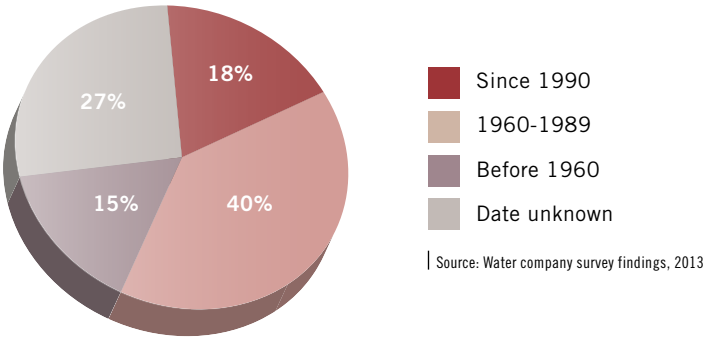
Maintenance and renewal of water distribution systems: getting the economic and environmental balance right

In 2011, the public water distribution system in France was a network of 906,000 kilometers of mains conveying drinking water from treatment plants to customer meters.

The quality of the water supplied depends on the condition of the mains, service continuity and the extent to which water is kept in the system by reducing leaks. Distribution system performances can vary considerably depending on the age of the mains, the materials in which they are built and pipe laying methods, but also factors like vibrations, topography and land use. Ageing pipes and wear are the main causes of leakage on distribution systems. Until the early 1960s, most of the pipes used in distribution systems were made of fragile and friable materials like cast iron, asbestos cement and steel.

Pipe maintenance and replacement are a key focus of local authority asset management policies. The SISPEA assessment of 2011 flagged up 1 billion m^3 in leaks – 20% of the water entering distribution systems. Indeed, one quarter of all utilities, most of them small, still had to improve their efficiency levels as well as their knowledge of the assets.

PIPE INSTALLATION DATES IN SERVICES RUN BY THE WATER COMPANIES



Source: Water company survey findings, 2013

Nearly half of the distribution systems in France (515,200 km of mains, or 57% of the total length of mains) are managed by the water companies. In 2013, data was available on the date of installation of nearly three-quarters of this network, nearly 44% of which is in PVC.

Multiple indicators to assess network performance

Assessing how effectively water distribution and sewer systems are managed involves a whole suite of performance indicators.

When it comes to water, the effectiveness of pipe maintenance and replacement policies in reducing leakage is reflected in two indicators.

The water distribution system efficiency indicator measures the relationship between the volume of water used and the volume of water entering the distribution system. Based on SISPEA findings, average distribution system efficiency was 80% in 2011, indicating a 20% leakage rate.

The larger the population served the better the efficiency level: in distribution systems supplying 100,000 people or more, efficiencies were in the 85% range, while in systems serving fewer than 1,000 people, efficiencies were in the 70% range on average.

Water distribution system efficiency	2009	2010	2011	2012
Services run by the water companies	81%	81%	81%	81%
All services	76%	80%	80%	80%

Sources: Water company survey findings, SISPEA reports, 2009, 2010, 2011 and 2012

Aside from the overall leakage rate, the number of leaks per kilometer of distribution system should be measured, as the water loss indicator of choice of many experts. Rural and urban distribution systems give very different values for this indicator, so good performance will translate into different levels in each case. In a rural service where performance is good, the indicator should be low (below 1.5 according to ONEMA experts) as the number of connections per kilometer is small. In urban distribution systems, a higher value is an indicator of good performance (below 7) as the number of connections per kilometer of mains is much higher.

Linear loss index for distribution systems (m3/km/day)	2009	2010	2011	2012
Services run by the water companies	5.5	4.5	4.1	4.1
All services	3.9	3.6	3.4	3.4

Sources: Water company survey findings, SISPEA reports, 2009, 2010, 2011 and 2012

How effectively a water distribution system is managed is also assessed based on the continuity of service indicator. This measures the number of water supply cuts linked to service failures and about which customers have received no advance warning. The figures below show that these types of cuts are infrequent and that management has improved since 2009 with a fall in unplanned supply cut rates since then.

Number of unplanned supply cuts per 1,000 connections	2009	2010	2011	2012
Services run by the water companies	3.1	2.8	2.8	2.9
All services	4.4	3.1	2.8	3.1

Sources: Water company survey findings, SISPEA reports, 2009, 2010, 2011 and 2012

With regard to piped sewerage, it is considered that a well-managed sewer system should require little emergency work. Such performances are measured according to the number of locations on the sewer system requiring maintenance at least twice a year because of cleaning requirements or blockages. The results show that management has improved since 2009 as the number of problem locations has fallen. Given that the water companies are concentrated more in urban areas, they generally have to deal with blockages more often than rural utilities do.

Number of locations on sewer systems requiring frequent maintenance or repairs (per 100 km of sewers)	2009	2010	2011	2012
Services run by the water companies	7.4	6.8	7.6	6.7
All services	13	7.4	6.9	6.9

Sources: Water company survey findings, SISPEA reports, 2009, 2010, 2011 and 2012

The harmonization of performance indicators across utilities

Since 2002, the water companies have been introducing guidelines on the performance indicators to be furnished in the annual reports to be provided to the delegating authorities. These guidelines apply to utilities providing services to over 10,000 people (some 30 million people in total). In 2008, under the decree and order of May 2, 2007, some of these indicators became mandatory for all utilities and must now appear in all annual reports.

Each year, in accordance with the applicable regulations, the water companies publish around **15 performance indicators for each water utility and for each wastewater utility.** Since the adoption of this practice for all utilities, the FP2E has continued its efforts to create a more robust performance monitoring system, in accordance with the recommendations of the 2008 interministerial circular introducing the requirement for annual reports on the price and quality of water and wastewater services – reports required . All annual reports now feature key performance indicators in appendix, these reports being produced for the purposes of reporting publicly on performances in service delivery. The indicators shown below reflect the performance of delegated services and the scope for progress that is possible when it comes to issues as diverse as tap water quality, service continuity and quality of service and knowledge of underground assets.

Some indicators are used to assess efficiency in the day-to-day running of public water and wastewater services. These include the percentage of unpaid bills which measures arrears in payments . A low percentage reflects good management of debt collection. A high percentage may be a reflection of a large number of customers experiencing exceptional hardship.

Percentage of unpaid bills for water services (amount of year N-1 unpaid bills as a percentage of revenue)	2009	2010	2011	2012
Services run by the water companies	0.7%	0.7%	0.6%	0.8%
All services	0.7%	1.2%	1.1%	0.9%

Percentage of unpaid bills for (piped) wastewater services (year N-1 bills)	2009	2010	2011	2012
Services run by the water companies	0.9%	0.8%	0.7%	0.7%
All services	1.5%	1.3%	1.4%	0.9%

Sources: Water company survey findings, SISPEA reports, 2009, 2010, 2011 and 2012

The removal of lead service connections

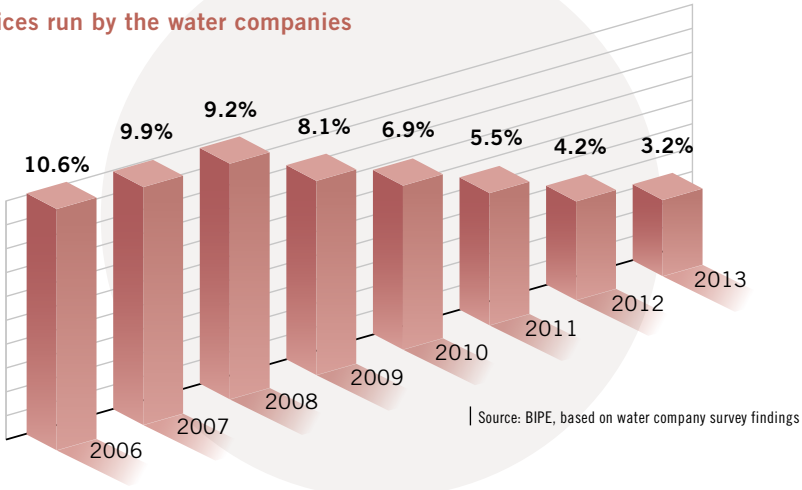
Lead was used in water distribution systems up until the 1970s as the only completely watertight material that did not contaminate the water carried by the pipes. Most of this lead was used in service connections.

In 1998, the maximum permissible concentration of lead in water intended for human consumption was set by an EU directive. Since the end of 2013, this concentration has been fixed at 10 micrograms per liter compared to 25 micrograms per liter prior to that.

Local authorities have expended efforts to meet these standards in the public part of the distribution system, most of them asking operators to replace lead service connections. By the end of 2013, only 3% of service connections on privately managed public networks were still made of lead – half the number that existed three years previously.

Over 15 years, 2.7 million public connections have been replaced for an estimated cost of €5 billion. According to the Ministry of Health, around 1.2 million service connections still had to be replaced by the end of 2013, representing just under 5% of a total number of service connections estimated at 24 million.

FALL IN THE NUMBER OF LEAD SERVICE CONNECTIONS
Services run by the water companies



Source: BIPE, based on water company survey findings

The customer viewpoint

Customers who are happy with water services

In 2013, 85% of French people said they were satisfied with their municipal water service (Source: 2013 TNS Sofrès survey for the Centre d'Information sur l'Eau).

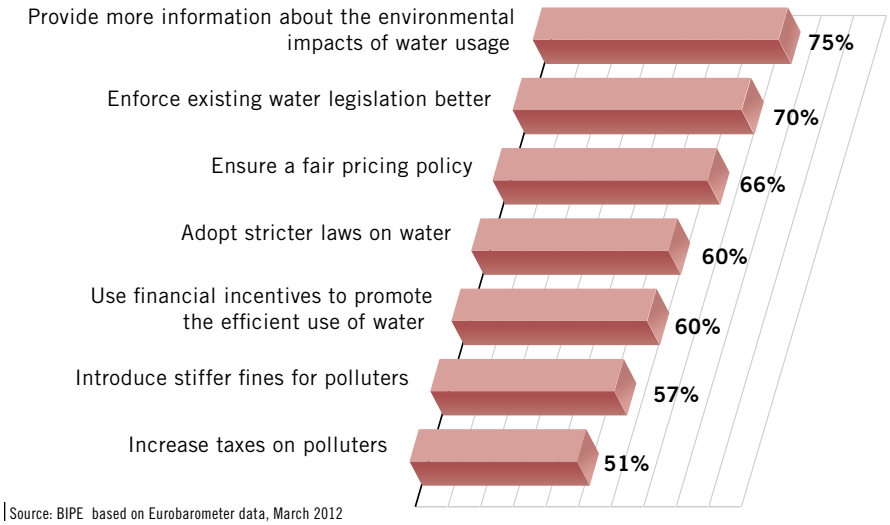
Based on ONEMA findings, fewer than 4 in 1,000 customers had written to their operator or local authority to complain about breaches of regulations or performance commitments. According to the findings of the performance monitoring system SISPEA, with regard to those utilities serving a large enough population to be eligible for a Commission Consultative des Services Publics Locaux (CCSPL) (a body composed of representatives of different interest groups), complaint rates about water and wastewater services were 3.8 per 1,000 and 2.5 per 1,000 respectively. In 2013, the respective complaint rates for complaints handled by the water companies were 3.4 per 1,000 and 0.2 per 1,000.

Existence of a Commission Consultative des Services Publics	2013
Water services run by the water companies	83%
Wastewater services run by the water companies	67%

Source: Water company survey findings

The vast majority of services run by water companies are assigned a CCSPL, enabling customers to obtain information about services, as well as to be consulted about plans to reorganize services or change the form of management.

ATTITUDES TO MEASURES TO REDUCE IMPACTS OF HUMAN ACTIVITY ON WATER



Source: BIPE based on Eurobarometer data, March 2012

A demand for information on the part of customers

When they are asked about what to do to reduce the impact of human activities on water quality and quantity, French people tend to favor measures to inform people better and to ensure that the existing legislation is properly enforced.

As a general rule, financial incentives such as subsidies and tax relief are considered to be more effective than punitive measures like fines or raising taxes on polluters.

PERFORMANCE OF SERVICES MANAGED BY THE WATER COMPANIES IN 2013

Performance of public water services run by the water companies

Indicators	2008	2010	2013
Sanitary quality: microbiological quality – compliance rate (base: volumes)	99.6%	99.7%	99.5%
Sanitary quality: physical-chemical quality – compliance rate (base: volumes)	98.7%	98.6%	98.0%
Distribution system efficiency (base: volumes)	82.0%	81.1%	81.0%
Percentage of unpaid bills (Year n-1 bills) (base: revenues)	0.7%	0.7%	0.7%
Percentage of complaints (base: population)	4.8%	4.9%	3.4%
Water distribution system asset knowledge and management index * (base: linear)	56.1%	55.6%	71.4%
Linear Leakage Index (m^3/km/day)	5.9	4.8	4.6
Index of progress on protection of water resources (base: volumes)	53.1%	58.2%	57.6%
Percentage of unplanned supply cuts (base: 1,000 customers)	3.1	2.8	2.9
Existence of a Commission Consultative des Services Publics Locaux (base: population)	79%	85%	83%

Performance of public wastewater services run by the water companies

Indicateurs	2008	2010	2013
Percentage of unpaid bills (Year n-1 bills) (base: revenues)	0.9%	0.8%	0.8%
Percentage of complaints (base: population)	3.2%	2.4%	0.2%
Sewer system asset knowledge and management index * (base: linear)	53.1%	50.1%	54.3%
Percentage of sewage sludge treated in a process that complies with the applicable regulations (base: tonnes)	94.7%	98.6%	97.4%
Number of sewer system locations requiring frequent cleaning per 100 km of sewer (base: linear)	4.8	6.8	6.9
Existence of a Commission Consultative des Services Publics Locaux (base: population)	71%	71%	67%

Source: Water company surveys of 2009, 2011 and 2014 (2008, 2010 and 2013 data)
Note: between 2008 and 2010, the scope of the survey was expanded to include utilities covering fewer than 10,000 people.
* The regulations changed in 2013. The new formula for calculating the index, introduced in 2013, factors in compliance with the requirement to produce a detailed description of the network. Index values for 2013 are therefore not comparable with those obtained in previous years

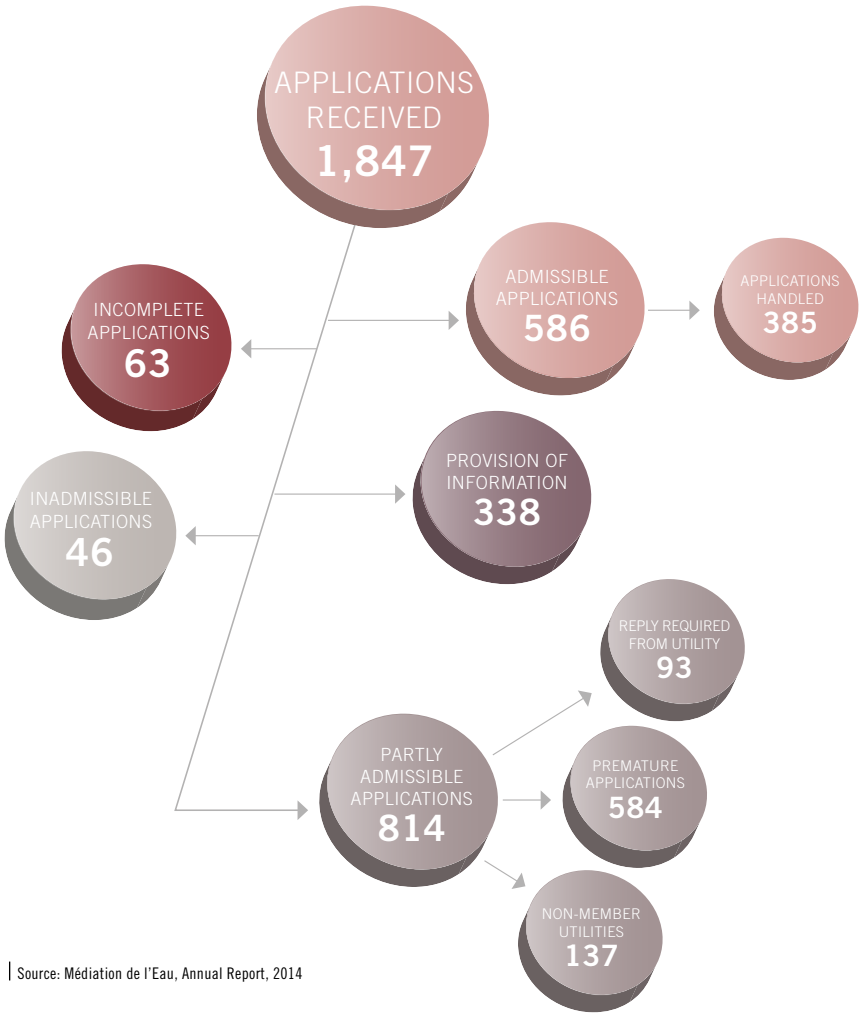
Customers who are using their right to mediation

The water mediator, the Médiation de l'Eau, of which the FP2E is a member, was set up in 2009 to facilitate the out-of-court settlement of disputes opposing customers and their water or wastewater utility, once all means of action that the utility has at its disposal have been exhausted.

Having handled over 5,000 disputes in just five years of existence, the Médiation de l'Eau is greatly appreciated in the water sector and has received widespread approval from customers. **83% of customers that used it said they were satisfied that the organization had properly understood the nature of their dispute.**

The record of the Médiation de l'Eau shows that the organization has come of age in a manner of speaking:

- **It has received 1,847 claims** since it came into being and the number of claims continues to rise (up by 17% in 2014).
- **It has resolved 85.5% of the disputes** that have come before it.



Source: Médiation de l'Eau, Annual Report, 2014

The water companies have been proactive in anticipating their legal obligations, as the work of the Médiation de l'Eau is consistent with the latest EU and French regulations in this area. In order to promote the out-of-court settlement of disputes, the so-called Consumption Act of March 17, 2014 requires that all contracts concluded between a professional and a consumer provide for the possibility of using mediation in the event of a dispute. This use of mediation in consumption-related disputes is also an objective pursued by the European Union (which introduced a directive to that end in July 2015).

Performances on social responsibility and access to affordable water

Water company policies that help the poorest families

Ensuring access to affordable water is a part of the remit entrusted to service operators by public authorities.

The water companies have a long-standing commitment to ensuring access to water and sanitation for all. They have encouraged access to clean water to be recognised as a basic human right by the UN, and help ensure that this basic right is realized by a policy of solidarity towards the poorest families

The water companies work with local authorities, grassroots social welfare organizations and not-for-profit organizations to develop innovative, targeted solutions that ensure that people have access to affordable water.

Indeed, the water companies are committed to helping ensure that the poorest families have access to affordable water.

