Public water and wastewater services in France

Economic, social and environmental data

2019

7th edition

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FP2E LES ENTREPRISES de l'eau

FP2E/BIPE Report (7th edition)
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Preliminary

This seventh edition of the BIPE-BDO/FP2E overview of public water and wastewater services in France comes amid the reaffirmation of a political will in France to reinvest in the sector. This, together with a drive to improve performances through contractual arrangements between actors, was clearly in evidence at the sector's national conference, the Assises de l'Eau. The ambition to achieve greater efficiency of services is reflected in the extensive use of strategic planning and the trend towards greater data transparency. Achieving the good status of water bodies remains a priority objective – an objective reinforced with the revision of the European Water Framework Directive. Indeed, adapting to the effects of climate change is now an imperative that cannot be ignored.

Efficiencies in the organization of public water and wastewater services are already at work and the coming years will show whether these efforts will help to reduce regional disparities as well as to future-proof funding mechanisms and improve economic and environmental performances.

The water companies are committed to contributing to this process and are working with water governance bodies, industry and agriculture, the research community and associations of users and elected representatives to that end. In particular they are continuing their efforts to improve their systems in order to provide better information to consumers.

It is against this background that BIPE and FP2E are publishing this latest overview of public water and wastewater services in France and abroad.

Status of water resources, consequences of climate change, trends in governance, investment, service performances and prices, wastewater 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. It is also our hope that the availability of public data and, above all, the exhaustiveness and reliability of those data, will improve significantly in the coming years, and in doing so will support policy makers in their efforts to improve public services.

So please read on!

Frédéric Van Heems
President of the FP2E

Pascal Le Merrer
President of the BIPE

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Water
A continuous cycle

From resource to consumption

Freshwater In liquid form makes up only 0.7% of the Earth's water

Water resources

Freshwater in liquid form makes up only 0.7% of the Earth's water, the bulk of which is salt water. The circulation of water is continuous as it evaporates from rivers, lakes, seas and oceans, comes back again as rainfall, then filters through the soil to aquifers, rivers and lakes from which it evaporates again back to the atmosphere.

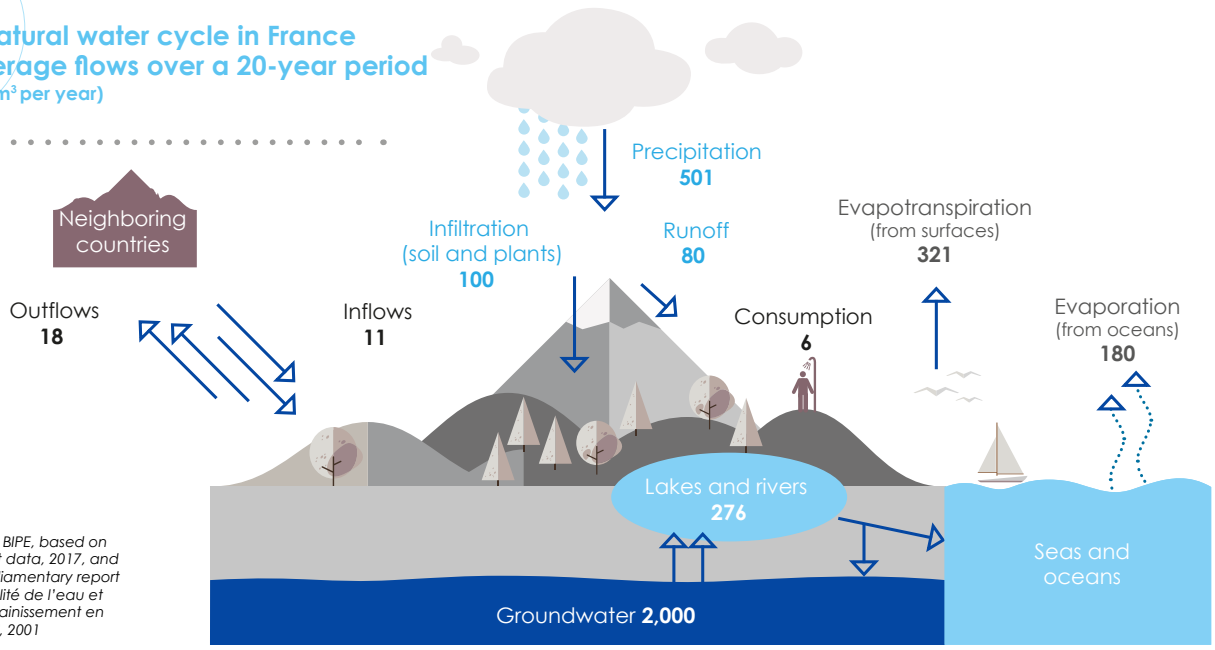
France is estimated to have **2,000 billion m³ of groundwater reserves**. Precipitation provides between 400 billion and 600 billion m³ of water annually, two-thirds of which return to the atmosphere through evaporation from surfaces. The remaining third, some 180 billion m³ of water each year, turns into "useful rainfall" i.e. the rainfall that feeds rivers and streams, is taken up by plants or seeps into the soil. After evapotranspiration and transfers to and from neighboring countries, France's **renewable water resources are estimated at 173 billion m3**. These figures should be seen in the light of regional disparities and annual variations in rainfall, however.

The two different repositories of freshwater are groundwater and surface water bodies. In 2013 France was home to 12,081 water bodies, just over 91% of which were in metropolitan France. For assessment purposes and in accordance with the Water Framework Directive, water bodies are divided into five categories:

Water bodies in France

Source : BIPE (2018)

The natural water cycle in France in average flows over a 20-year period
(billion m³ per year)



Source: BIPE, based on Eurostat data, 2017, and the parliamentary report "La qualité de l'eau et de l'assainissement en France", 2001

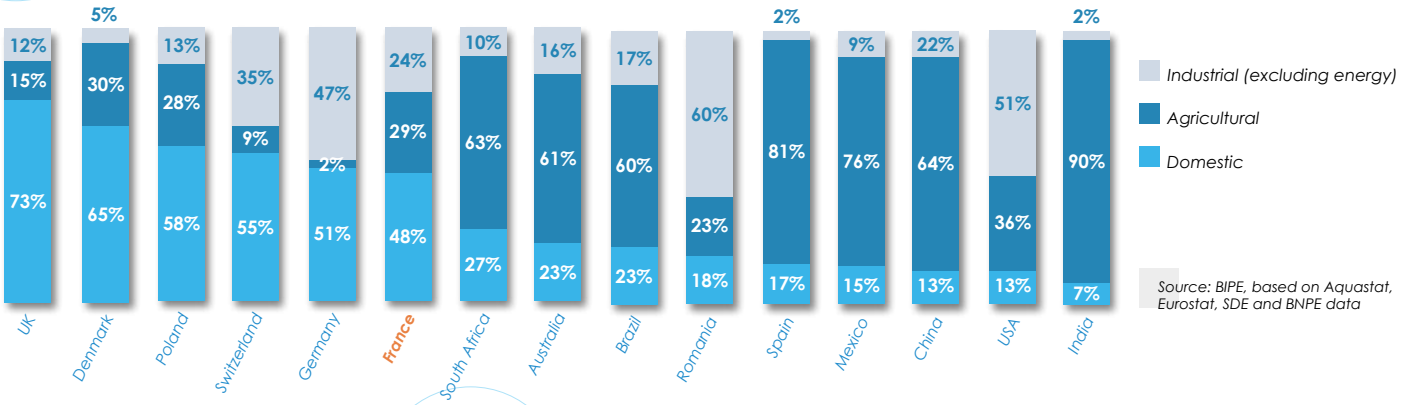
Water use

Water is a resource critical to supporting human activity and as such can be divided into different categories of uses:

- **domestic uses which**, in addition to use in the home, include all other uses of water provided by public water services, i.e. municipal uses such as water for buildings, urban irrigation and road cleaning, and tertiary-sector uses, such as water for offices, shops and hospitals;
- **agricultural uses** for purposes like irrigation, livestock watering and aquaculture;
- **industrial uses** including the use of water in the mining and manufacturing industries (for heating and cooling purposes or as a reagent or component of the manufacturing process). Water use in power generation, in particular for power plant cooling needs, is generally distinguished from other industrial uses.

Water use by sector differs from country to country and reflects the structure of the revenue-generating activities of the country concerned. In France, excluding water used in power generation, withdrawals for domestic uses account for nearly half of all withdrawals.

Water withdrawals by sector (percentage of total withdrawals in liters per person per day)



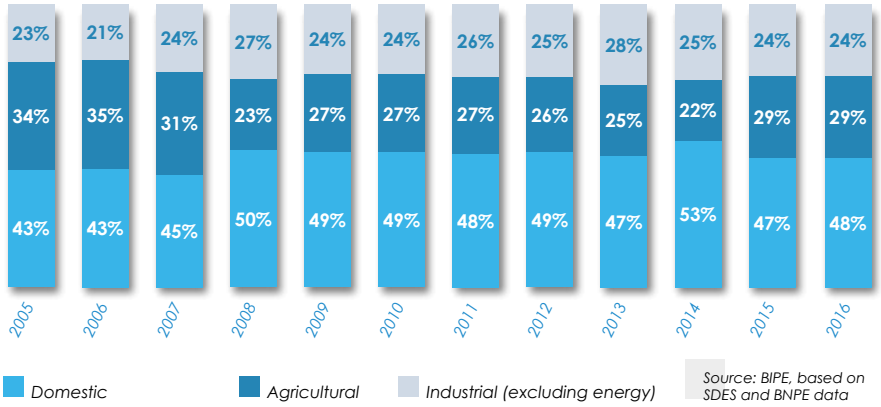
Source: BIPE, based on Aquastat, Eurostat, SDE and BNPE data

In France, apart from the overall decline in withdrawals for agriculture since 2005, withdrawal volumes have varied significantly from year to year.

These variations are due to irrigation requirements, which depend largely on the amount of rainfall received during the spring and summer.

Withdrawals for agriculture may also be miscounted in some cases.

Trends in water withdrawals by sector in France (percentage of total withdrawals in liters per person per day)



Source: BIPE, based on SDES and BNPE data

Trends in withdrawals for domestic use

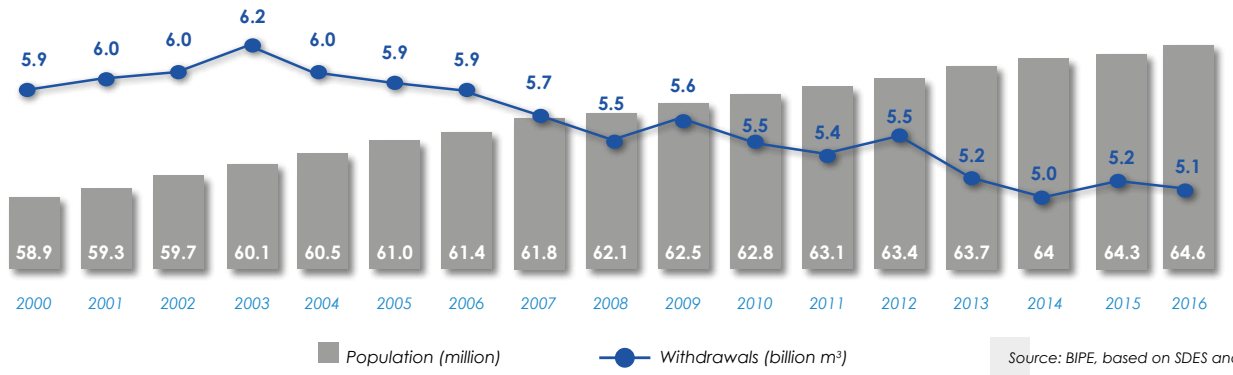
The 5.1 billion m³ of water withdrawn in 2016 for the production of drinking water is one of the lowest levels since 2000. **Between 2006 and 2016 this amount fell by 1.3% a year on average**. Indeed water withdrawals between 2014 and 2016 were **700 million m³ lower than those recorded between 2005 and 2007, whereas the population grew** by more than 2.9 million over the same period.

This decline in withdrawals reflects a number of trends:

- the replacement of ageing equipment in homes, offices and industrial buildings by a generation of more water-efficient devices;
- consumers who are more careful with their water usage, driven by greater awareness of environmental issues or the wish to save money;
- a changing manufacturing structure in a sector that shed more than 970,000 jobs between 2000 and 2016 and whose contribution to domestic added value shrunk from 13.7% to 12.3% during that time.

This downward trend is not specific to domestic water consumption but can also be seen in the agricultural and industrial sectors (excluding water usage for power).

Trends in water withdrawals for domestic use versus population trends
(metropolitan France)

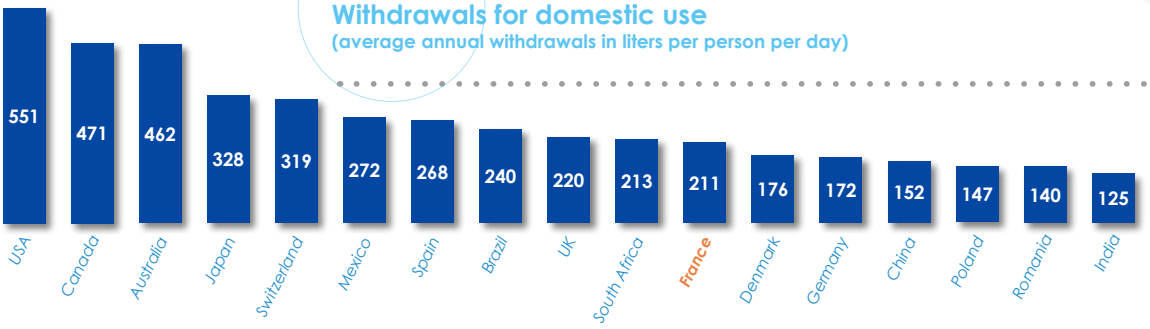


Source: BIPE, based on SDES and BNPE data

Regional disparities in withdrawals

In per person terms, these withdrawals of 5.1 billion m³ in 2016 amount to 77 m³ per year or 211 liters per day. This amount is close to average European levels and is far lower than that found in other developed countries like the USA.

Withdrawals for domestic use
(average annual withdrawals in liters per person per day)

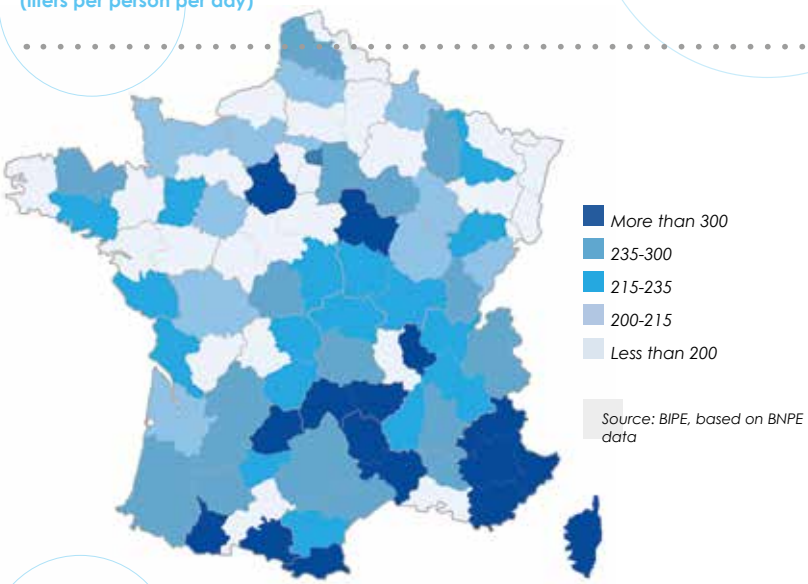


Source: BIPE, based on Aquastat, Eurostat, SDES and BNPE data

Average per person withdrawals for domestic use are unevenly distributed across the country, ranging **from 168 liters per day in the Loire Atlantique and Oise départements to more than 400 liters a day in the Hautes Alpes, Alpes Maritimes and Var.**

These disparities in withdrawal volumes are attributable to differences in demand which are in turn driven by local factors such as climate, population makeup (residential, seasonal, etc.), business activity and the distances between points of withdrawal and consumption.

Domestic water withdrawals by département in 2016
(liters per person per day)



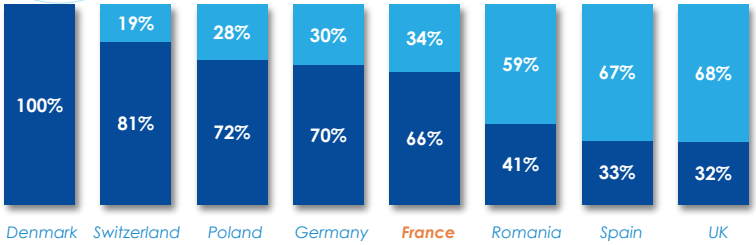
Source: BIPE, based on BNPE data

Water withdrawals by source

Two-thirds of water withdrawals for drinking water production in metropolitan France are from groundwater obtained from springs or aquifers. Groundwater is the preferred source of supply, where available, as it is usually of better quality than surface water, the latter being more widely used in agriculture.

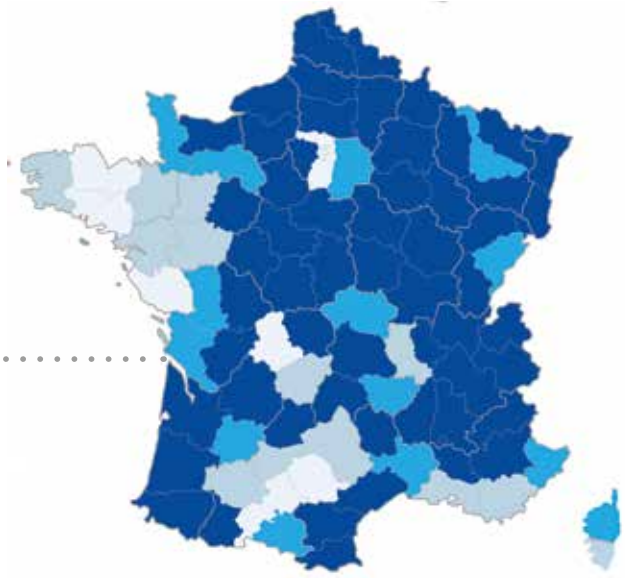
Looking beyond the average values, 85% or more of the water withdrawn in half of all departements is groundwater and in 25% of departements groundwater accounts for nearly all withdrawals (97% or more). Conversely, some regions (like Brittany, where the karst subsurface yields no or very little groundwater) get most of their water from surface sources.

Sources of raw water for the supply of drinking water



Source: BIPE, based on Eurostat and SDES data

Groundwater withdrawals for domestic use by département
(percentage of total withdrawals)

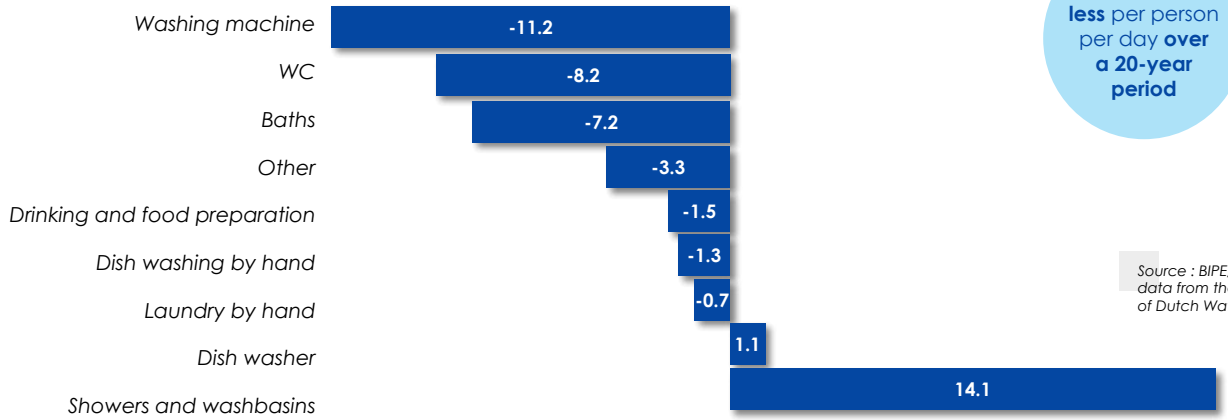


Source: BIPE, based on SDES data

Water demand: a mixed picture

The analysis of long-term trends in domestic water use shows that the **more recent generations of household appliances have led to a steep fall in water consumption**. Changes to washing machines and WCs have helped achieve most of the efficiencies. At the same time, people's habits have changed resulting in greater water demand: **showers have come to replace baths but, taken more frequently, have (contrary to popular belief) increased water usage**. In another trend, people's water consumption has been greatly impacted by climate change.

Changes in water demand by type of use over a 20-year period
(liters per person per day)



18 liters less per person per day **over a 20-year period**

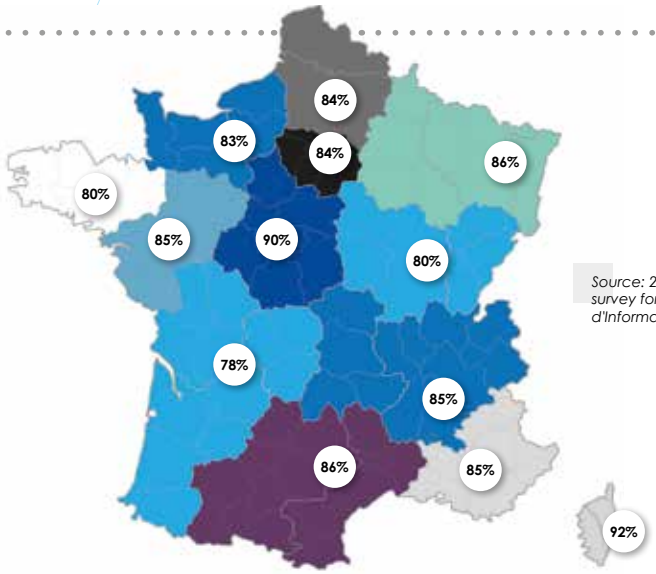
Source : BIPE, based on data from the Association of Dutch Water Companies

A public that is careful with its water usage

The vast majority of French people (84%, based on the TNS Sofres survey for the Centre d'Information sur l'Eau) believe that drought and water scarcity are a consequence of climate change. At the same time, a growing number of people (59% as opposed to 44% in 2000) fear possible water shortages in their region.

Although water scarcity is seen as a distant prospect in many parts of the country, 88% of French people say they are careful with their water usage and 86% of people say they are willing to use recycled water for things like washing and cleaning.

Proportion of French people who believe that climate change will impact water shortages and drought



Source: 2018 TNS Sofres survey for the Centre d'Information sur l'Eau

A halt in the decline of apparent per person consumption

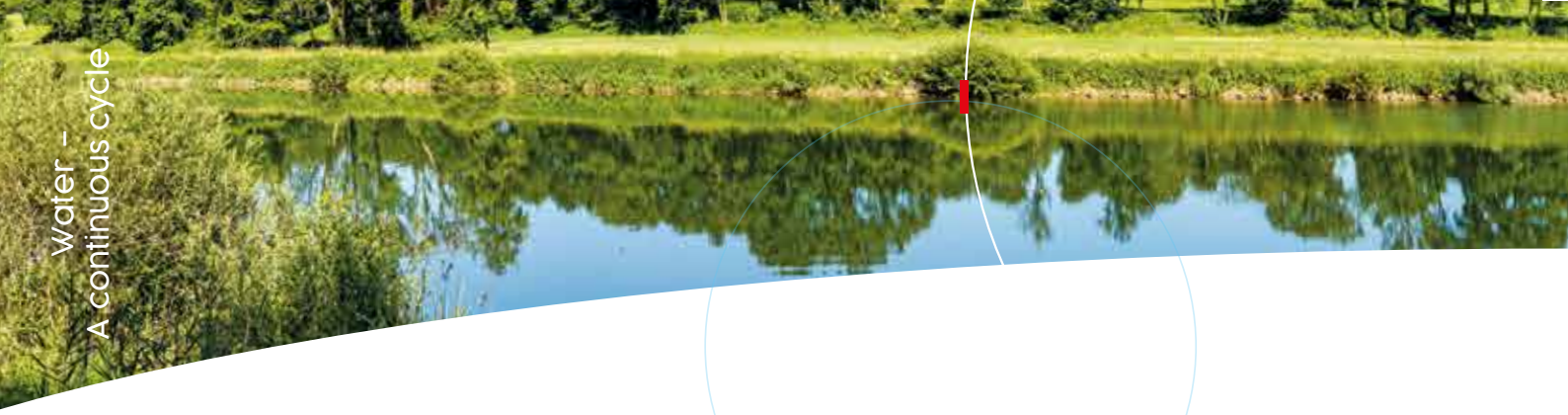
Following several years of decline, per person **water use started to increase in 2015, rising to 170 liters per day in 2016** according to BIPE estimates.

Moving in the opposite direction to withdrawals, this trend should be viewed with caution, however, as the data are incomplete. Indeed many utilities fail to enter their data in the national water information system and this moreover contains data that has not be validated by the competent authorities (i.e. the French biodiversity office OFB (formerly AFB) experts in charge of the performance monitoring system SISPEA).

The validated water consumption data therefore come from only half of the country's utilities and the corresponding population data do not match demographic trends as recorded by the French statistics institute INSEE. Indeed, while the French population has grown year on year, population numbers as reported in the national water information system have fallen in some years and risen in others. In the final analysis, population representativeness with respect to water consumption varies from year to year, with an uncertainty ranging from 25% to 40%.

Trends in domestic water use in Europe
(liters per person per day)

Source: BIPE, based on SISPEA and Eurostat data

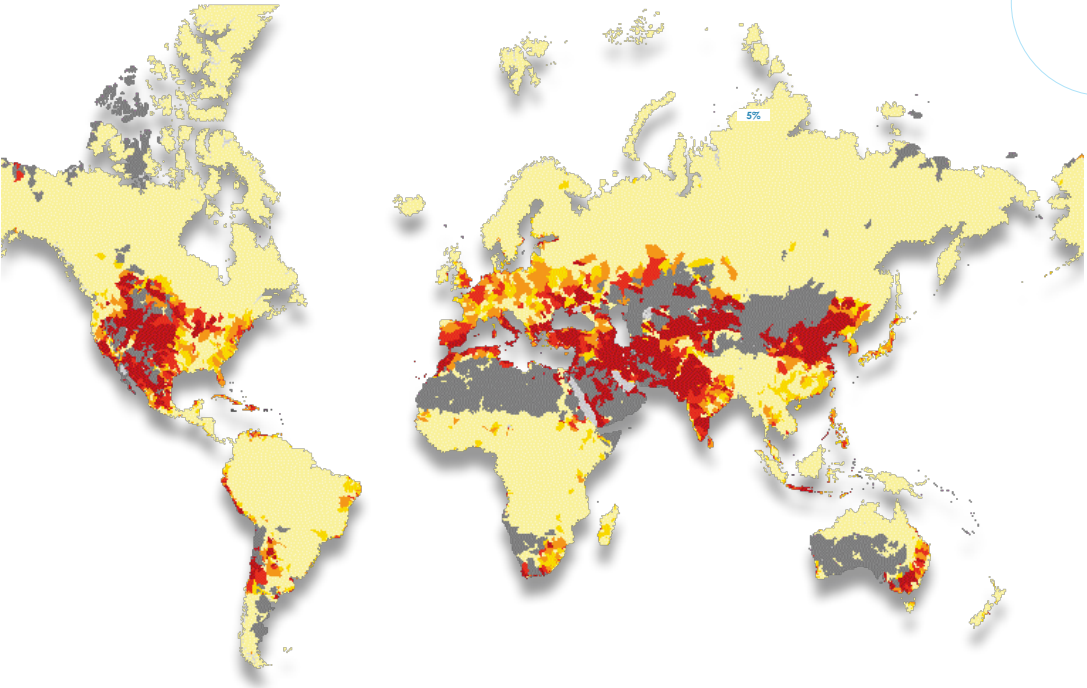


Growing water stress

Although there is an abundance of freshwater at the global level, these resources are finite and unevenly distributed among countries. A large part of the global population lives in regions with less than 1,700 m³ of water per person per year, i.e. below the water stress threshold. And with less than 1,000 m³ of water per person per year, **45 countries in Africa and the Middle East are in a situation of water scarcity.**

Driven by factors such as population growth, rapid urbanization, economic development and climate change, water stress - which reflects the mismatch between freshwater withdrawals and available renewable resources - is only likely to grow in the future.

Global water stress: real-time estimates up to 2030



- *Very low risk (<10%)*
- *Low risk (10-20%)*
- *Medium risk (20-40%)*
- *High risk (40-80%)*
- *Very high risk (>80%)*
- *Arid (minimal water use)*

Source: BIPE, based on Aqueduct, World Resources Institute data, 2015 (www.wri.org)

+ 1.5°c
the likely ***global temperature rise*** *by 2030/2052*

Climate change, whether the result of natural or manmade processes, is changing rainfall patterns (greater frequency and intensity of rainfall events) and accelerating snow and ice melt in many parts of the world - a trend that is leading to less availability of resources and poorer quality of drinking water.

A whole host of factors combine to reduce the quality and quantity of freshwater sources: the rise in temperatures and extreme temperatures, severe and more frequent episodes of drought, higher levels of evapotranspiration, increase in sediment loads, higher pollutant inputs associated with heavy rainfall, greater pollutant concentrations in periods of drought, temporary treatment plant shutdowns due to flooding, and so on. The impacts of such events will be even more serious in areas where populations are expanding and the demand for water increases accordingly.

The IPCC Special Report released in Autumn 2018 predicts that if temperatures continue to rise at the current rate, global warming is likely to reach 1.5°C between 2030 and 2052.

In such a scenario, which continues to be targeted under the Paris Agreement, there will be an increase in extreme temperature and precipitation events in many populated areas of the world, while some regions will most likely experience more frequent and protracted episodes of drought.

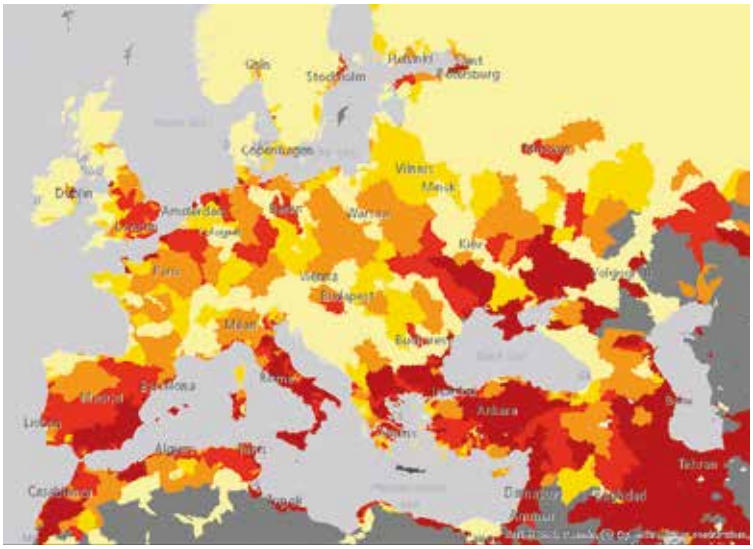
1/3
of European territory
is now facing water stress

Water stress in Europe: real-time estimates

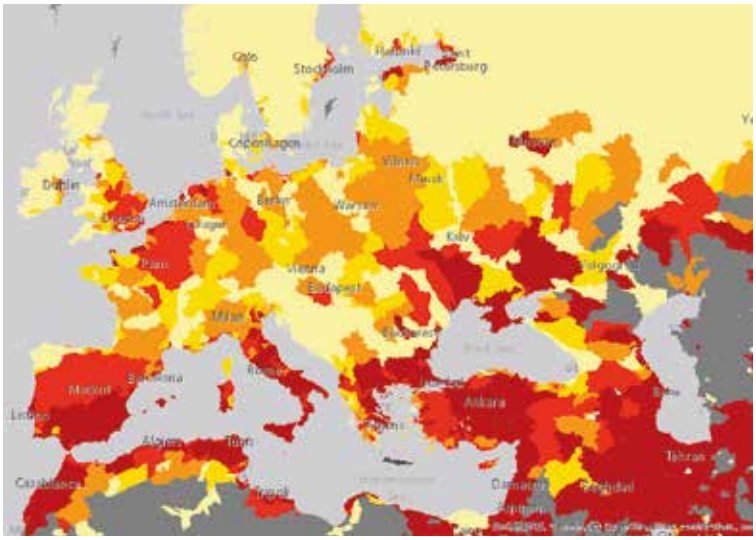
100 million Europeans affected by water stress

The 10-year period between 2008 and 2018 was one of the hottest on record, with Europe experiencing a succession of extreme heat waves beginning in the early 2000s (2003, 2006, 2007, 2010, 2014, 2015, 2017 and 2018). 15% of the territory of the European Union and 17% of its population have had to cope with yearly episodes of drought between 2006 and 2010. And European Environment Agency projections predict more frequent and protracted episodes of drought in southern Europe, a trend that will only exacerbate competition between sectors over freshwater resources.

2020



2040



Despite the relative abundance of freshwater resources in some parts of Europe, the uneven distribution of socio-economic activity results in significant seasonal and regional differences in water stress levels. **Thus, a third of European territory currently experiences either permanent or temporary water stress**.

Under a scenario where nothing is done to adapt to climate change, some **500 million Europeans could be affected** by water stress. **And that may include greater levels of water stress in parts of France**, in particular in the north-east, center and south-west of the country.

Source: BIPE, based on Aqueduct, World Resources Institute data, 2015 (www.wri.org)

The challenge of quantitative management of water resources in a context of climate change

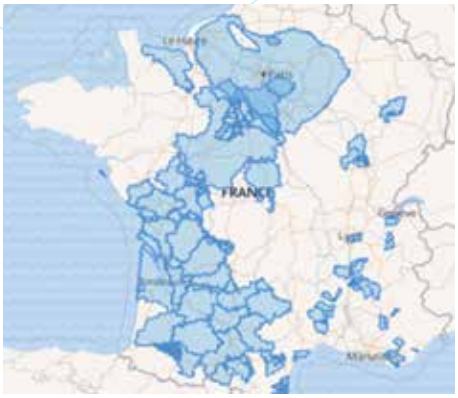
The quantitative management of resources is a growing challenge, as despite adequate quantities of water overall in France, **some regions are experiencing regular or chronic shortages likely to result in conflicts over water use**.

As a response to the delicate balance or imbalance between available and usable resources, the so-called water allocation areas (ZRE - Zones de Répartition des Eaux) were set up to manage the allocation of water between different sectors (domestic, agricultural and industrial).

Where a river basin (surface water source) or aquifer system (groundwater source) is classified as a ZRE, this affects the non-domestic use of water by lowering the withdrawal level above which a declaration must be filed or a permit is needed.

Climate change could potentially exacerbate low flow problems, with the Rhône, Garonne and Seine rivers seeing flow reductions in the 30% to 50%/60% range by the middle of the century (according to the Environment Ministry's "Explore 70" study) and lower streamflow in general in nearly all of the country's river basins.

ZREs (areas experiencing structural water shortages)

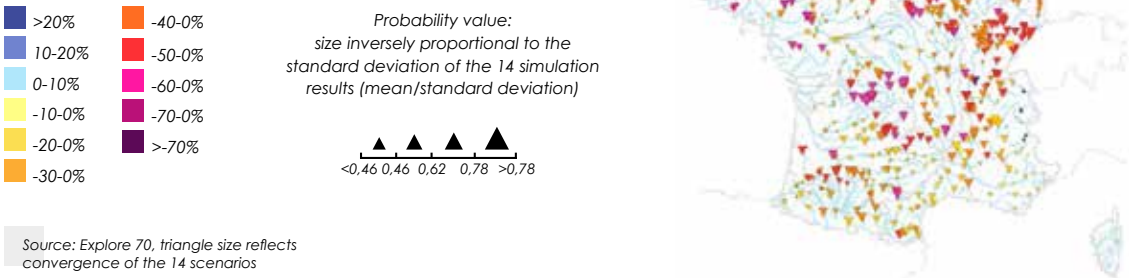


Source : Eau France, 2018

Faced with limited availability of resources, various adaptation strategies can be adopted:

- **the development of new sources of water:** reservoirs, transfer systems between basins, aquifer recharge, reuse of treated wastewater, seawater desalination;
- **demand-side measures:** ongoing reduction of distribution system water losses, better management of irrigation systems, adaptation of crop species, coordinated management among users, etc.

Possible relative minimum monthly low flow trends between 1961-1990 and 2046-2065
(averages based on 14 simulations)



Source: Explore 70, triangle size reflects convergence of the 14 scenarios

Restrictions on water usage are introduced as part of a long-term management strategy but communities are also having to cope with unforeseen and disaster events such as droughts and floods.