Through the Fonds de Solidarité pour le Logement (FSL), which helps households having difficulty paying their housing expenses, the water companies have worked with departmental bodies to put in place measures to waive water arrears and provide pre-emptive support to families in difficulty to help them manage their water use and their water bill. In 2013, these measures were applied in **35,000 cases for arrears in the amount of €2.4 million.**

Other solidarity mechanisms flow from local initiatives (on the part of water companies, the authorities tasked with organizing services, and the social welfare centers, the Centres Communaux d'Action Sociale (CCAS)). Water vouchers issued by the operators are financed by receipts from services and allocated to grassroots welfare organizations for the needs of benefit recipients. In 2013, nearly **28,000 customers benefitted from this highly targeted measure with the issue of over €1 million in vouchers.**

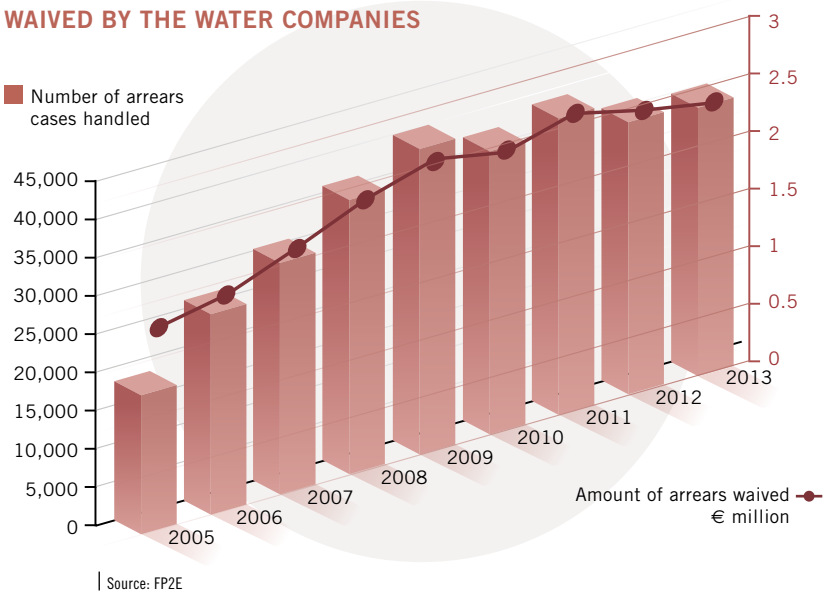
In the same year, 5% of customers receiving services provided by the water companies were in receipt of social assistance.

Further upstream, local customer services provided by operators are available to handle customer queries, to adjust payment terms for customers in difficulty and to reschedule payments where necessary.

The so-called Brottes Act of April 15, 2013, allows local authorities to trial special water rates for low-income families (social tariffs) over a period of five years, following which a national review will be conducted. The Act allows authorities to introduce more affordable tariffs granted on the basis of social criteria.

At the time of the production of this study, 50 local authorities are experimenting with social tariffs, among them the Paris region water authority SEDIF and the cities of Paris, Bordeaux, Dijon, Rennes and Lille.

NUMBER OF ARREARS CASES HANDLED AND TOTAL AMOUNT OF ARREARS WAIVED BY THE WATER COMPANIES



Source: FP2E

Economics of water services

Volumes

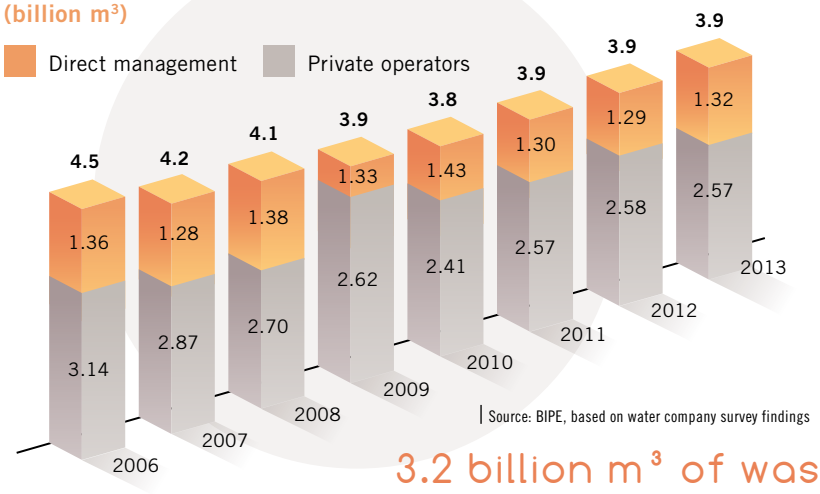
3.9 billion m³ of drinking water billed each year

In 2013, 3.9 billion m³ of drinking water were billed to customers supplied by water from France's public network. After falling by 15% between 2006 and 2009, the amount of water billed has remained stable even as the population has grown. This can be explained by the fact that customers are adopting more water-efficient behaviors, and that industrial use has slowed since 2008 as a result of a sluggish economy.

The water companies supply two-thirds of all tap water in France (66% in 2013), a proportion that has remained stable since 2006.

This amount of 3.9 billion m³ of water was billed to 23.6 million customers in 2011 according to SISPEA. Because many people live in apartment blocks or in buildings shared with commercial premises, many of them containing communal water meters, the number of customers is by definition lower than the number of households served. In 2011 the water companies billed 15.6 million customers – two-thirds of the total number of customers in France.

VOLUMES OF WATER DISTRIBUTED IN FRANCE BY TYPE OF OPERATOR (billion m³)



Source: BIPE, based on water company survey findings

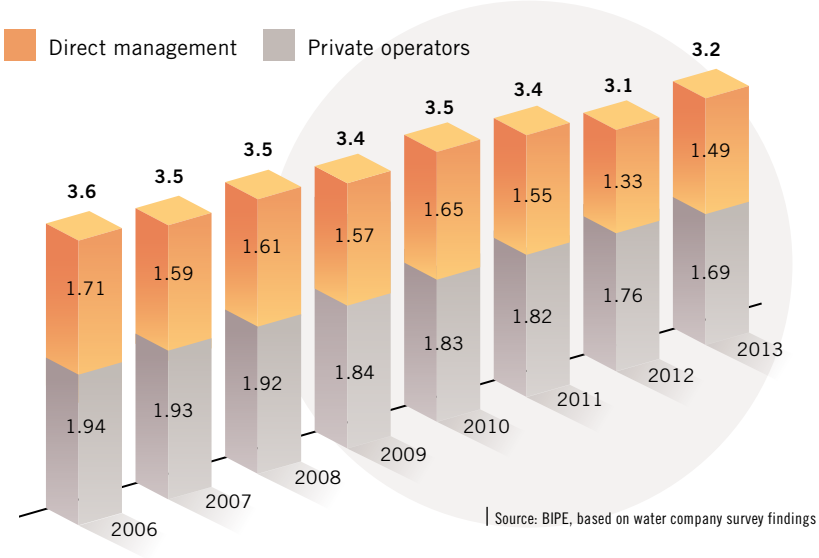
3.2 billion m³ of wastewater

In 2013, 3.2 billion m³ of wastewater were collected in France. As in the case of water, the trend is toward falling volumes (the amount of wastewater collected in 2013 was 13% lower compared to the amount collected in 2006).

The amount of wastewater collected is always smaller than the amount of water supplied. The difference, an average 0.6 billion m³ a year, is partly attributable to those homes with on-site sewage treatment and partly to the number of industrial facilities that are connected to the water distribution system but have their own sewage treatment systems.

In 2013, the water companies handled 53% of sewage collected in France and have handled on average 54% of the sewage collected since 2006.

VOLUMES OF WASTEWATER TREATED IN FRANCE BY TYPE OF OPERATOR (billion m³)



Source: BIPE, based on water company survey findings

The price of water services

Local rates for local services

In France, the price charged to the customer for water services covers operating and investment costs for the whole of the urban water cycle, from the withdrawal of ground or surface water for treatment, up to its return to the natural environment as treated effluent.

All water and wastewater services are local public services. The authority responsible for organizing the services sets prices by a vote of its deliberative assembly. Also included in the water bill are taxes and fees that do not fall within the organizing authority's purview but within that of the Agences de l'Eau, the state and the waterway authority Voies Navigables de France.

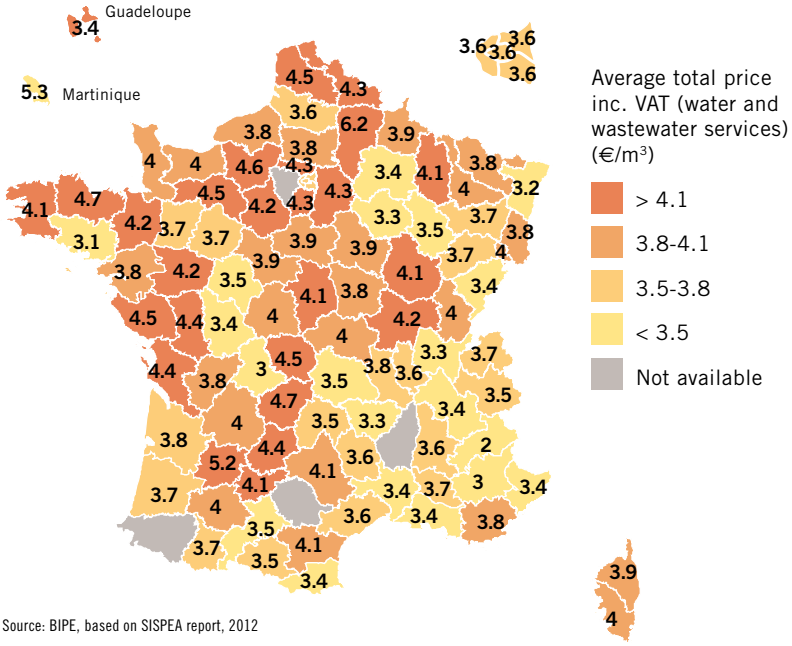
According to the French statistics institute INSEE, in 2013, the average price of water and wastewater services was €3.54 (inc. VAT) per m³, representing an annual water bill of €425 for a consumption of 120 m³. On average, households spent only €327 (inc. VAT), which is equivalent to an average consumption of 102 m³ (assuming that 15% of the annual water bill is a fixed charge). In view of the fall in water use over the past decade, 102 m³ appears to be the more realistic figure of the two.

Looking beyond the average price at a countrywide level, the price of services differs from place to place. Indeed, there are as many tariffs as there are water and wastewater utilities. The fact is that the authorities responsible for organizing the services may adopt different policies when it comes to asset management and service performance and quality, and this will result in disparities in the economics of services (which have to achieve a balance in terms of revenues and expenditure).

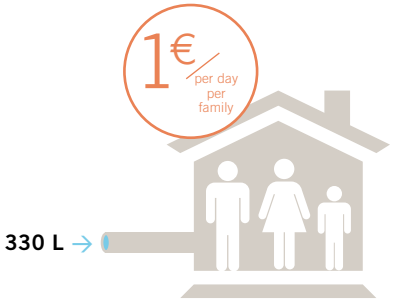
French families spend an average €1 a day on water and wastewater services, for approximately 330 liters of water supplied and sent to the wastewater system every day.

AVERAGE TOTAL PRICE OF WATER AND WASTEWATER SERVICES BY DÉPARTEMENT

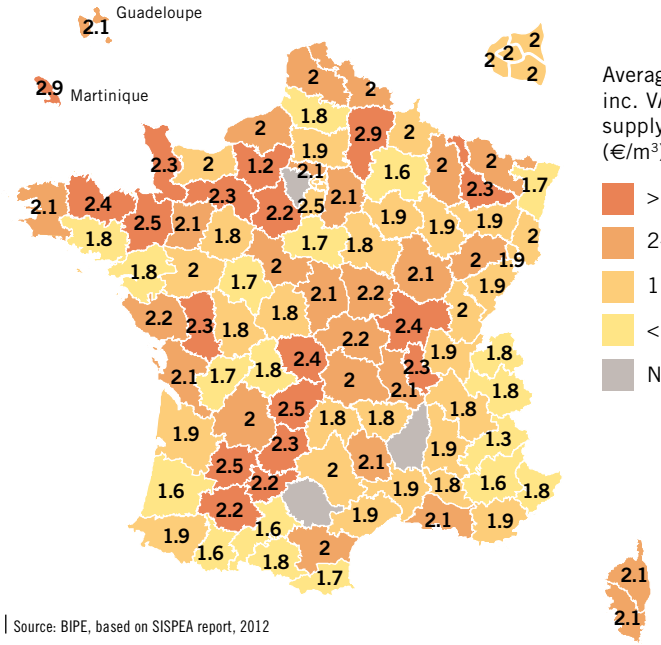
Price inc. VAT for an annual consumption of 120 m³, 2012



Source: BIPE, based on SISPEA report, 2012

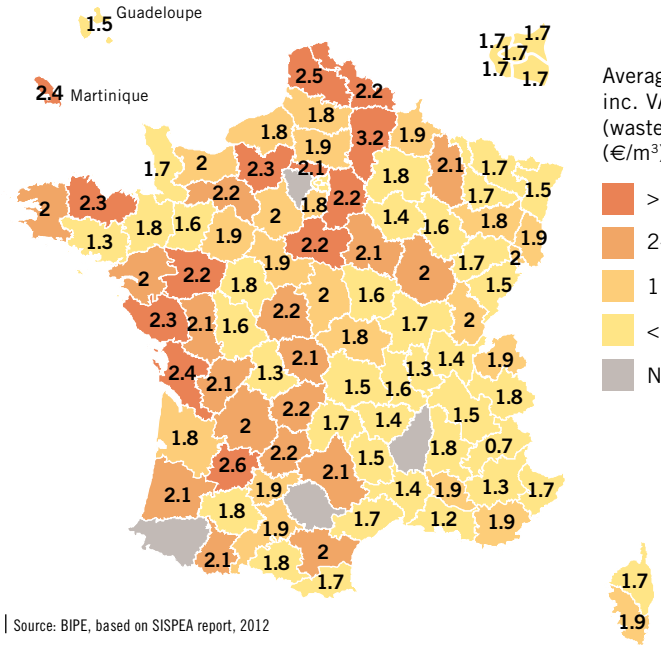


AVERAGE TOTAL PRICE OF WATER SERVICES BY DÉPARTEMENT



Source: BIPE, based on SISPEA report, 2012

AVERAGE TOTAL PRICE OF PIPED WASTEWATER SERVICES BY DÉPARTEMENT



Source: BIPE, based on SISPEA report, 2012

According to SISPEA findings, compared to an average water supply service price estimated at €2 per m³ in 2012, prices in Metropolitan France ranged from €1.28 per m³ (35% below the average price) in the Hautes-Alpes département to €2.91 per m³ (45% above the average price) in the Aisne (prices inc. VAT).

The same trend can be seen in wastewater services: compared to an average piped wastewater service price estimated at €1.85 per m³ in 2012, prices ranged from €0.66 per m³ (65% below the average price) in the Hautes-Alpes to €3.25 per m³ (75% above the average price) in the Aisne (prices inc. VAT).

Prices that are influenced by a range of factors

The factors behind the differences in price from one service to the next are multiple:

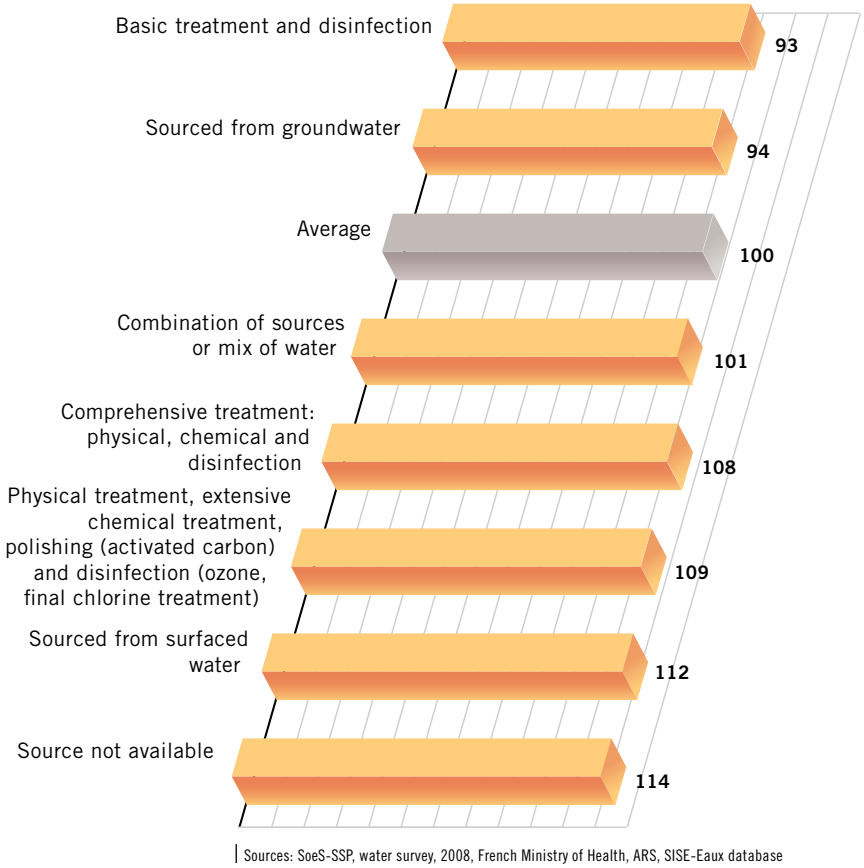
- **geographic factors:** the availability and origin of the resources, topography and housing density are all factors that can affect the length, configuration and density of the network;
- **technical factors** such as the quality of the supply source, protection around supply sources, the condition and performance of the network, the percentage of the population connected to the sewer system, storm drainage and facilities for managing stormwater, quality and sensitivity of the receiving environment, etc.;
- **socio-economic factors:** average consumption levels, seasonal differences in population numbers (due to tourism for example), presence of industry;
- **governance factors:** pricing systems, asset management policy as determined by the local authority, level of investment, degree of compliance of facilities;
- **quality of service:** communication and information services, telephone hotlines, procedures for sending bills and making payments, continuity of service.

The quality of the supply source, which is closely linked to where the water is taken from, is a key factor affecting the price of the service: surface waters are more difficult to treat and require more extensive treatment so the cost of the service will be higher:

- Surface water costs 20% more than groundwater to treat on average.
- The cost of a multi-stage treatment process, including polishing, is 18% more than that of a basic treatment process.
- The cost of drinking water derived from a surface water source requiring a multi-stage treatment process is 27% more than that derived from groundwater requiring only a basic treatment process.

These comparisons show that local factors have the biggest impact on the price of water services.