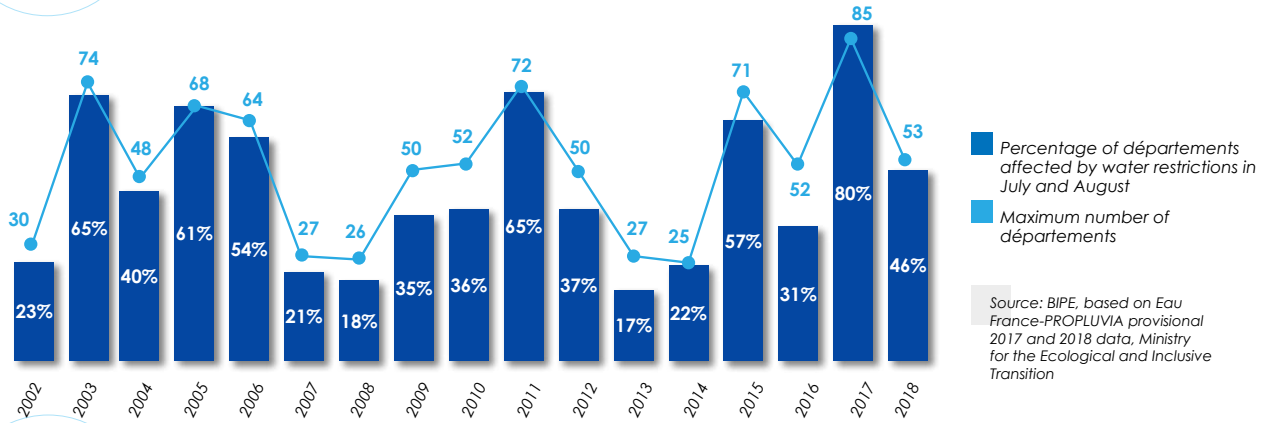
Each year, a more or less sizeable chunk of the country is affected by restrictions on water usage. In some départements (including Loire-Atlantique, Maine-et-Loire, Deux-Sèvres, Landes, Lot, Tarn, Tarn-et-Garonne, Drôme and Doubs) these restrictions are a regular occurrence at certain times of the year.

In the summer, these restrictions can cover upwards of 50 départements. They are intended as a preventive measure and do not usually affect the supply of water to homes. During the unprecedented episodes of drought that occurred in the summer of 2019, however, some communities had to be supplied by tanker truck.

Under their 10th programs of action, France's river basin water agencies, the Agences de l'Eau, earmarked €500 million a year to support regions in their efforts to adapt to climate change - money for works such as flood defenses and measures to increase the resilience of wetlands.

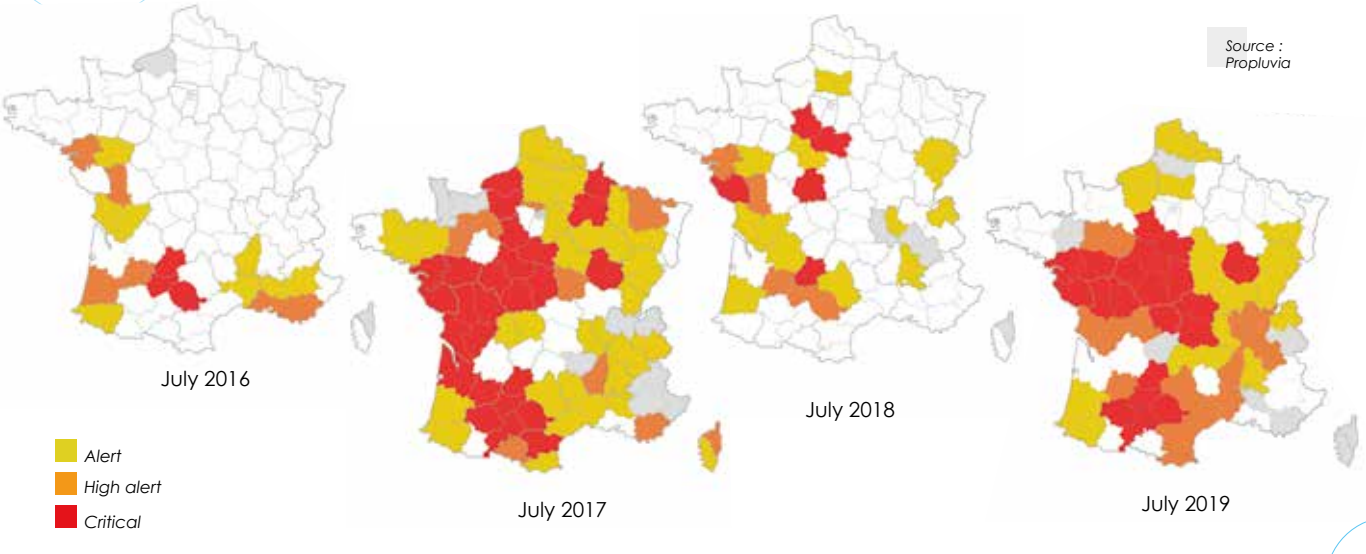
French départements affected by summer water restrictions

(Average percentage in July and August and maximum numbers of départements)

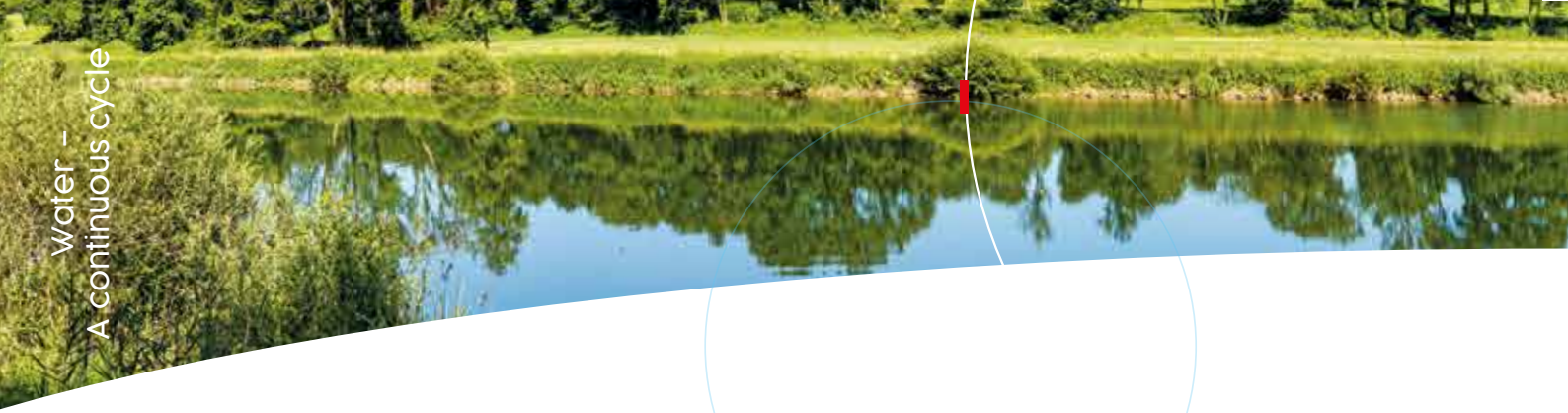


Source: BIPE, based on Eau France-PROPLUVIA provisional 2017 and 2018 data, Ministry for the Ecological and Inclusive Transition

Map of départements affected by water restrictions in July between 2016 and 2019



Source : Propluvia



An increase in water-related damage

When rivers and tributaries burst their banks, the water has a high soil content and untreated wastewater may end up in the receiving environment, resulting in **a deterioration of the quality of the supply source**. During such events water treatment processes are ramped up to preserve the quality of the water at the tap, and wastewater treatment is enhanced in an effort to improve the quality of the discharges and by extension that of local bathing waters.

Be they one-off or recurring events, floods and droughts can cause major damage to property, and loss of life in some cases sadly. In 2017 such events caused nearly **€1 billion worth of damage** accounting for 6% of all non-vehicle related claims since 1982. (The rest were primarily for hurricane damage in the overseas départements.)

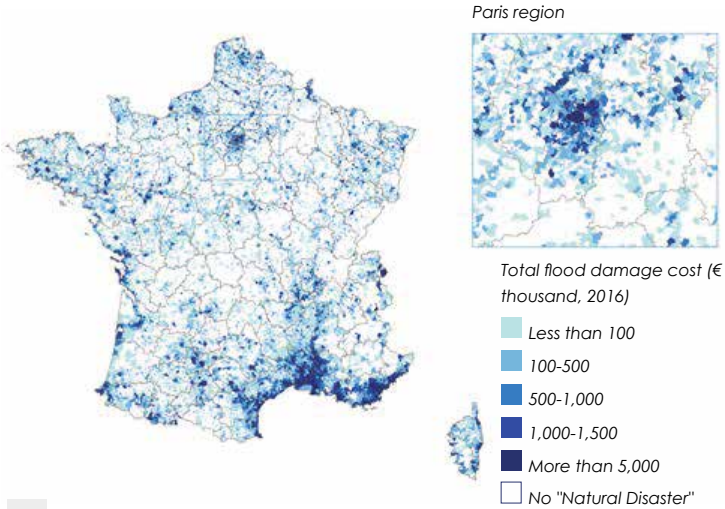
Some communities are more severely affected than others by flood and drought-related losses: over the past two decades, loss-related costs have been particularly high in three areas of France, namely the Mediterranean seaboard, parts of south-west France and the Paris region.

Since January 2018, the management of freshwater environments and flood prevention has been the remit of intermunicipal groupings. These can then transfer all or part of this responsibility to a river planning and management body, such as a Syndicat Mixte de Rivière, an Etablissement Public d'Aménagement et de Gestion de l'Eau (EPAGE) or an Etablissement Public Territorial de Bassin (EPTB). The Départements and Régions, which previously handled this task, can continue to be involved under an agreement specifying the respective roles of signatories and, where applicable, the funding mechanisms. In practice, this remit extends to the construction and management of water-retaining structures and other hydraulic structures such as flood basins. Funding for this work comes from the budget of the Etablissements Publics de Coopération Intercommunale (EPCI) or a new, earmarked tax, capped at a level equivalent to €40 per capita and shared by homes and businesses, in addition to existing taxes (taxes on developed and vacant land and the corporate property tax).

Cost of flood and drought damage in France

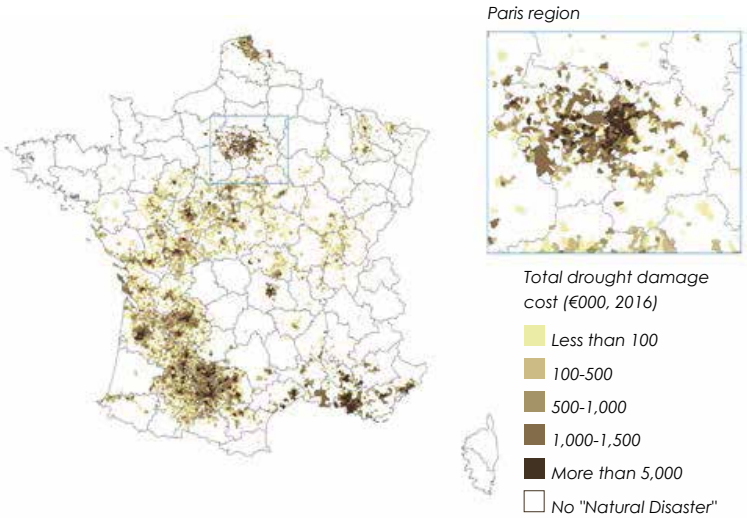
(total costs per commune, 1995-2015, € thousand)

Cost of flood damage



Source: Caisse Centrale de Réassurance

Cost of drought damage



Source: Caisse Centrale de Réassurance

The average cost of a claim incurred for an event recognized as a "Natural Disaster" has risen sharply in the last two decades: the average cost of a "National Disaster" flood claim has increased 2.4 fold and that of a drought claim by 3.4. This average cost may vary considerably from year to year due to the effect of exceptional weather events however: the 2003 drought (which saw 4,400 communes obtain Natural Disaster recognition for a total cost of €1.8 billion), the River Rhône floods of 2003 (National Disaster recognition for 1,550 communes for a total cost of €1.1 billion) and the 2010 floods in the wake of Storm Xynthia (cost: €800 million), among others.

While the average cost has risen, reflecting the growing frequency of extreme events, the total cost has fallen, reflecting better forecasting and preparedness for such events.

[1] *The total cost incurred by a case of Natural Disaster recognition is equal to the amount of compensation payable to victims and insured parties, plus the external costs associated with processing claims (lawyers, loss adjusters, etc.).*

Average cost of claims for flood and drought "Natural Disaster" recognition

(claims incurred in relation to the total number of events recognized as "Natural Disasters")

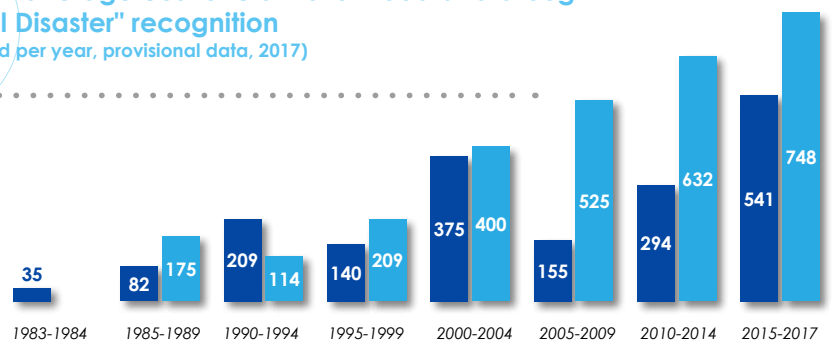
	1983-1999	2000-2016	Cost multiplied by
Average cost, droughts	€163,000	€546,000	3.44
Average cost, floods	€131,000	€319,000	2.4

Source: BIPE, based on Caisse Centrale de Réassurance data

** A commune granted "Natural Disaster" recognition for more than one event is counted more than once*

Trends in average cost of claims for flood and drought "Natural Disaster" recognition

(€ thousand per year, provisional data, 2017)



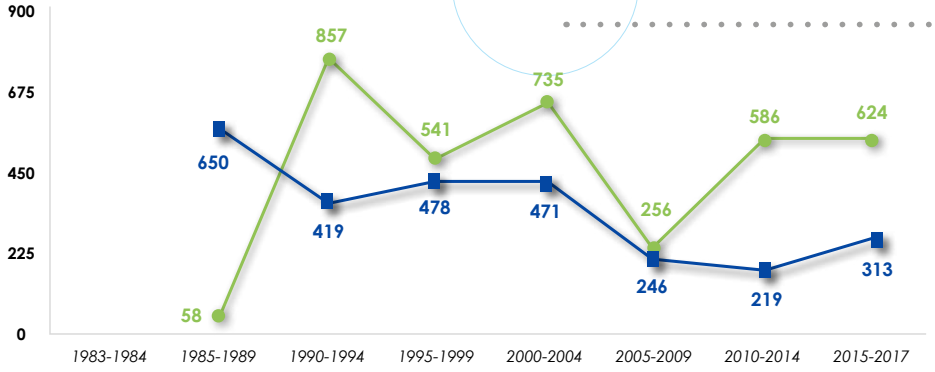
Flood "Natural Disasters"

Drought "Natural Disasters"

Source: BIPE, based on Caisse Centrale de Réassurance data

Trends in total drought and flood claim costs

(€ million euros per year, provisional data, 2017)



Average total claim costs for floods (€ million per year)

Average total claim costs for droughts (€ million per year)

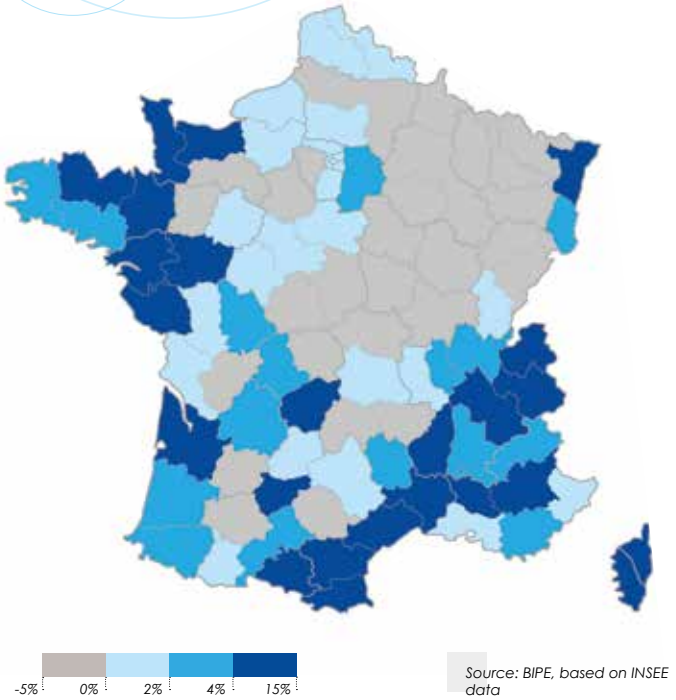
Source: BIPE, based on Caisse Centrale de Réassurance data

Regions under pressure from demographic trends

Between 2010 and 2018, the French population grew by 0.4% a year on average but **regional disparities widened**. Indeed, the number of départements with stable or falling populations grew, while areas like the Atlantic seaboard, Occitanie, Île-de-France (Paris region), Auvergne-Rhône-Alpes and Corsica saw their populations rise. The major conurbations and their suburbs experienced continuing demographic growth on the back of a high natural growth rate, while the migration of people away from urban hubs continued apace.

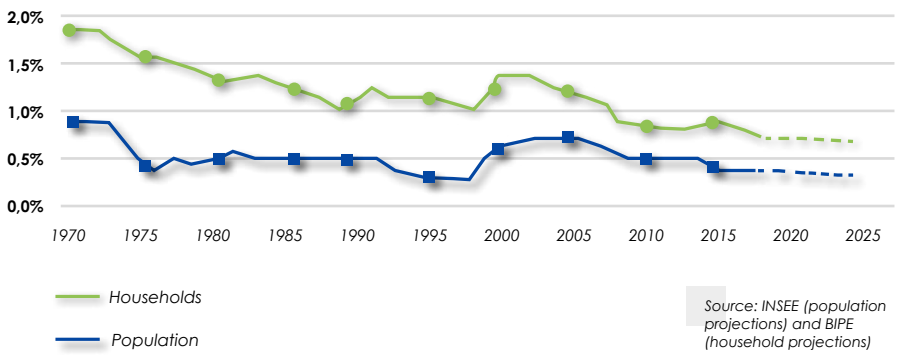
Overall, the western and southern parts of the country and the metropolitan areas were home to greater concentrations of people and rising urbanization. At the other end of the spectrum, populations declined in parts of central and eastern France due to both natural and migratory trends.

Trends in urbanization rates, 1999-2015



Source: BIPE, based on INSEE data

Growth in population and household numbers up to 2025
(metropolitan France)



Source: INSEE (population projections) and BIPE (household projections)

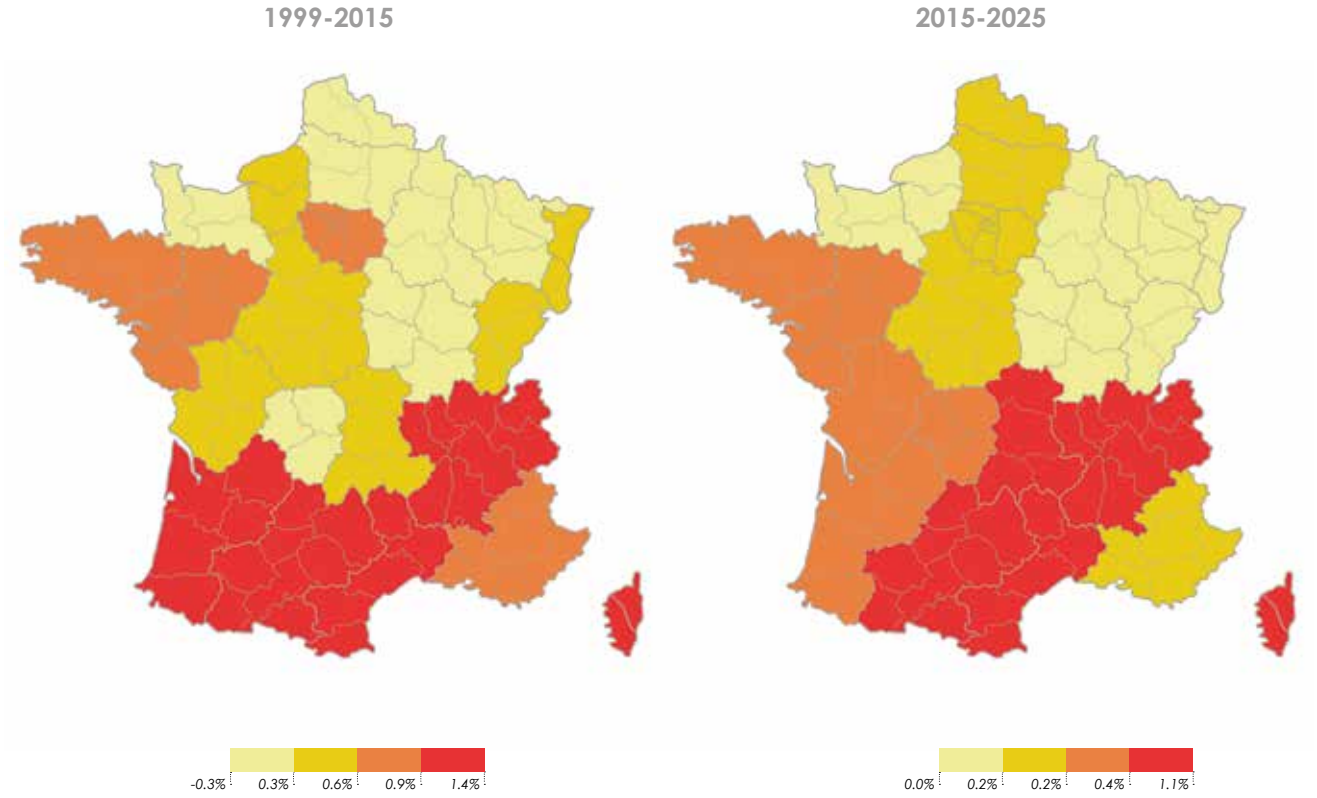
Overall population growth in France, projected to increase at an average rate of 0.33% up to 2025, **will be slower than it was in the previous 10-year period** and will be half as fast as that of households, in particular due to the increase in single-person households.

These trends will affect both overall and average per household domestic water demand.

Regional population disparities, driven by the natural cycle of births and deaths and internal population movements, **are set to continue up to 2025**, with the country split in two in terms of demographic trends, either side of a north-west/south-east divide.

Against this background, the challenge facing the water and wastewater utilities as well as other utility operators, lies in sizing the infrastructure and in some cases in pooling resources and the quantitative management of water. For it is the case that in **water-stressed regions populations will continue to rise, leading to conflicts between sectors over water.**

Annual population growth rates by region
(including natural population cycles and internal population movements)



Source: BIPE and INSEE

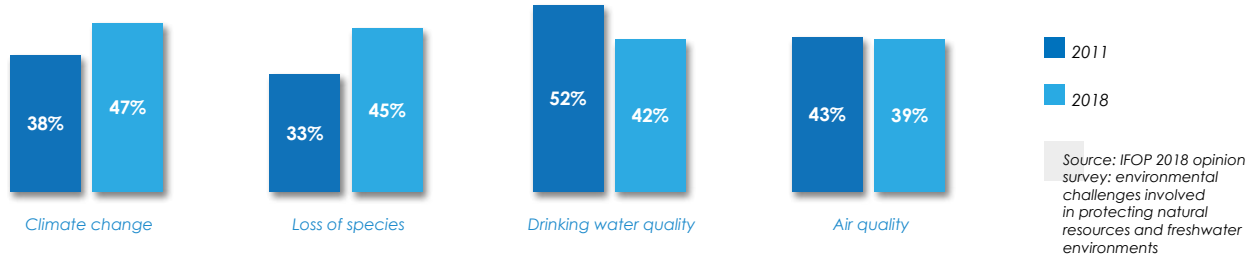
From quality of the source to quality at the tap

Water body quality status: an ever-present concern

One of the three main environmental concerns of French people is the quality of their drinking water. This fear focuses on issues further upstream in the water cycle, namely the pollution of watercourses and groundwater (a concern for 6 in 10 people) and the protection of biodiversity (a concern for 4 in 10 people).

Of the four environmental issues shown below, water quality was the first concern of French people in 2011 but now ranks third among their concerns.

Trends in the environmental concerns of French people



Source: IFOP 2018 opinion survey: environmental challenges involved in protecting natural resources and freshwater environments

€19.2 billion invested in meeting water body status targets: a shrinking budget

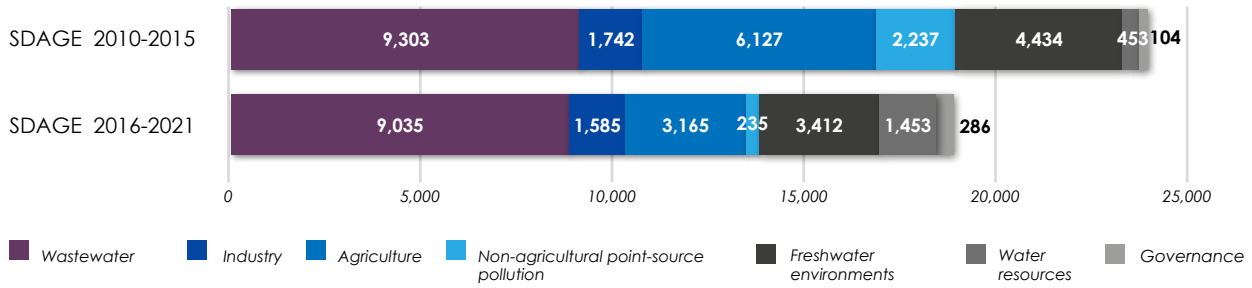
To achieve the good status targets for water bodies, each river basin adopts a strategic plan for the development and management of water (SDAGE), covering a period of six years. France's river basin water agencies, the Agences de l'Eau, contribute technical and financial support towards the effort to achieve SDAGE objectives.

The total amount allocated under the 2016-2021 programs is €19.2 billion, a full 21% less than the €24.4 billion earmarked under the previous cycle (2010-2015). Despite the drop, **most of this money (more than €9 billion, down just 3% on previous levels) is still allocated to municipal sewerage and treatment capacity** needs.

The biggest difference between the two cycles is the substantial (10-fold) reduction in funding to tackle non-agricultural non-point source pollution, and in financial support for agriculture– including protection of collection works - which has been cut by half.

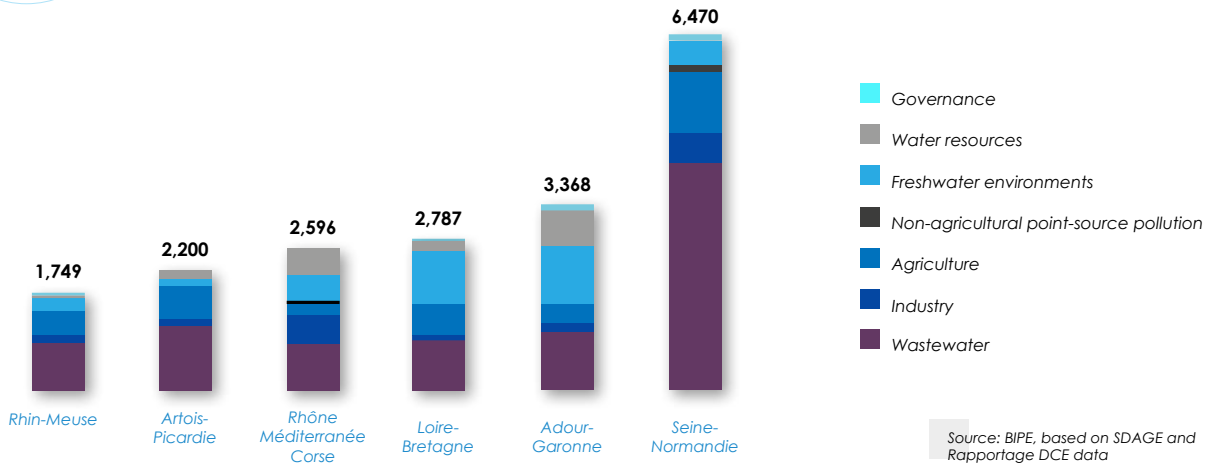
Although local authorities have carried out extensive works in recent years, the infrastructure as it stands today still fails to ensure the achievement and maintenance of good status of water bodies. There is still a need for further investment and the basin programs are expected to fund a whole range of measures, such as the rehabilitation of treatment plants, rebuilding or construction of small plants, improvement of phosphorus and nitrogen removal, improvements in the management of wet-weather discharges and the construction of new mains. Minimizing pollution by better sewerage and drainage is achieved by proper maintenance of the facilities and is a particularly stiff challenge for small communities facing significant investment requirements.

Trends in investment under the SDAGE programs (€ million)



Source: BIPE, based on SDAGE and Rapportage DCE data

Agence de l'Eau investment under the 2016-2021 SDAGE programs (€ million)



Source: BIPE, based on SDAGE and Rapportage DCE data

The development of a SDAGE strategic plan follows a well-honed process: it begins with an assessment of the current status of the water bodies involved as well as the risks and extent of the pressures they face. This is followed by the definition of the strategic goals and expected outcomes with respect to priorities and economic feasibility. Based on the goals identified, a program of measures is drawn up and the associated action plan submitted to the Comité de Bassin, while providing the basis for a public consultation process. Provisions for implementing this program are then outlined in a local planning tool (SAGE), and further detailed in the Agence de l'Eau action plan and in a local operational action plan (PAOT) coordinated by the Délégation Inter-service pour l'Eau et la Nature (DISEN).

The 2022-2027 programs are already in preparation and the main strategic goals were put out to public consultation and submitted to the committees at the end of 2018.

Following completion of the 10th Agence de l'Eau programs, the 11th programs for the period 2019-2026 have now got underway. In accordance with the recommendations emanating from the national water conference, the Assises de l'Eau, urban water cycle efforts will focus on **solidarity with rural areas to help them secure a better knowledge of their assets and plan improvements better**. At the same time, "bonuses" for efficiency in wastewater treatment will be progressively phased out.

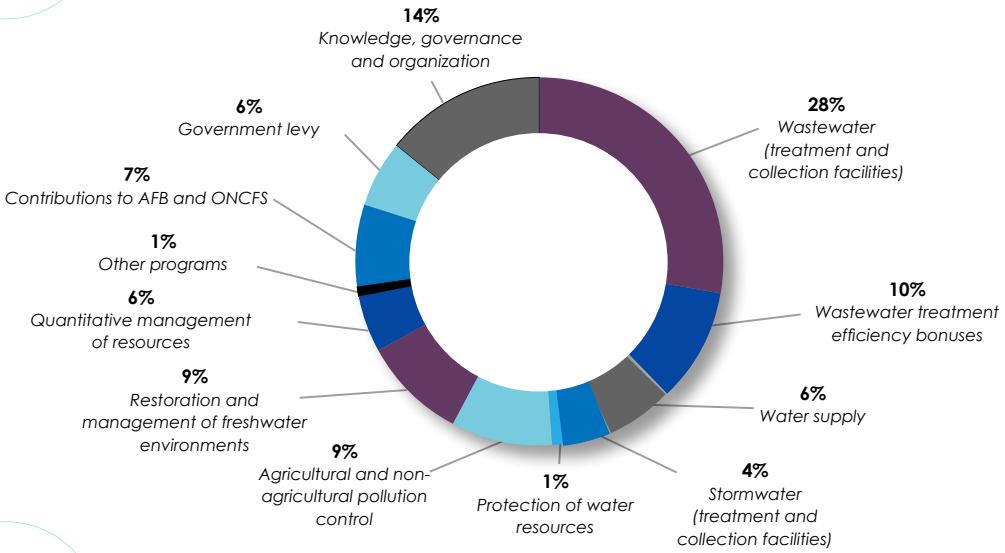
The 10th programs (2013-2018) had already demonstrated a will to reduce spending and shift the focus to municipal wastewater treatment further to the efforts made to meet the provisions of the Urban Wastewater Framework Directive.

At the same time, the 11th programs will step up **efforts directed at the natural water cycle** with the aim of achieving good water body status (i.e. tackling agricultural pollution and protecting water sources), implementing climate change adaptation measures (flood prevention and measures to tackle the effects of drought) and prioritizing prevention. The 10th programs had already set this trend in motion.

The €12.6 billion budget allocated under the 11th program is down by 9% compared to the previous one. The "Economics of Services" section of this report (page 72) looks at how Agence de l'Eau budgets have evolved in recent years.

2013-2018 commitments under the 10th Agence de l'Eau programs

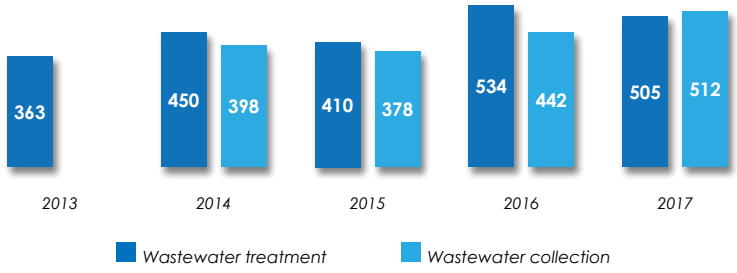
(2013-2017 actions and 2018 estimates)



Source: BIPE, based on data from an annex to the 2019 Finance Bill

Status of Agence de l'Eau wastewater programs

(€ million)



Financial support for wastewater programs, which was modest at the start of the 10th program in 2013, rose by 20% between 2014 et 2017.

Source: BIPE, based on PLF data, 2019

Framework and mechanisms for assessing water body status

The 2000 Water Framework Directive (WFD) commits European Union countries to move towards achieving good water body status targets by 2027.

Surface water quality is assessed based on mandatory limit values reflecting ecological and chemical status:

• **Ecological status** is based on biological criteria (macrophytes, fish life, etc.) and physical-chemical criteria (nitrogen, phosphorus, temperature, pH, etc.), which are generally altered by human activity.

• **Chemical status** is assessed based on concentrations of 41 priority substances as identified at EU level, including nitrates, pesticides, lead and radon.

A water body is considered to comply with quality standards when parameter values are below the mandatory limits in 95% of samples taken at regular intervals in the same place.

In 2019 the European Commission launched **a public consultation on the WFD "fitness check"**, with a view to a possible revision of the Directive. The aim of the check is to determine whether the Directive (including its "daughter" directives and also the Floods Directive) is fit-for-purpose and up to the current and future challenges facing freshwater bodies in the EU.

The Commission has also published a proposal for a recast of the Directive regarding the quality of water intended for human consumption. **This revision is intended to improve and promote access to drinking water.** With the aim of rebuilding consumer trust, the revised Directive encourages greater transparency and updates the parameters used to determine water quality (a dozen new substances and molecules, chlorate and chlorite, perfluorinated compounds and certain endocrine disrupting compounds). With a view to ensuring good quality drinking water, the Directive provides for a risk-based approach to monitoring water quality, from the source to the tap.

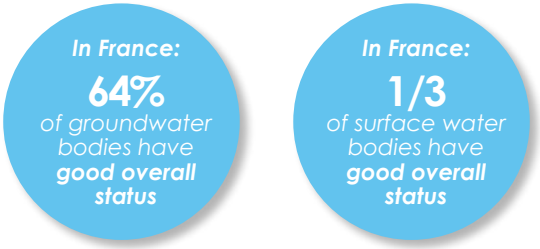
Although some of these substances are already monitored in France, the additional tests will have **an impact on treatment costs and the price of services**. This extra cost is put at €1.6 billion to €2.2 billion a year at the EU-wide level. The tests should however generate an estimated €600 million **in savings for European households** due to people drinking tap water instead of bottled water – an objective espoused by the Commission.* Following approval of the European Parliament in October 2018 and the adoption of a common position by the Council of the European Union in March 2019, the revised directive is currently the subject of trilogue negotiations.

Failing quality standards in Europe's surface waters

While three-quarters of groundwater bodies in Europe meet the standards for good chemical status, only 40% of all surface water bodies achieve good ecological status and 38% good chemical status. In most Member States, poor chemical status is caused by mercury from airborne deposits and from treated wastewater discharges.

The main factors affecting ecological status are structural changes to dams, embankments and other flow control structures which affect aquatic habitats, and non-point source pollution arising from farming practices and untreated wastewater discharges.

Moderate improvements in the ecological quality of water sources in France



The overall quality of water sources in France improved between 2009 and 2015 despite **continuing disparities between river basins**. Most groundwater sources (64%) had achieved good overall status by 2015 and nearly a third of all surface water sources had achieved good status. These trends meant that groundwater sources had achieved the target set in 2009, unlike surface water sources which remained seven percentage points below target levels.

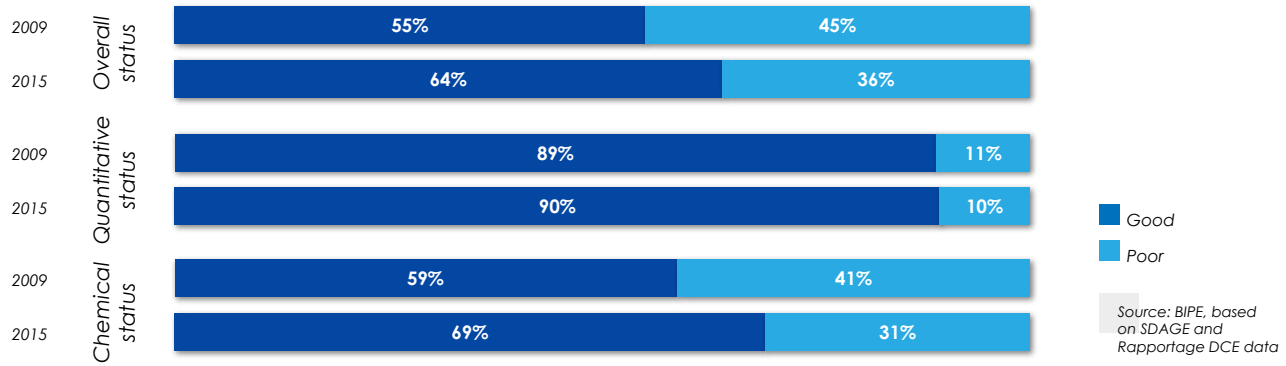
Further strides towards good status of groundwater sources have been made thanks to a 10 percentage point improvement in chemical quality. Nearly 70% of groundwater bodies met the standards for good chemical status, reflecting a lesser degree of urban, industrial and agricultural pollution. There are major differences between regions however: 8 in 10 groundwater bodies in the Rhône-Mediterranean basin achieved good chemical status as compared to only 3 in 10 in the Artois-Picardy and Seine-Normandy basins.