PRICE OF THE M³ OF DRINKING WATER ACCORDING TO THE SUPPLY SOURCE AND LEVEL OF TREATMENT REQUIRED
Average price = 100



Sources: SoeS-SSP, water survey, 2008, French Ministry of Health, ARS, SISE-Eaux database

Price rises that have remained modest

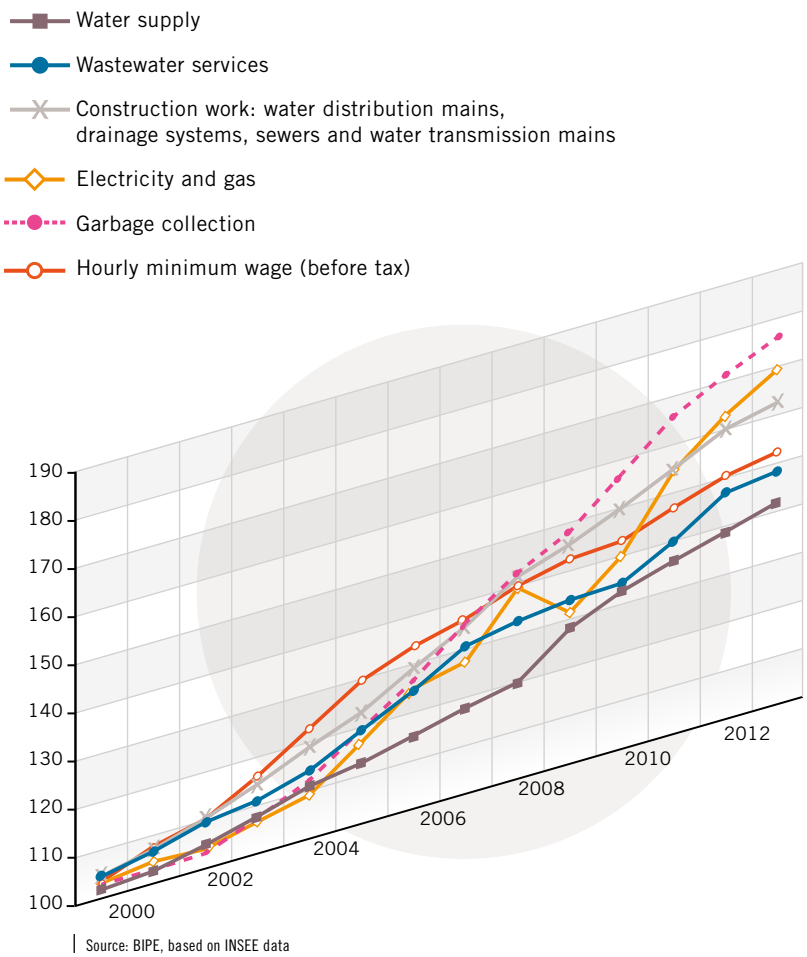
Between 2000 and 2013, the price of water services rose by 2.6% a year on average. This was one percentage point higher than the rate of inflation but the comparison is skewed because inflation takes account of consumer packaged goods, some of which are imported from countries with low production costs.

Compared with the price of other local services such as the distribution of fossil energy and household garbage collection (which rose by 3.9% and 4.2% a year respectively), water service prices rose at a slower rate over the same period however. Prices also rose more slowly than the cost of mains installation (which rose by 3.4% a year).

Over the same period, the price of water services also grew more slowly than the minimum wage (3% a year). Overall, since 2009, **water price rises have been kinder on household budgets than price rises in other services.**

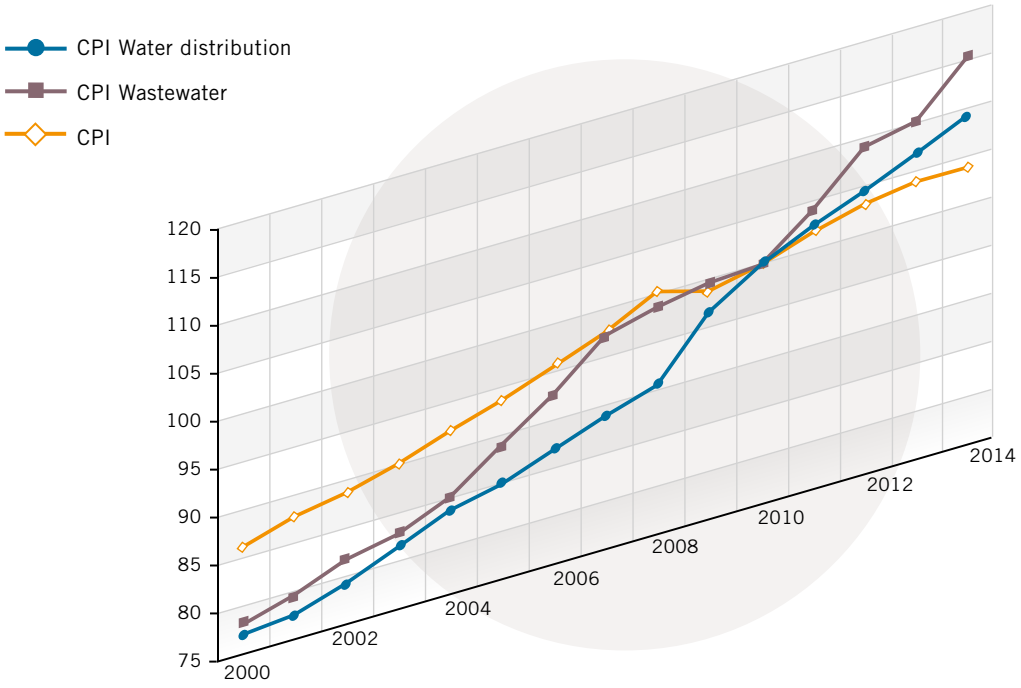
The water bill as a portion of the household budget thus grew only marginally between 2000 and 2013.

VARIATION IN PRICE AND COST INDICATORS OVER TIME (whole of France, 2000 = 100)



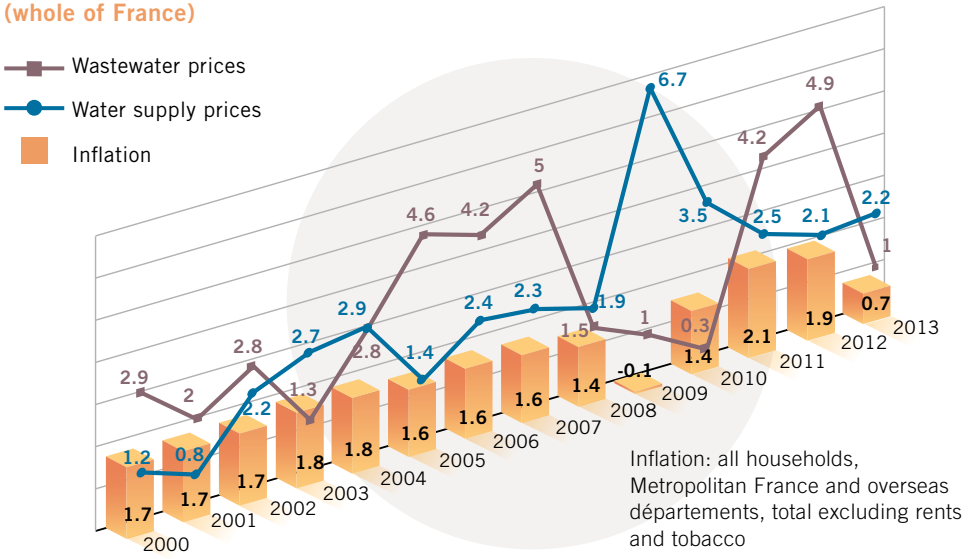
Source: BIPE, based on INSEE data

VARIATION IN THE CONSUMER PRICE INDEX OVER TIME



Source: BIPE, based on INSEE national account data (2010 = 100)

PRICE OF WATER AND WASTEWATER SERVICES VERSUS INFLATION (whole of France)



Inflation: all households, Metropolitan France and overseas départements, total excluding rents and tobacco

Source: BIPE, based on INSEE data (2010 = 100)

Big-city prices below the European average

In a survey by energy management consultants NUS Consulting, which looked at prices of water and wastewater services in major European cities, **the average price in the five largest French cities was 13% below that in other major European cities** (€3.52 (inc. VAT) per m^3 in France (€0.35 per liter) compared to an average €4.05 (inc. VAT) per m^3 in the other European countries surveyed).

Average prices in France have remained 13% lower than the European average. The price difference grew between 2013 and 2015, as it stood at 11% in 2013.

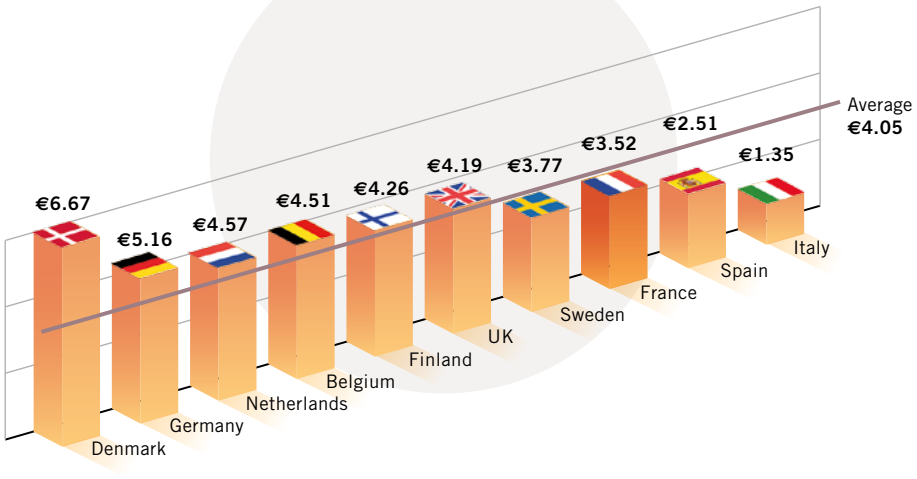
These findings show that French people are getting good value for their money from their public water and wastewater services.

In the two year period from January 2011 to January 2013, the price of services provided to a 42 million people in Europe climbed by 2.6% a year on average compared to only 2% in France.

The price of services in France is in the mid-range between the prices typically charged in northern Europe, which cover most of the operation and investment costs, and those charged in southern Europe, where operation and investment costs are only partially covered.

- Italy and Spain have a progressive tariff structure that is based on the amount of water used and favors households over businesses.
- In Belgium, France and the Netherlands a fee is charged for the amount of water withdrawn, whereas in the UK and Germany there is a standing charge for surface water drainage. At the other end of the scale, Sweden and Finland have no charges, either for withdrawals or for pollution control.

AVERAGE PRICES OF PUBLIC WATER AND WASTEWATER SERVICES IN THE FIVE LARGEST CITIES OF EUROPEAN COUNTRIES, 2015



Source: NUS Consulting, 2015

Household spending on water services

Stability in household spending on drinking water

Overall household spending patterns have changed since 2010. Prior to that, spending on water and piped wastewater services had grown at the same rate, and the water bill was split fairly evenly between the two items.

Since 2010, however, annual spending on water has fallen, dropping to an average €151 in 2013 (2008 level). Over the same period, spending on wastewater services continued to rise, reaching €176 per household in 2013.

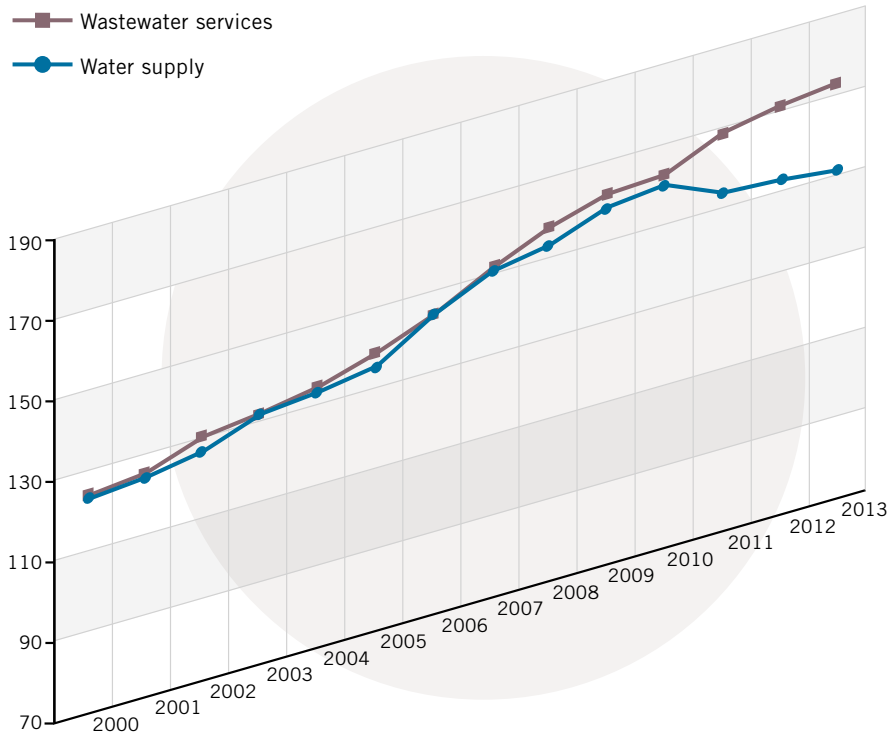
Overall, the water bill has risen at a much slower pace since 2010 (rising by just 0.4% a year compared to 2.7% prior to that) and wastewater now accounts for more than half of the water bill.

These trends can be explained by a number of factors:

- inclusion in the wastewater bill of the cost of upgrading wastewater treatment plants to the applicable standards. Wastewater services were also affected by the rise in VAT from 5.5% to 7% in January 2012, and to 10% in January 2014, the result being that total average annual household spending for wastewater rose by €12 between 2010 and 2013;
- a shrinking of household spending power between 2011 and 2013, prompting families to adopt more water-efficient behaviors and invest in water-saving devices. The result was that average annual household spending on water services fell by €8 between 2010 and 2013.

Assuming that 1% of the water used is used for drinking, **households spend less than €3 a year on average** on tap water used for drinking compared to €93 for bottled water.

HOUSEHOLD CONSUMPTION (current €)



Source: BIPE, based on INSEE national account data

The water bill: a stable expense as a portion of the household budget

According to the French statistics institute INSEE, in 2013, French households spent €327 on average for public water services – 0.83% of an average total annual expenditure excluding tax and benefit transfers (e.g. reimbursement of medical expenses and social benefits like subsidized nursery care, school meals and public transport) or 0.6% including such transfers.

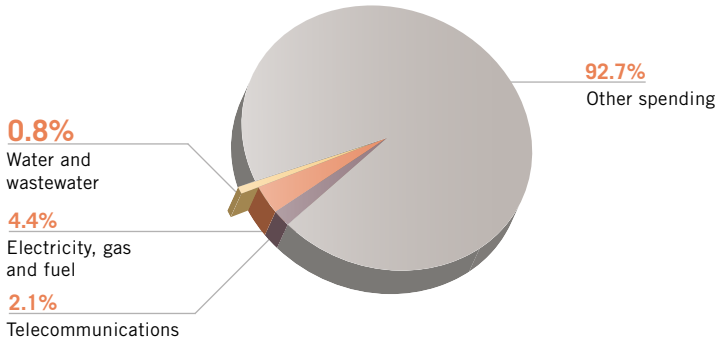
The portion of the total household budget claimed by water has barely changed over the past 14 years. This is not the case for other types of services:

- The share of the household budget spent on energy rose by 1.1 percentage points after 2000 to reach 4.4% in 2013.
- After rising by 0.6 percentage points between 2000 and 2010, the portion of the household budget spent on telephone services and internet subscription fees has fallen since 2011 to its current level of 2.1%.

INSEE data also confirm that, in Metropolitan France, the water bill remains below 1% of total expenditure per consumer unit, i.e. per adult equivalent in each household, irrespective of household income.

Again according to INSEE: in Metropolitan France, the water bill accounts for less than 1% of total household expenditure per consumer unit i.e. per equivalent adult within the household, and this regardless of the income decile. This compares to up to 2.6% of total expenditure in the lowest-income households in the overseas départements (Source: National Accounts – Family Budgets, 2011).

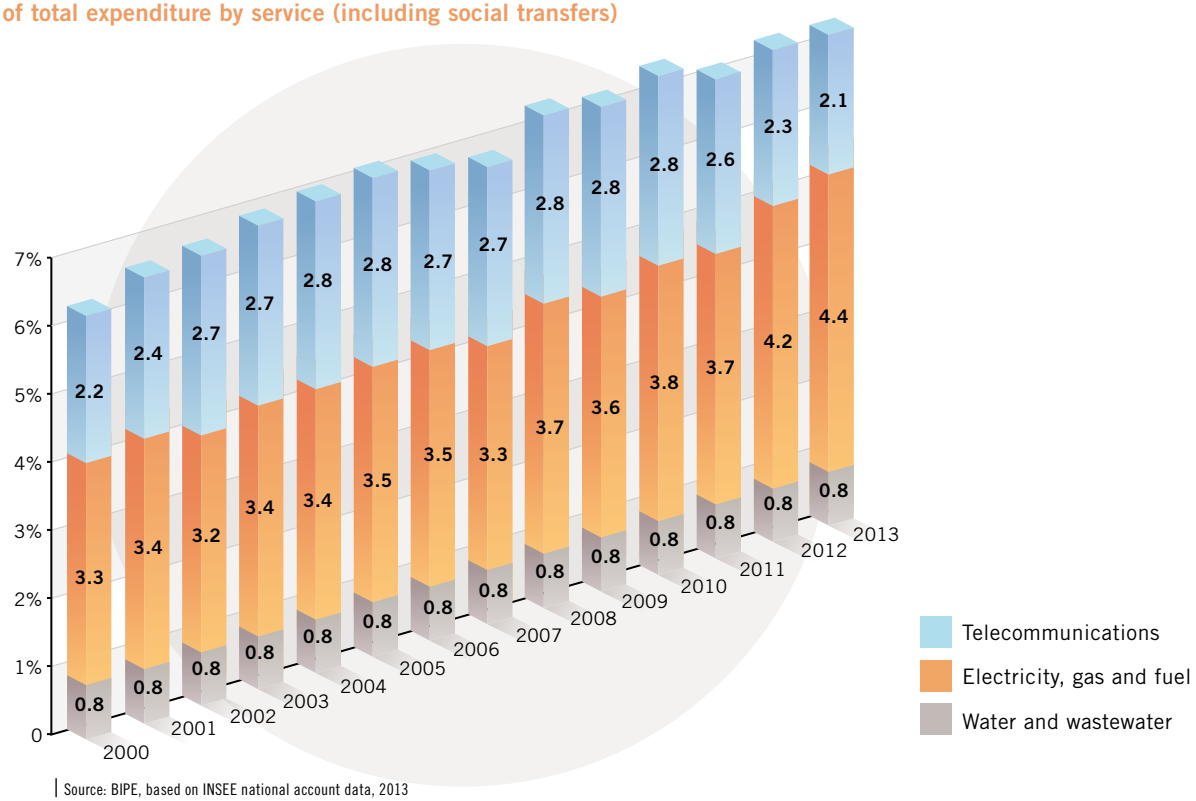
PROPORTION OF THE HOUSEHOLD BUDGET SPENT ON WATER AND WASTEWATER SERVICES IN 2013