** Source: The European Commission's impact assessment included in the proposal for the revision of the directive*

Where groundwater bodies are characterized by poor chemical status, restoring them to good quality will take many years as the process of replenishment is slow in many cases. The cleansing process will involve reducing the amounts of pesticides and nitrates used in intensive agriculture as well as toxic substances discharged from certain industrial facilities.

Only 10% of groundwater bodies have poor quantitative status, this reflecting a mismatch between the amount of water entering the aquifer and the amount of water withdrawn.

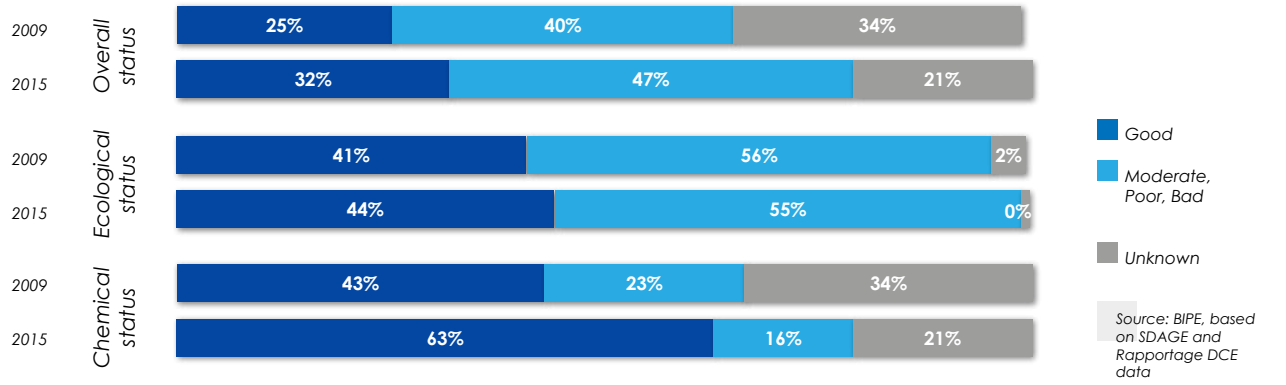
Status of groundwater bodies in France: results for 2009 and 2015



Source: BIPE, based on SDAGE and Rapportage DCE data

The overall status of surface water bodies has improved as a result of marked improvements in their chemical status and more modest improvements in their ecological status[2]. Although good chemical status and good ecological status have been achieved in 63% and 44% of cases respectively, only 32% of watercourses achieved good overall status (though there are many gaps in the knowledge in this area). There are significant disparities between regions: good ecological status was achieved in less than 10% of surface water bodies in the Sambre river basin in Hauts de Seine, as compared to 80% of rivers and streams in Corsica. Meeting the targets requires a bigger effort in some river basins than in others, as in the case of the Artois-Picardy basin where nearly all surface water bodies have poor overall status.

Status of surface water bodies in France: results for 2009 and 2015



Source: BIPE, based on SDAGE and Rapportage DCE data

[2] Chemical status reflects concentrations of certain chemical substances; ecological status reflects concentrations of various biological and physical-chemical elements.

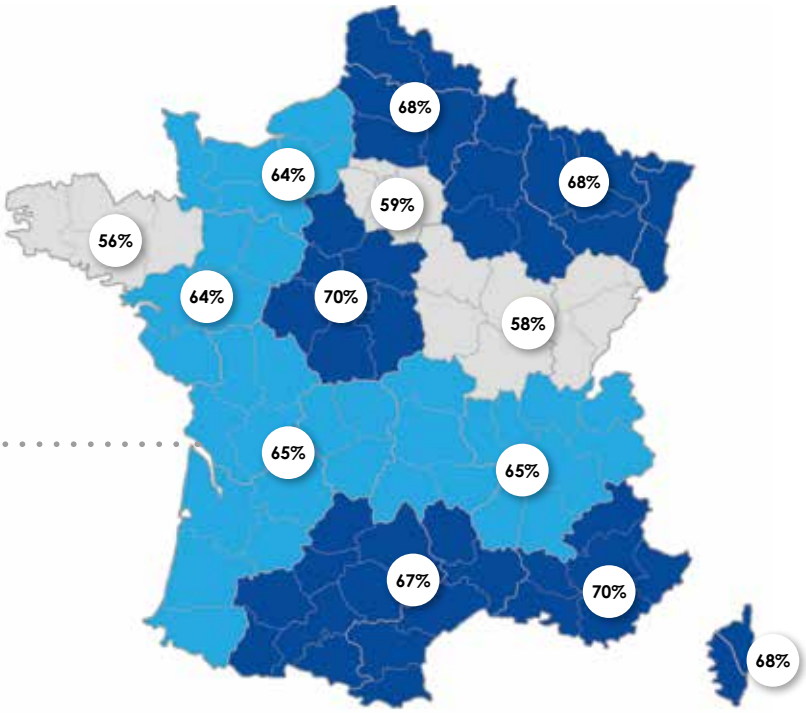
Ecological status of surface water bodies in 2015

- High
- Good
- Moderate
- Poor
- Bad
- Unknown

Source: Agences de l'Eau - Délégations de Bassin (findings based on data reported to the European Commission on November 30, 2016 in accordance with the Water Framework Directive). Base maps: AFB, produced by Olivier Debuf © AFB, 2017

Proportion of French people who think that the quality of water resources (groundwater, lakes and rivers) will deteriorate in the coming years

In spite of the gradual improvement of water body status in recent years, most French people (65%) think that the quality of water supply sources will deteriorate in the future.



Source: TNS Sofres survey for the Centre d'Information sur l'Eau, 2018

Tackling micropollutants in water bodies

The presence of micropollutants in water bodies is a potential source of harm to living organisms on account of their toxic and persistent nature. Micropollutants are organic or mineral substances - plastic components, detergents, metals, hydrocarbons, cosmetics, drug residues, pesticides, etc. - found in very low concentrations. A survey conducted in 2011 found them to be particularly prevalent in the Seine-Normandy and Artois-Picardy river basins, presumably due to the relatively heavy presence of industry in these areas.

Micropollutants are addressed in a government plan spanning the period 2016-2021. The plan prioritizes the at-source reduction of emissions in pollutants that have already been identified (pollutants from industry, hospitals and farms, for example). It also aims to promote a better understanding of these substances (more than 110,000 chemical substances identified by EU legislation) and their health and environmental impacts, so as to map them and prioritize actions. The challenge is to develop the capacity to continue improving detection of these pollutants and to determine the extent of the threat they pose.

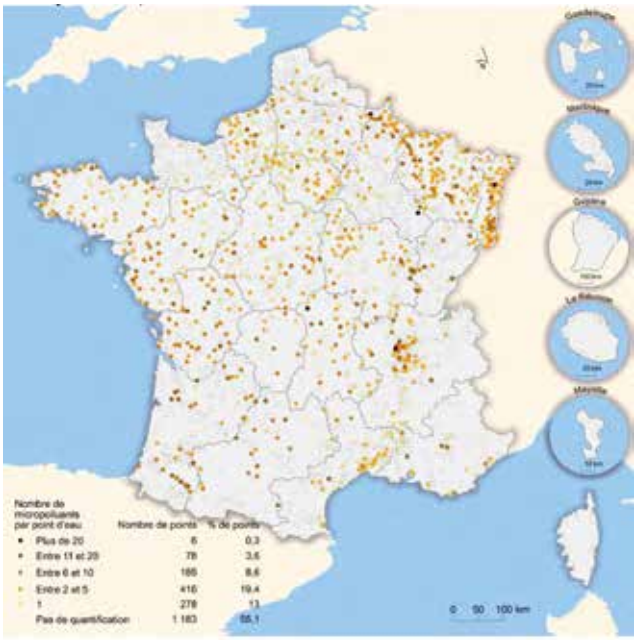
Authorities with responsibility for wastewater treatments plants of 10,000 PE or more in capacity are now required to conduct monitoring surveys of micropollutants in treatment plant influent and effluent. These surveys will help identify those substances present in large quantities and the main sources of these pollutants.

Emissions of so-called "specific pollutants" targeted under the 2009-2015 cycle must be reduced by 30% by 2021. The priority substances for this cycle, plus 12 new substances and the emissions of specific pollutants targeted under the 2016-2021 cycle must be reduced by 10% by the same year.

For each wastewater treatment plant it is therefore necessary to determine the requisite treatment processes, depending on local conditions and practices and the treatment processes already in use. **Technologies already employed by the water companies, such as ozonation and adsorption on activated carbon, would ensure the removal of the majority of listed micropollutants if used more widely.**

Numbers of micropollutants (excluding metals) found in rivers and streams in 2011

Numbers of micropollutants (excluding pesticides, metals and fluoride) found in groundwater in 2011



Source : SDES

A high standard of tap water

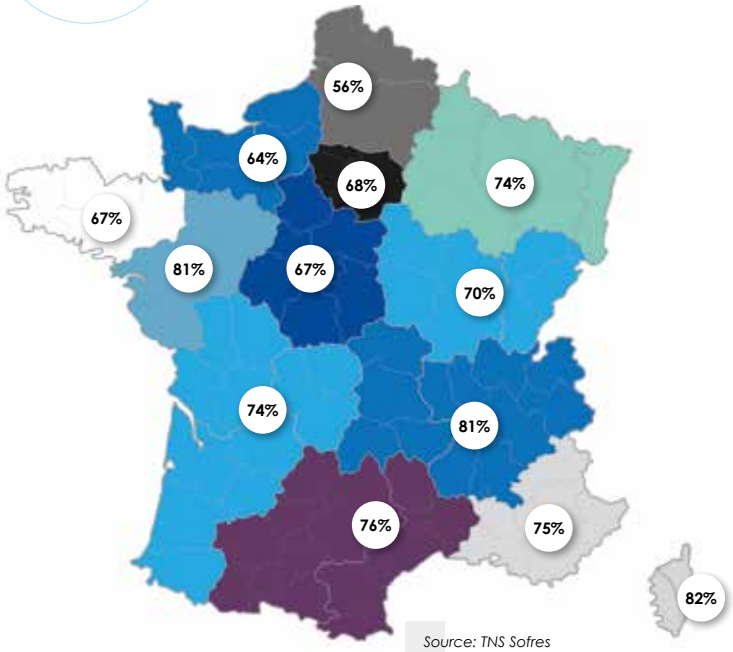
The applicable limit values for biological and chemical parameters affecting the quality of water sources are used to determine the **different levels of treatment needed to make tap water fit for consumption:**

1. A basic physical treatment process and disinfection
2. A standard physical-chemical treatment process and disinfection
3. An advanced physical-chemical treatment process, polishing and disinfection

To be safe to drink, water must meet very stringent quality criteria. Regulatory monitoring of drinking water quality is carried out under the auspices of the regional health agencies, the Agences Régionales de Santé (ARS). **More than 300,000 samples are thus analyzed each year covering the entire distribution system** (treatment plants, storage facilities and mains), with the result that tap water is the most strictly controlled foodstuff in France. The results of the tests are regularly updated and made available to the public on the Ministry of Health website.

In 2017, the **regional health agencies carried out more than 18.2 million tests** covering the entire country's public water and wastewater services - 4 million more than in 2013. The water companies also closely monitor the quality of the drinking water they produce and distribute. **In 2017 they carried out over 9.3 million tests, 1.2 million more than in 2013.**

Proportion of French people who are satisfied with the taste of their tap water



Source: TNS Sofres survey for the Centre d'Information sur l'Eau, 2018

High levels of satisfaction with the quality of the water at the tap

A substantial majority of French people (75%) are satisfied with the quality of their tap water: such is the finding of the 2018 TNS-Sofres survey for the Centre d'Information sur l'Eau. Reasons for dissatisfaction were taste (48% of respondents dissatisfied) and to a lesser extent hardness (23% of respondents dissatisfied). There was greater dissatisfaction with taste in the Hauts-de-France département and more generally in the north-west of the country.

Although the majority (73%) of French people are aware that water resources are polluted and think that the situation will worsen in the coming years (7 in 10 people), **they are very confident in the standards and tests used to ensure a high standard of tap water**, not least because these tests are performed by reputable and unbiased institutions such as the regional health agencies.

Although water pollution (i.e. pollution of rivers, lakes and groundwater) is one of the four main environmental concerns of French people, it is not one of their daily preoccupations (unlike air pollution and natural hazards) as they know that the tests ensure that the treatment processes do their job.

On the other hand, only 1 in 2 people are aware that rainwater is not treated and that some uses of such water, such as bathing and dish washing, carry health risks.

75%
of French people ***satisfied with the qualityof their tap water***

[3] *http://solidarites-sante.gouv.fr/sante-et-environnement/eaux/article/qualite-de-l-eau-potable*
Source: TNS Sofrès survey for the Centre d'Information sur l'Eau, 2018

[4] *Source: Special Eurobarometer Survey 468, 2017; CGDD 2016, Opinions et pratiques environnementales des Français*

Improvements in the microbiological quality of tap water

According to the regional health agencies (ARS), **the microbiological quality of tap water is constantly improving** at a countrywide level: **in 2017, 97.8%** of the population was supplied by water that consistently met the applicable microbiological standards, as compared to 96.8% of people in 2009.

Non-compliance in terms of microorganisms (bacteria, viruses and parasites) with the potential to cause (usually mild) intestinal problems may be due to poor protection or maintenance of collection works, a problem with the treatment or disinfection process or contamination of the water during transmission or storage.

The relatively few cases of microbiological non-compliance concern nearly all départements and 0.3% to 24% of their distribution systems. The largest numbers of non-complying water distribution systems are found mainly in the Hauts-de-France, Normandy and Occitanie regions. According to the regional health agencies, 17% of distribution systems serving fewer than 500 people fail to ensure year-round good microbiological quality.

In comparison with this 97.8% compliance rate at the national level, the services operated by the water companies achieve 99.3% compliance levels (source: BIPE, based on water company survey data).

Water quality standards: water company performances

Sample compliance levels

	Microbiological parameters	Physical-chemical parameters
2011	99.4%	98.1%
2013	99.5%	98.0%
2015	99.7%	99.0%
2017	99.3%	98.8%

Source: BIPE, based on water company survey findings

Water quality standards: performances of utilities under direct management

Sample compliance levels

	Microbiological parameters	Physical-chemical parameters
2011	99.1%	98.6%
2013	99.1%	98.7%
2015	97.1%	96.5%
2017	-	-

Source: BIPE, based on 2016 data from the performance monitoring system SISPEA extracted on 09-21-2018.
Caution: population representativeness is 70% to 80%, though increasing year on year

But a slight dip in water quality in terms of pesticide concentrations

Tap water quality in terms of pesticide levels is good overall. In 2017, 92.5% of the population was consistently supplied by water complying with pesticide standards, i.e. total pesticide concentrations of below 0.50 µg/l.

This performance, though below the 96.3% average achieved in 2010 and 2012, does not necessarily signify a deterioration in water quality. It can be explained more specifically by analysis techniques that are now able to detect more substances than before.

In nearly all instances of non-compliance, however, the exceedance of quality limits did not lead to restrictions on water use for human consumption. (4.87 million people or 7.5% of the population were affected by instances of non-compliance.) And the percentage of people affected by recurring cases of non-compliance (i.e. over-the-limit concentrations on 30 or more days of the year) has fallen off slightly (3% in 2017, down from 3.5% in 2012).

Though the cases of exceedance were caused by a number of substances, atrazine, the sale of which was banned in France in 2003, is the pesticide tested for the most (3,000 tests) and one of the most frequent causes of non-compliance. Glyphosate on the other hand, though the object of 2,250 tests, has not been found to exceed the legal limits.

At least one distribution system fails to comply with pesticide quality standards in nearly half of all départements. (Between 0.2% and 14% (3.6% on average) of distribution systems are non-complying in these départements.) The non-complying facilities are found mainly in the Champagne-Ardenne, Lorraine and Centre regions which are areas of wide-scale field crop (cereal, oilseed and potato) production. These regions are also among the areas where sales of some of the most toxic pesticides are highest.

To tackle these cases of non-compliance, the regional health agencies have recommended that communities switch to other water sources or introduce appropriate treatment processes.

Continuing high quality of tap water in terms of nitrate concentrations

Tap water is generally of good quality in terms of nitrate concentrations. In 2012, as in 2017, more than 99% of the population was supplied by water that consistently complied with standards in terms of nitrate concentrations, i.e. water with a maximum nitrate content equal to or below 50 mg/l.

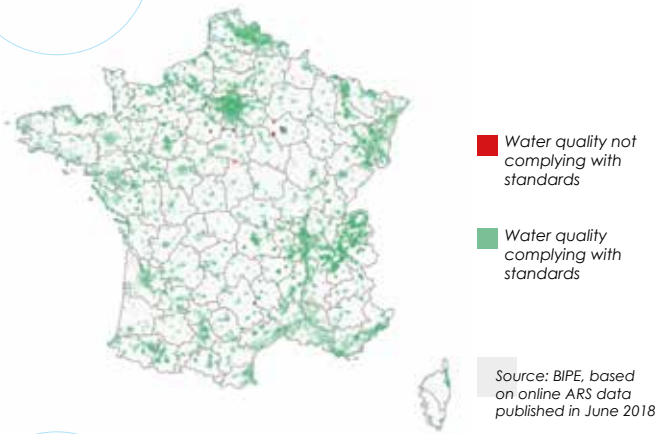
Instances of non-compliance where the limit was exceeded at least once affected 0.6% of the population (410,000 people) in 2017, and were found in 38 départements, mostly north of the Loire. The breakdown by type of area showed that, in 2018, **nearly all instances of non-compliance were in rural areas - another finding suggestive of a new regional divide in the sector.**

A total 18 départements have distribution systems that exceed nitrate limits, with the percentage of non-complying systems ranging from 0.5% to 10%, and a median non-compliance rate of 0.8%.

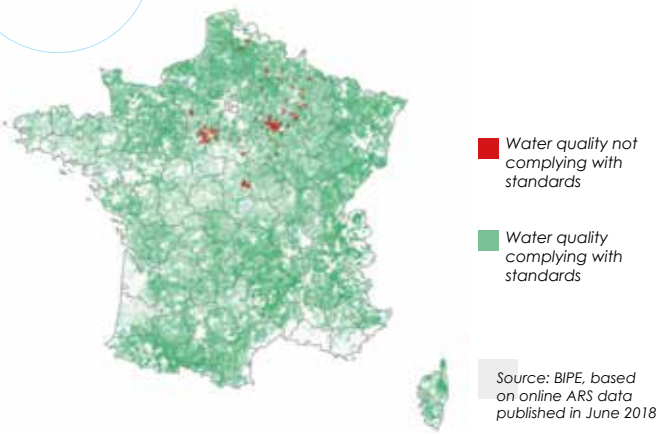
The installation of source protection zones and improvement of wastewater treatment processes are the measures recommended by the health authorities to tackle non-compliance with nitrate limits.

In addition to these preventive measures targeting water at the source, there are also water treatment processes that can be used to ensure compliance of water at the tap.

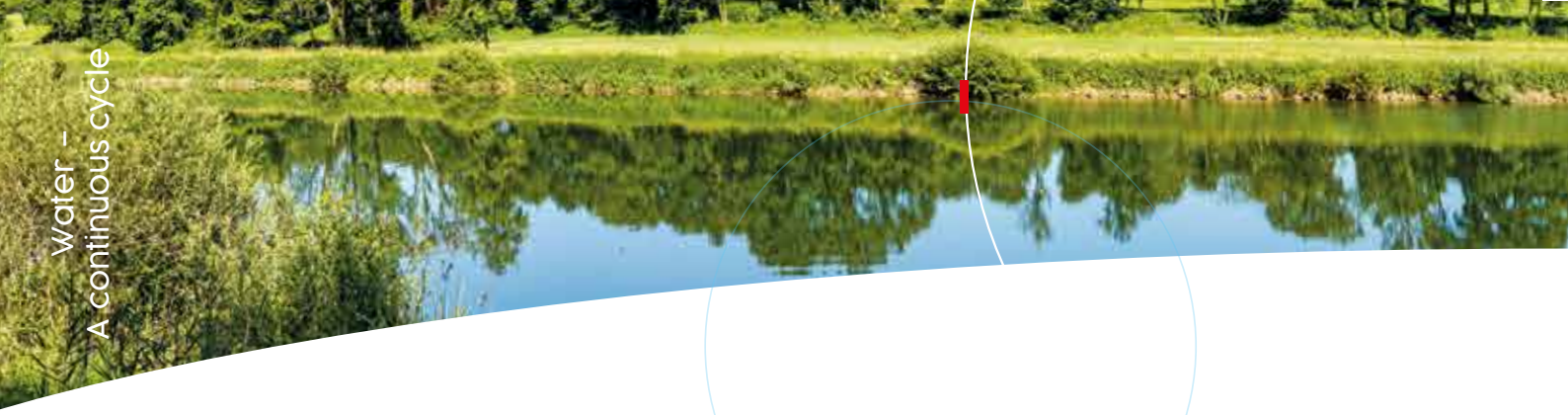
Nitrate non-compliance in urban areas: 0.1% of distribution systems (red dots)



Nitrate non-compliance in rural areas: 0.5% of distribution systems (red dots)



* Each dot on the map represents a water distribution system. Each distribution system belongs to an urban or rural area (as classified as such by INSEE) on the commune(s) it supplies. Urban communes are defined by INSEE as communes forming a continuous built-up zone (no space of more than 200 meters between any two buildings) with a population of at least 2,000. All other communes are rural.



Protecting water sources: measures and current situation

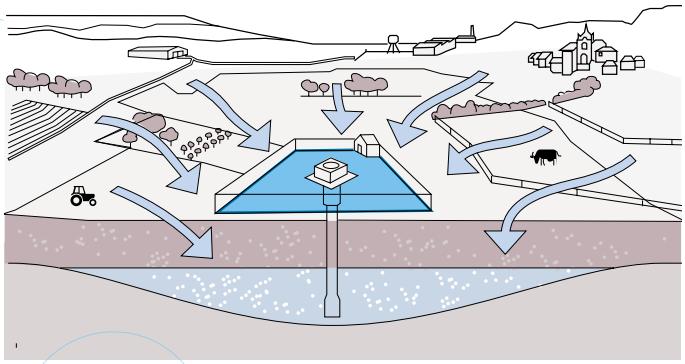
The production of drinking water in France relies on the country's 33,000 groundwater and surface water sources.

With the aim of protecting these resources against point-source, accidental and non-point source pollution, **the creation of source protection zones - a task that falls to local authorities - became mandatory under the French Water Act ("Loi sur l'Eau") of 1992. 25 years on, at the end of 2017, three-quarters (76.5%) of all collection works have protection zones. These supply 84% of the water produced, but further efforts are needed to ensure that all sources are protected.**

More than **75%** of all collection works have ***protection zones***

The source protection zones delineate and classify the areas around collection works in accordance with the vulnerability of the supply source and the risk of pollution.

Source protection zones

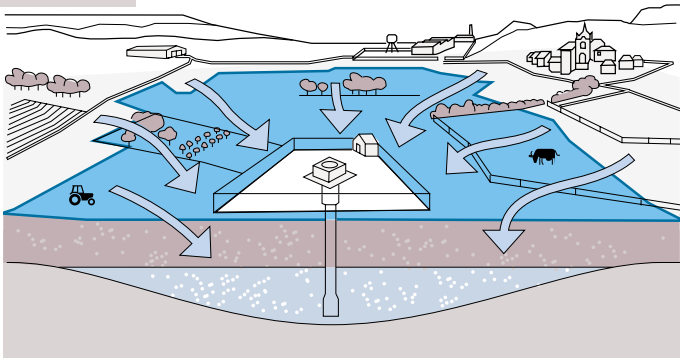


Inner protection zone

A few hundred square meters

Area fenced off and purchased by the water supplier

All activities prohibited

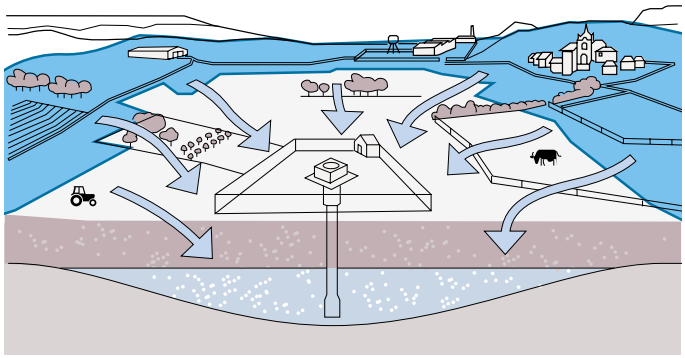


Intermediate protection zone

Capture zone

Several hectares

All activities and installations with the potential to cause point-source or accidental pollution are prohibited or regulated



Outer protection zone

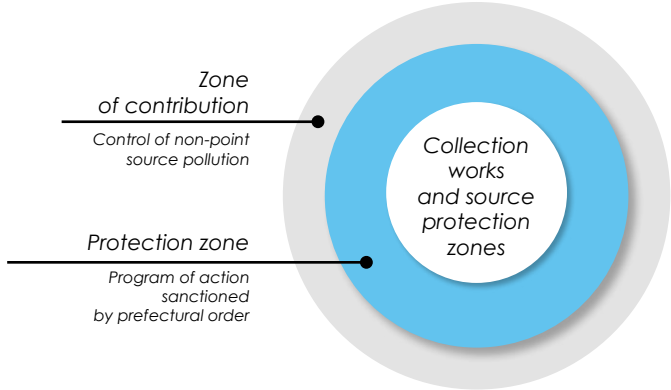
Zone of contribution

Of very variable area

Activities may be regulated if local conditions so dictate

Source: Ministry of Health

Zones of contribution



Source: Ministry of Health

In addition to the source protection zones, a second measure – the "zones subject to environmental constraints" (ZSCE) - was introduced by the Water Act of 2006. This involves protecting sources against non-point source pollution 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.

Priority sources

As part of public authority efforts to protect water sources, priority sources were identified in 2009 under the Grenelle de l'Environnement initiative, and then again in 2013 at France's second environmental conference.

A total 1,000 sources were identified from among those sources that were most under threat from non-point source pollution (high nitrate and pesticide concentrations). These priority sources were among the 2,700 sources classified as at-risk under SDAGE programs.

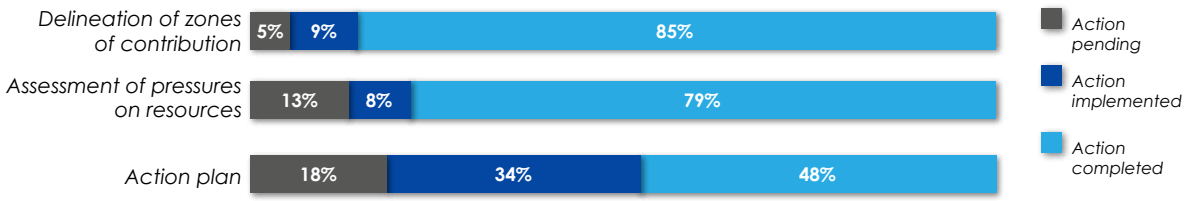
The purpose of identifying priority sources is to ensure that the water source is clean enough to reduce or eliminate nitrate and pesticide removal requirements in the treatment process. According to Agence de l'Eau Rhône-Méditerranée-Corse, **the cost of protecting a source is 2.5 times less than that of treating the water once it is polluted.**

Priority sources are determined according to three criteria:

- the quality of the water in terms of nitrate and agrochemical pollutants;
- the population supplied from the source;
- the importance given to restoring the quality of the source.

A plan of action involving all stakeholders is implemented after studies to delineate zones of contribution and investigate pressures on source waters from agricultural and non-agricultural pollution.

Status of the initiative to protect priority sources under the 2016-2021 SDAGE programs



Source: BIPE, based on Ministry for the Ecological and Inclusive Transition data

An action plan has been drawn up for one in every two priority sources and for a third of all sources the plan has been implemented. Significant progress has been made on the action plan for the Rhône-Mediterranean-Corsica river basin, where 80% of all sources have been addressed, but there has been little progress in the Artois-Picardy river basin where only 21% of sources have been tackled. At a national level, no zone of contribution has yet been delineated for 58 sources (5% of all sources).

The 534 "Grenelle" sources have fared better as tackled earlier: zones of contribution have already been delineated for 92% of these sources, the assessment of pressures has been completed for 85% of them and an action plan has been completed for 76% of them.

Water companies and chambers of agriculture as partners in the effort to protect sources

Restoring water quality in the zones of contribution is a priority identified in the Water Framework Directive, under the Water and Aquatic Environments Act ("LEMA") and in the objectives that came out of the second stage of the Assises de l'Eau. The water companies and the chambers of agriculture, who have been working together for several years now, want to be part of the effort to protect the 1,000 priority sources identified under the 2016-2021 SDAGE programs.

The partnerships between the water companies and chambers of agriculture translate into three types of initiative:

- **Research and innovation** applied to the protection of sources. The aim is to promote efforts to prevent agricultural pollution and to foster the development of organic farming and more traditional, low-fertilizer and low-pesticide farming practices as well as new mechanisms to support farmers.
- **Closer collaboration.** Closer relationships between key water cycle stakeholders will improve their ability to deliver multi-actor action plans at the basin-wide level (involving actors like the Agences de l'Eau, local authorities, user associations and the general public).
- **Resource protection programs as part of a preventive approach.** Although improving solutions to turn raw water into drinking water is vital, treating a raw water source that is ever more polluted cannot be the only answer. The partnership initiatives therefore aim to step up preventive measures aimed at protecting water resources and minimizing their deterioration.

Pilot sites involved in FP2E-APCA partnership initiatives

Under the APCA/FP2E partnership program, 10 pilot sites are being monitored. The initiative, which covers a diverse range of agricultural contexts, is part of the joint effort to protect priority sources.

Source : FP2E

1 — Size: 6,260 ha, including 4,200 ha of UAA
Number of farmers: 91
Agricultural context: mixed farming, livestock, vegetables

2 — Size: 2,300 ha, including 2,000 ha of UAA
Number of farmers: 35
Agricultural context: livestock

3 — Size: 4,860 ha, including 1,495 ha of UAA
Number of farmers: 41
Agricultural context: field crops, vegetables

4 — Size: 6,500 ha, including 3,700 ha of UAA
Number of farmers: 163
Agricultural context: field and other crops

5 — Size: 425 ha, including 348 ha of UAA
Number of farmers: 15
Agricultural context: field crops

6 — Size: 687 ha, including 516 ha of UAA
Number of farmers: 39
Agricultural context: mixed farming, livestock

7 — Size: 13,700 ha, including 9,700 ha of UAA
Number of farmers: 93
Agricultural context: mixed farming, livestock

8 — Size: 7,100 ha, including 3,190 ha of UAA
Number of farmers: 40
Agricultural context: field crops

9 — Size: 397 ha, including 325 ha of UAA
Number of farmers: 17
Agricultural context: corn

10 — Size: 46,800 ha, including 7,834 ha of UAA
Number of farmers: 483
Agricultural context: wine growing

Example of a partnership initiative involving a pilot site in Orléans

Various actions have been implemented under an agreement between the Orléans city council, the Loiret chamber of agriculture and Suez with a view to protecting the quality of the water supplied to the people of Orléans:

- ***wellhead protection:*** *installation of concrete well covers to prevent surface runoff into groundwater;*
- ***checking farming equipment near zones of contribution*** *to save on fertilizers and pesticides, and reduce or eliminate leakage of agrochemicals. Installation of water cisterns in sprayers to reduce the impact of pesticides where these are still used;*
- ***water quality monitoring:*** *no trace of pesticides whereas traces of atrazine and its by-products had been found in the past.*

In another initiative, FP2E and APCA are looking at the benefits of putting sewage treatment sludge back into the soil and ways of safeguarding this form of sludge disposal. The two bodies are seeking to promote better standards of practice in this area so as to improve tracking of sludge application.

170 liters
per person is the daily domestic water consumption in France

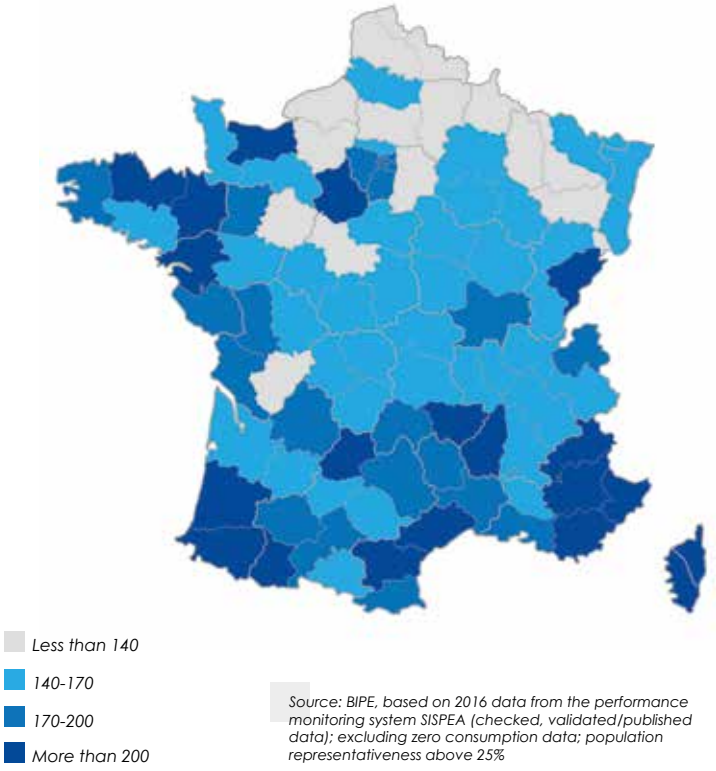
Domestic water use: big disparities between regions

The average daily per-person domestic water use in France is 170 liters (according to 2016 data representative of 69% of the population). Consumption levels vary from region to region however: in 2016, per-person water use was less than 120 liters per day in the Nord region of France (98% population representativeness of the data), twice that amount in Alpes de Haute-Provence (259 liters per day with 94% population representativeness) and three times that amount in the Var (360 liters day with 59% population representativeness).

These regional differences are mainly attributable to differences in the residential structure and the extent of tourism in the area. More water is used in the south of France for example due to the higher number of second homes and private swimming pools in this part of the country. And demand is also affected by differences in temperature.

Lastly, the departmental water demand data provided by the utilities will have different statistical significance depending on whether they cover a smaller or larger proportion of the département's population.

Domestic water use in France in 2016
(liters per person per day)



Source: BIPE, based on 2016 data from the performance monitoring system SISPEA (checked, validated/published data); excluding zero consumption data; population representativeness above 25%

Wastewater: from treatment to resource recovery

A majority of large wastewater treatment plants operated by the water companies

France's 21,400 wastewater treatment plants provide a total treatment capacity of 104 million population equivalent (PE). The plants are located across 15,916 communes. **Most of the treatment plants are small** facilities (81% of plants have a capacity of less than 2,000 PE) and treat only a small proportion (8%) of the total amount of wastewater generated.

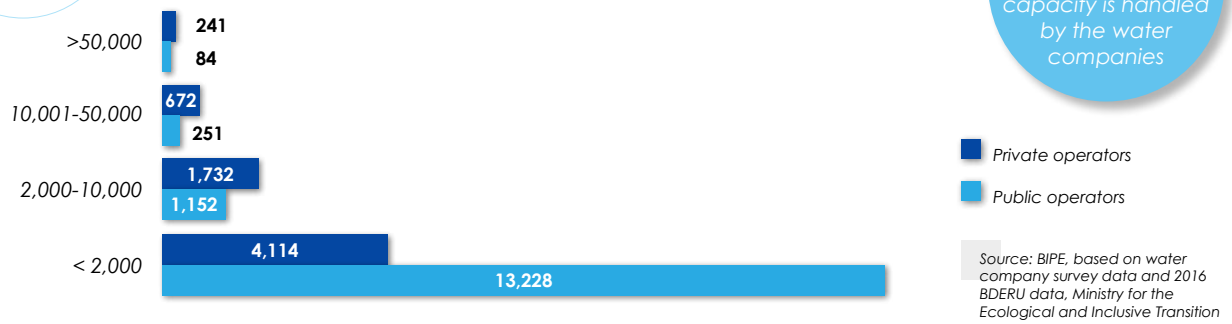
Between 2011 and 2016 the **number of wastewater treatment plants rose more rapidly than the total treatment capacity** (up 2.5% a year, compared to the 1% rise in capacity, representing an additional 1.04 million PE annually), reflecting a more extensive network of smaller treatment plants across the country.

The water companies operate nearly a third (31.5%, some 6,800 plants in total) of the country's treatment plants and nearly three-quarters of the country's large WWTPs (913 plants out of a total 1,248 plants of capacity greater than 10,000 PE). This accounts for 60% of the total treatment capacity (61.2 million PE).

They also operate 191,000 km of combined and separate sewerage and drainage system, proper maintenance of which is critical to preventing the discharge of untreated sewage to the natural environment. The total length of the country's sewerage and drainage system was 395,000 km in 2008 (source: SoeS).

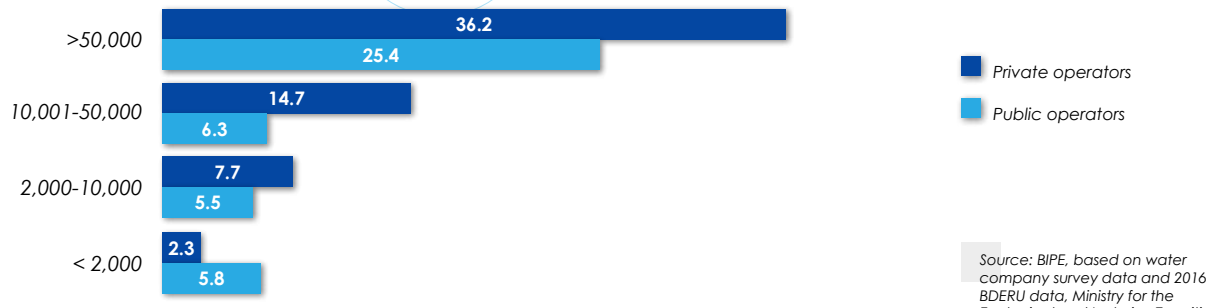
Number of wastewater treatment plants by PE capacity and type of operator

In France: **60%** of treatment capacity is handled by the water companies



Source: BIPE, based on water company survey data and 2016 BDERU data, Ministry for the Ecological and Inclusive Transition

Total rated capacities of plants (million PE) by PE capacity and type of operator



Source: BIPE, based on water company survey data and 2016 BDERU data, Ministry for the Ecological and Inclusive Transition

Stalled progress in upgrading facilities

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

The entire wastewater system, from the collection to the treatment facilities is governed by the regulatory framework fixing the applicable levels of treatment. Levels of treatment vary depending on the size of the community served and the sensitivity of the receiving waters. The issue of compliance is particularly critical for the large facilities, as in 2016, 80% of all wastewater was treated in treatment plants of capacities of 10,000 PE or more.

About 3% of the country's treatment plants reportedly need to be upgraded each year for reasons of obsolescence or insufficient treatment capacity. Assuming a service life of 30 to 40 years, that translates into 100 or so treatment plants a year in need of rebuilding or rehabilitation.

Although treatment plant compliance levels are high (more than 98%), reflecting sufficient capacity of facilities, compliance levels in terms of the performance of treatment facilities have seen a slight dip in recent years.

Compliance of the performance of wastewater treatment plants >2,000PE

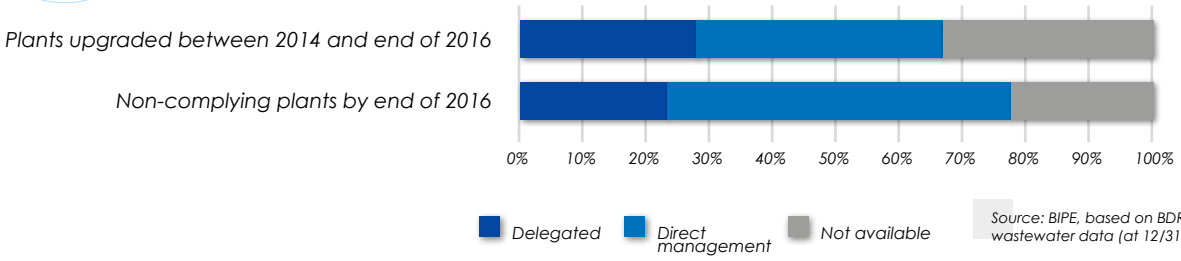
Source: BIPE, based on water company survey data and BDERU data, Ministry for the Ecological and Inclusive Transition

The European Commission steps up pressure over compliance

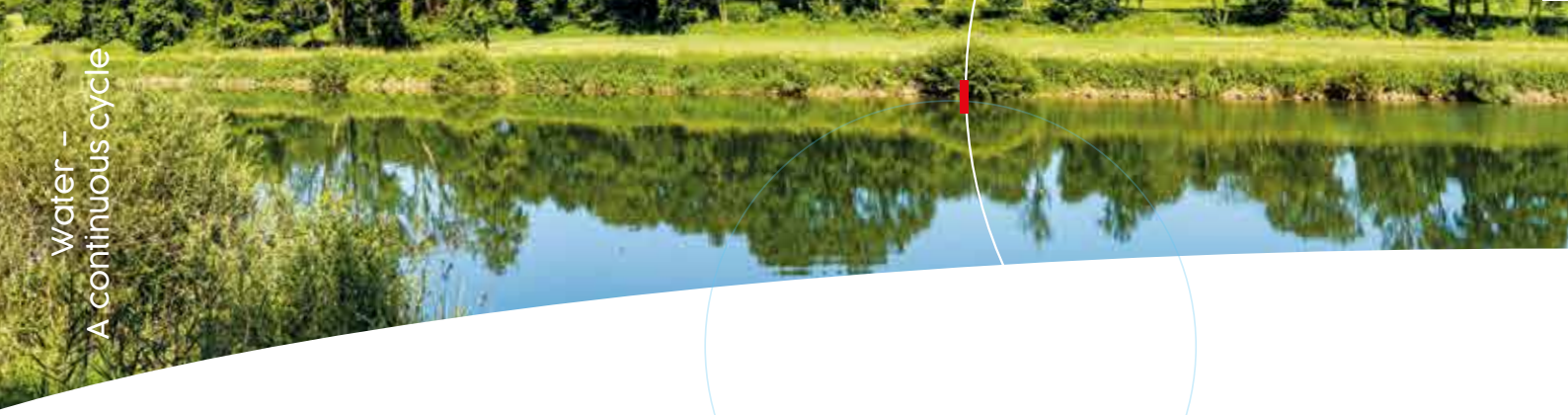
The European Commission, acting on the basis of 2014 data, has issued a warning to France over the failure of 373 French cities to comply with **urban wastewater treatment requirements**. 49 of those cities have also been asked to step up treatment levels where discharges occur in areas identified as "sensitive".

By the end of 2016, about half (191) of those cities had achieved compliance in terms of secondary treatment processes and nearly two-thirds of the "sensitive" cities had achieved compliance with tertiary treatment requirements. In the remaining cities, where most plants are operated under the direct management model, the facilities must be upgraded to the applicable standards as soon as possible.

Compliance status of treatment facilities in the 373 cities



Source: BIPE, based on BDRU and EC wastewater data (at 12/31/2016)



High levels of wastewater treatment efficiency in services run by the private companies

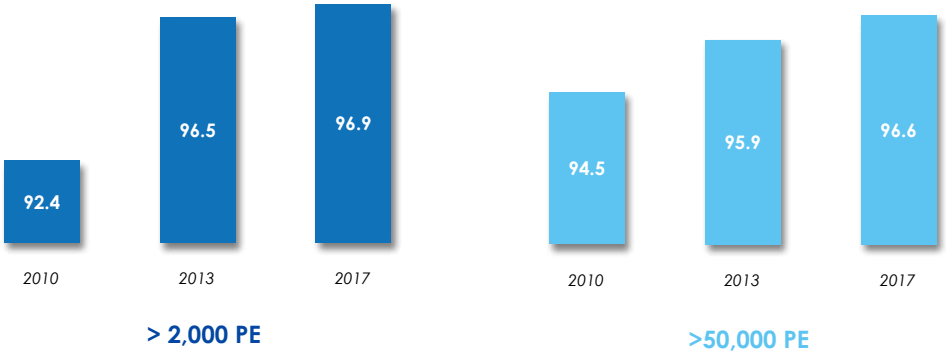
Wastewater treatment efficiency is the main indicator of the performance of the treatment plant. More specifically it is the ratio of pollutants removed by the treatment plant to pollutants entering the plant. Another efficiency indicator, Biological Oxygen Demand (BOD), is the amount of oxygen used by microorganisms when they bio-degrade organic material in a water sample.

The water companies have performed well in terms of wastewater treatment efficiency: with respect to the 2.25 billion m³ of wastewater treated in 2017, the plants of more than 2,000 PE in capacity reported wastewater treatment efficiency levels of 96.9% and the very large treatment plants achieved efficiencies of 96.6%.

The water companies are constantly improving their performance: **since 2010, the amount of wastewater handled by treatment plants has risen by 7.4%**, while treatment efficiency levels, which were already well above the 90% mark, have risen still further.

a 7.4% *increase in wastewater amounts handled by the water companies*

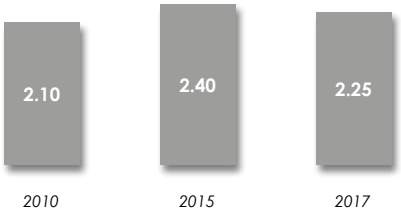
BOD removal efficiency in wastewater treatment plants run by the water companies (population equivalent)



Source: BIPE, based on water company survey data

The 2.25 billion m³ of wastewater treated by the water companies in 2017 represents a population equivalent of 40.5 million and two-thirds of their total treatment capacity.

Volumes of wastewater treated by the private companies (billion m³)

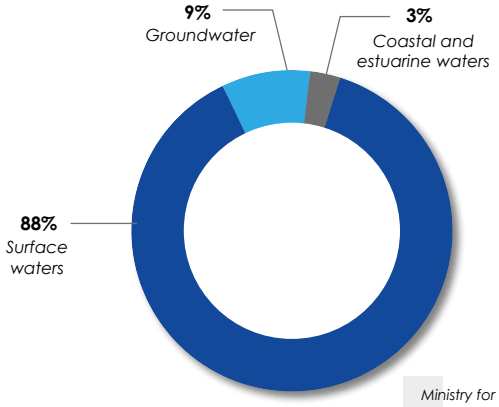


Source: BIPE, based on water company survey data

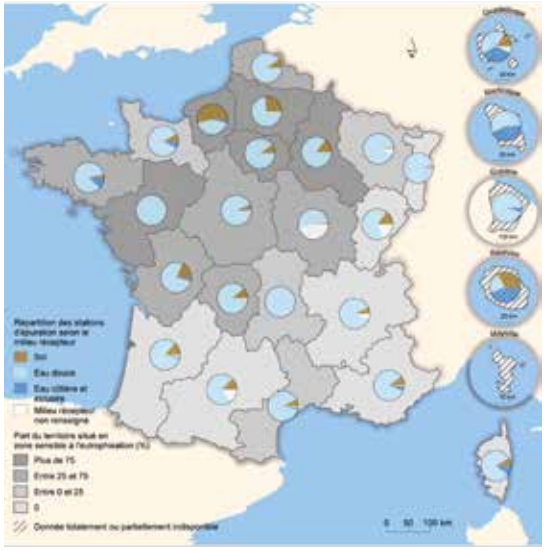
A trend towards higher levels of treated wastewater reuse in France and in Europe

In France, most of the wastewater treated by wastewater treatment plants is discharged to surface waters.

Percentage of treated wastewater discharges by receiving water type

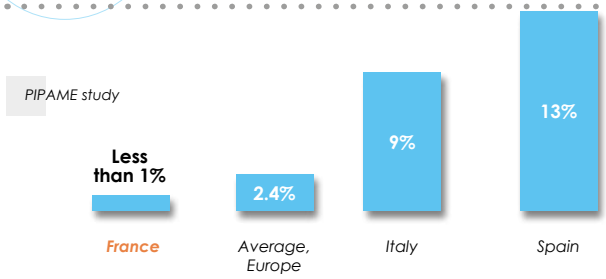


Ministry for the Ecological and Inclusive Transition



Wastewater reuse rates in France are estimated to be less than 1% (as against 9% in Italy and 13% in Spain). This reclaimed water tends to be used for irrigation and watering of golf courses but less often for municipal purposes. The reuse of treated wastewater can however be a viable option in areas where water resources are scarce, where groundwater is overexploited or where it is difficult to discharge treated wastewater to receiving waters in what may be sensitive areas.

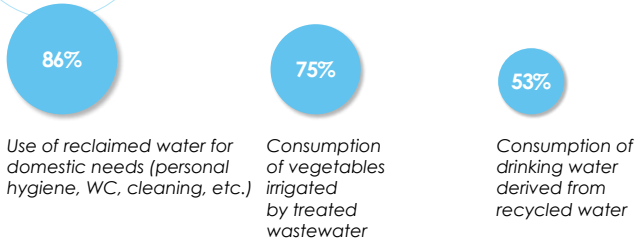
Estimated wastewater reuse rates in Europe



Wastewater reuse is an integral part of the circular economy as it helps to alleviate pressures on water resources. And used in irrigation, its excellent fertilizing properties reduce the need for chemical fertilizers. Whether such practices makes economic sense is assessed at the local level depending on factors like water stress, quality requirements and the possible need for additional treatment processes.

As a raw material for use in irrigation (whether in the public or private sphere and regardless of the type of crop or green space concerned), the reuse of treated wastewater is regulated in France. **In 2019 the European Commission prepared a regulation aimed at fostering the reuse of treated wastewater**, above all for irrigation and in some cases for other uses (industry, aquifer recharge, and specific domestic uses). Quality standards and monitoring frequencies will vary according to the type of crop irrigated, and the assessment criteria will include the treatment technology used. French legislation will be required to factor in these new guidelines, which are designed to promote safe wastewater reuse and so increase transparency and confidence in the treatment process.

Proportion of French people willing to adopt new water use practices



Source: TNS Sofres survey for the Centre d'Information sur l'Eau

Sewage sludge recycling: an integral part of the circular economy

All told, over 1 million (1,005,571) tonnes of dry solids were produced in French wastewater treatment plants in 2016. As the last component of the wastewater treatment process, **80% of the sludge produced is used in agriculture and urban landscaping**. The development of standard-compliant compost, produced from sludge of excellent quality and comprising the bulk (90%) of compost production, is the only sewage sludge disposal practice that has grown in the last five years. It is an example, moreover, of how water and wastewater services form part of the circular economy.

Under the applicable regulations, sludge disposal practices have to be environmentally sound, the most favored option being recycling and reuse. The disposal of sludge in landfill is accordingly a practice on the wane. As a disposal option that flouts circular economy principles, it can result in penalties being applied to the wastewater treatment efficiency bonuses paid to operators.

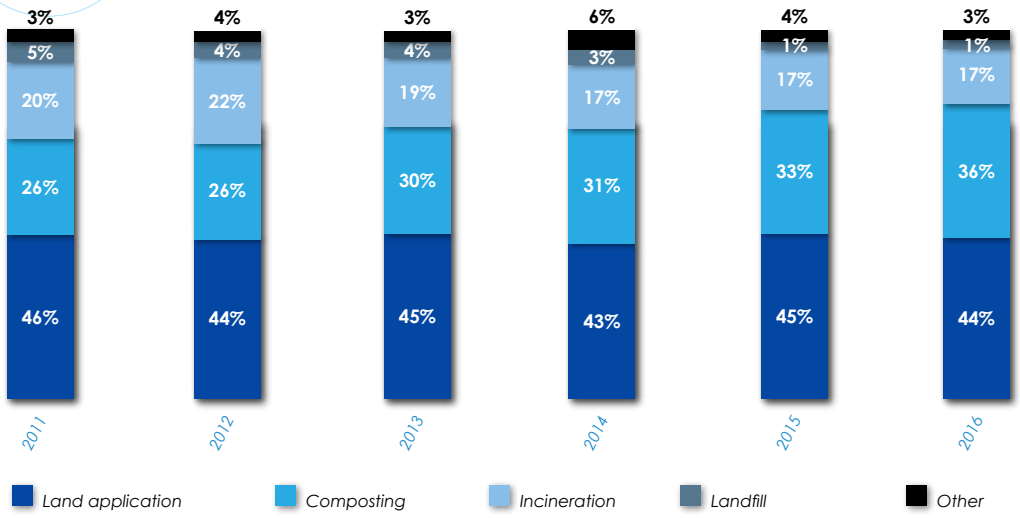
The use of sludge for land application has however been compromised by a new law[5] which puts limitations on sludge moving from the status of "waste" to the status of "product".

France's circular economy roadmap, FREC, has nevertheless stressed the desirability of increasing the share of renewable fertilizers, including those obtained from organic residuals. At the same time, it has insisted on the importance of ensuring the quality of these substances, particularly by regulating any possible biological or chemical pollutant content.

These recent developments raise questions about the extent to which French wastewater utilities will be able to recycle sewage sludge back to the land in the future, however desirable this may be in the eyes of many.

[5] *The so-called EGalim Act passed in 2018 to achieve a balance in trade relations in the agricultural and food sectors*

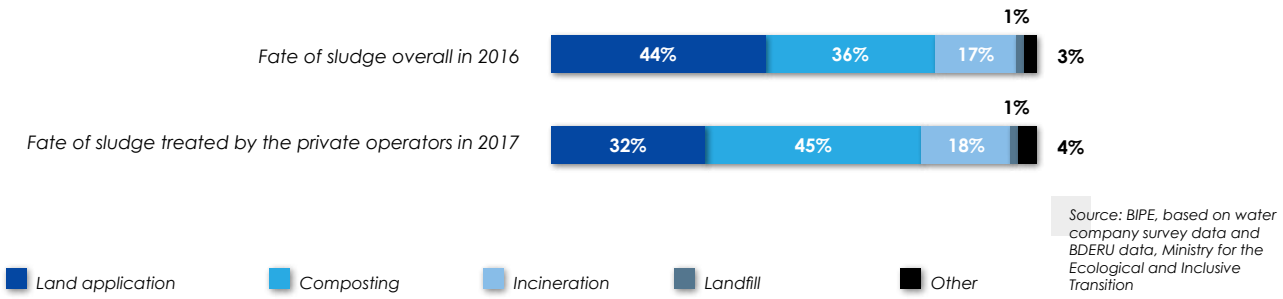
Fate of sewage sludge by disposal method



Source: BIPE, based on 2016 BDERU data, Ministry for the Ecological and Inclusive Transition

The facilities operated by the water companies produce 54% of all sludge generated in France. **The main form of sludge reuse** (accounting for 45% of the sludge produced) **employed by these companies is composting**. This percentage of sludge reuse is far higher than the national average. The quality of the sludge produced yields 94% levels of standard-compliant compost, i.e. compost that complies with strict regulations governing trace metal elements (TME) and organic trace compounds (OTC). Sludge recycled for agriculture with the status of waste includes sludge for land application (32%), with the requirement that the sludge is treated to ensure compliance with TME and OTC limits. Treatment plant operators also have to draw up an annual land application plan.

Fate of sewage sludge treated by the water companies



Source: BIPE, based on water company survey data and BDERU data, Ministry for the Ecological and Inclusive Transition

Processes considered as sustainable:

- land application: land application plan and declaration regarding the transport of the sludge
- composting: operating declaration or permit in the case of production levels of more than 10,000 tonnes per year
- incineration: operating permit and declaration regarding the transport of the sludge
- landfill: dry solid content of 30% or more, and transport declaration

Another form of sewage sludge reuse is anaerobic digestion This is a way of treating effluent while generating energy in the process. This form of energy recovery contributes to the attainment of the national target of 10% renewable gas in gas usage by 2030 – a goal that contributes to the energy transition and the development of a circular economy. The current biomethane injection target is 8TWh by 2023 for all processes (of which the anaerobic digestion of sewage sludge is just one).

According to the French environment and energy agency ADEME,[6] 85 wastewater treatment plants had anaerobic digestion facilities in 2014, out of a total 20,000 plants in France at the time. These plants handled the sewage generated by a 26.6 million PE and produced more than 265,000 tonnes of sludge, i.e. 0.54 TWh of energy, per year.

Anaerobic digestion is being rolled out gradually in France: such facilities were installed in some 15 plants between 2008 and 2014, providing an extra rated capacity of 5.6 million PE. Most of the biogas produced is used on site (in boilers) and in cogeneration; only a small proportion (3%) is injected into the grid or used as vehicle fuel (3%). In 2017, the average capacity of biomethane injection facilities in treatment plants was an estimated 0.015 TWh per year.[7] However, if all treatment plants of more than 5,000 PE in capacity were equipped with such facilities, the total potential would be 1.83 TWh per year and could (according to BIPE calculations based on a four-person household living in a house and using 10 MWh of electricity per year for heating) be enough to heat 183,000 homes.[8]

In 2020 as we speak, the potential for biomethane injected into the grid is estimated to be between 0.09 TWh and 0.57 TWh per year (as compared to 0.02 TWh per year in 2014) - **enough energy to heat between 9,000 and 57,000 homes.**

In 2017, the water companies produced 39,732 MWh of biogas in their treatment plants, enough to provide heat to some 4,000 households.

[6] *ADEME: "Evaluation du potentiel de production de biométhane à partir des boues issues des stations d'épuration des eaux usées urbaines"*
[7] *Source: "Panorama du gaz renouvelable en 2017"*
[8] *Demand calculated based on a family of four living in a house and using 10 MWh of electricity a year for heating*

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Governance of water and wastewater services

Institutional structure

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

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

• **the EU level** at which the concept of "good status of water bodies" – a goal that all Member States should work towards - was introduced, and at which environmental objectives are set under the EU Framework Directive, first published in 2000. Drinking water quality standard are also set at EU level;

• **the national level** at which water policy has been made since the 1960s and at which the management of water (management by main river basin, roles of the Comités de Bassin and Agences de l'Eau, planning tools, right to water, policing of water, etc.) is organized in accordance with EU directives;

• **the local level** where incentive mechanisms come into play in the operation and monitoring of services. It is at this level where the rights and responsibilities of water utilities and sectors are determined by means of "service regulations".

Alongside the authorities that organize the provision of services and the service operators, a number of other players, mostly public, have a role to play in financing, regulating and monitoring public water services. This multiplicity of actors requires effective coordination and the clear identification of roles and responsibilities:

European Union

The European Union issues framework directives that apply to Member States. Its Directorate-General (DG) for Competition ensures that the market operates in a way that enables fair and equitable competition.

The State

The State sets policy objectives for the water sector, both at the national and local levels (in the first case through government departments and administrations and in the second case through the Préfets and local state administrations). The Mission Interservices sur l'Eau et la Nature (MISEN) coordinates the work of local state administrations and public autonomous bodies at the département-wide level, ensuring that water, nature and biodiversity issues are addressed in a holistic manner. It also monitors compliance of drinking water quality through the regional health agencies.

OFB

The Office Français pour la Biodiversité (AFB until 12/31/2019) is the leading technical body for biodiversity information management and protection. It oversees the information system on water and public water and wastewater services and allocates funding for projects promoting the sound management of water resources.

The Agences de l'eau

The Agences de l'Eau implement strategic water management plans in France's six main river basins and have access to market-based instruments to help finance local investment.

Départements and Régions

The Départements and Régions provide financial support for local authority investment projects on an ad hoc basis and are involved in the management of regional development and sustainability plans.

The Cour des comptes

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.

DGCCRF

The Direction Générale de la Concurrence, de la Consommation et de la Répression des Fraudes (DGCCRF) and Autorité de la Concurrence are the competition watchdogs for the sector.

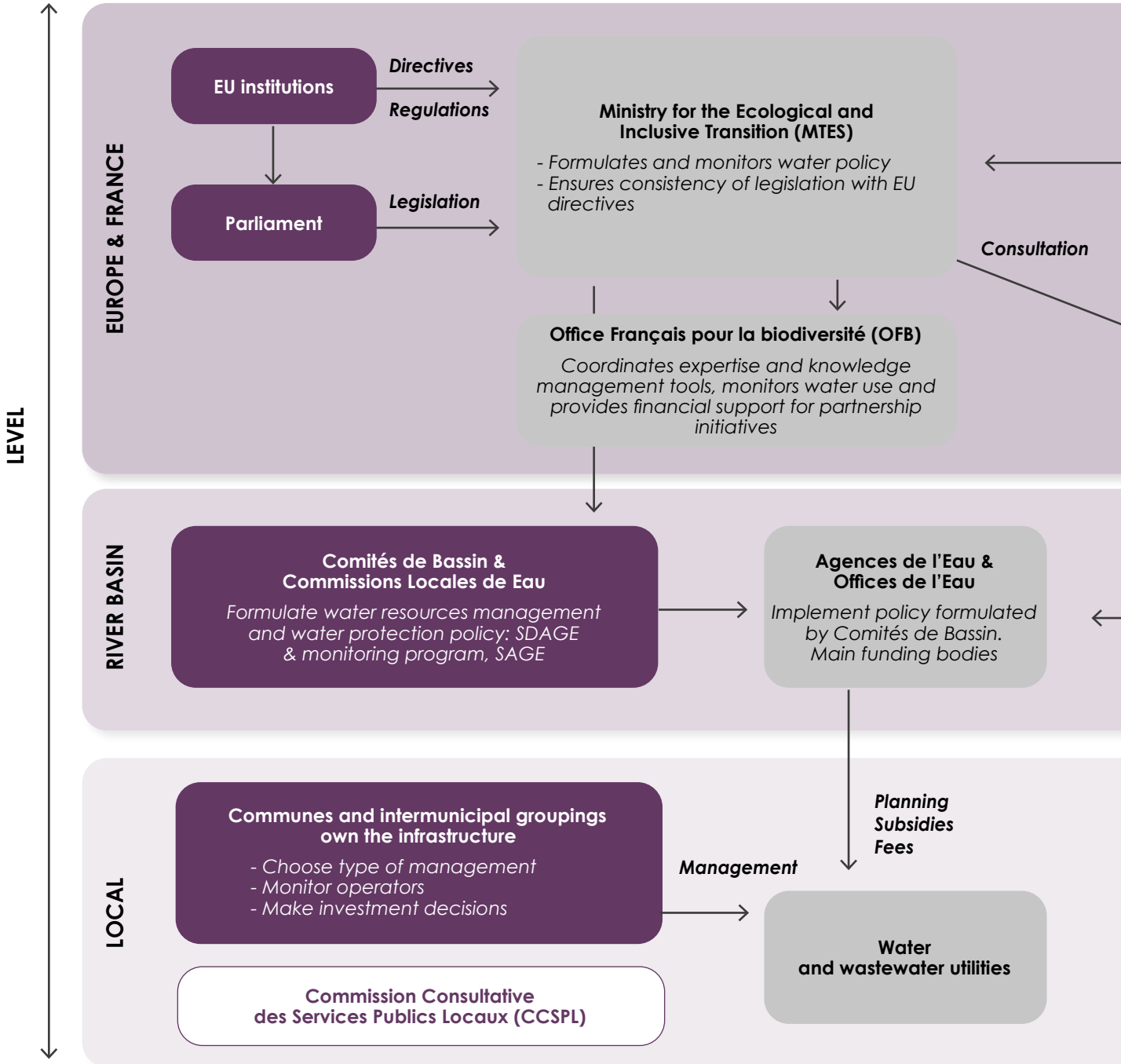
Haute autorité pour la transparence de la vie publique

The Haute Autorité pour la Transparence de la Vie Publique identifies potential conflicts of interest involving public authorities, i.e. potential clashes between public and private interests. It organizes reporting on the work of parties representing different interests – a process in which the FP2E and its members are involved.

CCSPL

At the same time, representatives of users and of 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 in EPCI intermunicipal groupings covering more than 50,000 people.

Water policy governance straddles local issues and a national and European regulatory framework.



Other government departments

- *Health*
- *Finance*
- *Interior*
- *Agriculture*
- *Overseas*

National stakeholder representatives

- *AFEPTB (Agences de l'Eau)*
- *FNCCR (local authorities)*
- *FP2E (private operators)*
- *FENARIVE (industry)*
- *FNTP (public works)*
- *Environmental federations*
- *User associations*

Prevention of conflicts of interest

Representation

Comité National de l'Eau (CNE)

Legality

Préfecture de Région - Police de l'eau
(water monitoring body)
- *MISEN (coordination)*
- *DREAL (regional state administrations for the environment)*
- *OFB delegations*

Prevention of conflicts of interest

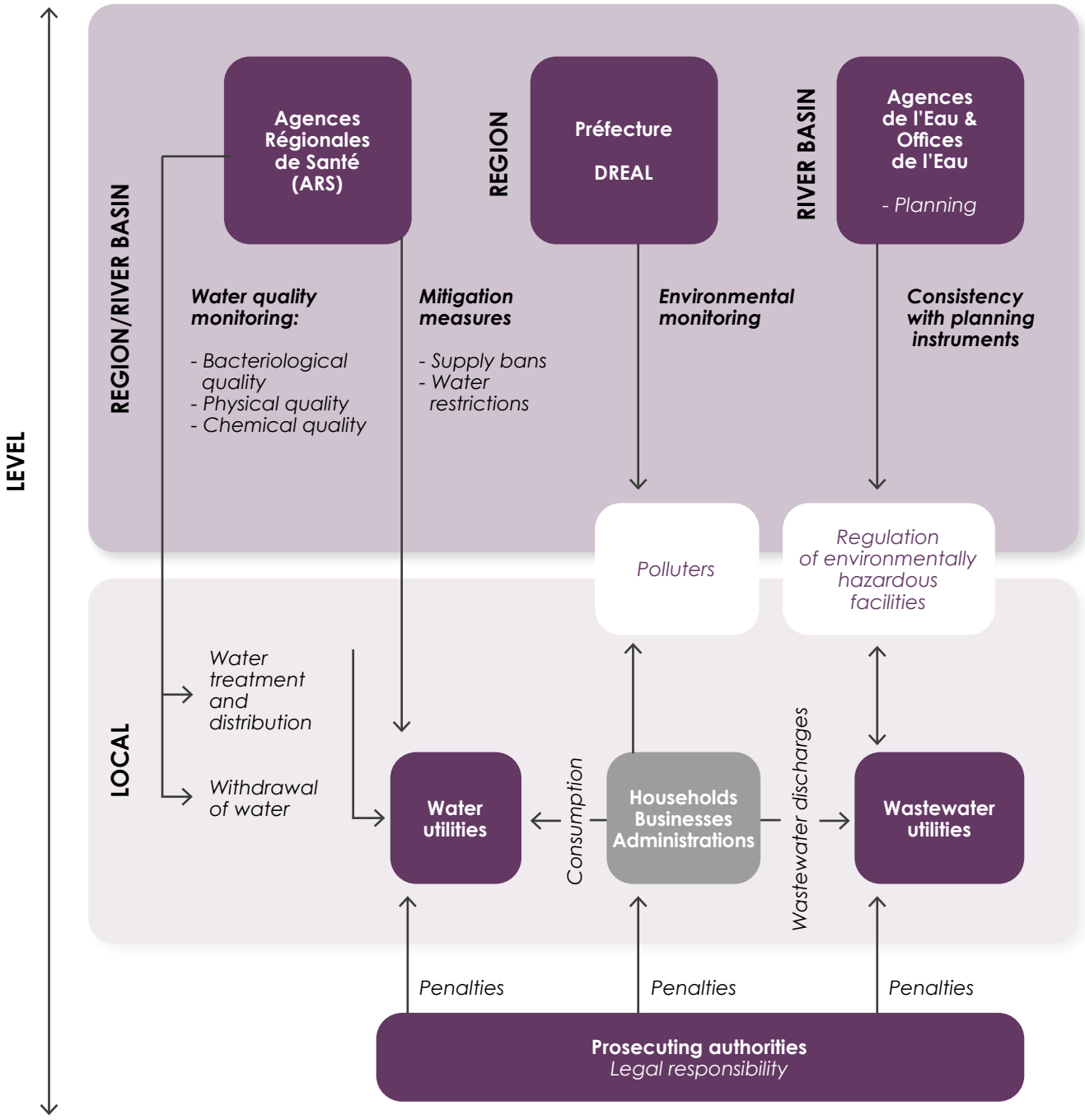
Prevention of conflicts of interest

Haute Autorité pour la Transparence de la Vie Publique

Promotes transparency and integrity of policy makers and stakeholder representatives

Deliberative body | Advisory body | Executive body

Consumer safety is at the heart of the monitoring system:



The tasks involved in regulating public water services, as defined by the OECD, are performed by a range of public bodies:

Task	Responsible entity
Definition of treated wastewater quality standards	✔ European Union ✔ Ministry of Environment ✔ 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 of Environment and Parliament (cap on fees)
Supervision of contracts with water companies	✔ Préfecture (legality) ✔ DGCCRF (competition)
Auditing of the management of public services	✔ Cour des Comptes and the regional auditors ✔ Local authorities tasked with organizing the provision of services
Pre-qualification of public and private operators	✔ Eligible tenderers selected by the organizing authority under the authority of the Autorité de la Concurrence (competition authority) and the administrative court
Promotion of technological innovation	✔ Ministry of Economy and Finance and Ministry of Environment (through the industry committee and the Contrat Stratégique de Filière Eau)
Definition of public service obligations	✔ Ministry of Environment ✔ Ministry of Health ✔ Ministry of Economy and Finance
Incentives to use water resources efficiently	✔ Ministry of Environment ✔ Office Français pour la Biodiversité ✔ Agences de l'Eau
Protection of consumers and out-of-court settlement of disputes	✔ DGCCRF ✔ Médiation de l'eau
Harmonization of accounting data	✔ Ministry of Economy and Finance ✔ Ministry of Interior
Information and data collection	✔ Ministry of Environment ✔ Ministry of Health ✔ Office Français pour la Biodiversité
Performance monitoring of public services	✔ Office Français pour la Biodiversité
Price regulation	✔ Ministry of Environment ✔ Parliament ✔ Local authorities tasked with organizing the provision of services ✔ Certain Agences de l'Eau

More than 20,000 local authorities organizing the provision of services

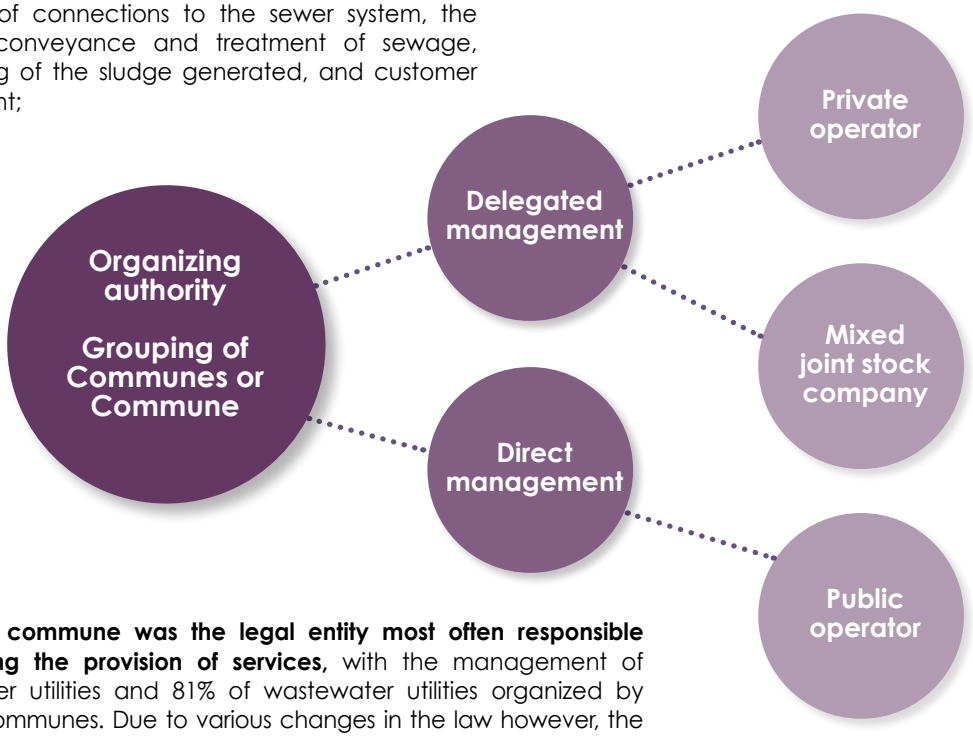
Water and wastewater services are two distinct public services of an industrial and commercial nature. The local authority (Commune or grouping of Communes) is the authority responsible for organizing the provision of services and for deciding the model of management to be used, as well as pricing policy, the requisite performance levels, investment policy and even social policy.

The operation of each public service involves various tasks:

- **in respect of water supply,** the sourcing (including the protection of the source), treatment, transmission, storage and distribution of water, and customer management;
- **in respect of piped sewerage and sewage treatment:** inspections of connections to the sewer system, the collection, conveyance and treatment of sewage, the recycling of the sludge generated, and customer management;
- **in respect of on-site sewage treatment:** the inspection of the treatment facilities and customer management.

The local authority may opt to either manage the services itself (régie, or direct management model) or outsource this task to a private operator under a concession arrangement, in some cases involving co-governance of the utility. The direct management option does not rule out the use of a private operator to handle all or part of the service under a contract for the provision of services. In this case the risk transferred is far smaller than that transferred under a concession contract.