Source: BIPE, based on INSEE national account data, 2013

PROPORTION OF THE ANNUAL HOUSEHOLD BUDGET SPENT ON SERVICES

Percentage of total expenditure by service (including social transfers)

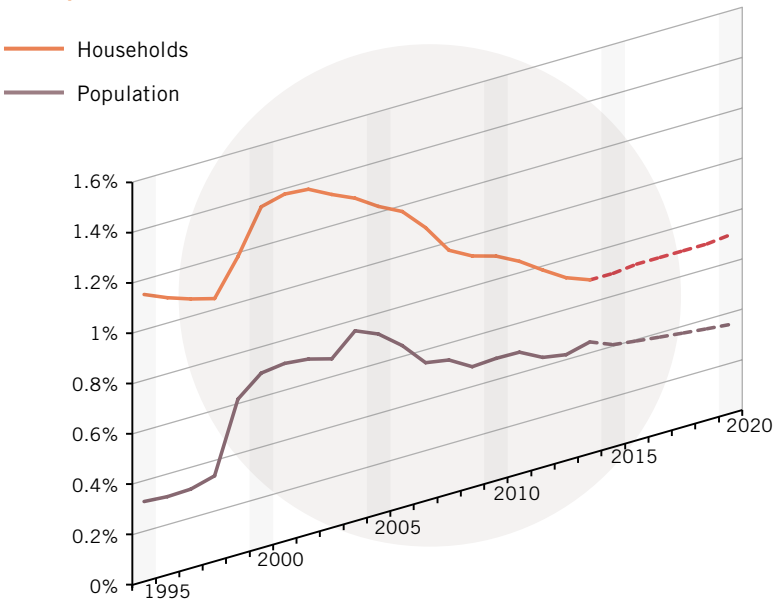


Source: BIPE, based on INSEE national account data, 2013

The impact of slower population growth

POPULATION TRENDS UP TO 2020

Metropolitan France



Sources: INSEE (population forecasts) and BIPE (household forecasts)

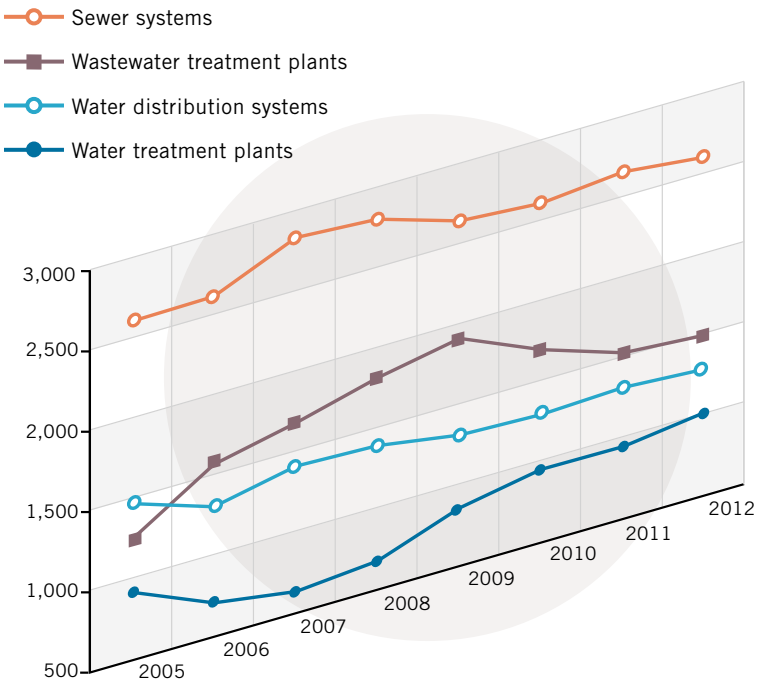
Population growth in Metropolitan France has slowed since the mid-2000s and households numbered 28.1 million in 2014. An ageing population, and the fact that people are now spending a smaller portion of their life living as part of a couple, mean that, by 2020, there will be more single-person households than ever before, and the rise in the number of households will be faster than the rise in the total population.

These demographic trends will continue to affect overall and per-household trends in water usage.

Financing of services

€6.5 billion invested in the sector

TRENDS IN CAPITAL INVESTMENT IN FRANCE (€ million)

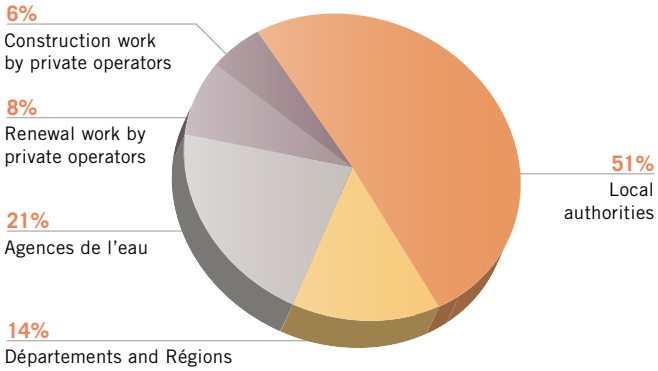


Source: BIPE, based on SoeS environmental accounts

In 2012, investment in the water and wastewater sector reached €6.467 billion, after climbing by an average 0.7% a year as of 2005. The money has gone into building new networks and facilities and replacing existing ones, but also into upgrading facilities in line with the latest regulations:

- Water sector spending was €2.3 billion overall, with spending on treatment plants rising significantly after 2008, despite the fact that capital expenditure on distribution systems remained higher overall.
- More than €4.1 billion was devoted to wastewater, two-thirds of which was spent on sewer systems. Investment in wastewater treatment plants slowed after peaking in 2009.

SOURCES OF CAPITAL INVESTMENT
Percentages of total investment in € million



Source: BIPE, based on SOeS environment account data and water company survey findings, 2012

Water companies operating under the delegated management model have made investments to the tune of €888 million, half of which has gone into renewing existing infrastructure and facilities.

Financial flows involving many different players

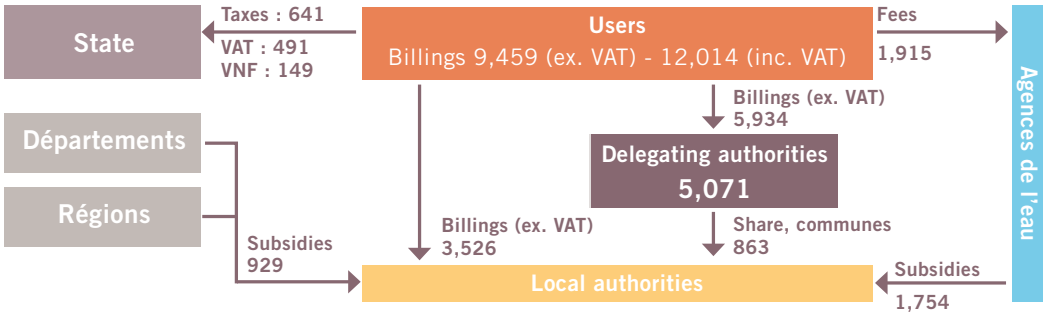
Water and wastewater services translate into an annual bill paid by households, businesses, schools, hospitals and other users, the revenue from which is split among several different institutions. Of a total €12.01 billion (inc. VAT) billed in 2012:

- the water and wastewater utilities received €9.460 billion: 3.526 billion for utilities operating under the direct management model and 5.934 billion for utilities operating under delegated management, of which €863 million was passed on to the local authorities which own the infrastructure.
- the Agences de l'Eau received €1.915 billion in fees;
- the state collected VAT and the waterway authority Voies Navigables de France collected a waterways tax, the two taxes bringing in €641 million between them;

The local authorities, as the owners of the infrastructure, received various subsidies for the purposes of investment:

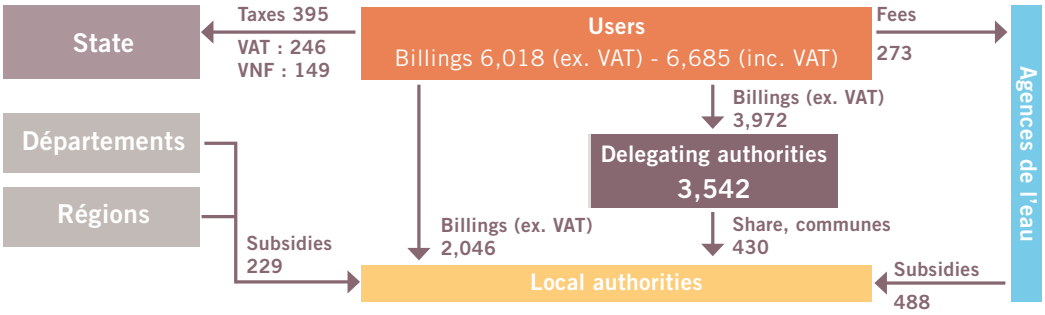
- €929 million from the départements and the régions. These layers of local government contribute through the planning agreements between national and regional governments (Contrat Plan Etat-Région) or for the purposes of financing major capital projects such as dams and large infrastructure schemes. The amount they pay in subsidies (€1.043 billion in 2008) has fallen steadily in recent years.
- €1.754 billion from the Agences de l'Eau. Revenues for the Agences come from withdrawal and pollution fees in the water bill. These fees are determined independently in each of the six main river basins within a framework set by Parliament.
- The total amount in subsidies increased by more than €600 million between 2008 and 2012 (7% per year on average) most of this increase going to programs addressing the natural water cycle, such as the management of receiving waters and the control of industrial and agricultural pollution.

FINANCIAL FLOWS IN BOTH SERVICES IN FRANCE
(€ million)



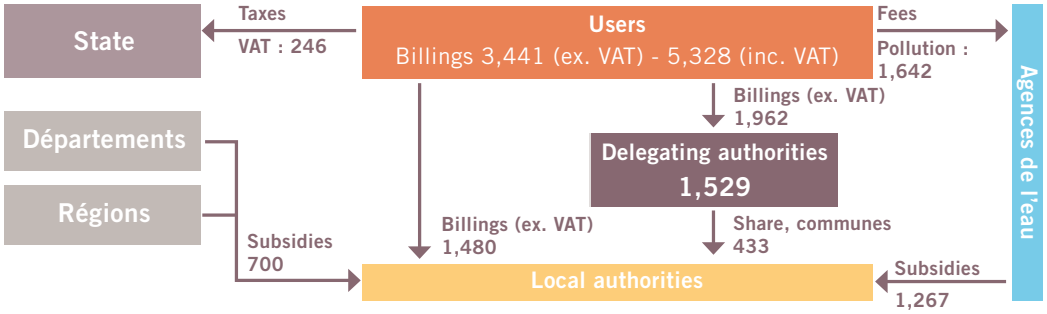
Sources: BIPE, based on data from: the budgetary annexes to the French Finance Bill, 2014; VNF annual reports, 2012; water company survey findings; and INSEE data

FINANCIAL FLOWS IN WATER SERVICES IN FRANCE
(€ million)



Sources : BIPE, based on data from: the budgetary annexes to the French Finance Bill, 2014; VNF annual reports, 2012; water company survey findings; and INSEE data

FINANCIAL FLOWS IN WASTEWATER SERVICES IN FRANCE
(€ million)



Sources : BIPE, based on data from: the budgetary annexes to the French Finance Bill, 2014; VNF annual reports, 2012; water company survey findings; and INSEE data

Changes in the method used to assess financial flows

In previous editions of this overview, the total amount of water billed was calculated on the basis of two prices:

– the INSEE (French statistics institute) price, which was used to calculate the total amount billed by the régies;

– the FP2E price, used to calculate the total amount billed by the private operators.

In this edition, only the INSEE price has been used to assess the amount billed. This is for reasons of consistency, as the INSEE and FP2E prices were obtained using two different methods to calculate the price of the cubic meter of water. The use of different methods of calculation makes it difficult to compare past data and, more specifically, trends in financial flows between the years 2009 and 2012.

The billings data obtained with this new method are also more consistent than the data furnished by 2013 French parliamentary reports.

The sustainability of the financing model

Developments in the last 10 years have prompted stakeholders to reflect on the sustainability of the funding model for water and wastewater services.

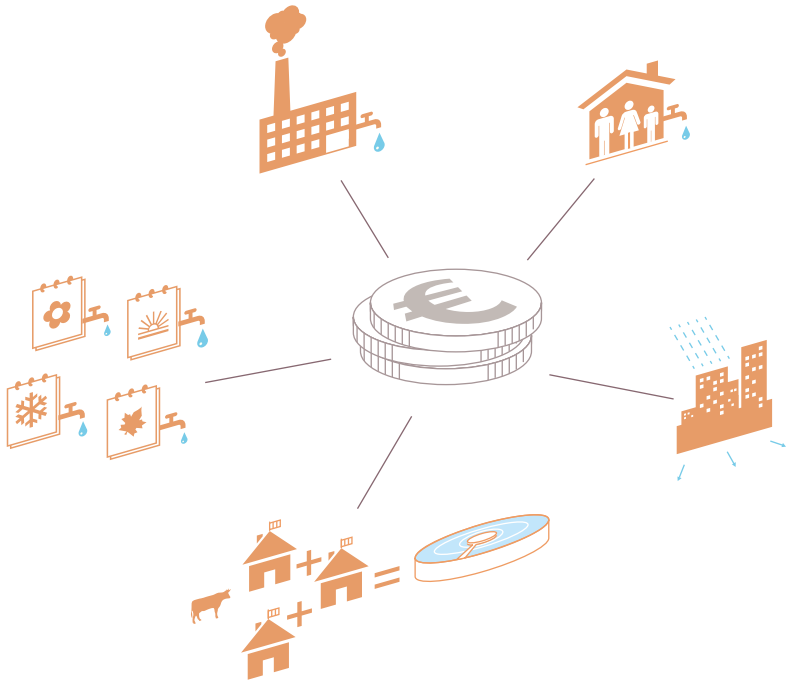
It being the case that the pricing system for the two services is for the most part based on volumes that are continuing to fall, the so-called water-pays-for-water principle has been used to justify a higher water bill as the answer to rising costs. Between 2000 and 2012, investment spending rose faster than running costs, both for water and wastewater. This investment has been a response to local needs and to hygiene and environmental objectives, as it has made it possible to properly size and modernize facilities and upgrade them to the applicable standards.

With current trends set to continue, the economic model for water services is being called into question. The prospect of further price hikes raises issues about the social acceptability and fairness of the pricing system and about the affordability of water for the poorest households.

The need to maintain the status quo in terms of the share of the household budget devoted to water should always be stressed however.

A number of studies have looked at ways of restoring financial stability, including:

- the introduction of seasonal pricing and progressive tariffs, with the proviso that actual consumption and the relevant socio-demographic and economic factors (the breakdown in terms of households, industry and tertiary activities, household composition, etc.) are taken into consideration;
- changes in prices charged to households, which, if social tariffs are introduced, would allow the ceiling on the fixed portion to be removed;
- the introduction of flat-rate pricing for wastewater services based on the amount of wastewater discharged to the public sewer system rather than water usage;
- the introduction of a special fee for industrial and service sector users discharging wastewater that is more difficult and more costly to treat;
- sharing the cost of the capital improvements required to bring networks in rural or low-population-density areas in line with requirements;
- the more widespread use of stormwater taxation based on the amount of developed or impervious cover. This would be an additional source of revenue for local authority budgets and would cover the cost of managing urban stormwater.



Competitiveness of the sector

The technologies of today and tomorrow

Water made fit to drink thanks to leading-edge technologies

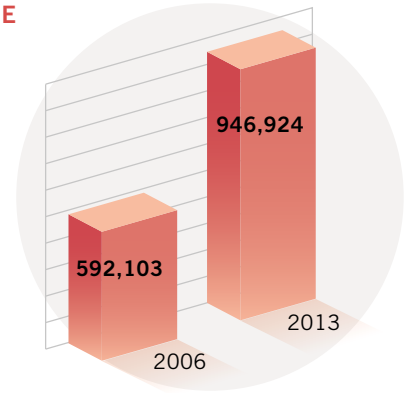
The water companies operate around 6,000 of a total 16,300 water treatment plants in France, representing a total treatment capacity of 22 million m³ per day.

The treatment of the raw water comprises successive stages involving physical, biological and/or chemical processes. The exact number of stages involved will depend on whether the water is taken from ground or surface sources and the sanitary quality of the source water.

A process that is increasingly used because it filters out even the tiniest particles (including viruses and pesticides) is filtration through organic or inorganic membranes. Between 2006 and 2013, **the treatment capacity of membrane treatment plants operated by the water companies rose by 7% a year on average** – an example of the capacity of the water companies to innovate under the delegated management model.

Disinfection, which is used to eliminate viral and bacterial pathogens, can be performed by several different processes, the most common of which are ozonation and chlorine disinfection. Chlorine is very effective in keeping the water safe on its journey through the mains to the customer's tap. More than one-third of the treatment capacity of the plants operated by the private companies depends on the use of chlorine disinfection alone.

TREATMENT CAPACITY OF MEMBRANE TREATMENT PLANTS (m³/day)



Source: Water company survey findings

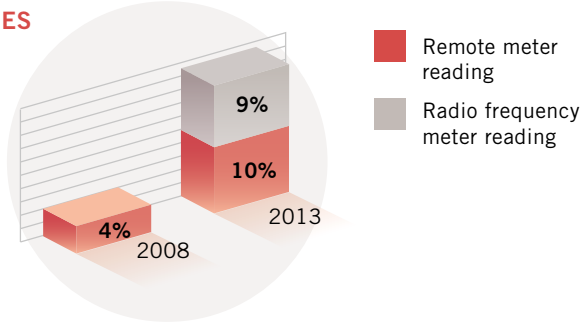
Smart meters to manage water usage

Water meters are acquiring the ability to communicate and help customers better manage their water use.

Radio frequency meter reading technology allows meters to be read remotely. With remote meter reading, utilities are able to obtain meter readings from a distance, while customers can see their water use online and be alerted to any leakage issues.

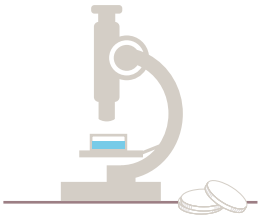
Of the 16 million meters managed by the water companies in 2013, 10% were fitted with a remote meter reading system and 9% with a radio frequency system.