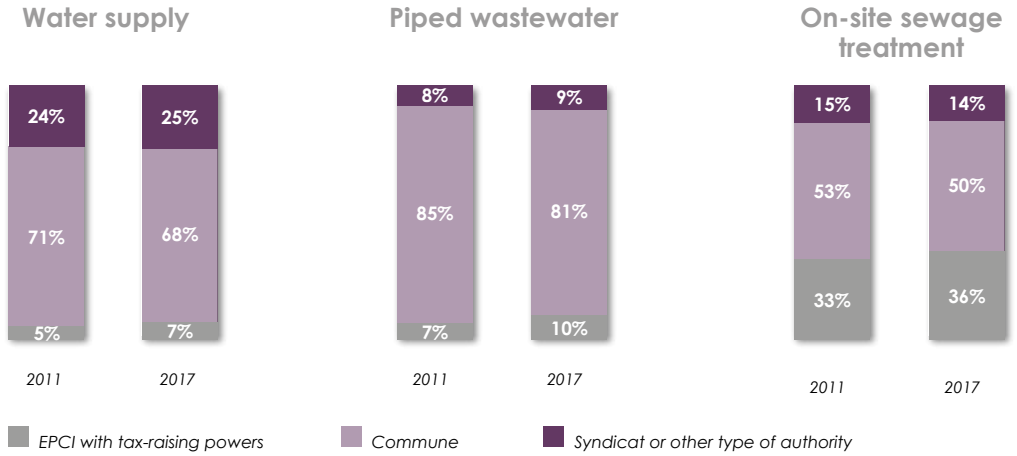
In law, the transfer of risk is the main criterion distinguishing concessions from public works contracts.



In 2017 the commune was the legal entity most often responsible for organizing the provision of services, with the management of 68% of water utilities and 81% of wastewater utilities organized by individual Communes. Due to various changes in the law however, the organization of services at the communal level is ceding ground to organization by intermunicipal groupings, such as Syndicats and Etablissements Publics de Coopération Intercommunale (EPCI) with tax-raising powers[9].

[9] *An EPCI is a group of municipalities banding together to pool skills and resources. Where an EPCI has tax-raising powers it has the power to levy local taxes such as the corporate property tax and the local economic contribution.*

Trends in the number of utilities by type of organizing authority



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

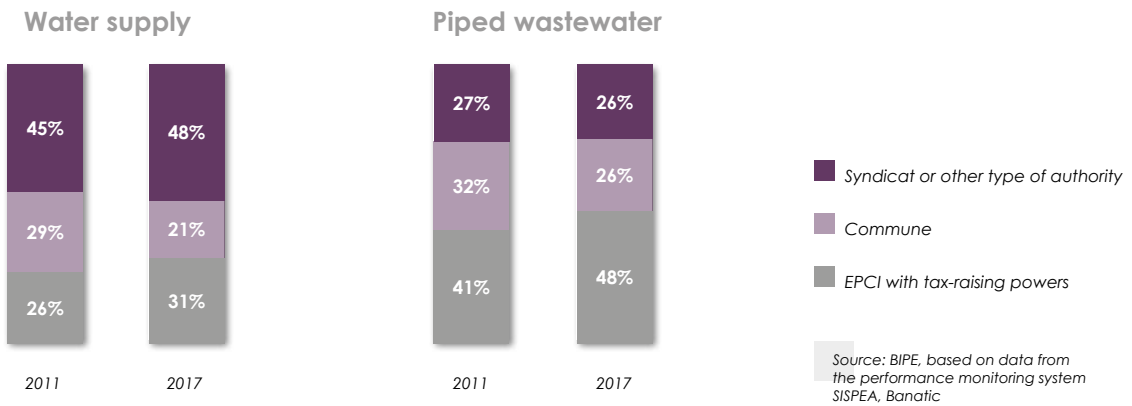
If the authority responsible for organizing services is an intermunicipal grouping, this is more likely than other types of entity to have responsibility for organizing all three types of operation:

• **in respect of water supply**, 93% of utilities under the responsibility of an intermunicipal grouping as compared to 85% of utilities under the responsibility of a commune or Syndicat, are tasked with the treatment, transmission (including storage) and distribution of water.

• **in respect of piped wastewater,** 93% of utilities under the responsibility of an intermunicipal grouping with tax-raising powers, as compared to 84% of utilities under the responsibility of a Commune and 73% of utilities under the responsibility of a Syndicat, are tasked with the collection, conveyance and treatment of wastewater.

Although the commune was still only recently the authority responsible **for organizing most services (in terms of numbers), for most French people, services are now organized by intermunicipal groupings**, allowing them to be concentrated in the hands of fewer players. In the case of water supply these groupings are usually Syndicats (which organize only a quarter of all services but cover 48% of the population) and in the case of wastewater, EPCIs with tax-raising powers (which organize 10% of services but cover 48% of the population concerned).

Trends in population served by type of organizing authority



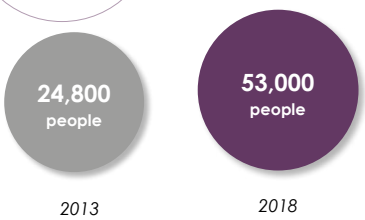
Source: BIPE, based on data from the performance monitoring system SISPEA, Banatic

A decline in the number of organizing authorities

A number of laws passed in the last 20 years have promoted the transfer of responsibility for water and wastewater services to intermunicipal groupings (Syndicats, Communautés de Communes, Communautés d'Agglomération and Métropoles).

The NOTRe Act of 2015 introduced the principle of membership of an intermunicipal grouping: as of April 1st, 2018, there were **1,264 EPCIs with tax-raising powers**, incorporating 35,353 Communes and covering the entire 67.2 million population of France. The number of EPCIs is unlikely to change to any significant extent in the near future. The act has also led to the establishment of ever larger EPCIs: in 2018 **a single EPCI covered 53,700 people on average**, as compared to 24,800 people five years earlier.

Average population covered by an EPCI



Source : collectivités-locales.gouv.fr

Changing responsibilities for organizing of the provision of services further to the NOTRe Act

Type of organizing authority	Situation before the NOTre Act	Situation after the NOTre Act
Métropole *Communauté urbaine*	*Responsibility for water and wastewater services is mandatory*	
Communauté d'agglomération	*Responsibility for water and wastewater services is optional.*	*Responsibility for water and wastewater services is mandatory from 2020 onwards.*
Communauté de communes	*Responsibility for water and wastewater services is neither mandatory nor optional.*	*Up until 2020 responsibility for water and wastewater services is optional, from 2020 onwards it becomes mandatory unless opposed by a minimum number of Communes. The Communes (at least 25% of them representing at least 20% of the population) have until 1st July 2019 to oppose the transfer of responsibility and have this differed until 1st January 2026.*
Syndicat intercommunal	-	*Possibility of retaining responsibility where at least two EPCIs are covered even partially.*
Commune	*Must belong to an EPCI covering more than 5,000 people. Responsibility for water and wastewater if not transferred*	*Must belong to an EPCI covering more than 15,000 people.* *No longer responsible for water and wastewater.*

The transfer of responsibility for water and wastewater services to Communautés de Communes

The transfer of responsibility for water and wastewater services to Communautés de Communes under the NOTRe Act was originally scheduled to come into effect on January 1st, 2020. New legislation was subsequently passed introducing accommodations to the transfer arrangements however.

Thus the transfer act of August 3, 2018 introduced the possibility of postponing the introduction of the new provisions until January 1st, 2026. And those Communes forming Communautés de Communes with no responsibility for services or responsibility for only one type of service were given the option or possibility of opposing the transfer.

If 25% of member Communes covering at least 20% of the intermunicipal population, voted by July 1st, 2019 to oppose the mandatory transfer of water and wastewater responsibilities, the transfer was postponed until January 1st, 2026.

The "Engagement et Proximité" Bill, tabled in the Sénat on July 17, 2019, introduced further accommodations to the transfer process:

- Extension of the deadline to oppose the transfer until December 31, 2019;
- Communes given the possibility to oppose the transfer even if the Communauté de Communes has only partial responsibility for either one of the services;
- Communautés de Communes and Commuautés d'Agglomération given the powers to delegate, by virtue of an agreement, responsibility for either one or both of the services to one of their member Communes, on condition that the commune commits to a specific "investment plan". The Bill specifically states however that the EPCI still has responsibility for the service.

These still evolving legal provisions have led to uncertainty over governance arrangements with respect to some of the authorities responsible for organizing the provision of water and wastewater services over the period considered.

Applicable legislation:

- Act N° 2015-991 of August 7, 2015 on territorial reform
- Act N° 2018-702 of August 3, 2018 concerning the implementation of the transfer of responsibility for the provision of water and wastewater services
- "Engagement et Proximité" Bill

The trend towards intermunicipal groupings should lead to ***a progressive alignment of service and price levels***

The situation in 2018

By mid-2018, 32% and 44% of EPCIs had responsibility for organizing the provision of water services and wastewater services respectively. These EPCIs cover most of the French population: 62% of the population for the provision of water services and 71% for wastewater services.

Many Communes had still not effected the transfer of responsibility by this date however: 24,000 Communes (i.e. two-thirds of all Communes) in the case of water supply services and 18,500 Communes in the case of wastewater services. **Those Communes have until 2020, or 2026 in some cases, to do so.**

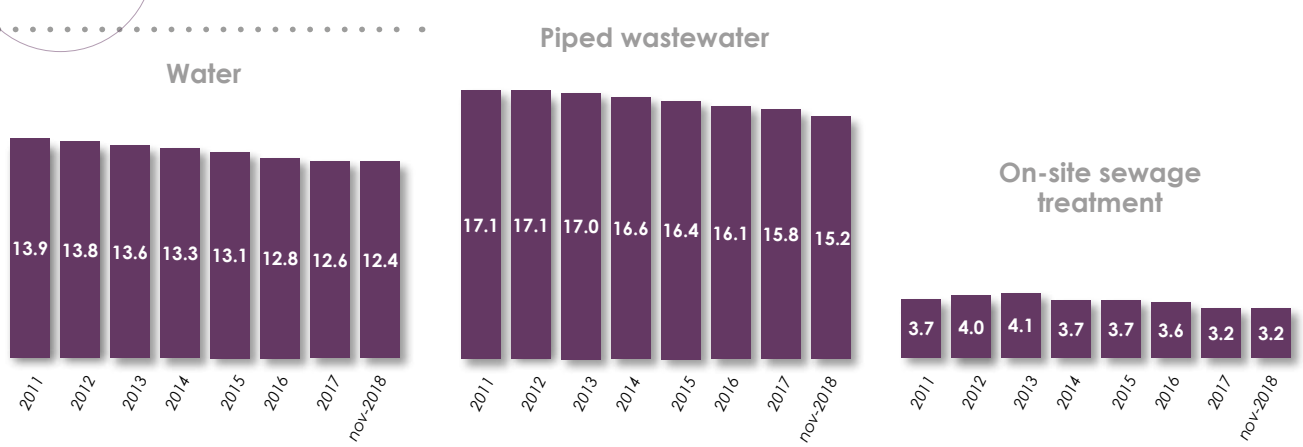
The trend towards intermunicipal groupings should lead to joint responsibility for both water and wastewater services within EPCIs (except in the case of Syndicats). It should also **have the effect of progressively aligning service and price levels** within EPCIs. The adoption of new asset management policies within EPCIs, as promoted by the national water conference, the Assises de l'Eau, may lead to price harmonization, including a process of solidarity extending from urban areas towards peripheral and rural areas. At the same time, the ambition to improve the management of assets may lead to price rises in some areas, though these will be partly offset by economies of scale in practices like purchasing and pooling of staff and facilities.

Overview of utilities

An 11% fall in the number of utilities in under six years

The number of utilities recorded at the end of 2018 was 30,800, this large number being attributable to the preponderance of services managed at the level of the commune and the many small, piped wastewater utilities. Numbers have been falling in recent years, however, with the loss of over 4,000 utilities in just six years.

Trends in utility numbers
(thousand)



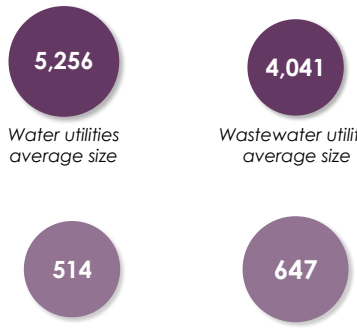
Source: BIPE, based on data from the performance monitoring system SISPEA (database of the organizing authorities)

A trend towards larger utilities

In 2016, 1 in 2 départements had water and wastewater utilities serving fewer than 5,000 people on average: a small number compared to the minimum of 15,000 people required for EPCIs with tax-raising powers under the NOTRe Act.

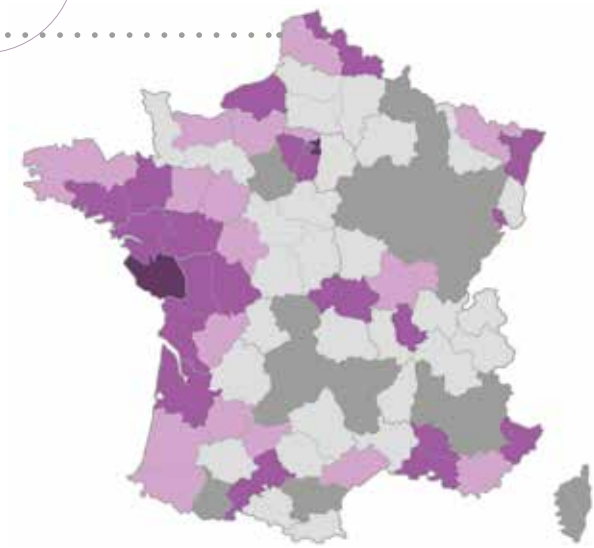
Water utilities were fewer in number and so on average larger than wastewater utilities: 25 départements had water utilities serving more than 10,000 people as compared to only 15 with wastewater utilities of that size.

Population numbers per utility



Source: BIPE, based on 2016 data from the performance monitoring system

Average number of people supplied by a water utility

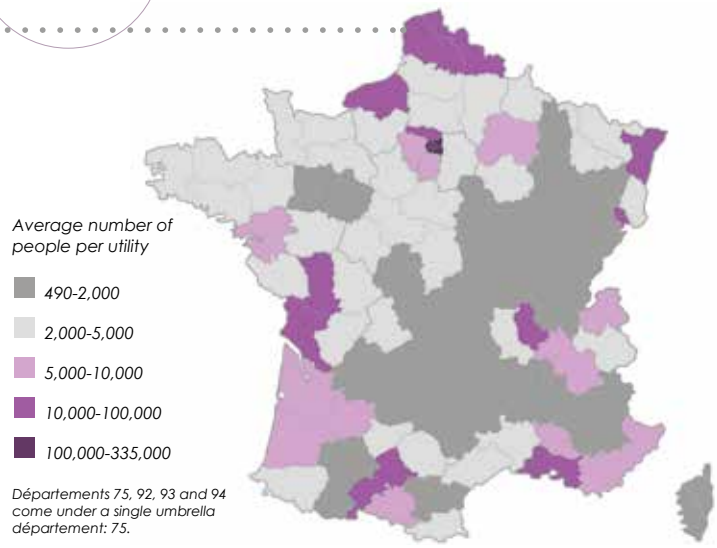


Source: BIPE, based on June 2016 data from the performance monitoring system SISPEA

The utilities serving the largest numbers of people on average were found on the Atlantic seaboard and in most départements with metropolitan areas (with the exception of Finistère, Meurthe-et-Moselle, Meuse, Loiret, Loir-et-Cher and Savoie).

The streamlined governance of services as pursued by the NOTRe Act will, by 2020, lead to a steep drop in the number of local authorities organizing the provision of services (from the current 120 authorities down to around 15), at the same time increasing the average size of utilities (with more than 46,000 people receiving services from a single water utility and 51,000 people from a single wastewater utility based on simulations by the Ministry for the Ecological and Inclusive Transition).

Average number of people served by a wastewater utility



Départements 75, 92, 93 and 94 come under a single umbrella département: 75.

Source: BIPE, based on June 2016 data from the performance monitoring system SISPEA

Estimated utility size by 2020

Simulation by the Ministry for the Ecological and Inclusive Transition

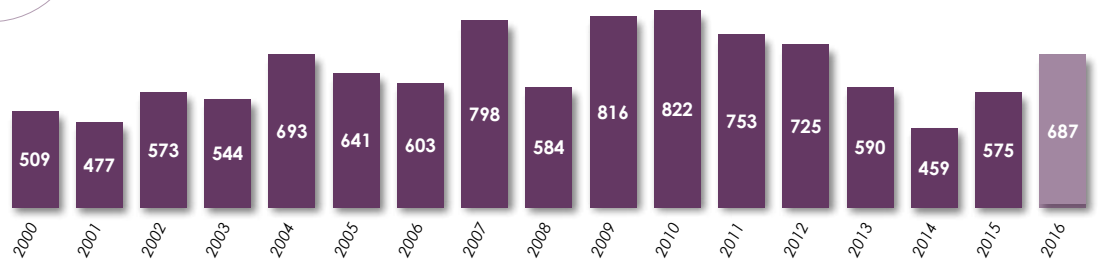
Water and wastewater contracts awarded by competitive procurement

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

- the Mazeaud Act of 1995, which specifies the nature of the information to be provided by private operators in the annual report on the activities of each utility;
- the so-called Grassroots Democracy Act ("Loi Démocratie de Proximité") of 2002, which makes provision for the participation of water users in the form of the Commissions Consultatives des Services Publics Locaux (CCSPL), bodies that must be consulted in the event of any plans to delegate services.
- the transposition into French Law of the 2016 EU Concessions Directive which promotes the principles of transparency in the award of contracts as laid down 25 years earlier under France's Sapin Act.

More than 600 contracts for the delegated management of services are put out to tender each year, on average. Year-to-year differences in numbers are mainly attributable to a cyclical effect. Nearly all contracts put out to tender now had already been tendered 11 years earlier. In over 97% of cases, the local authority is assisted by a consultancy. In recent times, there has been a rise in the number of competitive procurement procedures, which numbered 700 in 2016.

Trends in the number of competitive procurement procedures for delegated management contracts



Source: BIPE, based on the Sapin Act monitoring system, estimation 2016 BIPE data, based on water company survey data

In 2015, the most recent year observed by the biodiversity agency AFB at the time of the drafting of this report, more than half of procedures concerned small utilities (serving fewer than 4,000 people), while 1 in 10 were for utilities serving more than 20,000 people, accounting for two-thirds of the volumes billed for services for which contracts had been put out to tender.

In respect of the procurement procedures reviewed on behalf of the AFB in 2015, the organizing authority changed service provider in 1 in 7 cases.

Regardless of whether there has been a change in service provider, the share of the service price falling to the service provider has declined year on year overall: between 2008 and 2015, there was a 15-20% fall in the price of water services and an 8-30% fall in the price of wastewater services. This year-on-year fall in service prices had started to slow however: in 2016 the decrease in prices was only 14% and 8% for water and wastewater services respectively. Despite the need for a multi-criteria analysis (addressing aspects such as investments, technical, environmental and social performance and innovation), the price charged for the service is still the main criterion determining the choice of service provider (as was the case in 84% of all procurement procedures launched in 2015). The fall in price is not necessarily passed on to the consumer as in many cases it results in a rise in the share of the receipts going to the local authority, which allows the latter to finance investments.

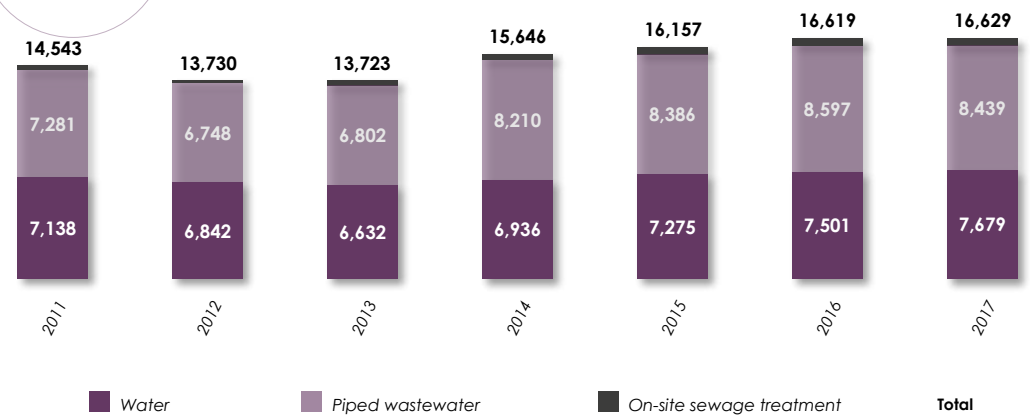
The average term of a delegated management contract was 10.5 years in 2015. Nearly all new contracts incorporate performance targets coupled with financial incentives.

More contracts handled by the water companies

The water companies are handling more and more contracts (delegated management contracts or public contracts), the total number of contracts rising from 13,700 in 2013 to more than 16,600 in 2017.

This trend indicates that water companies are increasingly involved in the delivery of services managed under direct management, either in part or all of service operations. At the same time, the growing number of delegated management contracts, particularly for the delivery of wastewater services, can be explained by increasingly stringent environmental requirements. By way of example, an order of 2015 introduced the principle of stormwater management upstream of the wastewater treatment process so as to reduce the amount of stormwater entering the sewer system, and laid down requirements governing the identification of micropollutants.

Trends in the number of contracts handled by the water companies



The number of contracts, regardless of the type of contract, is the number of all contracts awarded to water companies by local authorities

Source: BIPE, based on water company survey data

eco

nomics

Economics of services

A fall in billed volumes since 2006

A 10-year decline in the revenue base

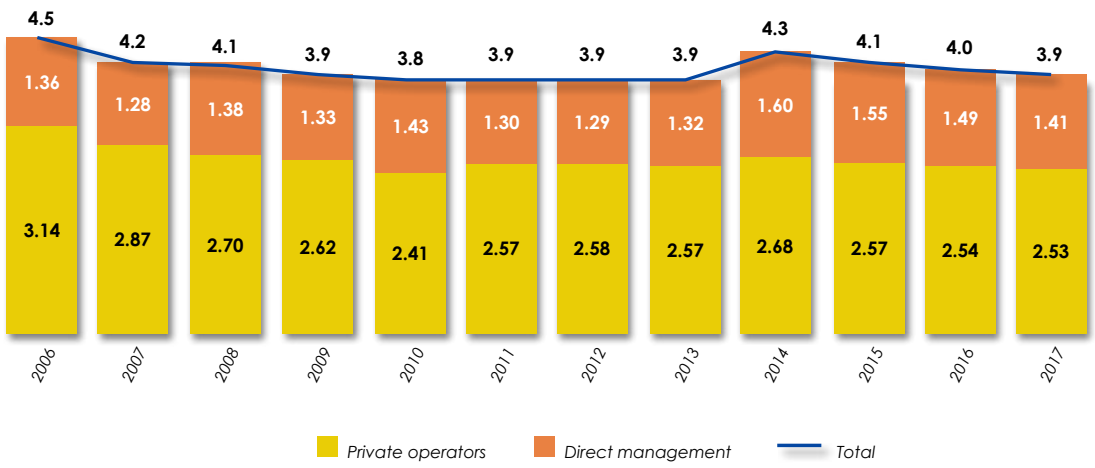
Each year, around 4 billion m³ of drinking water are billed to customers supplied by water from France's public network. Between 2006 and 2016, the amount of water billed fell by 11%, representing a significant fall of around 500 million m³.

The amount of water withdrawn in 2016 but not billed to consumers was 1.2 billion m³: part of this non-revenue water was used for service needs such as cleaning of service reservoirs and distribution system flushing, and part of it was lost through leakage on the distribution system.

In 2017 the water companies supplied 64% of all drinking water in France.

64% of drinking water was **distributed by the private companies** in 2017

Water: trends in volumes billed by type of operator
(billion m3)



Source: BIPE, based on water company survey data; break in series after 2014

Each year 4 billion m³ of water are billed to 24.2 million customers according to the performance monitoring system SISPEA (2015 data). Because many people live in multi-occupancy buildings equipped with communal water meters, the number of customers is smaller than the number of households served.

For the record, for 37% of the population of France (excluding Mayotte), their principal residence is an apartment. In 2015 the water companies provided services to 16.2 million customers - two-thirds of the total number of customers in France.

3 billion m³ of wastewater collected each year

The revenue base for wastewater billings was 3.1 billion m³ in 2017.

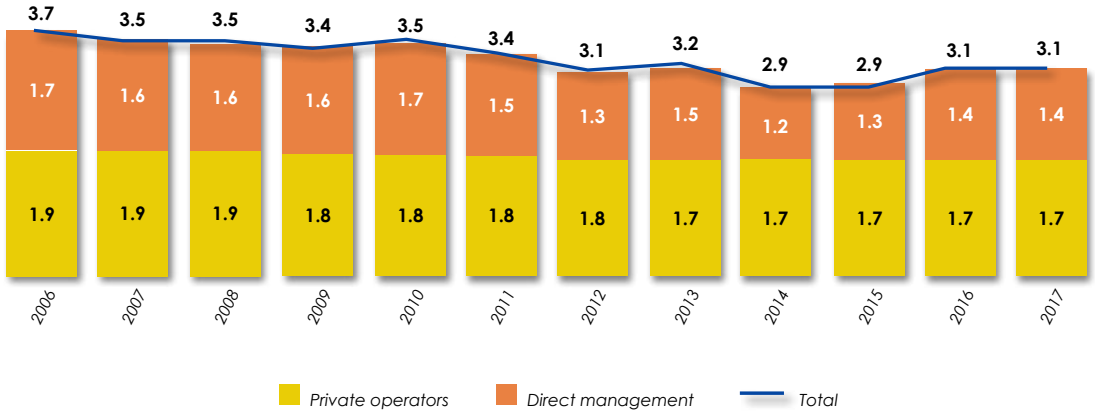
As in the case of water, the trend is toward falling volumes.

Each year the amount of wastewater collected is smaller than the amount of water supplied. The difference is attributable to those homes with on-site sewage treatment and to the number of industrial facilities that are connected to the water distribution system but have their own wastewater treatment systems.

In 2013 the water companies handled 53% of wastewater collected in France.

53% *of wastewater* ***collected by private companies*** *in 2017*

Piped wastewater: trends in volumes billed by type of operator
(billion m3)



Source: BIPE, based on water company survey data; break in series after 2014

A trend towards price convergence except among the smallest utilities

Given that water and wastewater services are local public services, it is the local authority responsible for organizing the provision of services that sets prices, and this by a vote of its deliberative assembly.

On average 23%[10] of the water bill is made up of taxes and fees that do not fall within the organizing authority's purview but within that of the State, the Agences de l'Eau and the waterway authority, Voies Navigables de France.

In France, unlike in other European countries, the price of the service covers all operating and investment costs associated with the entire urban water cycle, from the withdrawal of ground or surface water for treatment to its return to the receiving waters as treated effluent.

In recent years, the price of water services has helped to finance the biodiversity agency AFB, while another share of the receipts goes towards the State budget.

[10] *Source: BIPE, based on data from the performance monitoring system SISPEA (2016 data extracted on 09-21-2018. Calculation formula: VP.179/(VP.177 + VP.178 + VP. 179). Population representativeness: 40%*

A trend towards price convergence among water utilities

Service prices as measured on the one hand by the French statistics institute INSEE and on the other by the national performance monitoring system SISPEA differ slightly owing to different methods of calculation. In 2016, which provides the most recent basis for comparison, this price discrepancy was of the order of 8% (€3.71 (inc. VAT) per m³ according to INSEE as compared to €4.03 according to SISPEA).

Going by 2016 SISPEA data, which gives a granular picture of geographical disparities, price variations were larger among wastewater treatment utilities than among water utilities, and larger among very small utilities (most of them serving fewer than 1,000 people) in comparison with very large utilities (serving upwards of 100,000 people). **On average, in 2016 the total price, based on SISPEA data, was €4.03 (inc. VAT) per m³ for 120 m³ of water.**

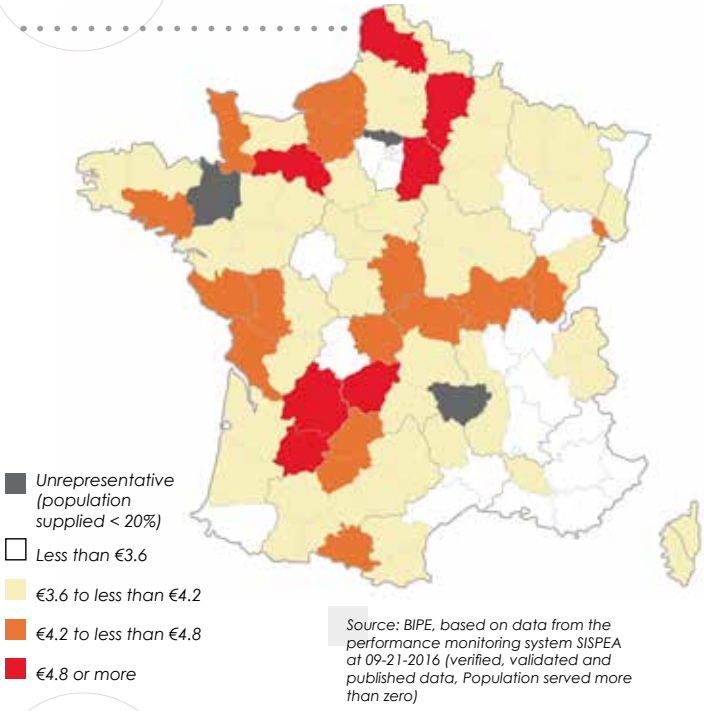
Among wastewater utilities, price dispersion increased between 2012 and 2016 (the average variation in price increasing from €0.78 to €0.85 per m3 among utilities covering two-thirds of the population) among very small and very large utilities alike. Among water utilities, prices tended to converge over the same period however (the average variation in price decreasing from €0.75 to €0.59 per m3 among utilities supplying 68% of the population). Although the spread of intermunicipal groupings has not caused prices to converge across the board as yet, there is a trend towards price convergence, which the changes introduced by the NOTRe Act will only amplify.

Greater price differentials among small utilities

There are big differences in price at the countrywide level: compared to an average price of €1.86 per m³ (inc. VAT) for 120 m3 of water in 2016 according to SISPEA data, in some areas, including French Guiana, Seine-et-Marne, Creuse, and Lot-et-Garonne, the price of water services is as high as €2.60 per m³ and in others like Ille-et-Vilaine, Pyrénées Atlantiques and Réunion as low as €1.20 per m³.

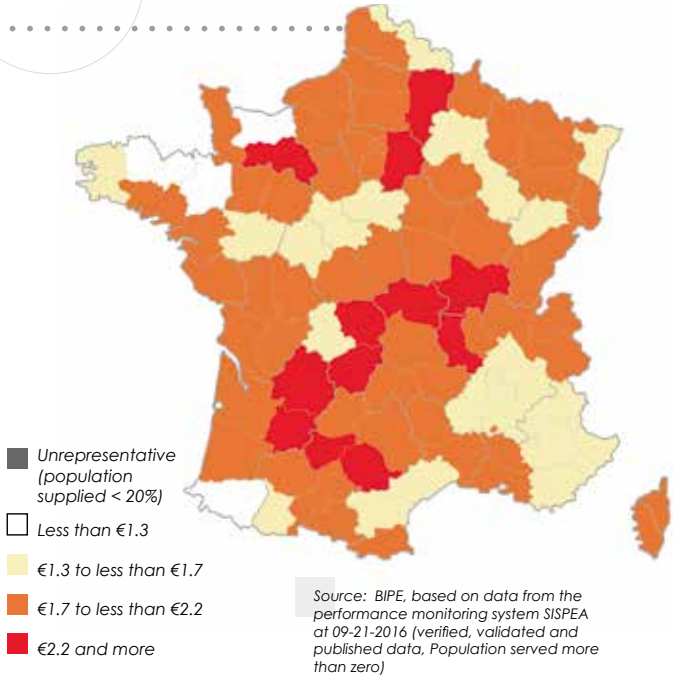
The same disparities can be found among wastewater services: compared to an average price of €2.03 per m³ (inc. VAT), in some areas including Pas-de-Calais and Lot-et-Garonne, the price of wastewater services is as high as €2.60 per m³ and in others like Alpes-de-Haute-Provence, Rhône and Réunion as low as €1.48 per m³.

Average prices (inc. VAT) of water services in 2016
(€ per m3 based on an annual consumption of 120 m3)



Source: BIPE, based on data from the performance monitoring system SISPEA at 09-21-2016 (verified, validated and published data, Population served more than zero)

Average prices (inc. VAT) of water supply services in 2016 (€ per m3 based on an annual consumption of 120 m3)



Source: BIPE, based on data from the performance monitoring system SISPEA at 09-21-2016 (verified, validated and published data, Population served more than zero)

Among water utilities, the price dispersion was €0.59 per m3 in 2016 with reference to 68% of the population, rising to €1.18 per m³ with reference to 95% of the population. The smaller the number of people served, **the larger the disparity in price.**

- For 68% of the population supplied by a very small utility (serving fewer than 1,000 people) prices vary between €1.34 and €2.57 per m³ - €0.62 above or below an average price of €1.95 per m³.

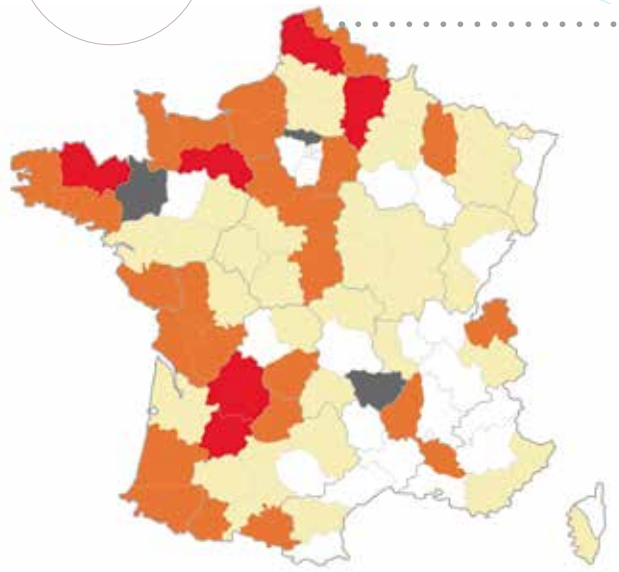
- Among the very large utilities (supplying more than 100,000 people), the range of prices is smaller as the average variation is only €0.36 with reference to 68% of the population, with prices ranging from €1.44 to €2.16 per m³ - €0.36 above or below an average price of €1.80 per m³.

Prices vary more among wastewater utilities than they do among water utilities: €0.80 per m³ in 2016 with reference to 68% of the population rising to €1.59 per m³ with reference to 95% of the population:

- For 68% of the population supplied by a very small utility, prices vary between €1.11 and €2.77 per m³ - €0.83 above or below an average price of €1.94 per m³.

- Among the very large utilities, for 68% of the population, prices vary between €1.23 and €2.42 per m³ - €0.6 above or below an average price of €1.83 per m³.

Average prices (inc. VAT) of piped wastewater services (€ per m³ based on an annual amount of 120m³)



Unrepresentative (population supplied < 20%)

Less than €1.3

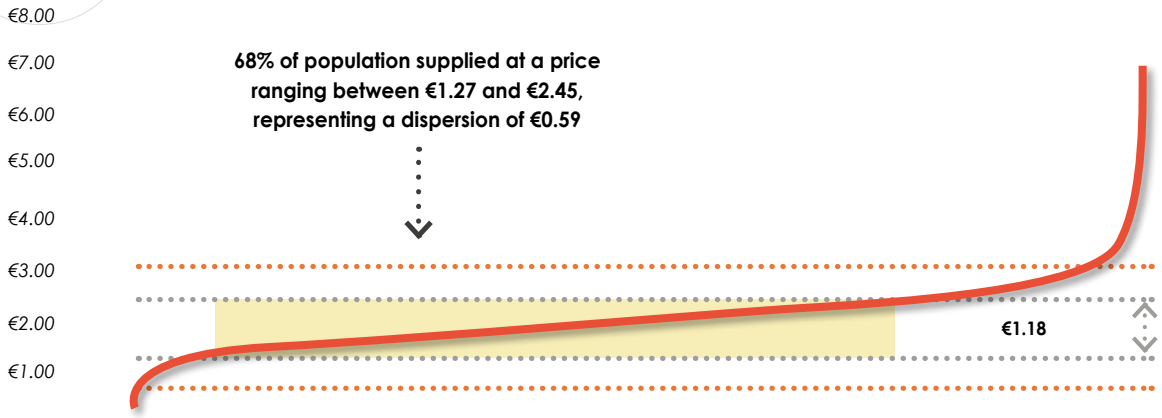
€1.3 to less than €1.7

€1.7 to less than €2.2

€2.2 and more

Source: BIPE, based on data from the performance monitoring system SISPEA at 09-21-2016 (verified, validated and published data, Population served more than zero)

Water: Range of service prices and price variations



Service price

Minimum/maximum price for 68% of the population

Minimum/maximum price for 95% of the population

Source: BIPE, based on data from the performance monitoring system SISPEA at 09-21-2016 (verified, validated and published data, Population served more than zero)

The factors determining the price of services

The factors behind disparities in service prices are multiple:

- **geographic factors:** the availability and origin of the supply source, topography (relief) 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, treatment levels, the condition and performance of the network (leakage), the percentage of the population connected to the sewer system, storm drainage systems and facilities for managing stormwater, quality and sensitivity of the receiving waters, etc.;
- **socio-economic factors:** average demand levels, seasonal differences in population numbers (due to tourism for example), presence of industry, levels of non-payment;
- **governance factors:** pricing systems, degree of compliance of facilities, social policy;
- **investment and replacement policy;**
- **quality of service:** customer services and information services, telephone hotlines, procedures for sending and paying bills, continuity of service;
- **applicable employment and tax regimes,** depending on the type of operator.