INCREASE IN THE NUMBER OF SMART METERS OPERATED BY THE WATER COMPANIES



Source: Water company survey findings

Investing in R&D to improve quality of service



120
million euros
Invested in R&D

870
people working
in R&D

In 2013, the water companies dedicated €120 million and some 870 employees to research and development activities. As the following examples clearly illustrate, spending on R&D is allowing new technologies to be developed to tackle the different issues involved in managing water and protecting receiving environments:

- control of treatment plants: water treatment plant operation is optimized by means of real-time monitoring systems that analyze the different processes involved in advanced treatment systems;
- leak detection: tools that collect data on specific segments of pipeline help reduce pressures on water resources;
- real-time management of sewer systems: sewer systems are increasingly equipped with sensors for the collection of data to model the system. By allowing continuous monitoring of parameters like flow, water quality, meteorological conditions and rainfall, the sensors help to ensure that sewage is conveyed safely to the treatment plant with a minimal risk of overflow and pollution;
- asset management: tools which make use of field data as well as data provided by supervisory systems and plant technical data are used to track and improve the management of water and wastewater system assets;
- bathing water quality monitoring: rapid information about water quality at beaches is obtained by means of molecular analysis tools and pollutant formation and transport models;
- customer management: the continuous production of performance indicators and dashboards is now possible thanks to information systems that cover each stage of the customer management process.

The use of smart tools has thus resulted in performance improvements on some networks:

- in Bordeaux, pressure regulators helped reduce water loss by a third in three years;
- in Beaune, savings equal to three months of water use were achieved;
- and in Greater Lyon, the installation of smart sensors has allowed leaks to be located to the nearest meter.

With the creation of the Contrat de la Filière Eau, companies involved at each stage of the water cycle have undertaken to grow the know-how of French companies and to expand their capacity to innovate. And the Comité Stratégique des Eco-Industries as the body for consultation between environmental companies and government, has stressed the fact that, in the face of growing international competition in the service industries, it befalls to French companies to strengthen their strategic focus on the technologies of the future. Examples of the areas of expertise concerned include:

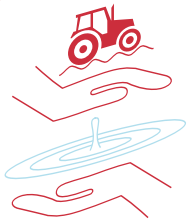
- resources management: low-energy desalination, reuse of treated wastewater; urban stormwater management; relationships with stakeholders (farmers, forestry sector and industry) to help them optimize the use of water;
- wastewater treatment: the use of nanotechnologies, membranes, UV disinfection and plant-based treatment;
- asset management by means of smart systems: geotagging, trenchless assessments and rehabilitation;
- reduction in energy use and recovery of materials from waste;
- the wastewater treatment plant of the future (energy self-sufficiency, minimal environmental footprint, resource recovery, biogas production).

Competitiveness clusters for collaborative R&D

The water companies are members of three French 'competitiveness clusters', whose purpose is to harness capacities to innovate and generate growth and jobs. The water companies take part in collaborative water-related R&D initiatives, partnering with SMEs, research centers and training centers within business ecosystems.

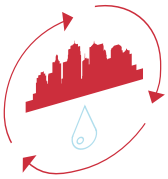
In 2013, the water companies and their business units were stakeholders in 15 or so green technology projects, working with the Eau, Dream Eaux & Milieux and Hydreos clusters. The commitment of the water companies to the smart and sustainable management of water is reflected in the topics addressed in these projects:

Smart water management



- Groundwater pollution monitoring tools
- Integrated network information and management tools
- Tools to protect groundwater from agricultural practices

Sustainable infrastructure



- New-generation membranes for recycling municipal wastewater
- New pipe coatings to prevent deterioration of water quality
- A new anaerobic digestion process for the treatment of sewage sludge

Water recycling and reuse

- Small-loop cycles in the reuse of industrial wastewater
- An environmentally-friendly process for the treatment of industrial and municipal wastewater
- Reuse of treated wastewater
- Creation of constructed wetlands at the outlet of wastewater treatment plants

Expertise dedicated to recycling water

The water companies are developing solutions to recycle drinking water and produce new resources from the wastewater treatment process. The treatment plants of the future will produce clean water, part of which will be reusable, as well as new biomaterials and efficient bioenergies.

- The principle of recycling is to increase the number of times the same water is used. Thanks to new water distribution monitoring systems, potable water can be used twice before being sent down the drain, once for essential needs like drinking and personal hygiene, and a second time for purposes like street cleaning and industrial processes.
- The production of biogas by the anaerobic digestion of the organic matter in wastewater will potentially allow treatment plants to achieve energy self-sufficiency. And the trend is towards more energy-efficient anaerobic digestion technologies.
- New technologies are allowing wastewater to be used to heat and cool residential and industrial buildings and offices.
- Biomaterials similar to those produced from petroleum products in the chemical industry will be used to produce biopolymer beads which can be used in the manufacture of various plastic products.

Tomorrow's expertise put to use abroad

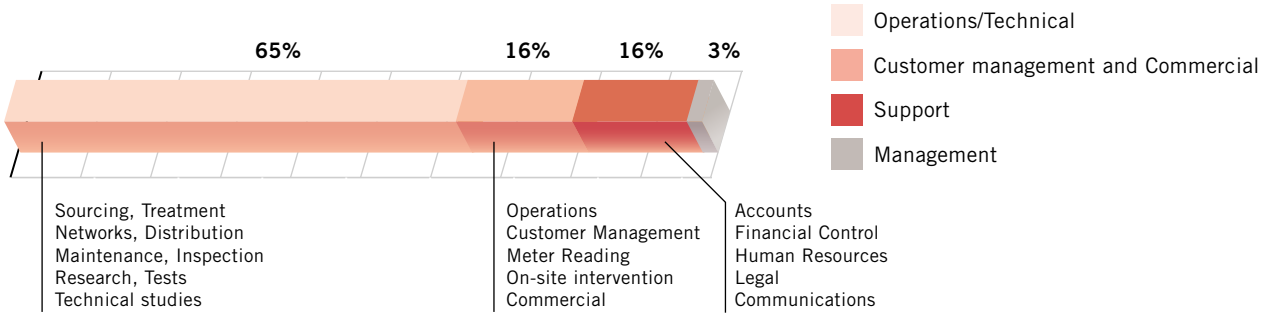
The water companies and their business units are also taking their know-how abroad, in particular for the purposes of data integration and improving water supply security.

- In Shanghai, Pudong and Prague, vast amounts of data on criteria like water resources, water treatment and distribution, wastewater, assets and customers are processed at giant water control centers with a view to optimizing costs, minimizing water distribution system losses and managing potential contingency situations.
- The world's 16,000 desalination plants are located in 120 countries. In Australia, a country with a very uneven distribution of water resources, solutions like desalination and the reuse of treated effluent in industry are used to provide drinking water to cities like Melbourne and Sidney.
- The state of California now has facilities for recycling wastewater, generating water savings of 30 million m^3 a year and producing five types of recycled water for uses like irrigation, industrial use and groundwater recharge.
- Reclaimed water caters for a third of the municipal needs of Namibia's capital Windhoek.
- In Milan and Barcelona, wastewater recycling plants produce water for irrigation, thereby reducing the pressure on resources in a climate pre-disposed to drought.

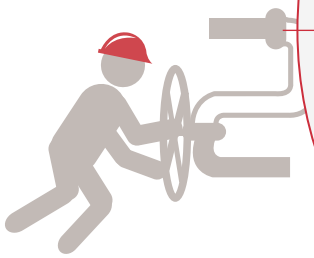
The skills of today and tomorrow

Changing job descriptions and skills: a challenge for the utilities of the future

TYPES OF EMPLOYMENT OFFERED BY WATER COMPANIES



Source: QUADRAT ETUDES for FP2E, 2011 data



Examples of jobs in water sourcing and treatment

Water Engineer: designs the infrastructure and facilities

Plant Manager: manages pumping, treatment, storage and distribution facilities

Maintenance Technician: manages maintenance work and repairs on mains and service connections

Design Engineer

Water Treatment Technician

Distribution System Technician

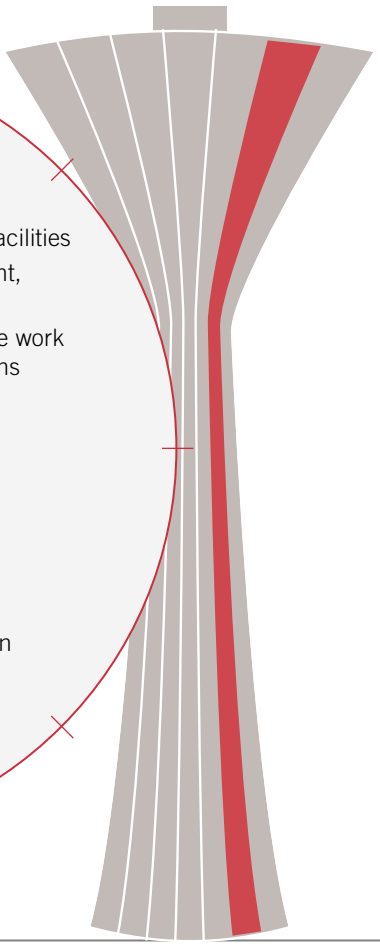
Examples of jobs in sewerage and sewage treatment

Treatment Plant Manager

Maintenance Technician: system inspection and failure management

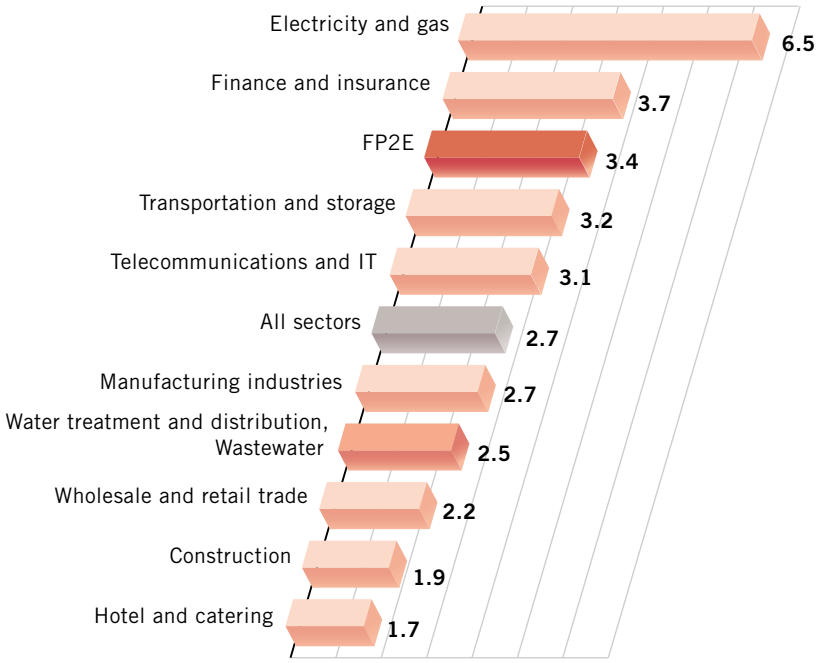
Sewer Monitoring Technician

Sewage Treatment Technician



Training: a key to staying competitive

INVESTMENT IN TRAINING AS A PERCENTAGE OF PAYROLL



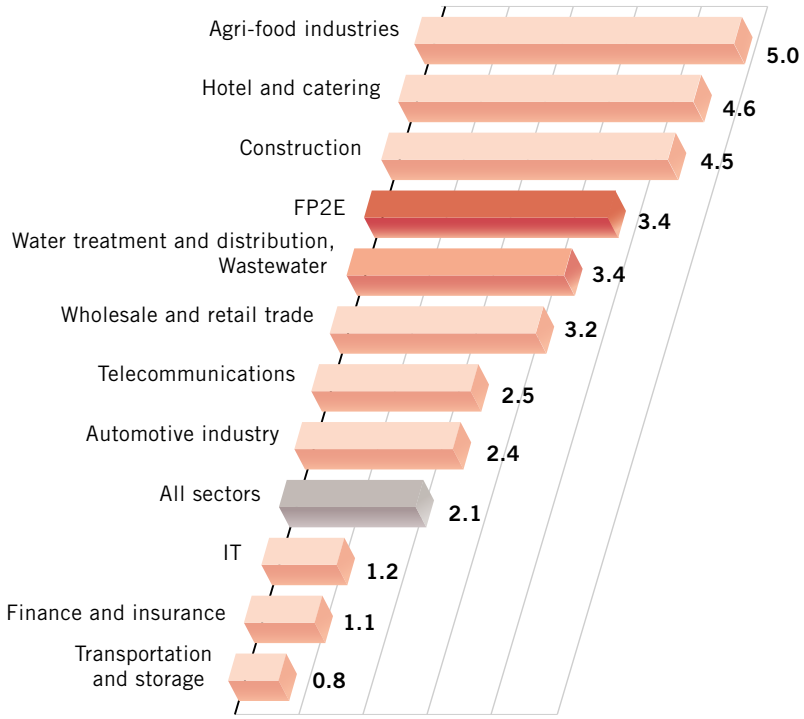
Sources: BIPE, based on CEREQ data, 2011 and water company survey findings, 2011

The water companies invest 3.4% of their payroll in training, a higher proportion than the average for all sectors (2.7%) and for the whole of the public water and wastewater sectors combined (2.5%).

This investment helps employees to maintain a high level of skill and develop new skills in line with the expectations of customers and the authorities responsible for organizing services.

Apprenticeships: investing in the future

PERCENTAGE OF EMPLOYEES IN APPRENTICESHIPS



Sources: BIPE, based on INSEE employment survey data, 2012 and water company survey findings, 2012

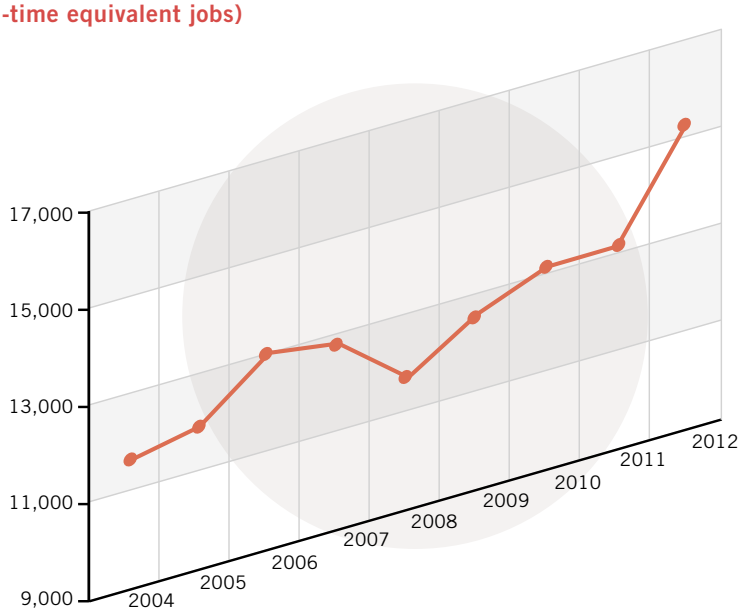
The water companies invest both time and resources in organizing the transfer of knowledge and skills.

The number of junior employees in apprenticeships in the water companies exceeds the average for all sectors (3.4% as compared to 2.1%).

The water companies had 12,273 employees in apprenticeships in 2013, and as a proportion of the total workforce their number is growing steadily, up from 2.6% in 2008 to 3.4% in 2012 and 3.8% in 2013.

The growth of SMEs in the environmental engineering sector

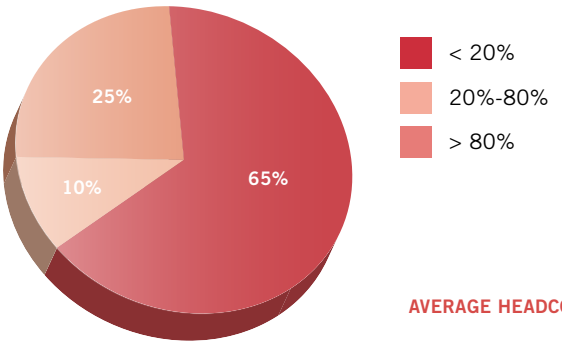
NUMBER OF JOBS IN FRANCE IN ENVIRONMENTAL ENGINEERING (full-time equivalent jobs)



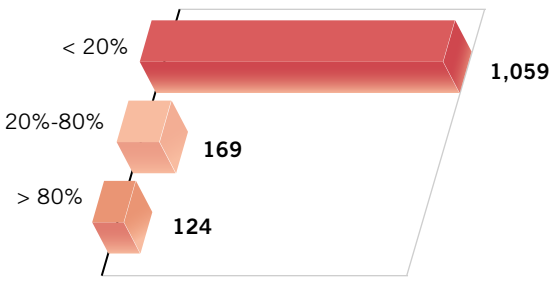
Source: SoeS environmental accounts

In 2012, private engineering companies in the environmental sector in France provided 15,400 engineering jobs in sectors such as agriculture, construction, risk management and biochemistry. These engineering jobs, which cover all of the activities involved in protecting the environment and in managing natural resources, have grown at an average rate of 3.4% a year since 2004.

BREAKDOWN OF CONSULTING ENGINEERING COMPANIES ACCORDING TO REVENUE GENERATED IN THE ENVIRONMENTAL SECTOR



AVERAGE HEADCOUNT



Source: BIPE survey 2012, 2011 data

Environmental engineering is a highly specialized sector: 25% of companies surveyed by the BIPE generate more than 80% of their revenues from environmental activities. These tend to be small or medium-sized firms with an average headcount of 125. At the other end of the scale, 65% of such companies are large consulting engineering firms that generate less than 20% of their revenues in environmental engineering.

A thriving competitive sector

Each year sees local authorities using competitive procurement procedures to award contracts for the management of their water or wastewater services. These procedures are governed by a strict regulatory framework:

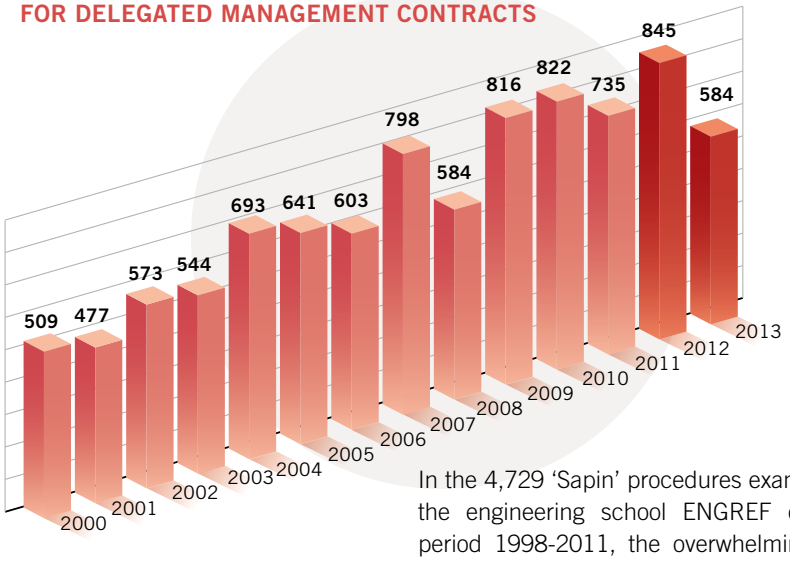
- **The Sapin Act of 1993** made competitive tendering the norm and introduced rules governing the award of contracts by the authorities responsible for organizing services.
- **The Mazeaud Act of 1995** specified the nature of the information to be provided by private operators in the annual report submitted by each utility.
- The 'Grassroots Democracy' Act **(Loi Démocratie de Proximité)** of 2002 made provision for the participation of water users in the form of the Commission Consultative des Services Publics Locaux (CCSPL), a body which must be consulted in the event of any plans to delegate services.

In Spring 2016, the transposition of the Concessions Directive into French law will change the system to reflect the principles adopted by the EU. The effects will differ depending on the sector (drinking water concessions being excluded from the scope of the new rules, unlike wastewater concessions).

The trend is towards a growing number of competitive tendering procedures for the delegation of services: prior to the mid-2000s, nearly 600 procedures were launched each year on average, since then there have been over 700 procedures a year. The year 2013 broke the trend however – a reversal that can be explained by two factors:

- the average length of the contracts is 11 years so the dip in 2013 echoes the dip that occurred in the early 2000s;
- the fall in the number of utilities as a result of the new intermunicipal groupings.

NUMBERS OF COMPETITIVE PROCUREMENT PROCEDURES FOR DELEGATED MANAGEMENT CONTRACTS



Sources : Engref, based on data from the Sapin Act observatory (1998-2011: number of procurement procedures); BIPE, based on water company survey findings, 2012-2013 (estimates of the total number of procurement procedures based on the number of delegated service contracts coming up for renewal)

In the 4,729 'Sapin' procedures examined by the engineering school ENGREF over the period 1998-2011, the overwhelming trend (96.8% of procedures) is the continuation of the existing model of management:

- 2.1% of contracts switched from direct to delegated management.
- 1.1% switched to direct management.
- 96.8% were concessions that were renewed.

On average, 14% of all service contracts put out to tender result in a change of operator.

Since 2009, these procedures have generally led to a fall in the price paid to delegated service providers. This fall has not always been passed on to the customer, since some local authorities have simply increased their share of the receipts so that they have more money to invest.

Since the introduction of the Sapin Act, the duration of most delegated management contracts has stabilized at 12 years.

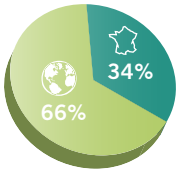
Changing expectations on the part of the contracting parties have led to the emergence of new types of contract based on service performance and the achievement of sanitary quality, environmental and social targets. Indeed, ONEMA has identified specific performance targets in 60% of new contracts.

The water companies as drivers of sustainable development

Contributing to the economy: the international presence of the water companies

Water companies that are taking their know-how abroad

DOMESTIC/INTERNATIONAL BREAKDOWN OF WATER COMPANY JOBS

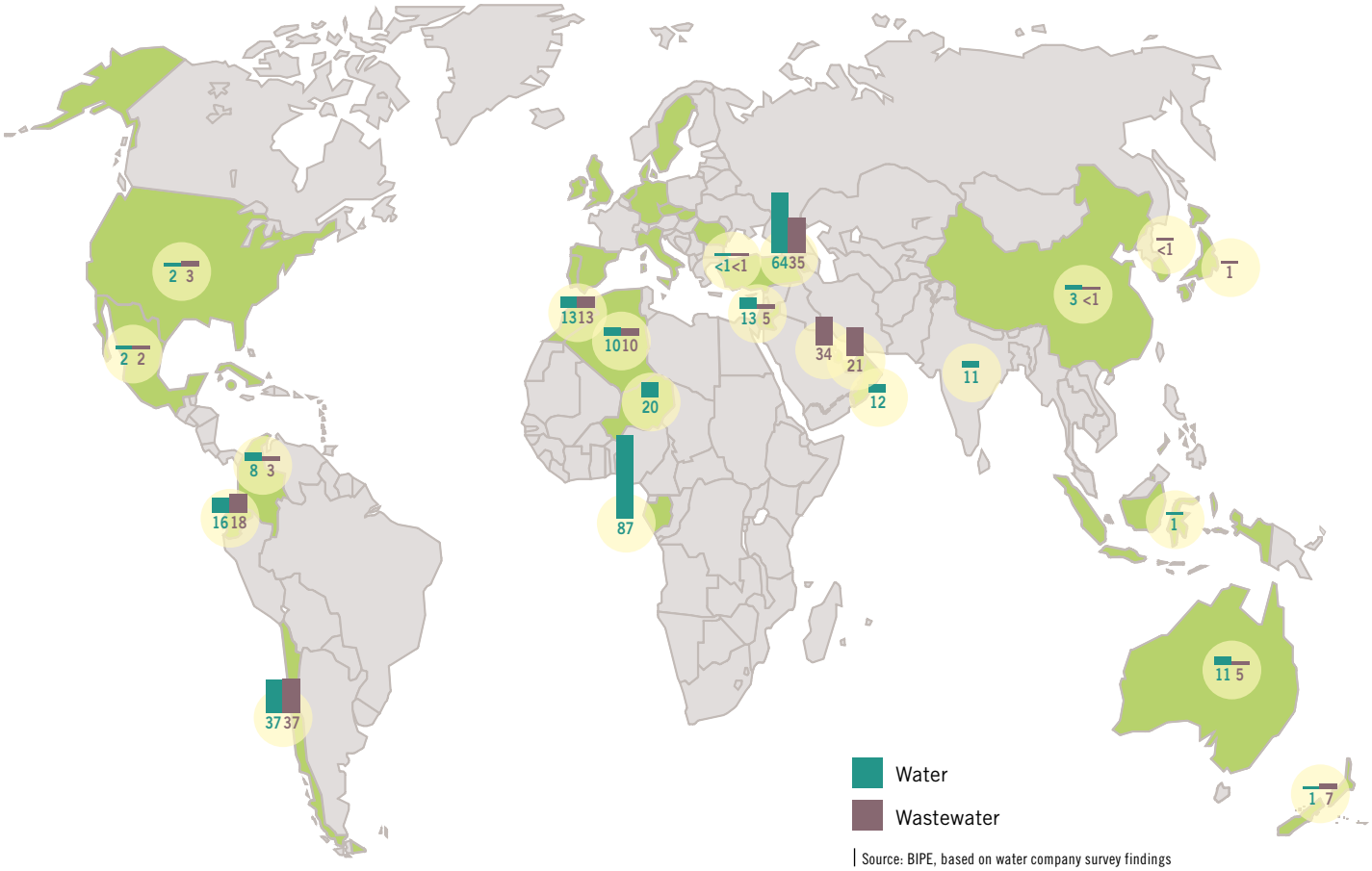


Increasing investment in R&D means giving the water companies the capacity to take French know-how abroad and make a positive contribution to France's trade balance.

In 2013, revenues generated abroad by French companies specializing in water and wastewater services amounted to €8.4 billion and made up 60% of their total revenues. And the number of employees based abroad in 2013 (more than 62,000) was nearly twice the number based in France.

In the same year, nearly 132 million people abroad were supplied with water by French companies and 75 million received wastewater services from French companies.

NUMBER OF PEOPLE ABROAD RECEIVING SERVICES FROM FRENCH WATER COMPANIES
(percentage of total country population)



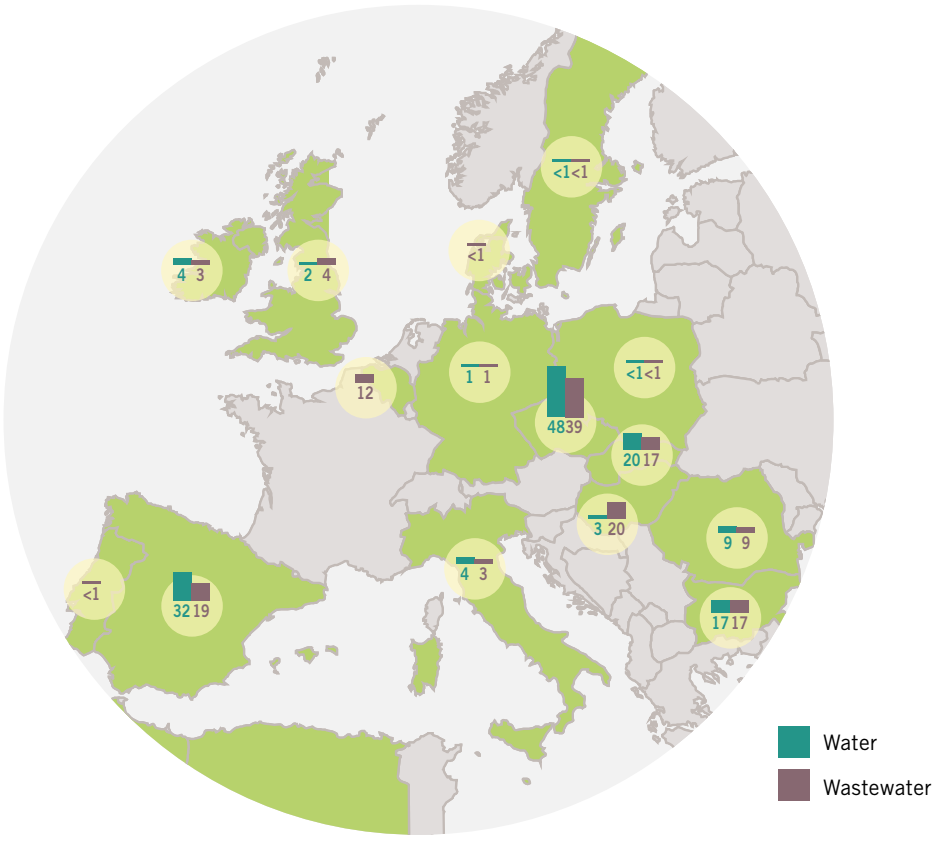
Source: BIPE, based on water company survey findings

NUMBER OF PEOPLE ABROAD RECEIVING SERVICES FROM FRENCH WATER COMPANIES
(thousands)

Continent	Water	Wastewater	Total
Europe (excluding France)	29,334	25,491	**54,825**
Africa	12,371	7,905	**20,277**
Oceania	2,617	1,448	**4,064**
Americas (North & South)	19,514	20,858	**40,372**
Asia	68,002	19,130	**87,132**
Total (outside France)	131,839	74,832	**206,671**

Source: Water company survey findings

NUMBER OF PEOPLE IN EUROPE RECEIVING SERVICES FROM FRENCH WATER COMPANIES
(percentage of total country population)

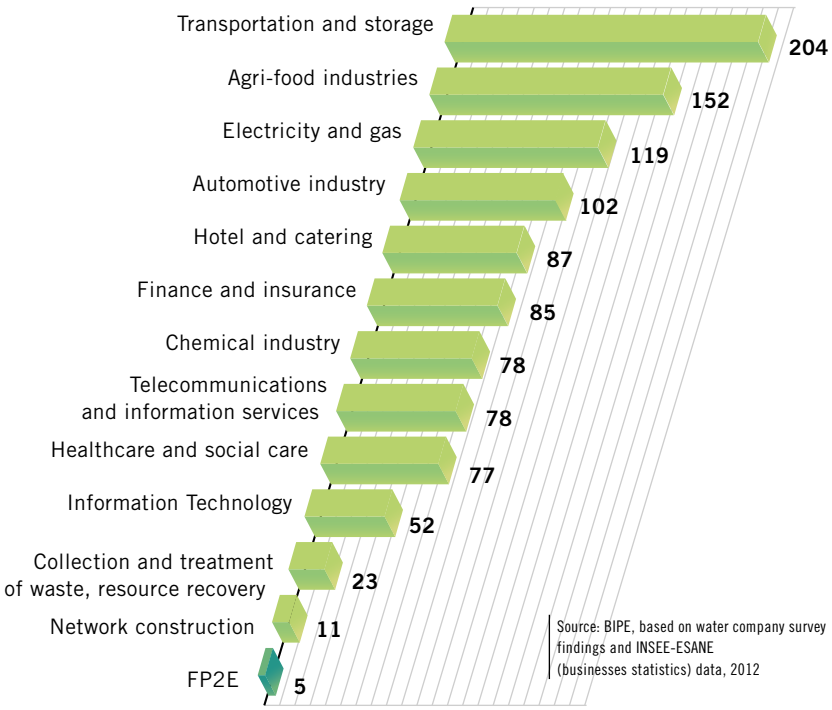


Source: BIPE, based on water company survey findings

Water company operations in France: revenues, productivity and jobs

€5.3 billion in revenues generated on the domestic market

REVENUES BY SECTOR (€ billion)

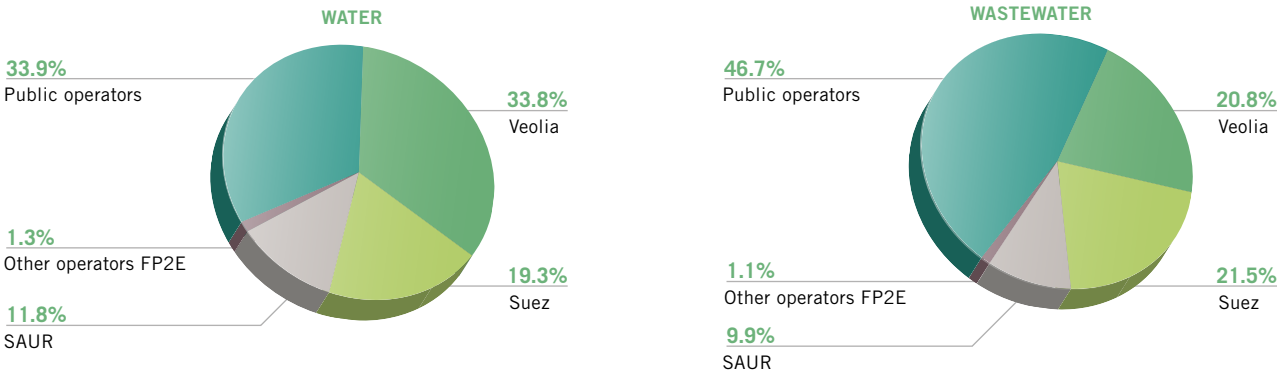


Source: BIPE, based on water company survey findings and INSEE-ESANE (businesses statistics) data, 2012

In 2013, the water companies reported revenues of €5.3 billion (ex. VAT) for water and wastewater services provided in France: €4.9 billion under delegated management arrangements and €0.4 billion for other services. Overall revenues over the period 2010-2013 have remained stable.

The water companies have improved their productivity. In the utilities run by the water companies, in 2013, each million euros provided services to 13,700 customers as compared to 13,600 customers in 2009. And in 2013, each job at a water company allowed 2,300 customers to receive services, up from 2000 customers in 2009.

FRANCE: BREAKDOWN IN POPULATION SERVED BY OPERATOR IN 2013
As a percentage of the total population served



Sources: BIPE, based on water company survey findings and INSEE data

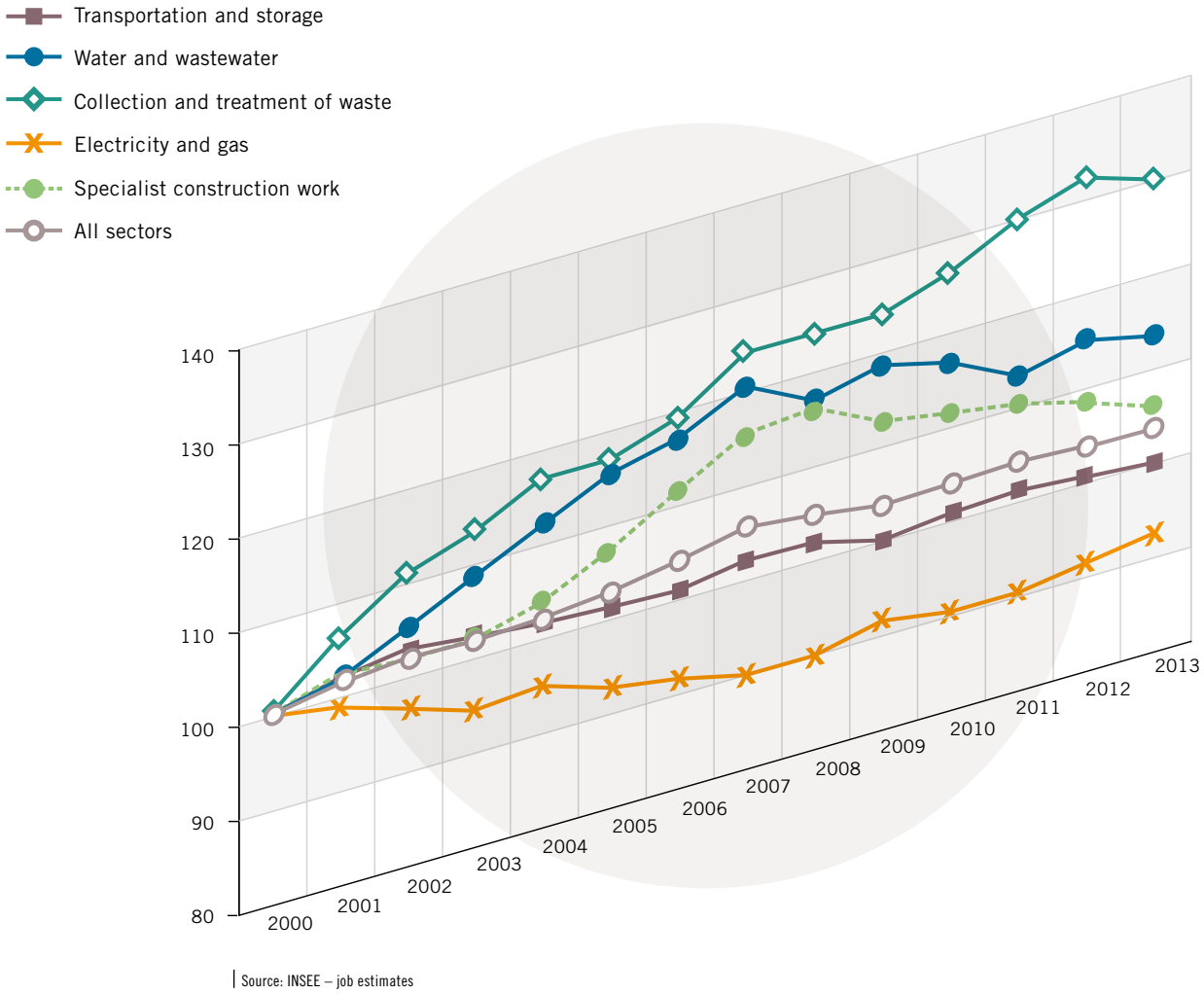
A recent decline in job numbers

Between 2000 and 2007, jobs in the water services sector were increasing at an average rate of 2.8% a year – a more rapid progression than job growth across all sectors combined, which was 0.8% a year over the same period.

Salaried jobs in the sector were hit harder than the average by the effects of the economic downturn, with job growth in the sector shrinking by 0.9% a year between 2007 and 2012, compared to 0.3% a year for total job growth.