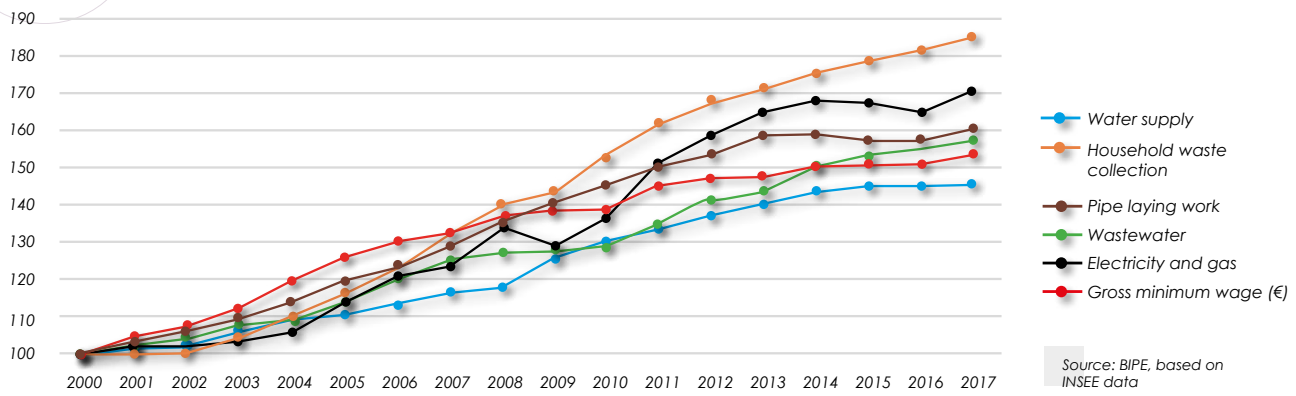
The rising price of wastewater services

Price rises in water and wastewater services were, for many years, smaller than those in other local services such as domestic energy supply and household waste collection.

Water supply service price rises have been small compared to those of other services: rising by 1.6% a year since 2010, the average price of water grew only slightly faster than the minimum wage (1.4% a year). At 2.9% a year, the rise in the price of wastewater services has been more pronounced since 2010 – higher than price rises in waste collection (1.7% a year) but lower than the growth in domestic energy prices (3.2%).

Comparative trends in service prices

prices (base 100 = 2010)



Source: BIPE, based on INSEE data

These unit price rises should be seen in the light of falling demand and are a consequence of the need to cover what are **mostly fixed costs in the sector, as well as changing tax rates** (rise in VAT on wastewater services from 5.5% to 10% since 2010) **and increasingly stringent regulations** (order of July 21, 2015 on the control of treated effluent discharges, the network damage prevention reform, the Warsmann Act which sets a cap on variations in water bills due to leaks, the Brottes Act prohibiting disconnections, and the new micropollutant removal requirements). These price rises, combined with lower levels of water demand **have resulted in an overall flattening of household spending in this area.**

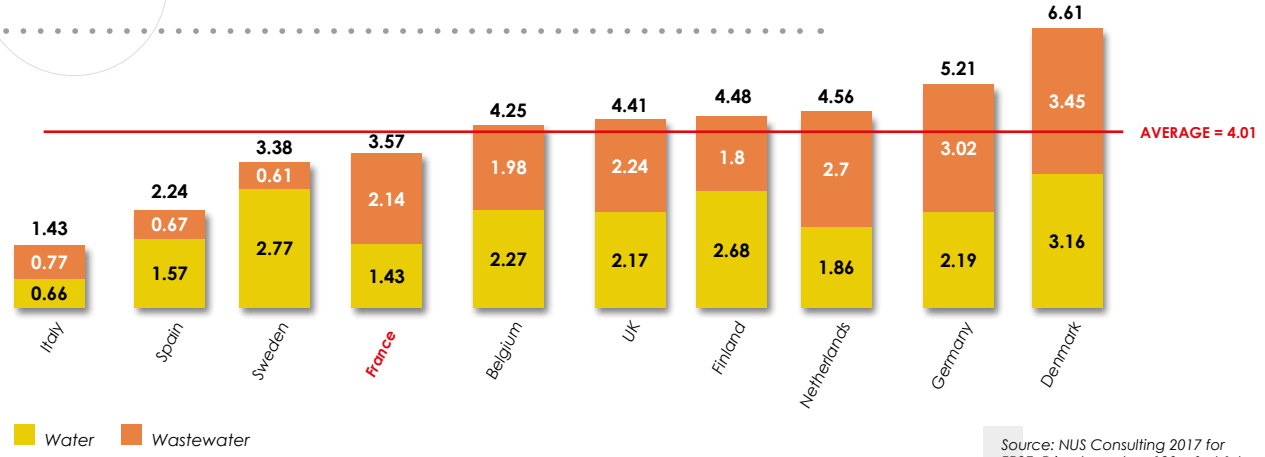
Big-city prices below the European average

Big-city dwellers in France enjoy water service prices that are 11% lower on average than those found in most European countries (€3.56 per m³ as compared to a European sample average of €4.01 per m³).

The French model is especially efficient given that nearly all operating and investment costs involved in the provision of public water and wastewater services are covered by the water bill, unlike in Italy and Spain, for example, where some of the service costs are financed by other means.

Big-city dwellers in France *enjoy water prices that are 11% lower than those in other European countries*

Average price of public water services in the five biggest cities of 10 European countries in 2017



Source: NUS Consulting 2017 for FP2E. Price based on 120 m³ at 1st January, including taxes and fees. Prices weighted by population except average for Europe

1 in 2 French people *say they are willing to pay more for their water*

Public expectations of a price rise

The vast majority of French people (82% according to the 2018 TNS Sofres survey for the Centre d'Information sur l'Eau) expect the price of water services to rise, particularly on account of worsening pollution of water resources and the associated increase in treatment costs, but also as a result of growing water scarcity.

1 in 2 French people say they are willing to pay more for their water: 54% for better quality water and 57% for better protection of water resources.

Given this moderate degree of willingness on the part of people to pay more for water, other ways of funding investments need to be found in addition to the water bill.

At the Assises de l'Eau, the FP2E mooted the idea of a sustainable mix of funding sources, with the burden shared by the different players, i.e. the State, the water and wastewater utilities and users.

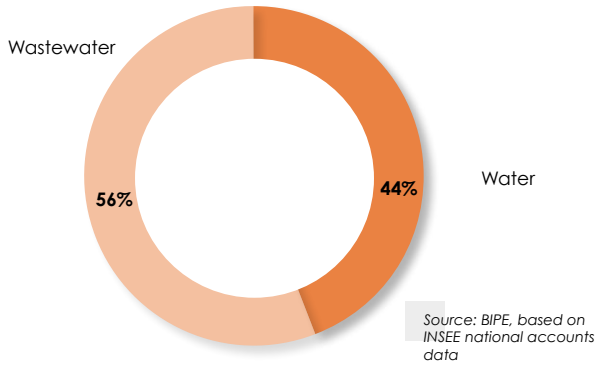
Household spending

A modest upward trend

Average household spending for public water services was €351 (inc. VAT) in 2017. Having flattened between 2010 and 2013, due to the decline of domestic water use as a share of the household budget, spending is increasing again at an average rate of 2% a year.
This new upward trend is the result of changes in wastewater pricing, with wastewater charges now accounting for half the amount of the water bill.

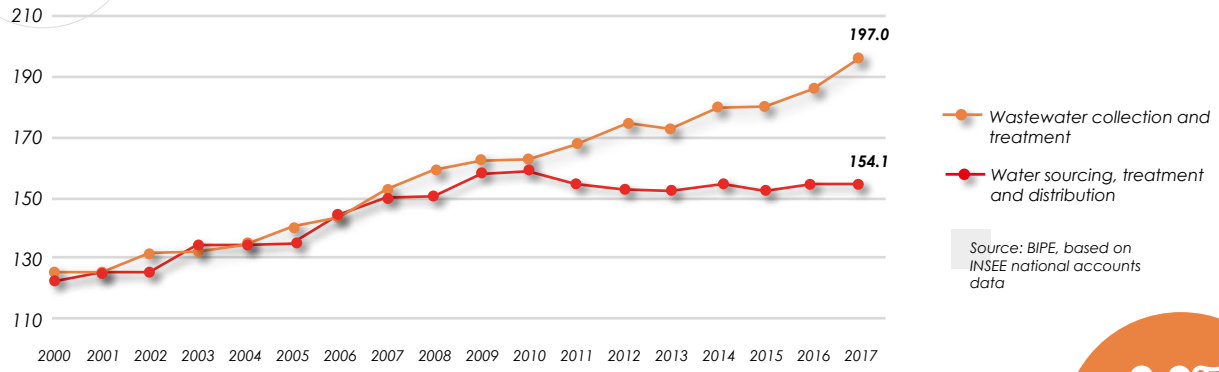
The rise in the price of wastewater services can be explained by two factors: VAT rises in 2012 and 2014 (from 5.5% to 7% and from 7% to 10% respectively) and the inclusion in the wastewater bill of the growing cost of upgrading wastewater treatment plants to the applicable standards.

Breakdown in household actual final consumption in terms of water and wastewater services in 2017
(current €)



Source: BIPE, based on INSEE national accounts data

Trends in household actual final consumption
(current €)



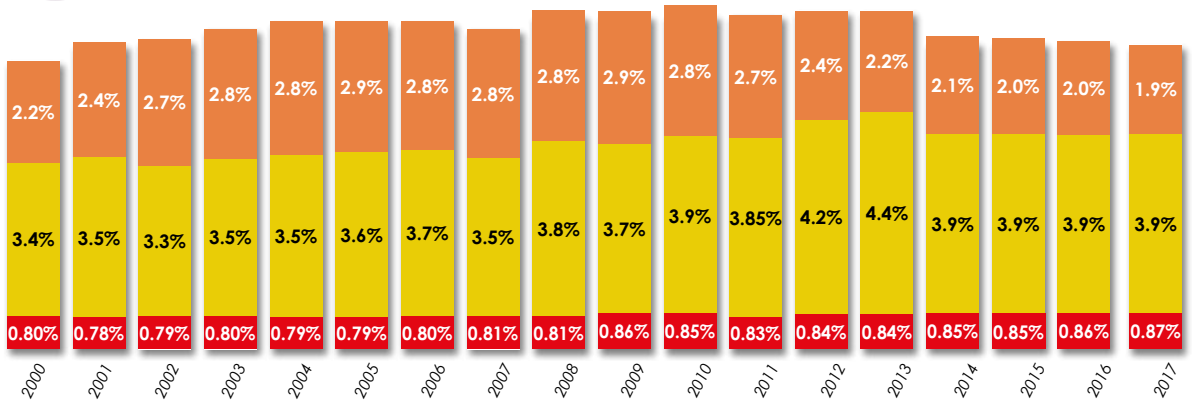
Source: BIPE, based on INSEE national accounts data

Water and wastewater services: less than 1% of the household budget

0.9% ***of the household budget*** *spent on public water services*

In 2017 French households spent on average 0.9% of their budget (€40,365) on public water services. As a share of the household budget, water has barely changed in recent years, particularly when set against energy which tends to vary considerably from year to year, and telecommunications which, after increasing rapidly in the 2000s, has fallen in recent years.

Share of the household budget spent on water and wastewater services



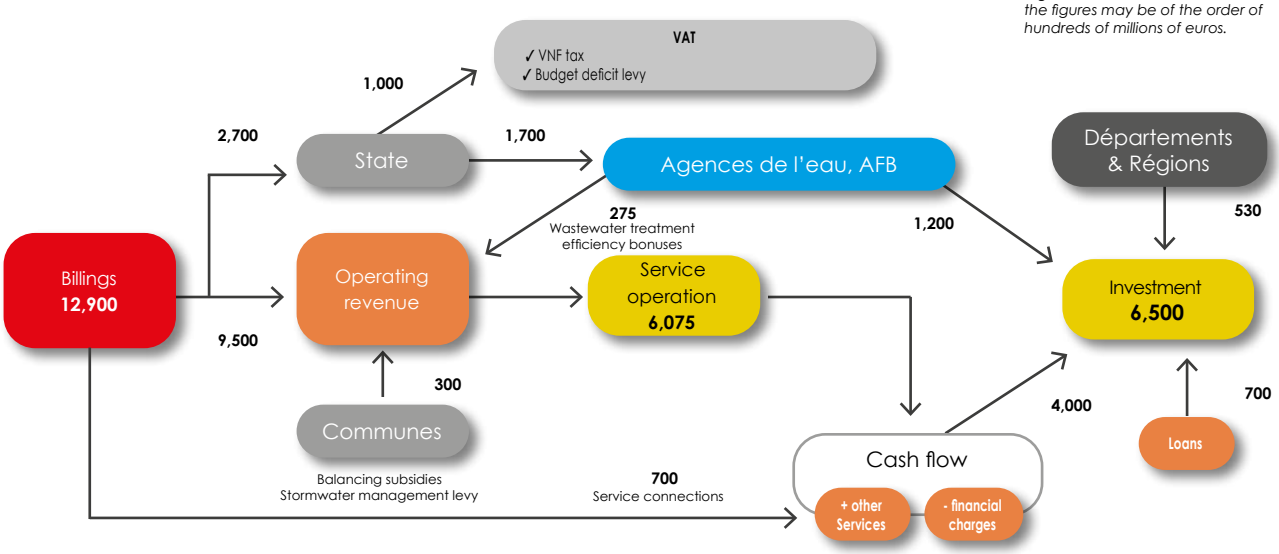
Source: BIPE, based on INSEE national accounts data

Financing of services

Public accounting rules with respect to water and wastewater services dictate that receipts and operating & investment costs should balance (with some strictly regulated exceptions when it comes to utilities serving fewer than 3,000 people). The prices charged by utilities are thus affected by the level of investment determined for each service and the subsidy policies adopted by the Agences de l'Eau. The process of balancing financial flows as illustrated below allows for an annual level of debt of €700 million.

Financial flows with respect to water and wastewater service operating and investment costs (€ million)

Source: BIPE, based on CGEDD data (2009-2012 averages). The CGEDD urges caution as uncertainties in the figures may be of the order of hundreds of millions of euros.



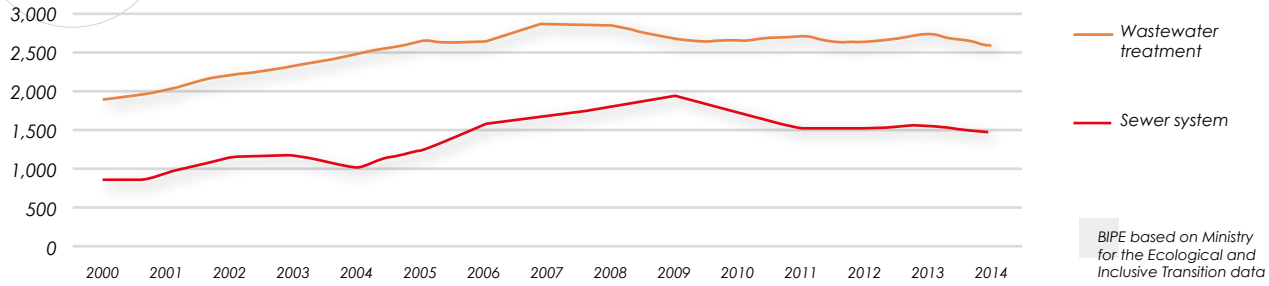
A decade of sluggish investment

The (incomplete) data available on capital investment spending show that this has remained sluggish over the past 10 years. Public procurement in the water sector bottomed in 2014 and spending levels have rallied only slightly since then.

By way of example, capital expenditure in the wastewater sector rose substantially in the 2000s only to shrink by 20% between 2008 and 2014 - a fall in investment of €560 million. This decline is partly attributable to the completion of the bulk of the work undertaken to upgrade wastewater treatment plants to the applicable standards and replace lead service connections.

[12] *Sources: Caisse des Dépôts/AdCF surveys and the CGEDD report: "Eau potable et assainissement : à quel prix ?"*

Wastewater : trends in investment spending
(€million, current)



BIPE based on Ministry for the Ecological and Inclusive Transition data

At the same time, there would seem to have been no movement in the country's asset management policy since 2014. Knowledge of the assets is still weak (with an average score of around 50 out of 120 for the index measuring knowledge and management of infrastructure) and replacement rates have remained low (0.29 on average).

The environmental and sustainable development advisory body CGEDD has also established that weak investment, particularly in terms of the replacement of assets, has enabled some organizing authorities to keep water prices down, to the detriment of an assets management strategy worthy of that name.

The need for more investment in the replacement of assets

Infrastructure investment is the remit of local authorities, which can commission private companies to do the work under public contracts or concession contracts. **The Assises de l'Eau conference of 2018 and 2019 flagged up the need for greater efforts to replace assets.**

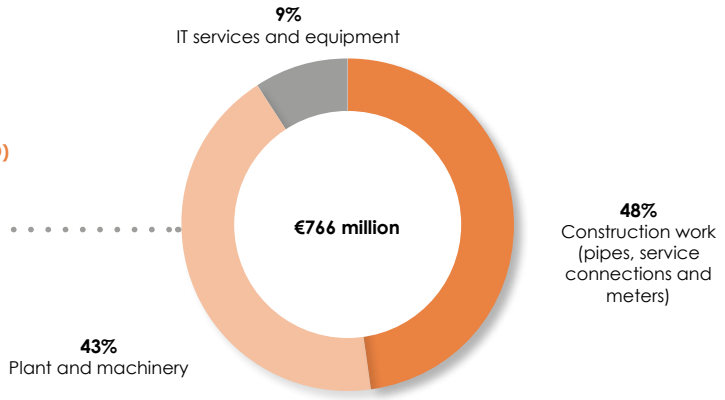
Investment and replacement needs will increase significantly and should translate into prices that reflect the need. Studies[12] conducted over the period 2009-2013, found that the **investment deficit in terms of the replacement of water mains and service connections topped the €1 billion mark on average (13% of total receipts).**

With on average 0.53% of the distribution system replaced each year since 2010, it will take 190 years to replace all of the mains. The true picture is more complex however as some parts of the system - the 41% of water mains that are more than 40 years old, for example - have never been replaced.

There is also a need for more investment to allow utilities to **meet public health, climate and environmental challenges,** such as tackling micropollutants, expanding wastewater reuse and anaerobic digestion, and modernizing first-generation wastewater treatment plants.

[12] *UIE « les enjeux de l'eau »*

Investment by water companies in 2017 under delegated management contracts (excluding R&D)

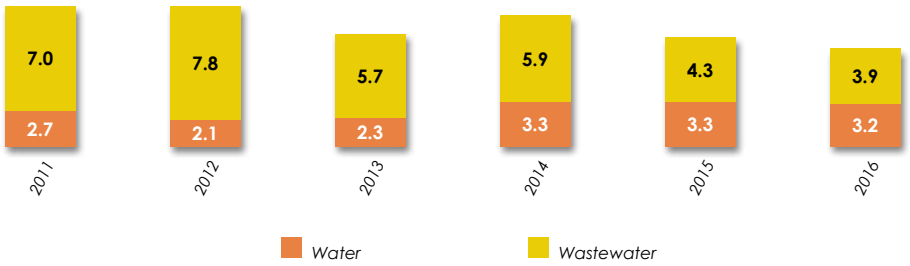


Source: BIPE, based on water company survey data

Scope for maneuver on debt

With debt repayment periods being short among water utilities and having shrunk significantly among wastewater utilities, there is real potential in terms of the borrowing possibilities available to the authorities organizing the provision of services.

Debt repayment periods (in years)



Source: BIPE, based on 2016 data from the performance monitoring system SISPEA extracted on 09-21-2018 (verified, validated and published data). Caution: population representativeness is less than 50% (46% for wastewater services and 43% for water services)

However the representativeness of this indicator rarely exceeds 41% of the population over the period concerned and both absolute values and trends should be viewed with caution.

Assuming the figures to be correct, the significant fall in wastewater utility debt levels may reflect smaller investment needs (further to the efforts made to upgrade treatment plants) but also the lower cost of servicing the debt due for example, to a progressive rise in prices or to the task of replacing infrastructure being transferred in part to the private operator.

The trends in debt repayment periods are similar among all types of authorities responsible for organizing the provision of services, be they Communes, Syndicats or EPCIs with tax-raising powers. The very large utilities (serving more than 100,000 people) have shorter debt repayment periods than those found among their smaller counterparts (serving between 50,000 and 100,000 people), these being around 1 to 2 years in the case of water utilities and 3 to 4 years in the case of wastewater utilities.

Regarding local authority debt repayment periods in recent years, no significant difference has been found between delegated utilities and utilities under direct management. Mirroring the general trend, spending on the replacement of network infrastructure in the hands of private operators has fallen by 5% in recent years, dropping to €500 million in 2017 (excluding debt servicing), down from €526 million in 2013. Whereas debt repayment periods are similar overall, a study[14] has found that debt levels per consumer are lower among delegated utilities in comparison with utilities under direct management (a differential of €150 per person, according to 2009 data, assuming immediate repayment of the debt).

[14] *Institut d'Administration des Entreprises, "Public Versus Private Management in Water Public Services: Taking Stock, Looking Ahead"*

A redeployment of investment aid

Since they were established in 1964, the six river basin water agencies, the Agences de l'Eau, have been tasked with preparing multi-year action plans for implementing national water policy in each of the country's main river basins. These programs are financed through a fee paid by consumers (households and businesses) in their water bill. The fees collected by the Agences for the withdrawal of water, water pollution and the modernization of water and wastewater networks are redistributed to local authorities to pay for capital investment.

Under the applicable legislation, Agence de l'Eau receipts are capped with the stated aim of reducing pressure on household budgets. This has had the effect of limiting increases in the subsidies paid to local authorities for investment purposes. Under the10th program (2013-2018), receipts were capped at €13.8 billion (excluding the portion of the fee going to ONEMA/AFB), i.e. €2.3 billion annually, and the **11th program (2019-2024) will see receipts capped at €12.6 billion, or €2.1 billion annually, down 9% compared to levels under the previous program.**

Moreover, part of the proceeds (12% in 2018) are used to fund the biodiversity agency, AFB, and the hunting agency, Office National de la Chasse. Since 2014 the water boards have been required to contribute part of their working capital (8% of Agence de l'Eau receipts in 2018) to the State budget - a departure from the "water pays for water" principle which had hitherto been the basis for financing water policy.

In another development, the government's aim since the 2018 Assises de l'Eau, has been to reallocate to rural or deprived areas, €2 billion of subsidies earmarked under the 11th program for the replacement of network infrastructure. At the same time, measures should be introduced to encourage local authorities to make up for past underinvestment in the water sector – measures such as low-interest, long-term loans from the Caisse des Dépôts (the institution dedicated to local authority development), the "contrats de progrès", financial support for the preparation of asset inventories and funding for stormwater management.

Financial flows between water sector players

In France, nearly all of the funding for the operation of water and wastewater services and the investments needed to operate them comes from the water bill. This revenue, provided by households, businesses and the non-market sector, is then split among several different institutions. Of a total €13.3 billion (ex VAT) billed in 2016:

- **the water and wastewater utilities received** €3.6 billion in the case of utilities operating under the direct management model and €5.2 billion in the case of privately-operated utilities, of which €1.4 billion was passed on to the authorities organizing the provision of services for investment purposes;
- **the Agences de l'Eau** collected €2.3 billion in withdrawal and pollution fees. These fees are determined independently in each of the six main river basins within a framework set by Parliament;
- **the State** collected VAT, and the waterway authority Voies Navigables de France collected a waterways tax, the two taxes bringing in €836 million between them.

At the same time, local authorities, as the owners of the infrastructure, received various subsidies for the purposes of investment. In 2016 these were as follows:

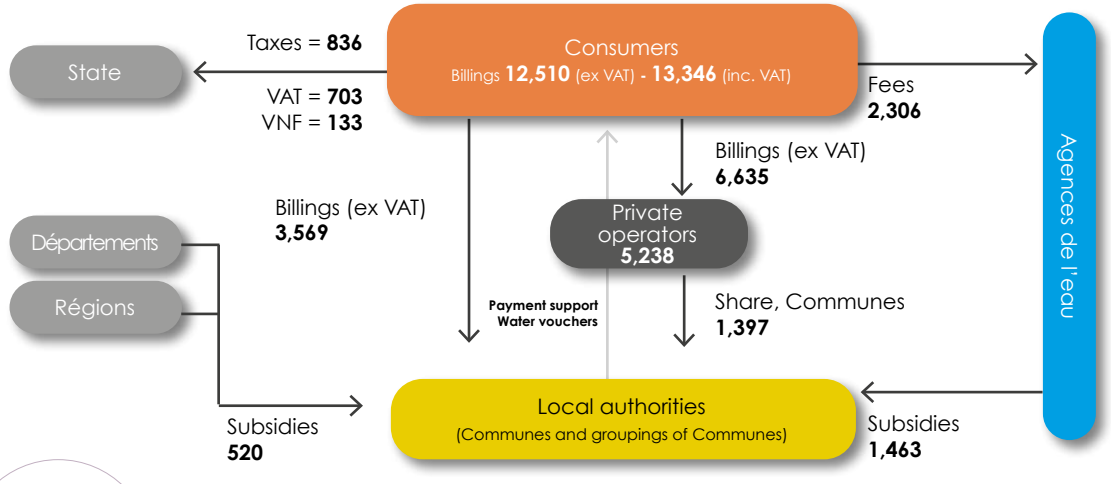
- €1.5 billion from the Agences de l'Eau. Most of this amount is intended for investment in the sewage collection and treatment facilities and the payment of treatment efficiency "bonuses" to the infrastructure owners. Some of the money also goes towards source water protection and water supply facilities.

  Most of the subsidy commitments from the Agences de l'Eau are for the urban water cycle. (These account for 67% of their budget excluding operating costs and the budgetary contributions under the 10th program, 2013-2018.) The trend is downwards however as the urban water cycle had received 80% of the subsidy commitments under the previous programmer (2007-2012). That amounts to €274 million less a year from one cycle to the next on average as more money goes to support the natural water cycle and actions such as restoring the quality of receiving waters, improving the quantitative management of resources and tackling agricultural and non-agricultural pollution.
- Some €500 million from the Départements and the Régions. These authorities contribute through the "Contrats Plan Etat-Région" and through major capital works projects (dams and other large-scale facilities). These sources of funding are those about which the least is known. The figures are therefore based on estimates and should accordingly be viewed with caution.

- The Régions have access to EU funds through the European Regional Development Fund (FEDER). These are intended for climate-change related needs such as flood and coastal defenses. The Assises de l'Eau highlighted the underuse of this source of funding in France.

Financial flows in both services in France in 2016

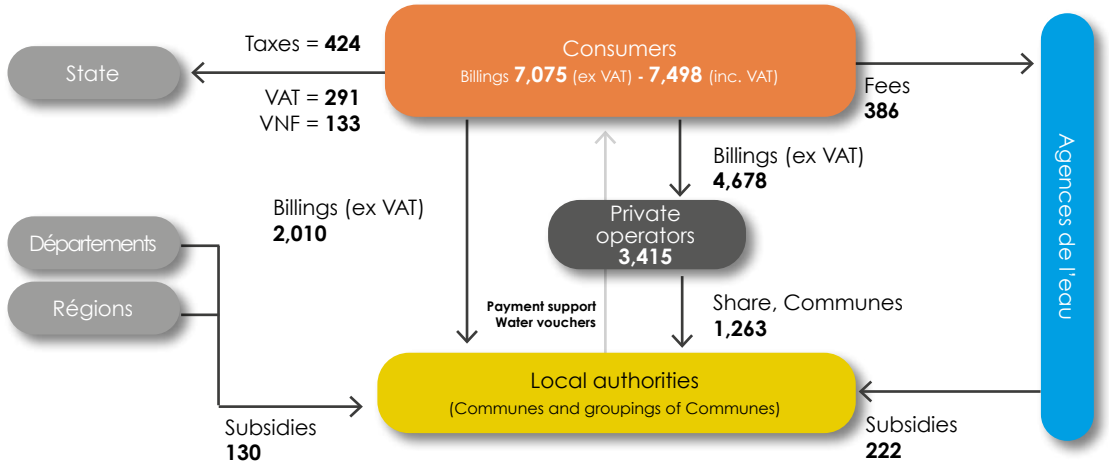
(Water and wastewater € million)



Source: BIPE, based on data from the budgetary annexes to the French Finance Bill, VNF annual reports, SDAGE, water company survey findings and INSEE

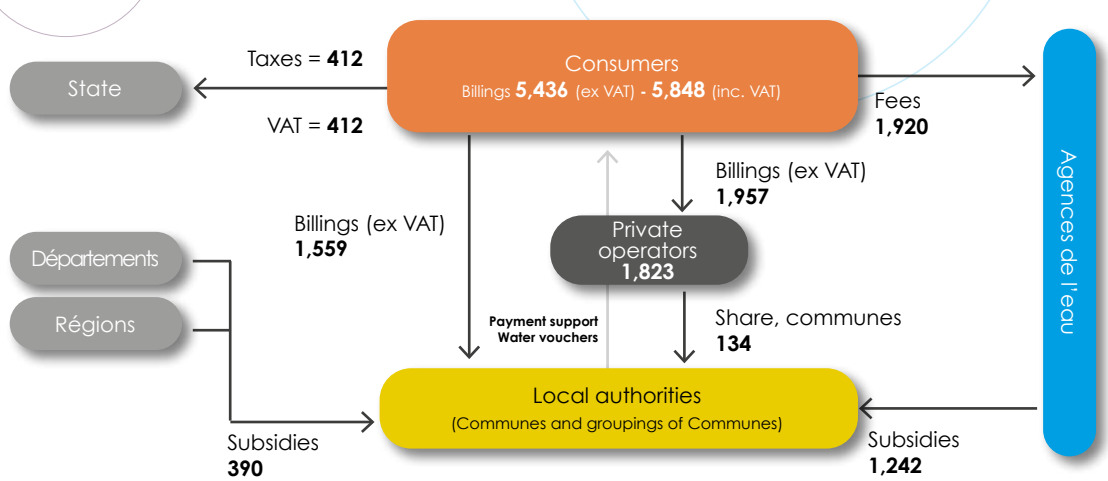
Financial flows in water services in France in 2016

(€ million)



Source: BIPE, based on data from the budgetary annexes to the French Finance Bill, VNF annual reports, SDAGE, water company survey findings and INSEE

Financial flows in wastewater services in France in 2016



Source: BIPE, based on data from the budgetary annexes to the French Finance Bill, VNF annual reports, SDAGE, water company survey findings and INSEE data

Higher levels of non-payment, less uptake of payment support

Under the Brottes Act passed in 2013, it is now prohibited to disconnect the water supply in a person's primary home for non-payment of their water bill. This ban no longer applies only to the most vulnerable families. Unlike gas and electricity disconnections which are only prohibited during the winter months, the ban applies throughout the year.

Against this backdrop, the percentage of unpaid bills has risen sharply since 2015. In the utilities managed by the water companies these account for 1.9% of all bills issued in 2017, a much larger proportion than in 2013. The non-payment of bills also pushes up management costs in terms of functions such as customer relations and debt collection.

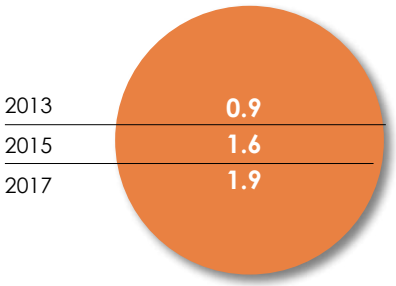
The higher levels of non-payment will lead to price rises to offset the extra expense incurred.

At the same time, far fewer applications were made for help with water bills. Applications to the Fonds de Solidarité Logement (FSL), the organization which helps households struggling to pay their housing expenses, went down by 18,000 between 2013 and 2017. The result was a fall in debt forgiveness to the tune of nearly €455,000. This recent trend would seem to suggest **that some consumers in difficulty are no longer using the support mechanisms available to help them pay their bills reflecting the emergence of a certain lack of civic-mindedness in this respect.**

Trends in percentage of unpaid bills for water supply services

(amount of year N-1 unpaid bills as a percentage of revenue)

Percentage of unpaid bills for services run by the water companies



Source: BIPE, based on water company survey data

The rise in unpaid bills would suggest the need for price rises to cover the growing costs incurred, with each utility having to determine appropriate measures to recover debt.
Non-payment for wastewater services also rose in 2017 for services operated by the water companies.

In another trend, the water use that was not billed to consumers, in accordance with the provisions of the Warsmann Act of 2012 which sets a cap on variations in water bills due to leaks after the meter, amounted to a shortfall of €86 million for water utilities in 2017, amounting to 2.75% of their total revenues.

Possibilities for financing water services

The future of the financing model for water and wastewater services has been a burning issue for many years now. In response to the 2018 rise in Agence de l'Eau contributions to the State budget (which increased by more than €160 million) and to the budgets of other public bodies (AFB, ONCFS), there have been calls for the principle of "water pays for water" to be respected.

Given that the pricing system is for the most part based on falling – or at best, flat - volumes, in keeping with the water pays for water principle, it has been necessary to cover fixed costs (including investment spending) by increasing unit prices.

Indeed, further price rises are likely for a number reasons: the requirement to step up drinking water treatment processes to address micropollutants and the new Drinking Water Directive parameters; the need to improve wastewater treatment to reduce the environmental impacts of treated effluent discharges; the adaptation measures required to cope with growing flood risk; the necessary reinvestment in infrastructure; and the increase in unpaid bills and the associated debt recovery procedures.

These prospects are leading experts and stakeholders to examine the social acceptability of further price rises as well as issues of social equity in the pricing structure and continued access to water for the poorest people in society.

Various new ways of balancing budgets have been explored and put up for discussion, including:

- the introduction of **price floors**;
- **lower VAT** on wastewater services (a return to the 5.5% rate) so as to unleash possibilities in terms of the management of assets;
- greater use of the **EU funding** possibilities accessible to the Agences de l'Eau and the Régions;
- the introduction of **special charges** or taxes to address stormwater and flooding issues;
- the introduction of a **special charge payable by the industrial and tertiary** sectors as polluters generating bigger and more costly requirements in terms of treatment processes;
- pooling of resources, investment costs and responsibilities, in particular through the expansion of intermunicipal groupings and the provisions of the NOTRe Act, while at the same time fostering **greater solidarity between urban and rural areas**;
- the creation of **a benchmark for performance** in the provision of services, facilitating **exhaustive and regular assessment** and, as a result, performance improvements;
- the gradual **removal of the ceiling on the fixed portion of the bill in the event of the introduction of targeted social tariffs**.

Moreover, a number of possibilities have been explored for reforming the pollution fee paid to the Agences de l'Eau, given the continuing and undisputed relevance of the polluter pays principle:

- extending the fee for domestic pollution, until now borne by consumers, to treatment plants in proportion to the levels of pollutants contained in treated effluent discharges;
- increasing the fee for non-point source pollution, based on fertilizer and pesticide sales;
- introducing a charge for pressures exerted on biodiversity, the exact nature of which is still to be determined.

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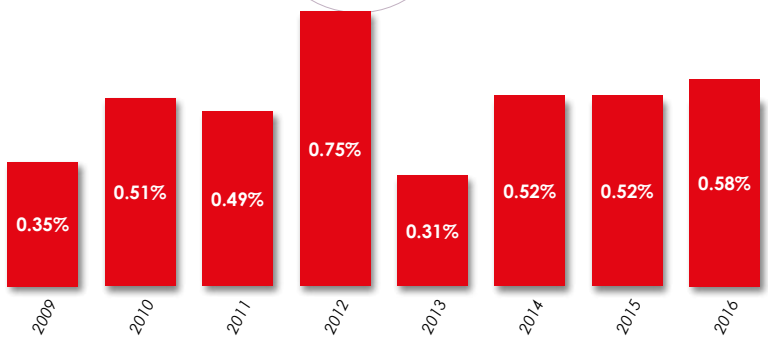
Performance of water and wastewater services

Economic and environmental performance

Replacement and maintenance of water distribution system infrastructure

Water mains have been replaced at a rate of 0.5% since 2009. **This rate would appear to be insufficient given that there is general recognition of the need for a responsible asset management policy** as well as better protection of water resources and the still critical challenge of sanitary quality.

Average water main replacement rates



Source: BIPE, based on data from the performance monitoring system SISPEA, data available on 09-21-2018 (verified, validated and published data) Population representativeness higher than 60% since 2013 (65% in 2016) and higher than 50% in 2011 and 2012

There is no apparent link between utility size and mains replacement rates: utilities providing services to more than 100,000 people report replacement rates similar to those of utilities serving between 10,000 and 50,000 people (respectively 0.64% and 0.60% in 2016) and higher than those covering between 50,000 and 100,000 people (0.48%). Utilities serving between 3,500 and 10,000 people posted replacement rates that were far higher than others in 2015 (0.70% as compared to a maximum of 0.53% in very large utilities) and similar to those of utilities serving between 50,000 and 100,000 people in 2016 (0.51% and 0.48% respectively).

However, when it comes to small utilities (providing services to fewer than 3,500 people), the low representativeness of the data means it is not possible to assess their asset management policies.