After a surge in job growth in 2012, the decline resumed in 2013 and 2014, a fiscal year in which the water companies had a total headcount of 31,000.

TRENDS IN SALARIED EMPLOYMENT
(Metropolitan France, 2000 = 100)



Source: INSEE – job estimates

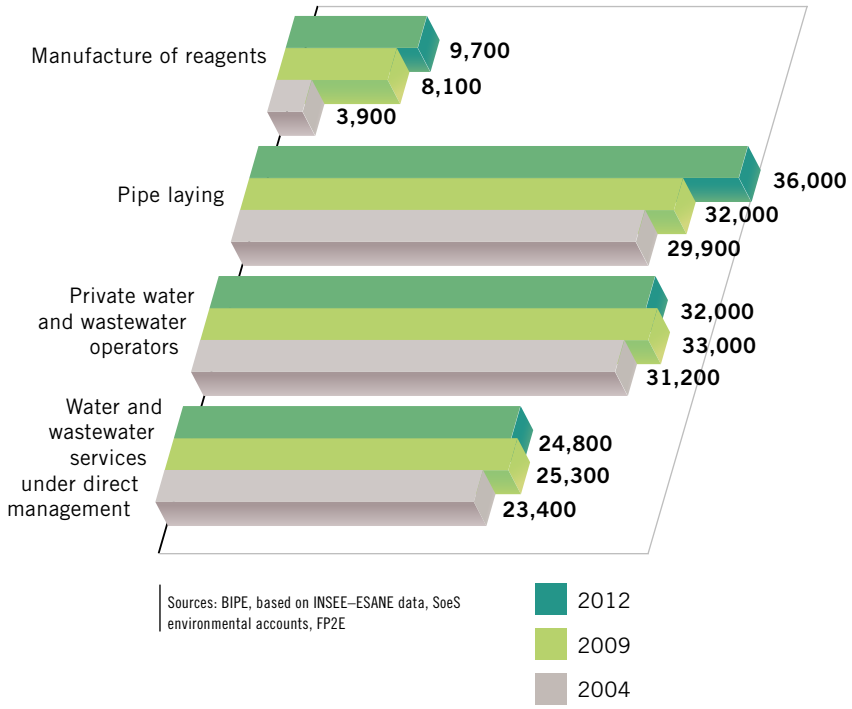
More than 100,000 jobs in water and wastewater services

In 2012, the number of jobs in water and wastewater services was estimated at 57,000, over half of which (56%) were with the water companies.

In 2008, and for the first time since the early 1990s, jobs at the water companies declined. The fall in jobs in water and wastewater services between 2009 and 2012 was a trend that affected both the régies and the private operators. A number of factors appear to have resulted in staff cutbacks, in particular declining water use, the amalgamation of utilities as intermunicipal groupings expanded, but also the trend toward fierce competition in the delegated management sector.

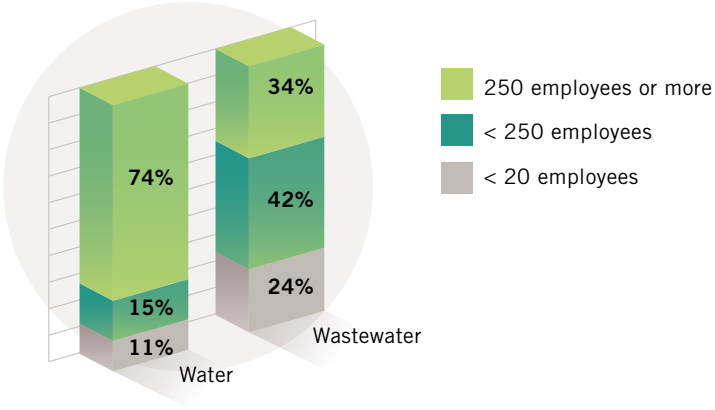
At the same time, jobs in the construction of water distribution and sewer systems grew on account of local authority pipe replacement programs. This sector has been hit by the slump in public sector orders however. Jobs in the manufacture of reagents have also been on the rise as a result of the ecological and chemical status of the source water used and stiffer treatment requirements.

JOBS IN 2004, 2009 AND 2012



Sources: BIPE, based on INSEE–ESANE data, SoeS environmental accounts, FP2E

HEADCOUNT DISTRIBUTION



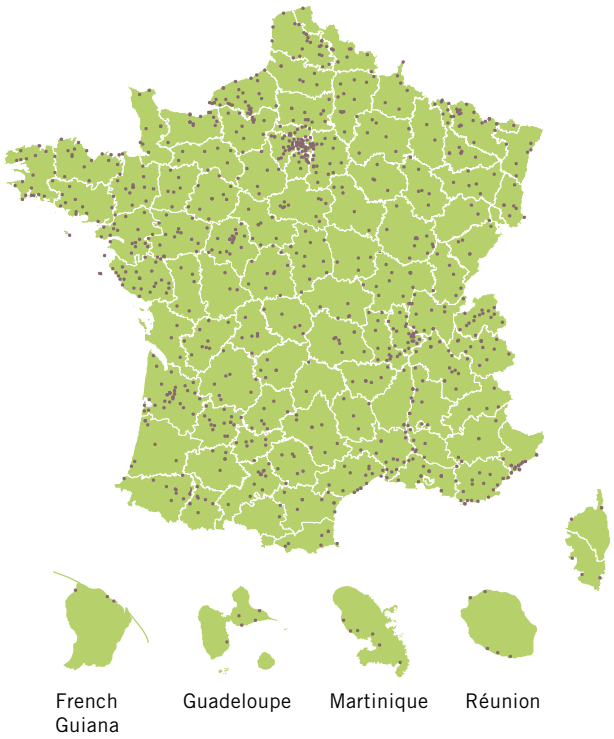
Source: BIPE, based on INSEE–ESANE data

Water company jobs all over the country

The water companies operate everywhere and have on average four employees for every 10,000 people in the population.

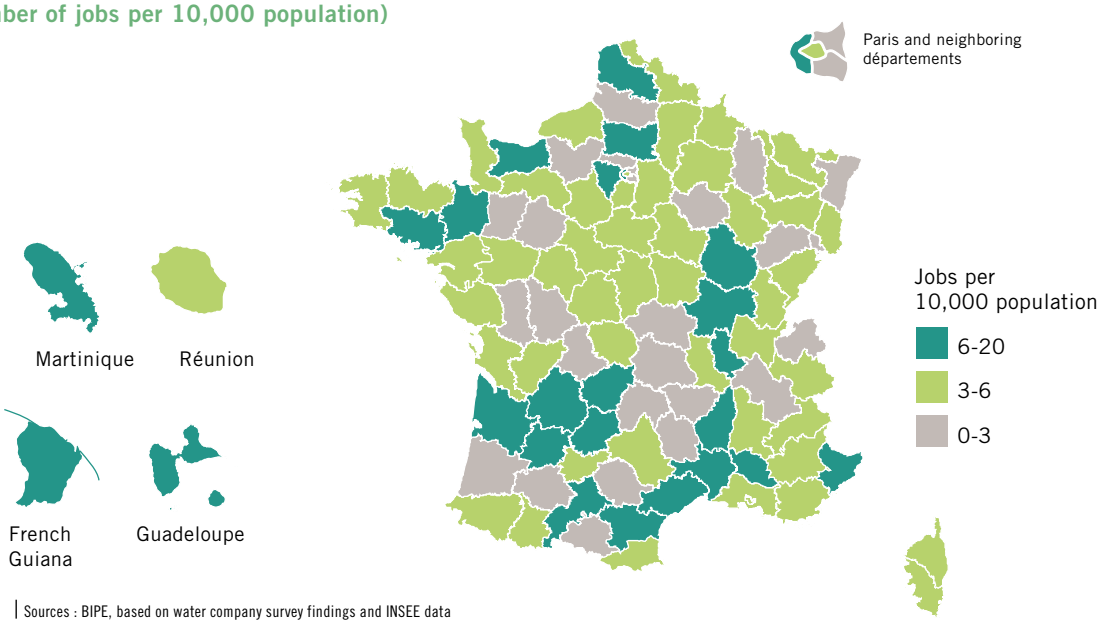
Boasting a strong local presence (offices in each département of France), the water companies are an important part of local economies: in 2013, through the local economic contribution, the corporate property tax and the tax based on added value, they paid €79 million in taxes to the communes, €3 million (3.8%) more than in 2010.

LOCATION OF WATER COMPANY JOBS IN FRANCE



Source: BIPE, based on water company survey findings

NUMBER OF WATER COMPANY EMPLOYEES BY DÉPARTEMENT
(average number of jobs per 10,000 population)

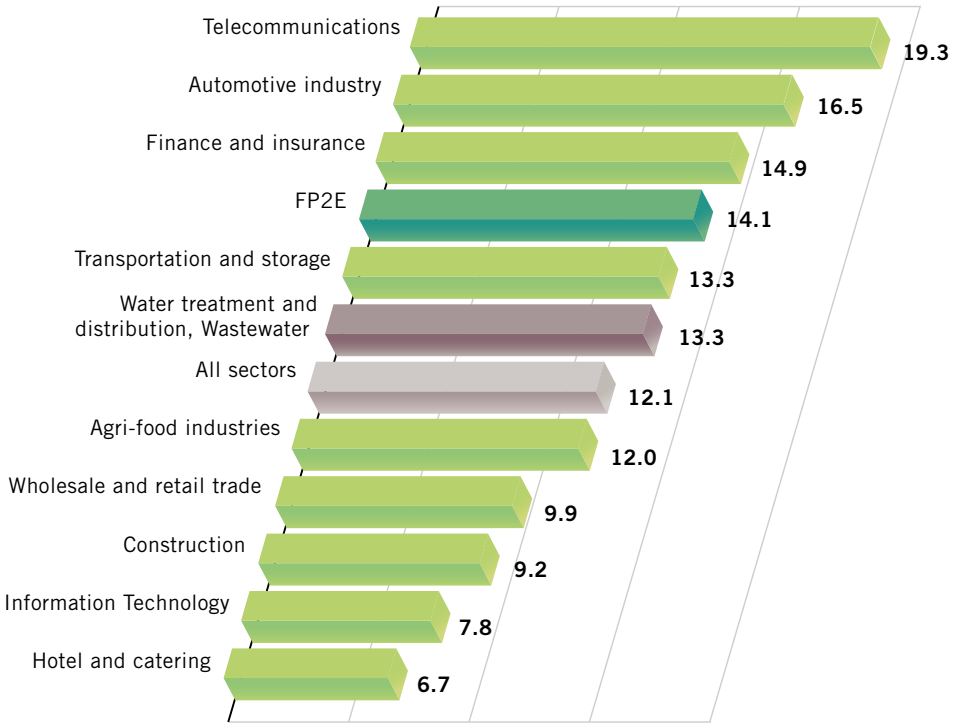


Sources : BIPE, based on water company survey findings and INSEE data

Water companies that continue to provide good conditions of employment

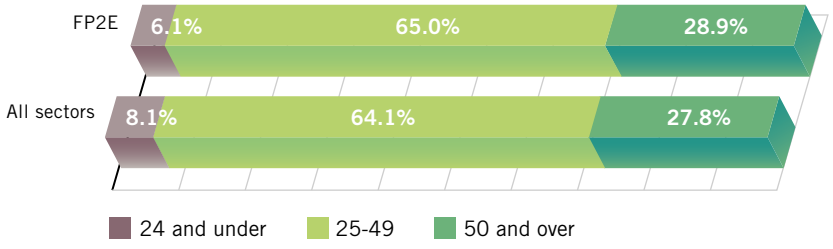
Water company policies for preserving know-how translate into high staff retention rates and the expansion of apprenticeships. Average length of service is 14.1 years – higher than the national average – in a trend fostered by a high ratio of open-ended contracts.

AVERAGE LENGTH OF SERVICE OF EMPLOYEES IN COMPARISON WITH OTHER SECTORS (number of years)



Sources: BIPE, based on INSEE job survey data, 2012 and water company survey findings, 2012

PERCENTAGE OF EMPLOYEES BY AGE GROUP IN COMPARISON WITH THE NATIONAL AVERAGE

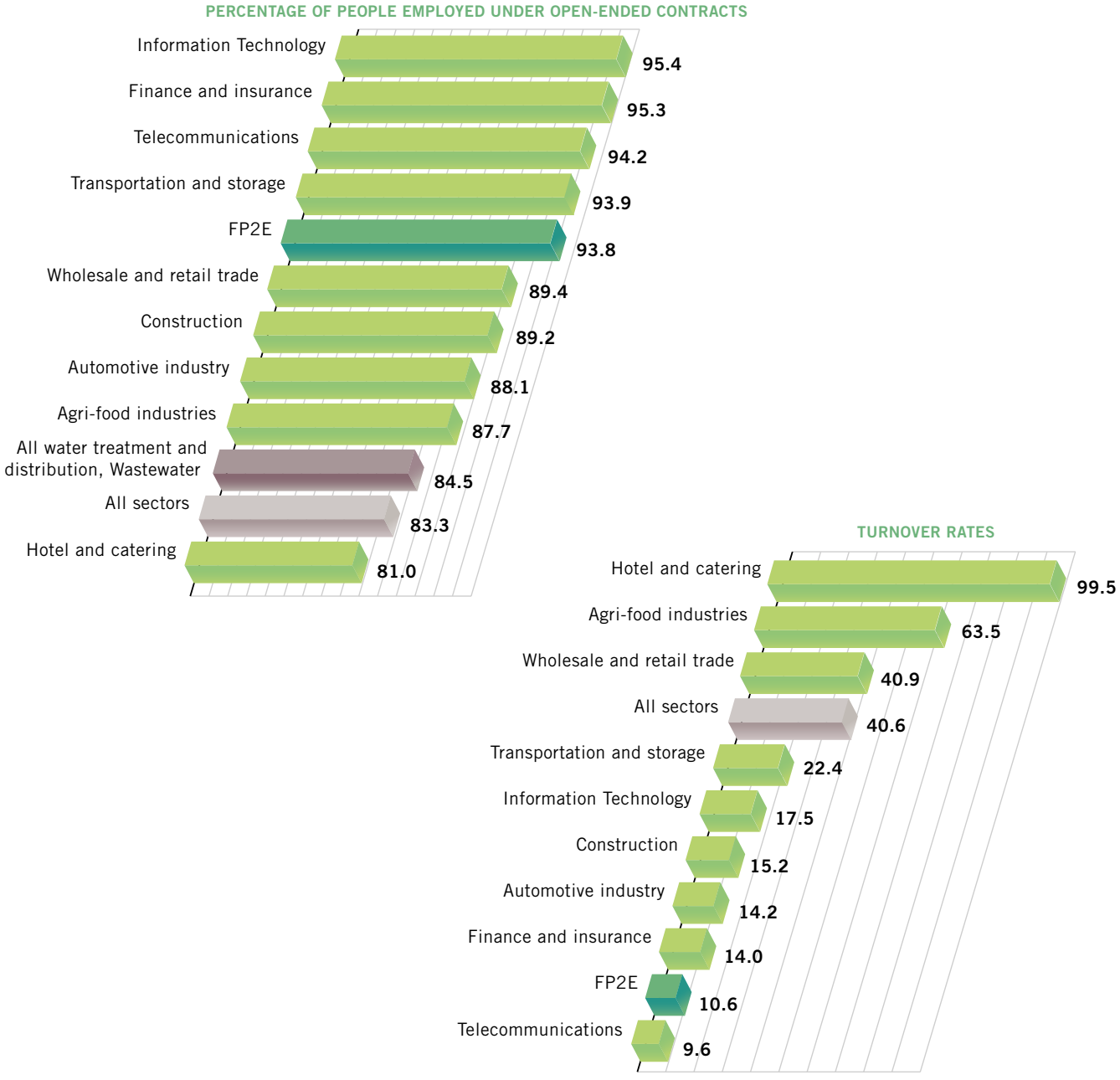


Sources: BIPE, based on INSEE job survey data, 2012 and water company survey findings, 2012

Stability of employment

Nearly 94% of water company employees are employed under open-ended contracts (CDI), 10 percentage points more than the average for all sectors.
Staff turnover in water companies is lower than the average for all sectors.

EMPLOYMENT INDICATORS: PERCENTAGE OF EMPLOYEES EMPLOYED UNDER OPEN-ENDED CONTRACTS COMPARED TO OTHER SECTORS



Sources: BIPE, based on INSEE employment survey data, 2012 and water company survey findings, 2012

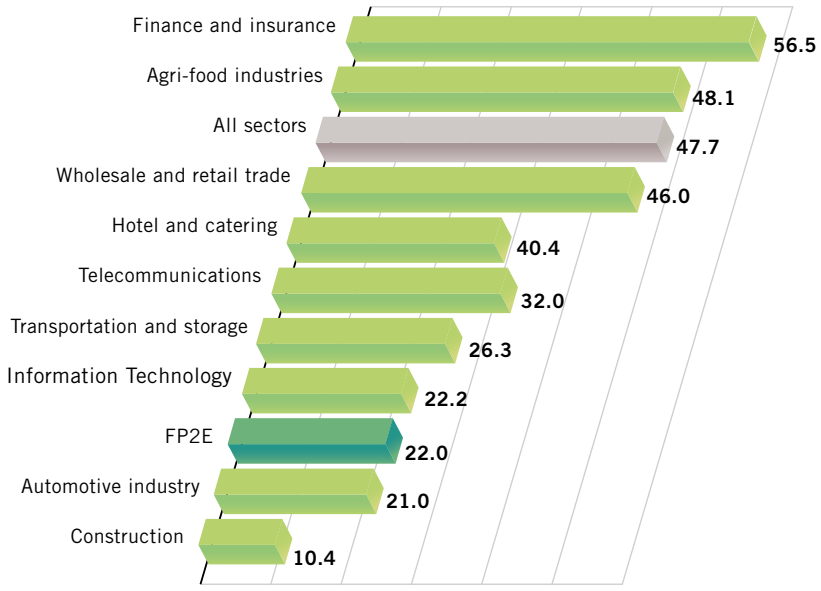
Contributing to society

Water companies that drive diversity

The water companies attach particular importance to diversity in the workforce.

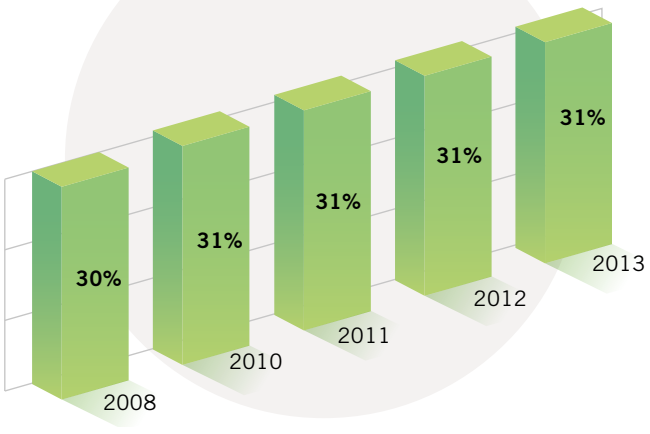
In 2012, women made up 22% of the workforce in water companies. This proportion of women is close to the national average for the sector (21.5%) and in three years has increased by 1%. At the same time, women now account for a third of new hires in any given year, reflecting the fact that more and more women are coming into the sector.