The government's aim, as articulated in the wake of the 2018 Assises de l'Eau, is to enable 1% of pipes to be replaced each year through measures directed at local authorities, such as support to improve knowledge of the networks and easier access to long-term loans (Banque des Territoires Aqua Prêt scheme and Caisse des Dépôts loans, for example).

Knowledge of the infrastructure

The prerequisite to any multi-year investment scheduling policy is a good knowledge of the distribution system and service connections. The State had moreover instructed local authorities to prepare a detailed description of their distribution systems by the end of 2013. **There is now a far better knowledge of water distribution system assets**, partly due to the introduction of disincentives: under the so-called leakage order, withdrawal fees were increased in 2015 for a failure to prepare a description of the distribution system and in 2017 for a failure to produce a leakage reduction action plan.

The big utilities generally have a better knowledge of their distribution system assets as compared to their smaller counterparts (20 to 50 percentage point differences between the two in 2015 and 2016 respectively), although the low representativeness of the small-utility data hampers accuracy in assessing these levels. This can be explained by the fact that the larger utilities are more able to draw on the requisite human and material resources needed to manage the facilities efficiently.

Trends in network asset knowledge and management indices

Utilities operated by the water companies

	Water	Wastewater
2013	71	45
2015	86	48
2016	-	-
2017	90	51

Source: BIPE, based on water company survey data

All utilities

	Water	Wastewater
2013	58	48
2015	92	59
2016	74	54
2017	-	-

Source: BIPE, based on 2016 data from the performance monitoring system SISPEA extracted on 09-21-2018; weighted averages for volume produced + volume imported (verified, validated and published data).
74% population representativeness in 2016 with respect to water utilities and 69% with respect to wastewater utilities

The public water distribution system in France is an estimated **906,000 kilometers of mains conveying drinking water from treatment plants to customer meters.**

The physical condition of the mains will affect the sanitary quality of the water supplied as well as 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 the distribution system. Until the early 1960s most of the pipes used in distribution systems were made of fragile and friable materials like cast iron and steel.

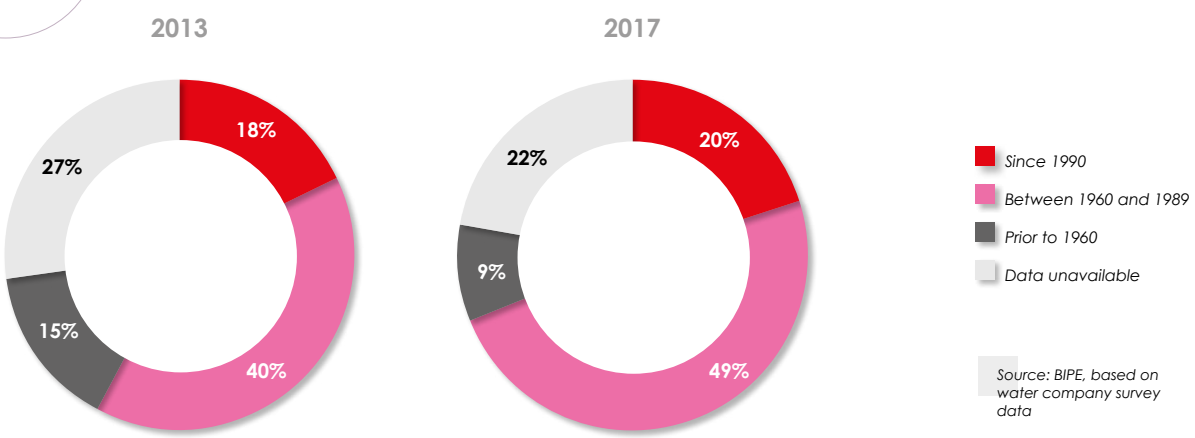
More than half of the distribution systems in France (511,000 km of pipes, or 57% of the total length of pipework) **are managed by the water companies**. In 2017, data was available on the date of installation of nearly 80% of this network, a five percentage point improvement since 2013.

In the utilities managed by the water companies:

- By 2017 those mains laid prior to 1960 accounted for only a small portion (9%) of the total length of distribution system and have been identified as a priority for replacement.
- Other priority sections of network are asbestos pipes which accounted for less than 12,000 km of water mains, or 2.3% of the distribution system in 2017.
- 1 in 5 km of mains are less than 27 years in age.
- 51% of the network is composed of PVC pipes, most of which were laid after 1980.

According to the Ministry of Health, public PVC pipes installed prior to 1980 may be the cause of excessive levels of vinyl chloride monomer (VCM) in tap water, particularly in rural areas located at the end of the distribution system. This would be due to longer water residence times in the distribution system compared to those found in cities. According to the Ministry, the situation is not the same everywhere and the most sustainable way of protecting sanitary quality is to replace PVC pipes installed prior to 1980 in cases where VCM limits are exceeded.

Pipe installation dates in utilities run by the water companies (percentage length)



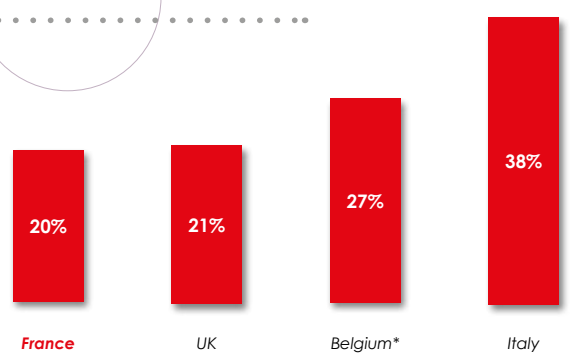
Source: BIPE, based on water company survey data

Multiple indicators to measure network performance

Efficiency in the management of water distribution and sewer systems can be assessed by a range of indicators,

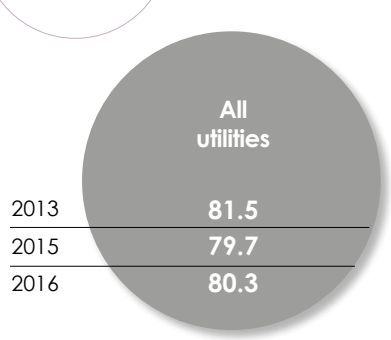
- **The water distribution system efficiency indicator** measures the relationship between the volume of water entering the distribution system and the volume of water used. Although efficiency levels improved during the 2000s, in recent years they have been in the 80% range, reflecting a constant leakage rate of around 20% since 2012. The asset management process has therefore failed to have any significant impact on leakage during this period. **That said, the leakage rate is not disproportionately high.**

Leakage rates in Europe



* *Includes water used by the fire services and for emergency preparedness*

Percentage trends in water distribution system efficiency



Source: BIPE, based on 2016 data from the performance monitoring system SISPEA extracted on 09-21-2018; weighted averages for volume produced + volume imported (verified, validated and published data). 64% population representativeness in 2016 across all utilities

The larger the population served the greater the efficiency level. This indicator would appear to be meaningful in the case of population representativeness levels of above 55%, irrespective of the size of the utility (with the exception of the very small utilities supplying fewer than 1,000 people). With efficiency levels of below 70%, average performances of systems supplying fewer than 50,000 people would appear to be inadequate.

Water distribution system efficiency by utility size

Source: BIPE, based on 2016 data from the performance monitoring system SISPEA extracted on 09-21-2018; weighted averages for volume produced + volume imported (verified, validated and published data). 69% population representativeness in 2016 across all utilities

Per kilometer leakage

Per kilometer leakage can be used to obtain a more detailed understanding of distribution system efficiency. This is measured by the linear loss index, which is the ratio of the volume of losses to length of mains. Since 2009 this indicator has fluctuated around an average value of 3 m³ per km of network per day – a good level of performance for medium-size distribution systems (with between 25 and 50 customers per km of distribution system).

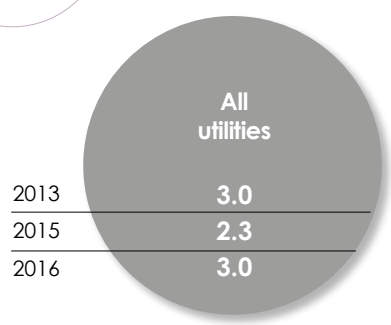
Indicator values should evidently be interpreted differently according to the type of area served (urban or rural):

- **In rural distribution systems** where the number of customers per kilometer of mains is small, a good level of performance is an index of below 1.5 (2.5 for an acceptable level of performance).
- **In urban distribution systems** where the number of customers per kilometer of mains is much higher, a good level of performance is an index of below 7 (between 7 and 10 for an acceptable level of performance).

Per kilometer losses in 2016 appear to be relatively higher among small utilities compared to those among very large ones.

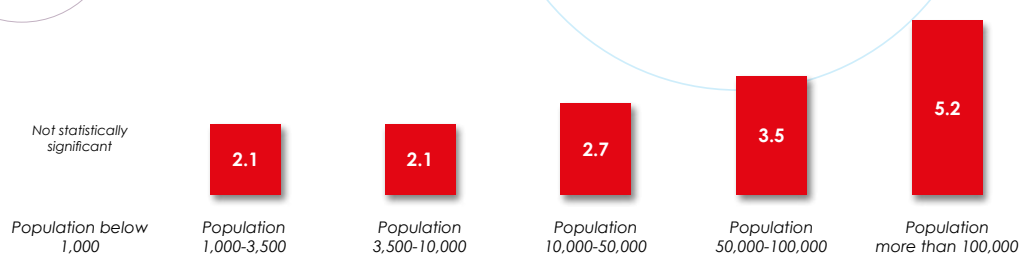
Trends in linear loss index

(m³ per km per day)



Source: BIPE, based on 2016 data from the performance monitoring system SISPEA extracted on 09-21-2018; weighted averages for mains pipes not including service connections (verified, validated and published data). 67% population representativeness in 2016 across all utilities

Linear loss index in 2016 by size of population supplied (m³ per km per day)



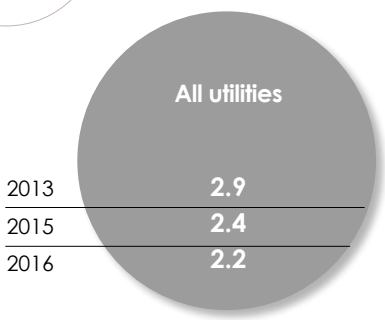
Source: BIPE, based on 2016 data from the performance monitoring system SISPEA extracted on 09-21-2018; weighted averages for volume produced + volume imported (verified, validated and published data). 67% population representativeness in 2016 across all utilities

Continuity of service

How efficiently a water distribution system is managed is also assessed based on continuity of service. This is determined by an indicator measuring the number of water supply cuts linked to service failures in cases where customers have had no advance warning. **Unplanned service interruptions are extremely rare** and among delegated utilities have fluctuated between 2.8 to 3.9 per 1,000 customers (i.e. by around 0.3%) since 2009. These variations may be linked to factors such as the condition of the distribution system, weather and changing numbers of customers.

When it comes to all utilities combined, the indicator should be interpreted with caution given the low representativeness of the data (43% of the population covered in 2016).

Trends in unplanned supply cuts index (number of cuts per 1,000 customers)

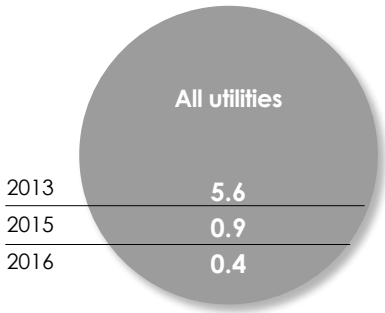


Source: BIPE, based on 2016 data from the performance monitoring system SISPEA extracted on 09-21-2018; weighted averages for volume produced + volume imported (verified, validated and published data). Caution: 43% population representativeness in 2016

Frequency of emergency sewer maintenance operations

It is considered that a well-managed sewer system should require little emergency work in any given year. Performances in this respect are measured according to the number of locations on the sewer system requiring maintenance at least twice a year due to cleaning requirements or blockages. Water company management of sewer systems has improved in recent years as the number of problem locations has fallen. The trend across all utilities should be viewed with caution given the low representativeness of the data.

Trends in the index representing the number of locations on sewer systems requiring frequent cleaning (per 100 km of sewer)



Source: BIPE, based on 2016 data from the performance monitoring system SISPEA extracted on 09-21-2018; weighted averages for network length (verified, validated and published data).
Caution: 48% population representativeness in 2016

Towards greater visibility of performance

The 2018 Assises de l'Eau conference drew attention to the requirement for all authorities organizing the provision of services to publish service results by a time horizon still to be determined.

This requirement should result in a far better picture of the true levels of performance of public water and wastewater services (overall performances and performances according to size and type of management). Indeed, today the picture is clouded by data that is not sufficiently representative of the population served, including some of the data pertaining to large utilities. At the same time, across-the-board checking of the information furnished should make for greater reliability of data.

In another development, the biodiversity agency OFB, which oversees the national performance monitoring system SISPEA, plans to improve data analysis possibilities by means of new composite indicators providing a better insight into overall service performance and the financial effort made by local authorities. Capital investment monitoring also needs to be improved so as to put these efforts and the associated performances into perspective.

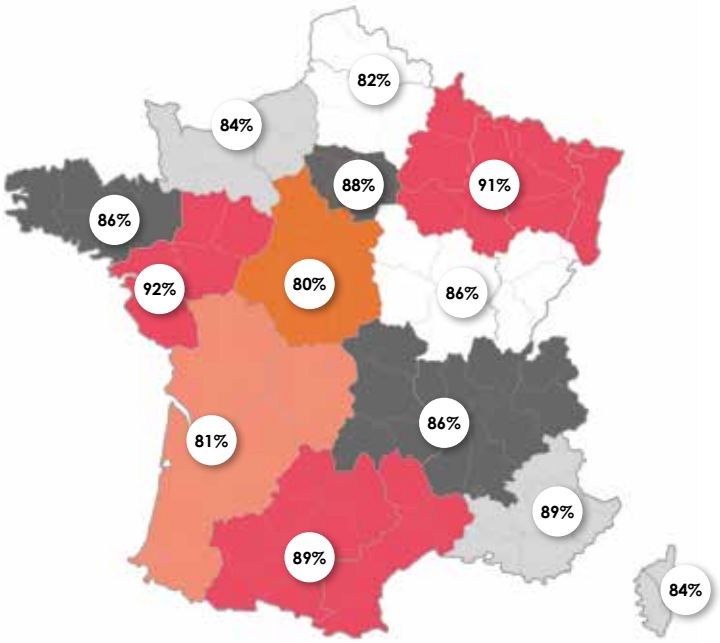
High levels of public satisfaction with water services

More than 8 in 10 French people (84%) are satisfied with their local water service - such is the finding of the 2018 TNS Sofres survey for the Centre d'Information sur l'Eau.

On either side of this national average, regional disparities are found, ranging from 90%-plus satisfaction levels in two regions (Pays-de-la-Loire and Grand Est) to levels of 85% or below in six others (Hauts-de-France, Normandy, Centre-Val-de-Loire, Nouvelle Aquitaine and Corsica).

These differences of opinion cannot be explained solely by the size of the utility: although satisfaction levels are lower among people living in rural areas or in urban areas with populations below 20,000 (with satisfaction rates of between 80% and 85%), they are high in the Grand Est, a region where there are nevertheless many small utilities.

Satisfaction with water and wastewater services in France in 2018



Source: TNS Sofres survey for the Centre d'Information sur l'Eau

By 2017, a large majority (76%) of utilities run by water companies had been assigned a Commission Consultative des Services Publics Locaux (CCSPL), a body promoting the provision of information to customers about the management of services (prices, quality, etc.), and allowing them to voice their opinions and be consulted about plans to reorganize services or change the type of management.

Existence of a Commission Consultative des Services Publics (CCSPL)

Utilities run by the water companies

	Water	Wastewater
2013	83%	67%
2017	76%	76%

Source: BIPE, based on water company survey data

All utilities

	Water	Wastewater
2013	51%	65%
2016	51%	63%

Source: BIPE, based on 2016 data from the performance monitoring system SISPEA extracted on 09-21-2018; weighted averages for volume produced + volume imported (verified, validated and published data).
Caution: 42% population representativeness in 2016 with respect to water utilities and 39% with respect to wastewater utilities

About **3 in 1,000 customers write to their operator or local authority to complain** about service performance, including issues with their water bills.

The percentage of complaints has been fairly stable in recent years and accounts for barely 2 in 1,000 customers dissatisfied with wastewater services. Complaint levels in utilities managed by the water companies are lower than overall levels (complaint levels of 1 in 1,000 with respect to water services and 0.5 in 1,000 with respect wastewater services). And whereas complaints about wastewater services would seem to have increased significantly, complaints about water services would appear to have followed the opposite trend.

Trends in levels of complaints in writing
(per 1,000 customers)

Utilities run by the water companies

	Water	Wastewater
2013	3.4	0.2
2017	1.1	0.4

Source: BIPE, based on water company survey data

All utilities

	Water	Wastewater
2013	3.3	1.4
2016	3.2	1.6

Source: BIPE, based on 2016 data from the performance monitoring system SISPEA extracted on 09-21-2018; weighted average customer levels (verified, validated and published data).
Caution: 42% population representativeness in 2016 with respect to water utilities and 39% with respect to wastewater utilities

Summary of service performances in utilities run by the water companies

Performance of public water supply services run by the water companies

	2008	2010	2013	2017
Sanitary quality: microbiological quality - compliance rate (in relation to volumes)	99.6%	99.7%	99.5%	99.3%
Sanitary quality: physical-chemical quality – compliance rate (in relation to volumes)	98.7%	98.6%	98.0%	98.8%
Distribution system efficiency (in relation to volumes)	82.0%	81.3%	81.0%	81.6%
Percentage of unpaid bills (Year n-1 bills) (in relation to revenues)	0.7%	0.7%	0.9%	1.9%
Percentage of complaints (in relation to population)	4.8%	4.9%	3.4%	1.1%
Water distribution system asset knowledge and management index * (in relation to length)	-	-	71.4%	89.8%
Linear index of unaccounted-for-water (in relation to length: m³ per km per day)	5.9 m³ per km per day	5.4 m³ per km per day	4.6 m³ per km per day	3.3 m³ per km per day
Index of progress on protection of water resources (in relation to volumes)	53.1%	59.0%	57.6%	67.2%
Percentage of unplanned supply cuts (in relation to 1,000 customers)	3.1 ‰	2.8 ‰	3.4 ‰	3.6 ‰
Existence of a Commission Consultative des Services Publics Locaux (in relation to population)	79%	86%	83%	76%

Source: BIPE, based on water company survey data.
** 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. Between 2008 and 2010, the scope of the survey expanded to include utilities serving fewer than 10,000 people.*

Performance of public wastewater services run by the water companies

	2008	2010	2013	2017
Percentage of complaints (in relation to population)	3.2%	2.5%	0.2%	0.4%
Sewer system asset knowledge and management index * (in relation to length)	-	-	45.1%	50.7%
Percentage of sewage sludge treated in a process that complies with the applicable regulations (in relation to tonnes)	94.7%	98.5%	97.4%	99.8%
Number of sewer system locations requiring frequent cleaning (in relation to length)	4.8 per100km	7.7 prer 100km	6.9 per 100km	6.1 per 100km
Existence of a Commission Consultative des Services Publics Locaux (in relation to population)	71%	70%	67%	76%

* change in the method of calculation in 2013

Source: BIPE, based on water company survey data
** 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. Between 2008 and 2010, the scope of the survey expanded to include utilities covering fewer than 10,000 people.*

Societal and social performance

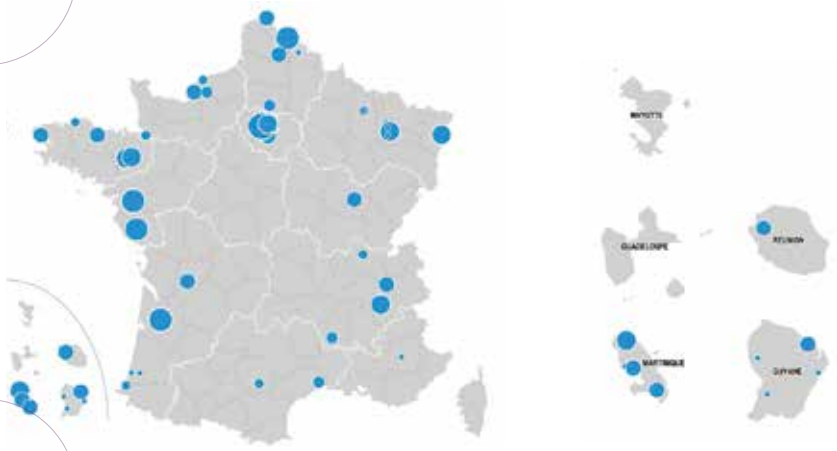
Tackling water poverty

The Brottes Act of 2013 allowed local authorities to trial social tariffs, the aim being to make water affordable for the very poorest families at a cost acceptable to all parties.

The trial is to be extended until 2021 in order to get sufficient perspective on the economics of the system, before rolling it out more broadly. **The impact in terms of non-payment rates and balancing budgets has yet to be established.**

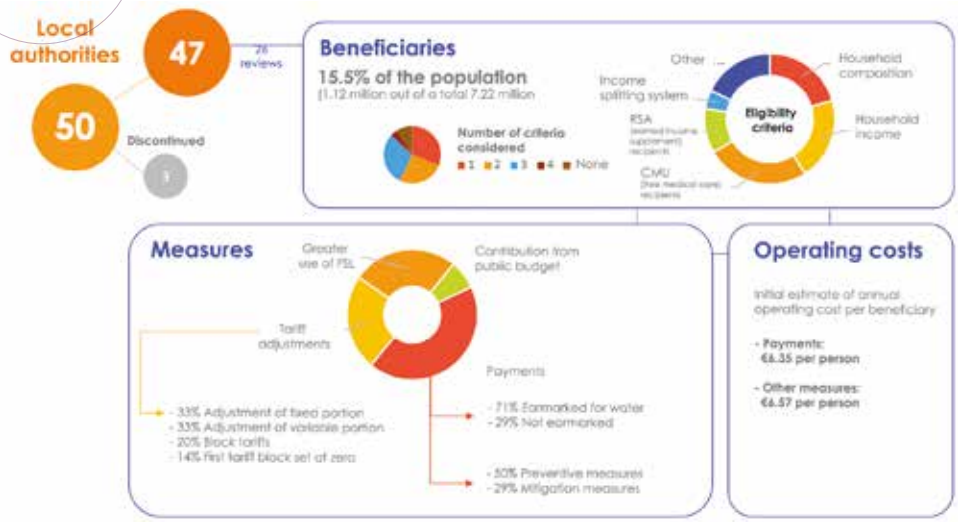
Around 50 local authorities have seized this opportunity to experiment with social tariffs to date.

Local authorities that have trialed social tariffs



Source : DGA 2016

Preliminary results of social tariff trials



Source: BIPE, based on Comité National de l'Eau data

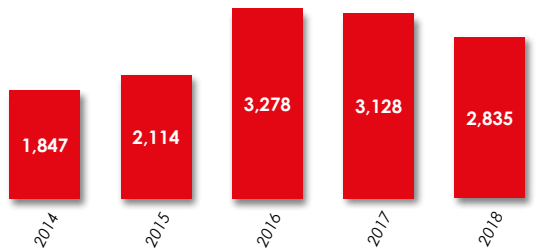
A progress review performed by some 25 local authorities under the aegis of the Comité National de l'Eau has produced the following conclusions:

- The number of potential beneficiaries has been overestimated and varies sharply (from 1% to 20% of customers) from area to area.
- **In most cases the measures implemented take the form of help in paying bills.** Tariff adjustments based on social criteria were used in only a third of all cases.
- **The average yearly amount paid to households is €50** but there are big differences in payments.
- The cost of managing the system is small where beneficiaries are identified automatically. There is very little take-up where customers have to claim support. Various sources of data (child benefit data, healthcare coverage, metered water use) are used to identify water poverty and determine the appropriate tariff adjustments.
- In the interests of fairness, progressive tariff systems where water is billed on the basis of consumption blocks should be used in conjunction with mechanisms to compensate large families and implemented only in those areas where seasonal variations in water usage are small.
- Social tariffs are easier to implement where there is price harmonization and just one authority organizing the provision of services in the area concerned.

In addition to these trials, the government, in wrapping up the Assises de l'Eau, articulated its wish to allow local authorities **to introduce a water voucher scheme** based on the existing energy voucher scheme and to move to full-scale implementation of social tariffs. New legislation was expected to that end at the time of drafting this report.

The water mediator in key figures

Trends in the number of applications received



Mediation that is accessible to all

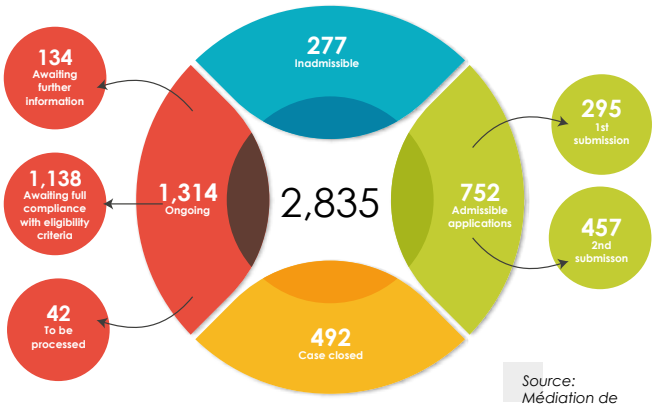
The role of the water mediator, the Médiation de l'Eau, is to facilitate the out-of-court settlement of disputes opposing customers and their water or wastewater utility, once all means of action provided for under the contract have failed.

The Médiation de l'Eau was set up in 2009 on the initiative of FP2E, France's markets watchdog AMF and the association of municipal councilors ADCF. It became mandatory in January 2016 following the transposition into French law of an EU directive. Now all water and wastewater service customers should have access to mediation free of charge.

Since 2016, it has been **mandatory** for any public water service employee dealing with a customer to inform them of the possibility of taking their case to the mediator. This does not always happen however as, two years on, **12% of the population still has no access to mediation because the utility has not signed up to the service. In most of these cases, the utility is small and operated under direct management.**

Most of the applications concern the water bill: disputes over adjustments made, but above all over leaks or unusually high bills. **The mediator resolves 80% of the disputes that come before it.**

Status of applications received in 2018



Source: Médiation de l'Eau, annual report

Water companies supporting vulnerable families

The issue of access to water is critical to the task that the public authorities entrust to the water companies. The latter were quick to encourage the recognition of the basic right to water as articulated by the United Nations, and today help to enact that right through a policy of solidarity towards the most vulnerable families.

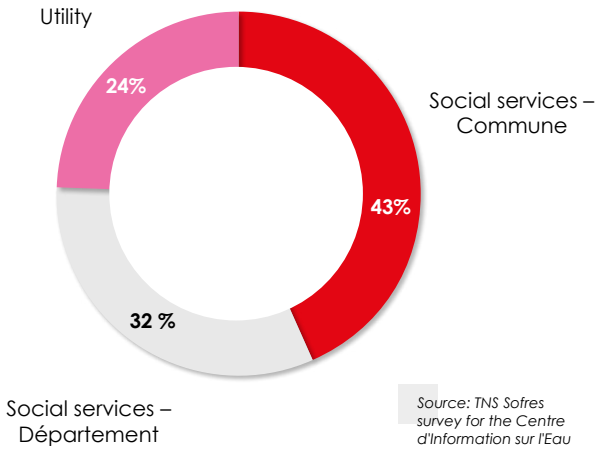
Relatively few consumers (30% of water users according to the TNS Sofres survey for the Centre d'Information sur l'Eau) are aware of the solidarity mechanisms available to help them pay their water bill, but relatively few consumers should ever have a need for them. (Only 3% of people said they had actually used them.)

The survey shows that people generally have a good awareness of those involved in the social aspects of water provision.

The so-called Brottes Act allows local authorities to opt on a voluntary basis to charge lower tariffs to customers selected on social criteria. **By working with the organizing authorities to adopt this system, the water companies were able to provide social tariffs to more than 17,000 customers in 2017.**

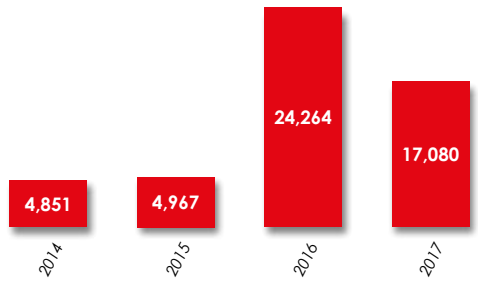
Working with elected representatives, local social welfare organizations and non-profits, the water companies have come up with innovative ways of helping struggling families access affordable water at an acceptable cost.

Public awareness of actors involved in the social aspects of water provision



Source: TNS Sofres survey for the Centre d'Information sur l'Eau

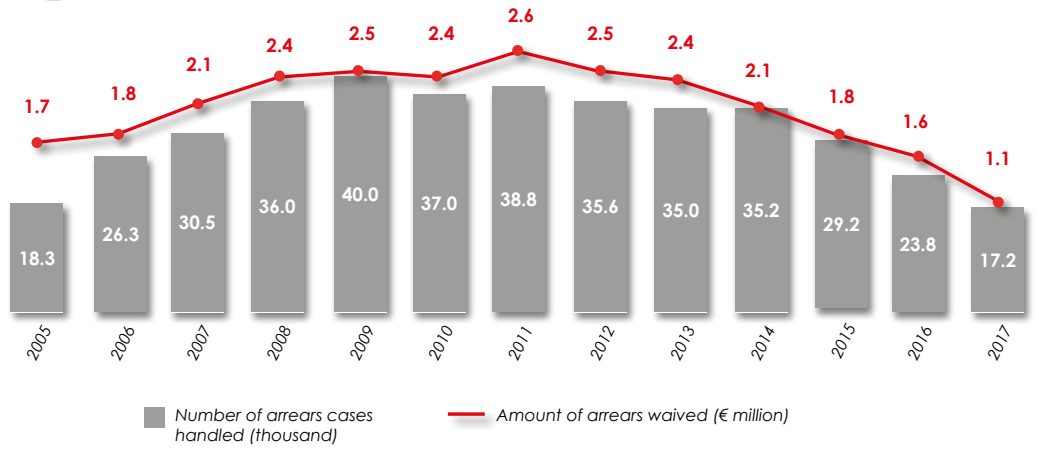
Trends in the number of customers billed under the social tariff system



Source: BIPE, based on FP2E data

Through the Fonds de Solidarité pour le Logement (FSL), a body whose role is to help households that are struggling to pay their housing expenses, the partnerships established between water companies and departmental bodies have resulted in measures to waive water arrears and provide pre-emptive support to vulnerable families to help them manage their water use and their water bill. In 2017 these measures were applied in 17,000 cases for arrears in the amount of €1.1 million.

Trends in the number of arrears cases handled and total amount of arrears waived



Source: BIPE, based on FP2E data

Other solidarity measures are the result of grassroots initiatives as implemented by the water companies, the organizing authorities and the social welfare centers, the Centres Communaux d'Action (CCAS). The so-called water vouchers are issued by the operators, funded by water revenues and allocated to local social welfare bodies (usually the CCAS) for issue to welfare recipients. In 2017, **vouchers to the tune of €2.3 million** (€1 million more than in 2013) **were distributed to 19,300 customers,** who each received €120 worth of vouchers an average.

The EU Drinking Water Directive, currently under revision, is likely to provide for "actions aimed at improving access to water intended for human consumption for all, notably by setting up indoors and outdoors equipment in public spaces where technically feasible". This objective will need to be transposed into French law and will considerably improve conditions for people without access to the mains water supply, such as the homeless, slum dwellers and travelers.

footp

rint

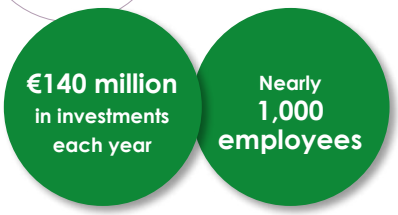
The water company footprint

Technological and organizational innovations

Innovative water treatment technologies

In 2016, the water companies dedicated **€140 million** and some 1,000 employees **to research and development activities. R&D spending has risen substantially** in the space of just a few years, up 17% since 2013, representing an increase of €19 million. This investment in R&D is vital as it allows new technologies to be developed to tackle the different issues involved in managing water and protecting receiving waters.

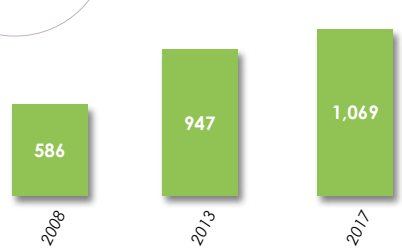
R&D in water companies



Key topics:

- *Removal of micropollutants*
- *Efficiency of systems*
- *Digitalization and smart cities*

Treatment capacity of membrane treatment plants (thousand m3 per day, FP2E companies)



Source: BIPE, based on water company survey data

The treatment of raw water to drinking water standards comprises successive stages involving physical, biological and/or chemical processes. The exact number of stages involved and their complexity will depend on whether the water is taken from ground or surface sources and the sanitary quality of the source water (which depends on the pollutant content).

In 2017, 5,300 water treatment plants out of a total 16,700 plants in France were operated by the water companies, representing a total treatment capacity of 22 million m^3 per day. The treatment capacity of membrane treatment plants was nearly **1.1 million m^3 per day**, accounting for 5% of the total.

Membrane filtration (filtration through organic or inorganic membranes) is increasingly used because it filters out even the tiniest particles (viruses, bacteria and pesticides). The amount of water treated by membranes at plants operated by the water companies has risen by 3% a year on average since 2008.

Disinfection, which is used to eliminate pathogens, can be performed by several different processes, the most common of which are chlorine disinfection and ozonation. Chlorine disinfection is an inexpensive treatment that keeps the water safe on its journey through the mains to the customer's tap. Half of the treatment capacity of the plants operated by the private companies (11.2 million m^3 per day representing 51% of the total treatment capacity) involves the use of chlorine disinfection.

Demand management technologies

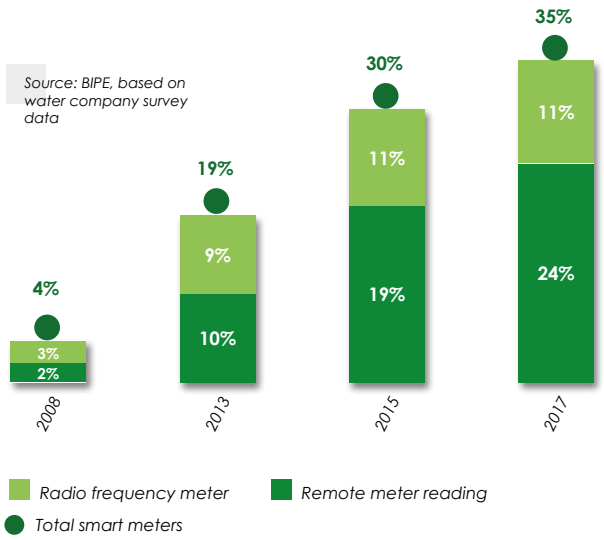
Water meters are acquiring the ability to communicate and help customers better manage their water use, while also flagging up leakage issues.

Radio frequency meter reading is a short range meter reading technology that allows meter readings to be taken from outside the home without meter readers having to enter premises. With remote meter reading, utilities are able to obtain meter readings automatically and from a distance. They can thus identify any leakage problems and alert customers accordingly. At the same time, customers can see their water use online and create their own alerts.

Of the 16.1 million meters managed by the water companies in 2017, **over a third (35%) are smart meters.** The transition to these types of meters, and in particular remote-read meters, is happening fast.

The use of smart readers is patchy across utilities: **60% of these meters are used in urban services, compared to 40% in rural services.** Most (90%) of the overuse and leak alerts generated by smart meters in 2017, were within urban services.

Growth in the number of smart meters operated by the water companies
(percentage of total meters)



Internet services in customer relations

Water company websites were **visited 16.1 million times in 2017**. 5.3 million visitors were customers who had an online account or customer space. Nearly 40% of these had opted for electronic billing but only 5% use online payment services which accounted for €220 million in payments made in 2017.

At the same time, nearly 6.9 million customers have chosen the direct debit payment option accounting for €3.68 billion in payments, and nearly 5.5 million customers have chosen monthly payments representing a total amount of €1.85 billion.

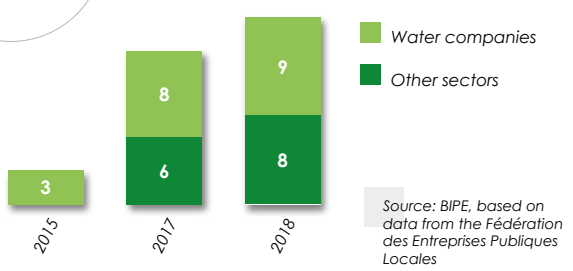
Mixed governance of services as water companies innovate

The water sector is particularly innovative when it comes to governance as reflected in trends like the growing involvement of local authorities and consultation of user associations and scientific committees.

By way of example, water companies are involved in nearly half of all SEMOPs (Société d'Economie Mixte à Opération Unique), for all operations combined, a new type of structure introduced in 2015. This type of public undertaking allows a local authority or local authority grouping to appoint, by means of a procurement procedure, the private operator with which it will partner as joint shareholders of a new structure – the SEMOP - created for the purposes of performing the contract awarded to the private operator. The local authority is thus involved in managing the public services outsourced and is involved in operator governance issues as a joint shareholder. Driven by an alignment of interests, these structures facilitate dialogue between the delegating authority and the private companies, in particular about tools used to manage the facilities. It is important to maintain a clear distinction between the respective roles of the organizing authority and operator within these structures however.