THE FEMINIZATION OF EMPLOYMENT
Percentage of women employees in the workforce



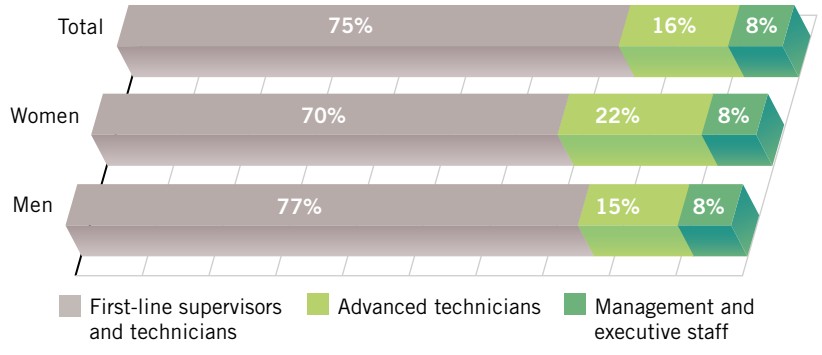
Sources: BIPE, based on INSEE job survey data, 2012 and FP2E-FDEI data, 2012

HIRING RATES FOR WOMEN IN THE WATER COMPANIES
Percentage of women hires in the total number of hires



Source: Water company survey findings

WATER COMPANY EMPLOYEES BY CATEGORY AND BY GENDER

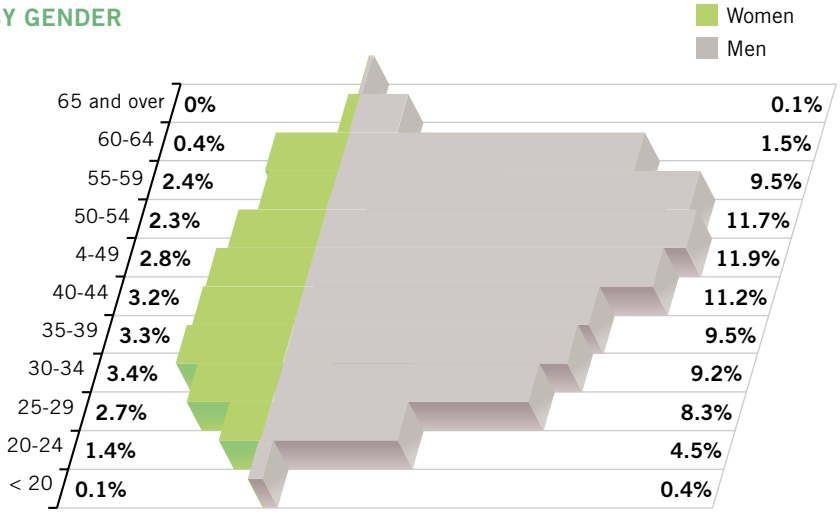


Source: BIPE, based on water company survey findings, 2013

Women are as prevalent as men at senior executive level (8% of the total workforce) and more represented than men in middle management and executive positions (22% against 15%).

On average women earn 4% less than men – a pay gap that is very low compared to a national average of 18% (in terms of hourly earnings), and compared to levels of 19.6% and 11.7% in the service and industrial sectors respectively.

WATER COMPANY WORKFORCE AGE PYRAMID BY GENDER

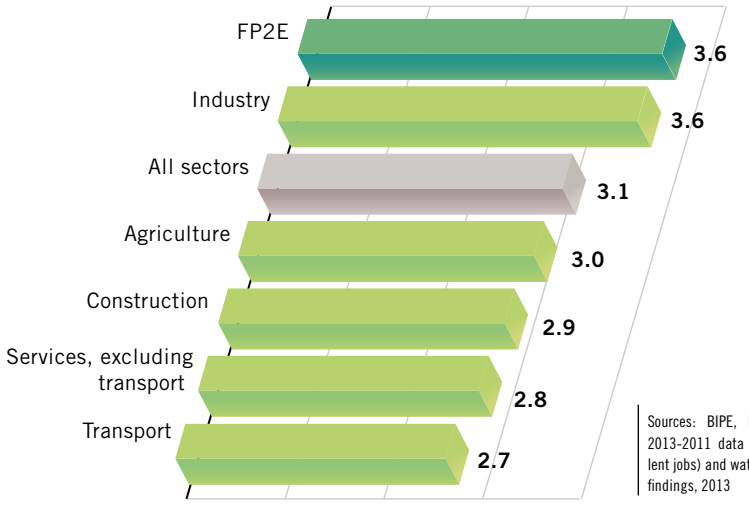


Source: BIPE, based on water company survey findings, 2013

The growing number of women in the sector is reflected by larger percentages of women among younger employees: Over half (56%) of all female employees are in the 25-45 age range (as compared to less than half of all men (48%)). The fact that female employees are relatively young has led to policies to help women acquire the requisite skills, since 69% of women employed by the water companies had attended a training initiative in the course of the year.

PERCENTAGE OF EMPLOYEES WITH A DISABILITY

Percentage of disabled employees in workforce



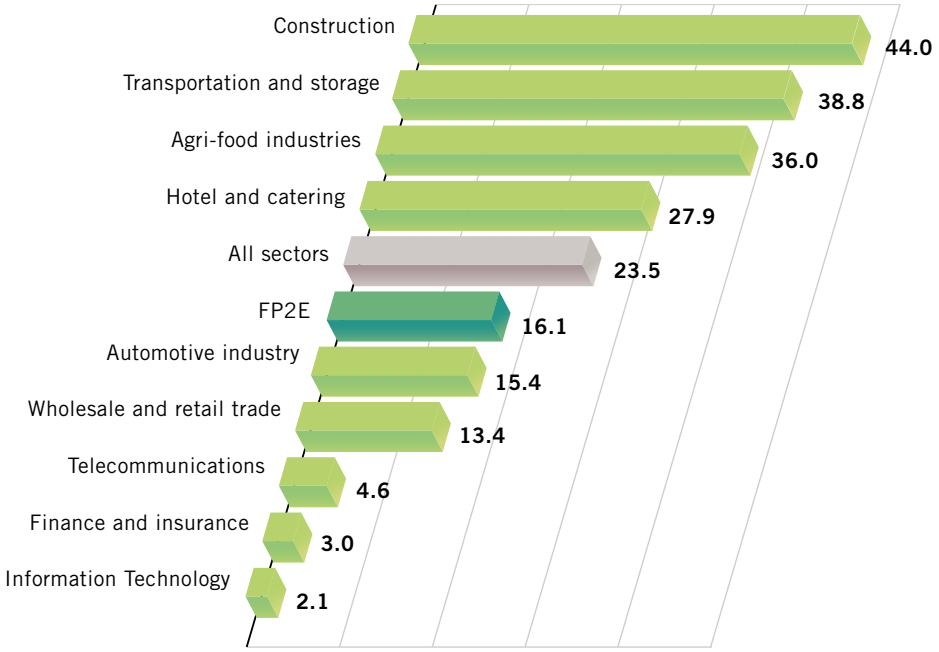
Sources: BIPE, based on DARES 2013-2011 data (full-time equivalent jobs) and water company survey findings, 2013

Water companies are employing more and more people with disabilities (3.6% of the total workforce in 2013, up from 2.1% in 2004). They also contribute 0.8% of their payroll to the Etablissements et Services d'Aide par le Travail (ESATS) as organizations that help people with a disability find employment.

Workplace accidents are relatively rare in the water companies despite the high level of technical skill required in many jobs. The severity of accidents is also lower than the French average. These good results are down to the effective risk management policies adopted by many water companies.

WORKPLACE ACCIDENT RATES: WATER COMPANIES IN COMPARISON WITH OTHER SECTORS

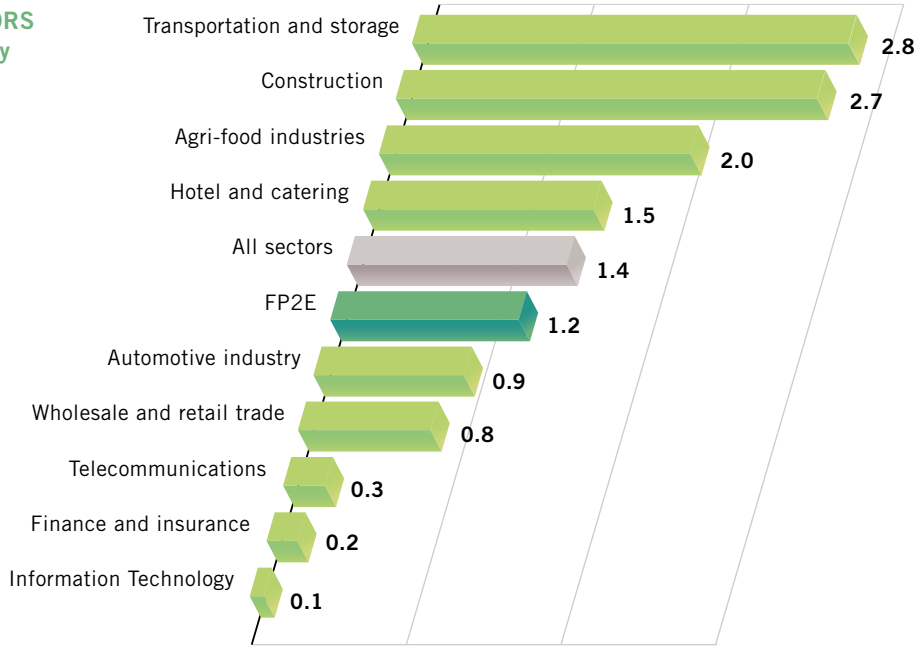
Number of workplace accidents per million hours worked



Sources: BIPE, based on data from the Caisse Nationale de l'Assurance Maladie (national healthcare fund), 2012 and water company survey findings, 2012

ACCIDENT SEVERITY RATES: WATER COMPANIES IN COMPARISON WITH OTHER SECTORS

Number of days of temporary incapacity for work per thousand hours worked



Sources: BIPE, based on data from the Caisse Nationale de l'Assurance Maladie (national healthcare fund), 2012 and water company survey findings, 2012

A process of social dialogue that is very much alive in water companies

The water companies actively support dialogue with representatives of employees, both within the company and at a sector-wide level.

The water companies have 2,200 employee representatives (including union members, staff delegates, works council members and members of health, safety and working conditions committees) – 7% of the total workforce.

In 2013, the water companies signed more than 60 labor-related agreements:

- 43 on pay;
- 12 on social dialogue;
- 8 on health, safety and working conditions.

The FP2E, via a social commission composed of equal numbers of representatives of employers and of five trade unions in the sector, is tasked with improving the collective bargaining agreement, which has been in force since December 2000 and covers all employees in the sector. The FP2E also enters into agreements with trade unions and these are extended to all companies in the sector by ministerial order.

In 2013 and 2014, the following agreements were extended to the rest of the sector:

- an amendment to the sectoral collective agreement raising minimum salary rates for each category of employee;
- two amendments to the sectoral agreement of January 2005 on in-work training.

In 2014 a foresight observatory for the water and wastewater sector was set up within the social commission. Its purpose is to promote reflection on how skills profiles in the sector are likely to evolve. Three studies have been conducted since its creation. The first mapped out the different skills associated with the sector. The second study was an analysis of the main diversity indicators and the third looked at the creation of jobs for young people in the sector.

In 2015, with a view to meeting the requirements of a new law on in-work training, the sector embarked on a program to introduce a system of professional certification. And the same year saw the conclusion of a new agreement on in-work training.

All of these examples show that social dialogue is alive and kicking within the sector.

Minimizing environmental impacts

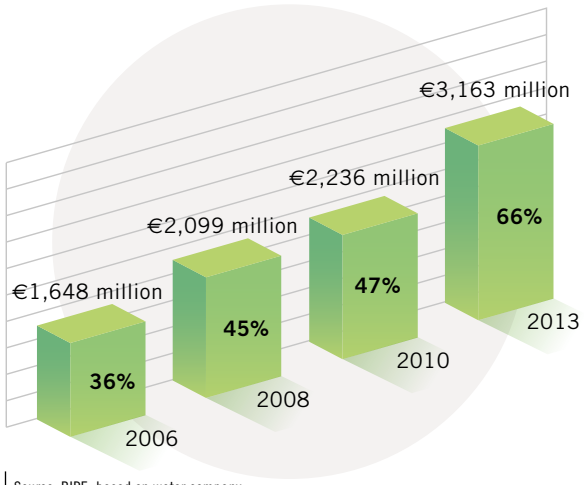
Water companies that are growing their green credentials

The water companies are engaged in a wide range of initiatives to reduce the environmental impact of their operations and are partnering with local authorities to expand ISO 14001 environmental certification.

In 2013, 66% of water company business was generated in ISO 14001-certified activities. With an increase of 20 percentage points in just three years, progress has been considerable.

More specifically, revenues generated by the water companies for ISO 14001-certified activities account for 65% and 68% of their total water and wastewater sector revenues respectively.

PERCENTAGE OF REVENUES GENERATED FROM ISO 14001-CERTIFIED ACTIVITIES



Source: BIPE, based on water company survey findings, 2007, 2011 and 2014

Water companies that are reducing their greenhouse gas emissions

The water companies have cut their greenhouse gas emissions, in particular by improving energy efficiency in their industrial processes. The biggest contributors to greenhouse gas emissions are:

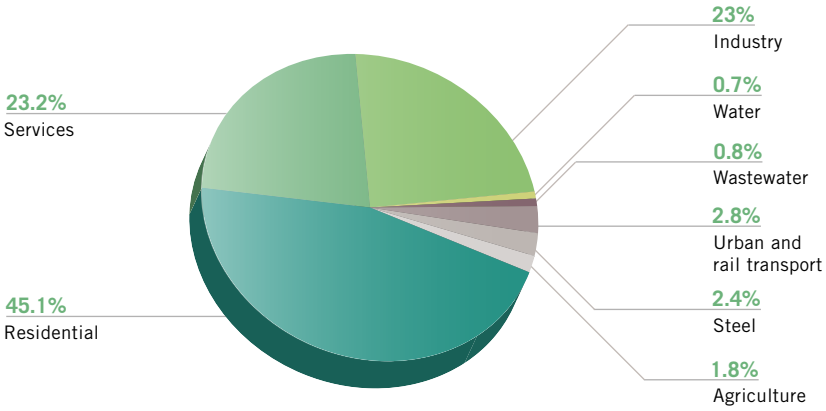
- in the water supply sector, treatment and pumping operations, and delivery by the first booster station;
- in the wastewater sector: aeration process and pumping.

In 2013, non-fuel energy use by the water companies was assessed at 49 kWh/capita in water services and 69 kWh/capita in wastewater services – amounts equivalent to average household energy use over five and seven days respectively. In the water services run by the water companies, energy use remained stable between 2010 and 2013. In wastewater services it grew however over the same period as a result of the more stringent requirements regarding the quality of treated effluent and improvements in treatment levels.

This energy consumption in water and wastewater operations is responsible for annual greenhouse gas emissions of 4.2 kg CO_2 equivalent per capita and 5.9 kg CO_2 equivalent per capita in water and wastewater services respectively. By way of comparison, these levels of annual emissions are equivalent to the carbon dioxide emissions from a petrol-fueled Renault Twingo travelling a distance of 95 km. For the record, at 5 tonnes CO_2, total per capita emissions from energy use in France were below the EU-27 average of 7 tonnes.

In continuing their efforts to reduce their emissions, the water companies are increasingly turning to renewable energy. In 2013, this accounted for 11% of total energy usage and, climbing by one percentage point in three years, is growing at the same rate as renewables in France's electricity mix. Moreover, 18% of the renewables used by the water companies in 2013 was self-generated.

GREENHOUSE GAS EMISSIONS FROM ELECTRICITY CONSUMPTION, BY SECTOR (KWH, 2012)



Sources: BIPE, based on data from INSEE, SOeS, and CGDD, January 2014

The FP2E

The FP2E – the Federation of French Water Companies – was set up in 1938 to represent water companies tasked with running water and wastewater services in France. Its seven members, which comprise the majority of water companies operating in France are:

- **Alteau**
- **Derichebourg Aqua**
- **Saur**
- **Société des Eaux de Fin d'Oise (SEFO)**
- **Sogedo**
- **Suez**
- **Veolia**

The Federation works to bring stakeholders – elected representatives, user associations and public authorities – the insights of practicing water-sector professionals. To assist it in that task, it draws on the experience of member companies in the business of operating water and wastewater facilities, and managing customers and relations with local administrations. It fulfils its remit with the help of seven commissions (economic, scientific & technical, legal, social, customer relations, European Affairs, and health and safety) staffed by experts from member companies.

The BIPE

Founded in 1958, the BIPE is an organization providing economic and strategic consultancy services to major private companies and public authorities. Its 50 consultants are based in Paris.
The BIPE's work covers all of the key economic sectors. Its expertise, which is both regional and international in scope and extends to issues like socioeconomic and environmental impacts, the dynamics of demand and markets, strategic positioning and strategic marketing, helps inform the decisions of its clients.

To address issues of growing complexity, the BIPE draws on multidisciplinary skills (macroeconomics, sectoral economics, socio-demographics, engineering, BtB & BtC marketing) and robust and adaptable methodologies (foresight studies, forecasts, models and analytical tools). The BIPE is an independent company whose guiding principles are a respect for the facts, scientific rigor and innovation.

Methodology

The information given in this document is based on the analysis of data collected from the key institutional and sectoral players:

- various national and international public agencies (French Ministry for Ecology, Sustainable Development and Energy and its statistics department SOeS, ONEMA/ SISPEA, Agences de l'Eau, Agences Régionales de Santé, etc.);
- an exhaustive survey among FP2E member companies.

The aim of the FP2E and the BIPE is to make more information available each year. Indeed, the field of water is constantly changing and the key institutional players are striving to get a better understanding of the sector. The private operators, for their part, are doing more to produce information. For that reason some of the data included will evolve over time and do not bear strict comparison from year to year.

BIPE - Le Vivaldi
11-13, rue René-Jacques,
92138 Issy-les-Moulineaux Cedex
Tel +33 (0)1 70 37 23 23
Fax +33 (0)1 70 37 23 00
E-mail contact@bipe.fr
www.bipe.fr

FP2E
Fédération Professionnelle
des Entreprises de l'Eau
19, avenue de Messine,
75 008 Paris
Tel +33 (0)1 53 70 13 58
Fax +33 (0)1 53 70 13 41
E-mail fp2e@fp2e.org
www.fp2e.org