Of the 17 SEMOPs set up since the introduction of the 2014 Act, 9 are for the management of public water services.

Total number of SEMOPs created

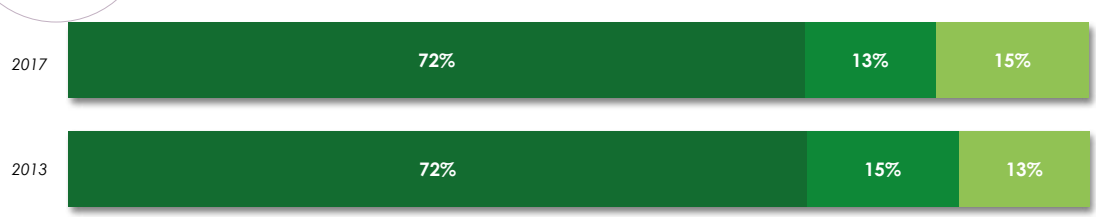


Skills essential to the needs of today

Customer-focused technical excellence

The skills possessed by employees are essential to improving the performance of the services. 7 in 10 water company jobs are of a technical nature, thus forming a bedrock of key competencies.

Types of employment offered by water companies



Source: BIPE, based on water company survey data

Operations/Technical

Sourcing, Treatment
Networks, Distribution
Maintenance, Inspection
Research, Tests
Technical studies

Customer Management/ Commercial

Management,
Customer relations
Meter reading,
On-site intervention
Commercial

Support

Accounts
IT
Legal
Quality, Environment
Human Resources
Purchasing, Administration
Communications

Examples of jobs in Operations

Sourcing, Treatment	The **treatment plant manager** oversees treatment operations and ensures that the treated water complies with the applicable standards.
Networks, Distribution	The **network technician** monitors sewer or water distribution system operation (mains, below-ground structures, lift stations and pumping stations) ensuring compliance with hygiene and public health requirements. His or her job entails anticipation, analysis and assessment of issues such as system efficiency, flow rates and leakage risks.
Maintenance and Inspection	The **maintenance technician** inspects the facilities, helps prevent incidents and manages failures. He or she applies skills in electronics, electromechanical systems and control systems to an increasingly complex range of equipment.

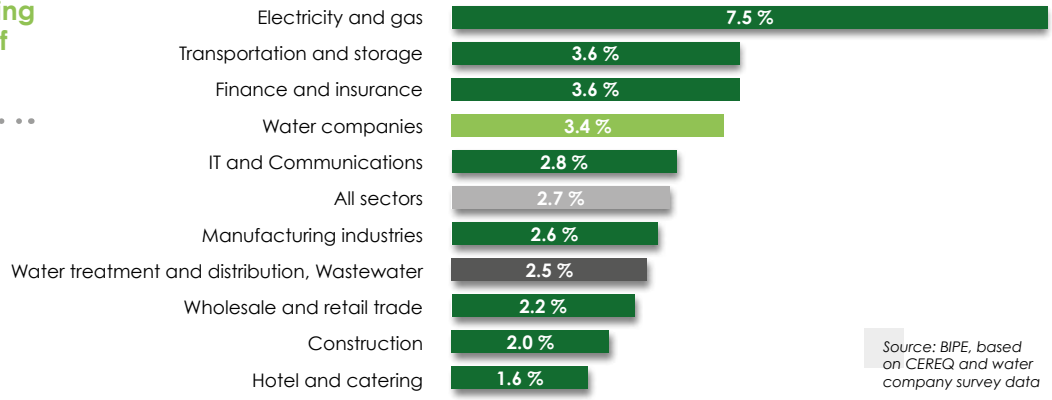
High levels of investment in training

In 2017 as in 2012, **the water companies invested 3.4% of their payroll in training**, a far higher proportion than the average for all sectors (2.7%) and for public water and wastewater sectors combined (2.5%). Each employee received on average 150 hours of training in 2017.

This investment helps employees to grow professionally as well as to maintain a high level of skill and acquire new skills in line with the expectations of customers and the authorities responsible for organizing the provision of services. Since 2018, the industry-wide organization for water and wastewater companies has awarded various new qualifications, the Certificat de Qualification Professionnelle (CQP) for schedulers, and the Certificat de Qualification Professionnelle Interbranche (CQPI) for industrial maintenance operators and industrial maintenance technicians respectively.

The idea is for water companies to support skills development within a framework recognized by the sector and promote the development of different careers. For employees, this means official recognition for their skills, which can help them move up the career ladder. Other certificates are in the pipeline, both in sectors experiencing shortages and in new skills sectors.

Investment in training as a percentage of payroll



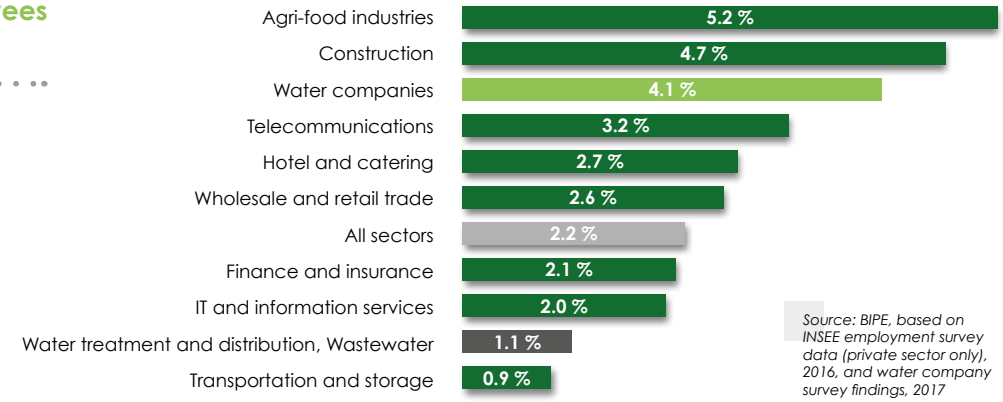
Source: BIPE, based on CEREQ and water company survey data

Apprenticeships on the rise

It is the water companies' belief that maintaining and future-proofing skills will also be achieved through apprenticeships and work experience.

The number of junior employees in apprenticeships in the water companies far exceeds the average in the private sector in general. As a proportion of the total workforce their number has continued to grow, up from 2.6% in 2008 to 3.4% in 2012 and **4.1% in 2017**.

Percentage of employees in apprenticeships



Source: BIPE, based on INSEE employment survey data (private sector only), 2016, and water company survey findings, 2017

The economic contribution of the water companies

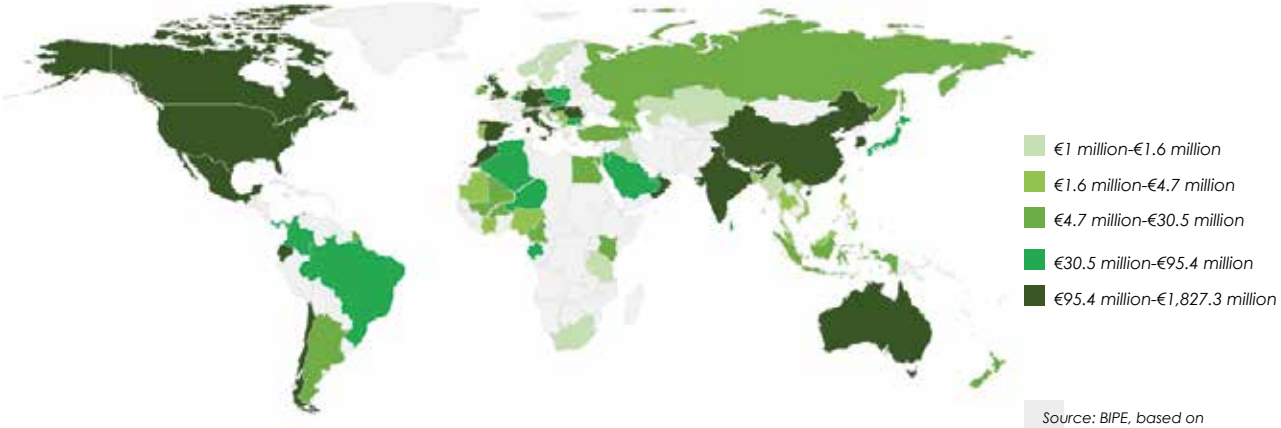
A dynamic international presence extending to all five continents

Number of people abroad receiving services from French water companies
(million)

	Water	Wastewater	Total
Europe (excluding France)	16.56	32.37	48.94
Americas	23.61	21.42	45.03
Asia	58.47	32.20	90.67
Africa, Near & Middle East	20.62	21.62	42.24
Oceania	9.27	4.76	14.03
Total (excluding France)	128.54	112.38	240.92

Source : BIPE, based on water company survey data

Revenue generated abroad by the water companies
(€ million)

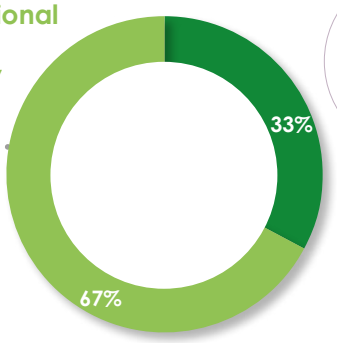


Source: BIPE, based on water company survey data

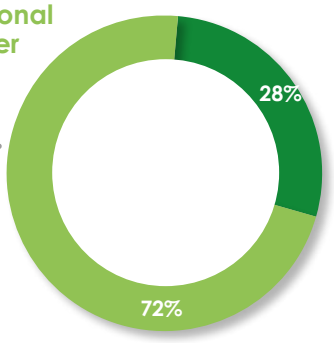
French water companies reported revenues generated abroad of nearly €11 billion in 2017. This is a highly dynamic segment, which has grown by 31% since 2013 and which accounts for **two-thirds of all water sector operations**. International operations moreover involve 2.5 times the number of people employed in France, accounting for over 71,000 jobs in more than 40 countries.

This dynamic international presence demonstrates the capacity of the water companies to take French know-how abroad and make a positive contribution to France's trade balance.

Domestic/international breakdown of water company revenues



Domestic/international breakdown of water company jobs



France

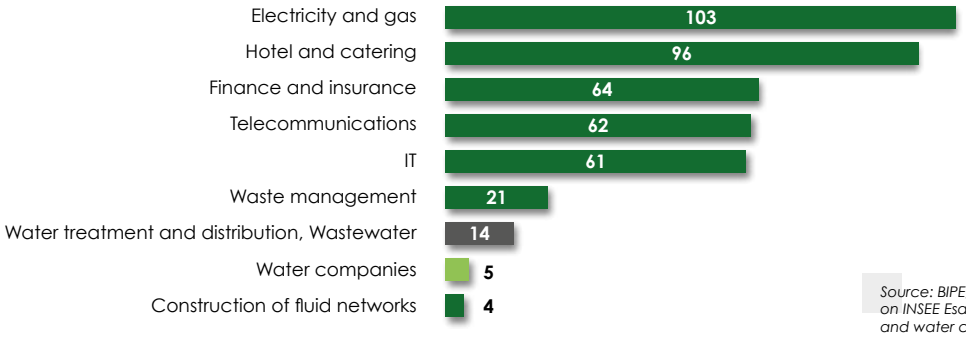
International

Source: BIPE, based on water company survey data

Bringing in €5.3 billion to the French economy

The water companies reported revenues of **€5.3 billion (ex VAT)** for water and wastewater services provided in France in 2017: €4.7 billion under delegated management contracts and €0.5 billion under contracts for the provision of services. Overall revenues have slightly declined since 2011.

Sectoral comparison of revenues
(€ billion ex. VAT)



Source: BIPE, based on INSEE Esane data and water company survey data

Market share is based on the population served - a variable that is difficult to determine given that it involves converting numbers of customers into numbers of persons and that operators regularly change how they calculate this parameter. The upshot is that any interpration of variations in market share over time is difficult.

The task is even more challenging in the case of wastewater services as the number of different operators serving the same customers is generally higher than in the case of water, with some providing collection of sewage and others wastewater treatment for example - a situation that moreover may lead to customers being counted twice. In terms of share of population, delegated utilities serve 65% and 54% of the population in the case of water and wastewater services respectively.

More than 100,000 jobs involved in delivering water and wastewater services

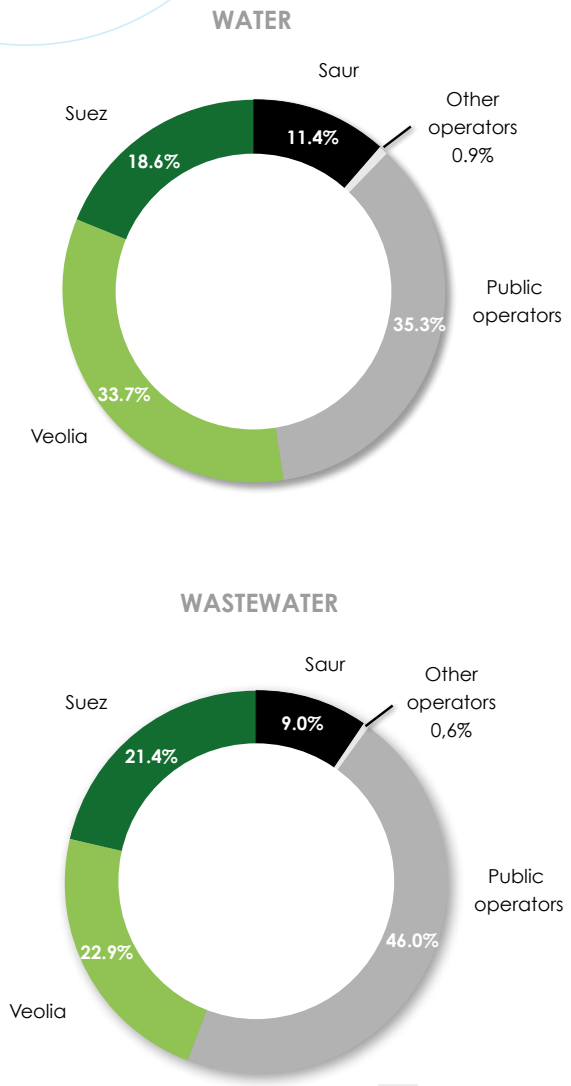
In 2016 the number of jobs in water and wastewater services was estimated at 63,000, nearly half of which (46%) were with the water companies. For a "whole-sector" view, the number of pipe-laying jobs should be added to these: another 39,000 jobs all told.

Most of the private segment of public water services began to shed jobs in the late 2000s:

- Amid downward pressures on water prices, the water companies shed jobs in a bid to improve productivity.
- With fewer contracts put out to tender, local authorities started to cut back on pipe replacement programs resulting in job losses in the water distribution system construction sector.

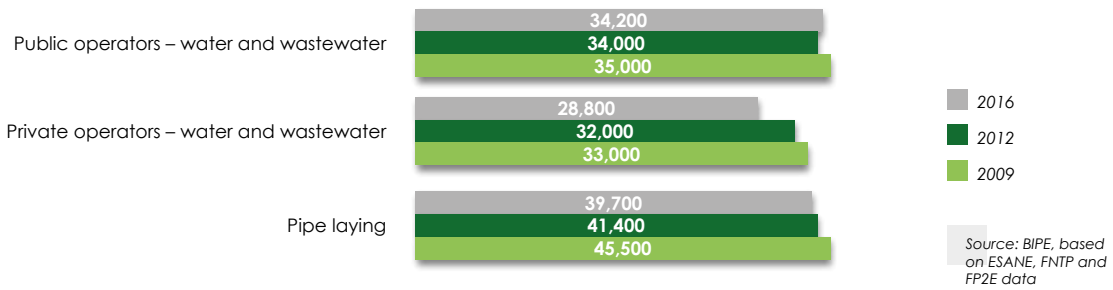
Breakdown in population served by operator

(percentage of the total population served, 2017)



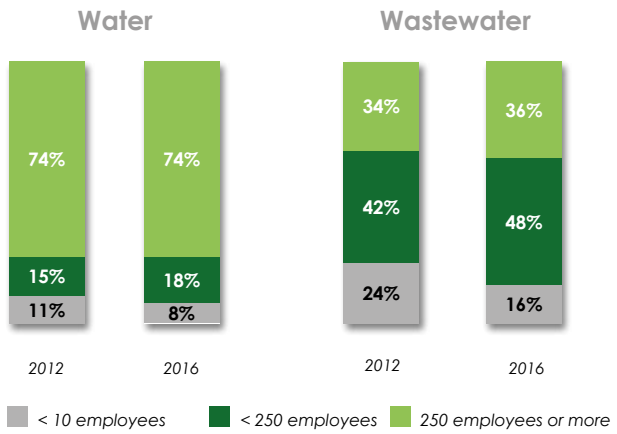
Source: BIPE, based on water company survey data and INSEE data

Job growth in the water sector



Source: BIPE, based on ESANE, FNTP and FP2E data

Headcount distribution



The water companies have also helped create 23,000 spin-off jobs, as a result of their purchases as well as work contracted out and investment (excluding subsidiaries). These jobs are found in different sectors like construction, the manufacture of plant and equipment, operations-related activities such as sewage sludge disposal, and cross-cutting activities such as IT, engineering and studies.

Source: BIPE, based on ESANE data, 2015

A water sector that is shedding jobs

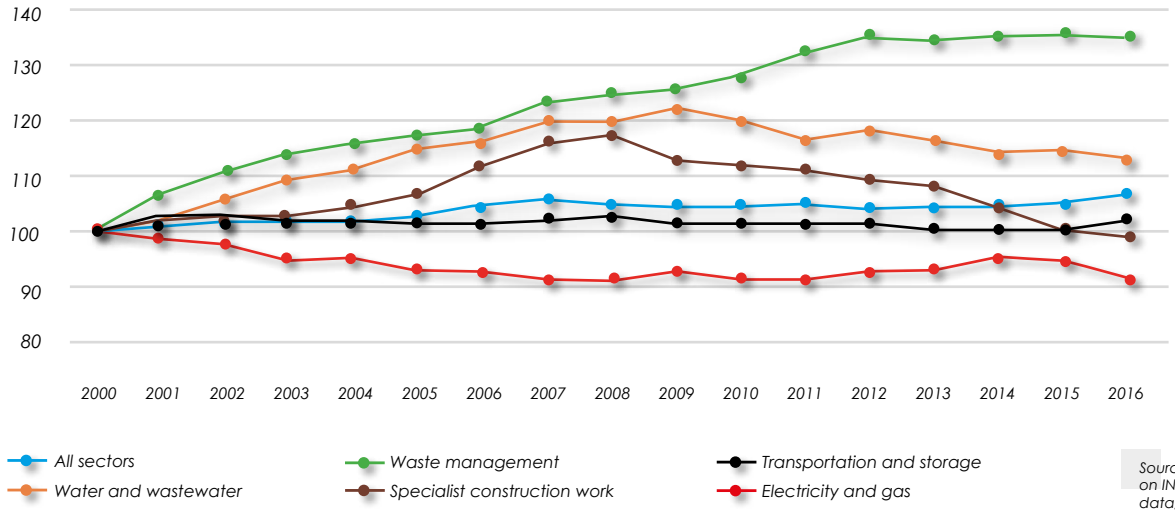
Having for several years created jobs at a higher rate than all sectors combined, including some utility sectors like power generation, water sector job numbers have declined by 1.1% a year since 2009. This downward trend is faster than that in all sectors combined, including other municipal service sectors such as domestic energy and waste collection.

The fall in water company job numbers continued in 2017 (down 2%, representing 1,000 fewer jobs in the space of a year).

This decline reflects stresses in the sector due to pressure on prices and the resulting drive for greater productivity (revenue per employee rose by 23% between 2013 and 2017). Renewed investment and the many innovative projects in the sector offer hopes of a brighter future on the jobs and skills front.

Trends in salaried employment, metropolitan France

(base 100 = 2000)



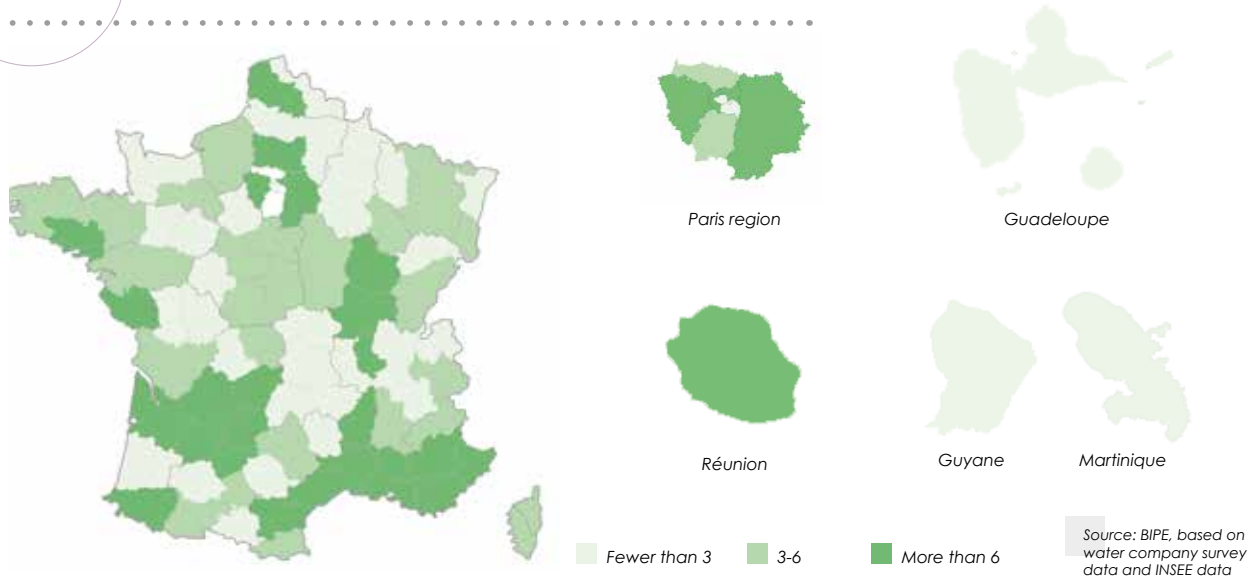
Source: BIPE, based on INSEE job estimate data, 2016

Employing people throughout the country

The water companies have a countrywide presence and employed four people per 10,000 population on average in 2017.

Number of water company employees by département in 2017

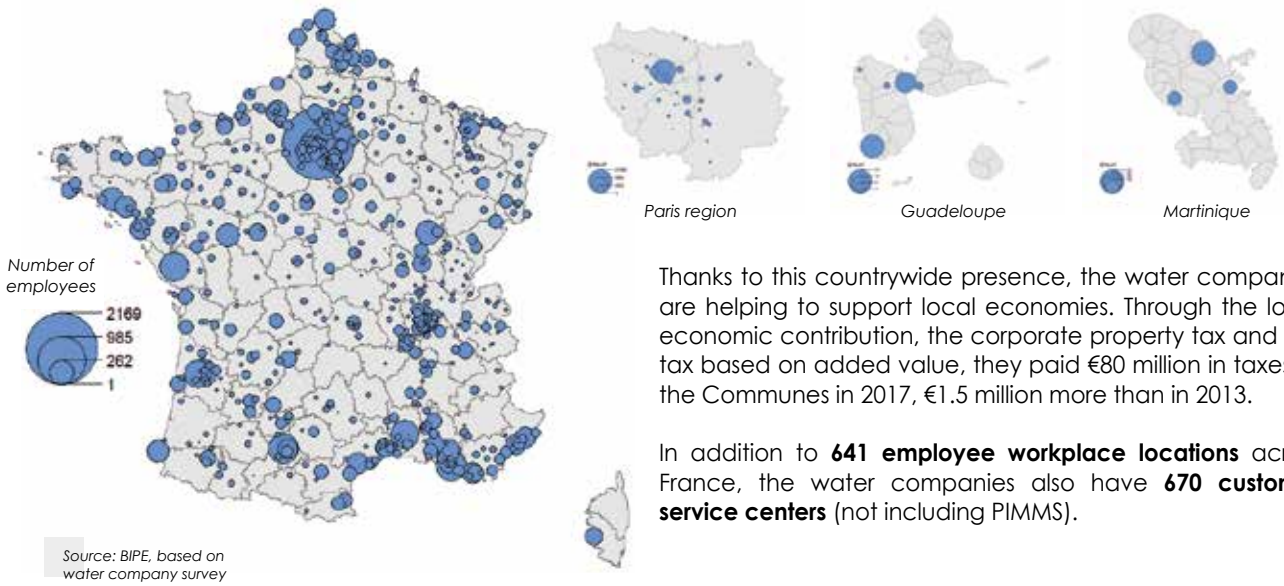
(average number of employees per 10,000 population)



Source: BIPE, based on water company survey data and INSEE data

Locations of water company jobs in France in 2017

(average number of employees per 1,000 population)



Source: BIPE, based on water company survey and INSEE data

Thanks to this countrywide presence, the water companies are helping to support local economies. Through the local economic contribution, the corporate property tax and the tax based on added value, they paid €80 million in taxes to the Communes in 2017, €1.5 million more than in 2013.

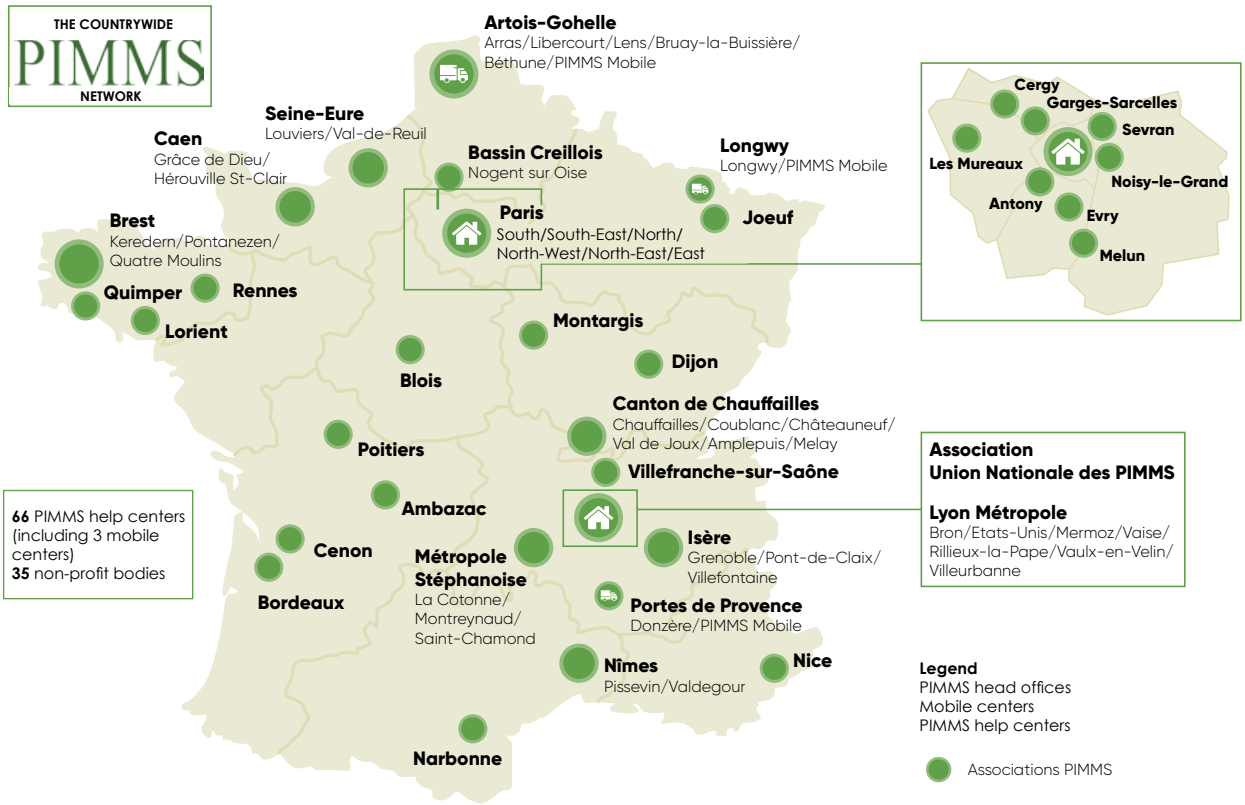
In addition to **641 employee workplace locations** across France, the water companies also have **670 customer service centers** (not including PIMMS).

Job creation through local partnerships

The water companies are also partners to more than half of all PIMMS (Points Information Médiation Multi Services), a countrywide network of not-for-profit social mediation points. Providing an interface between the public and public service operators, they were set up in 1995 by the State, local authorities and their partner companies to facilitate access to public services and help people into jobs and sustainable employment.

The PIMMS employ nearly 400 front-desk staff and supervisors, whose role is to provide information about things like water quality and the calculation of the water bill, as well as advice about saving water and money. When it comes to disputes, they help people reach a resolution with the utility or, failing that, direct them to the water mediator.

The PIMMS network



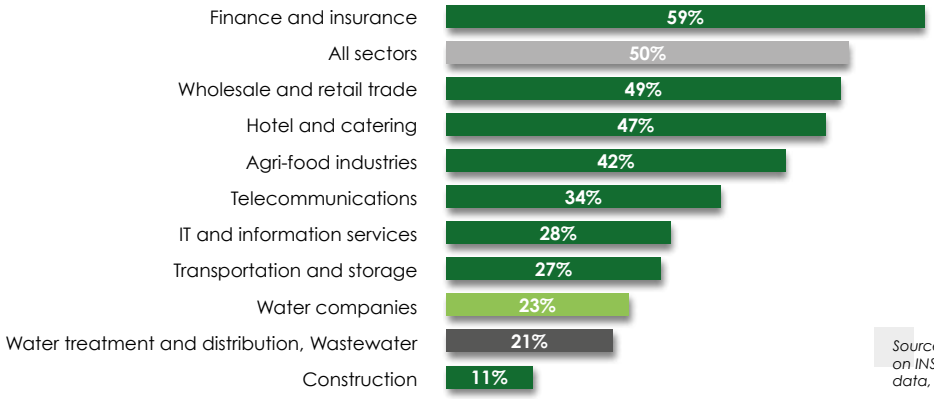
Source : PIMMS

The feminization of employment

Women make up 23% of the workforce in water companies, a slightly higher proportion than the national average for the sector.

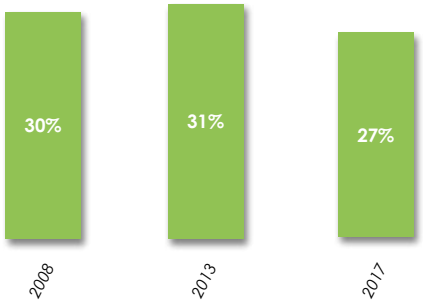
Having grown over many years, the feminization of the sector has stalled slightly, with the proportion of female hires falling by 3% between 2013 and 2017.

The feminization of employment
(percentage of women employees in the workforce)



Source: BIPE, based on INSEE job estimate data, 2016, FP2E

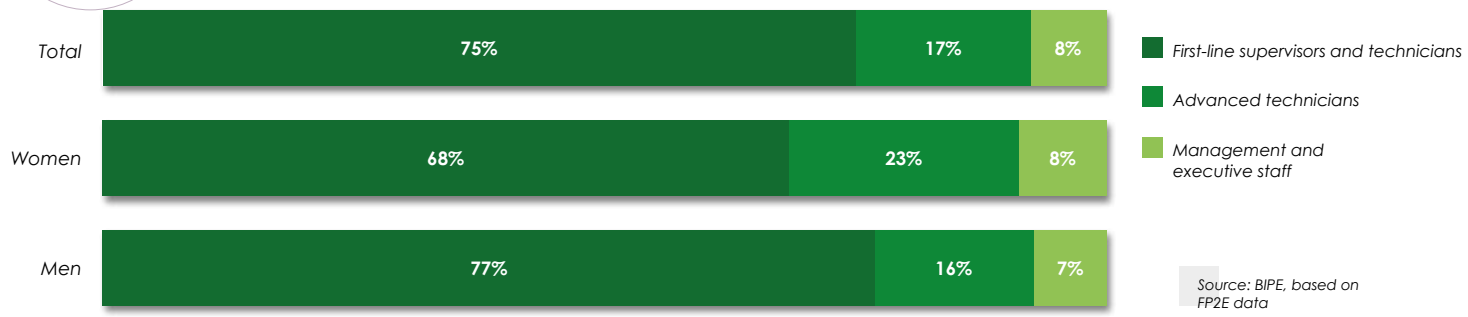
Hiring rates for women in the water companies
(percentage of women hires in the total number of hires)



Source: BIPE, based on water company survey data

However, women earn 2.8% more than men on average – quite an exceptional situation in view of the national all-sectors average (which amounts to a gender pay gap of 18.5% in favor of men according to INSEE).

Water company employees by gender and by category

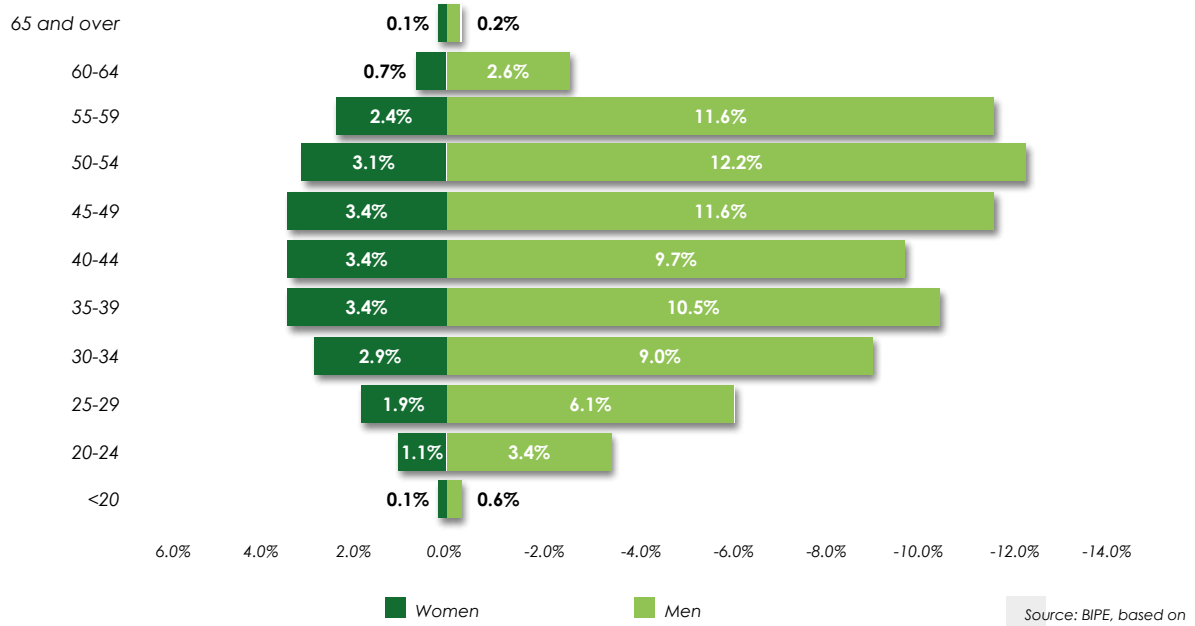


Source: BIPE, based on FP2E data

The feminization of the sector is reflected by larger percentages of women among younger employees. Two thirds (66%) of all female employees are in the 25-45 age range.

70% of women employed by the water companies had attended at least one training program in 2017.

Water company workforce age pyramid by gender



Source: BIPE, based on water company survey data, 2017

The social footprint

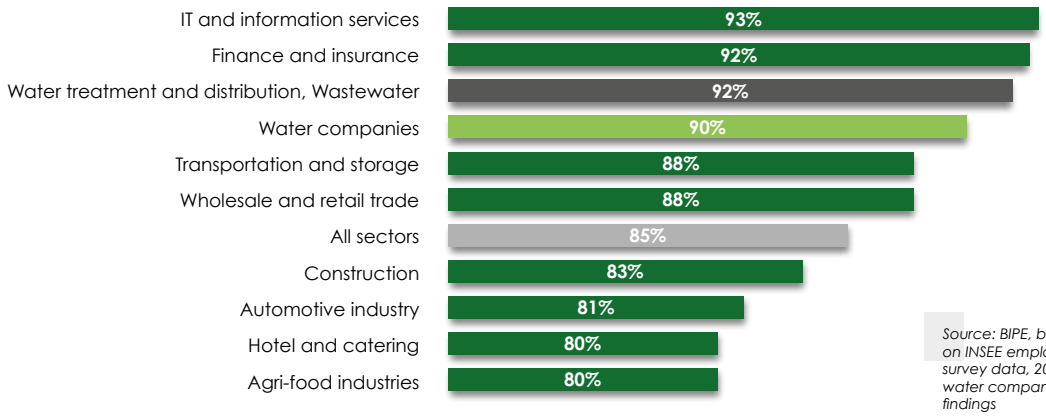
Good conditions of employment

People working for water companies tend to stay with the company until well past the age of 50.

Average pay is slightly higher than the all-sectors average and for administrative staff and operatives the hourly pay is higher.

9 out of 10 water company employees are employed under open-ended contracts (CDI), a far higher proportion than the all-sectors average.

Percentage of employees employed under open-ended contracts

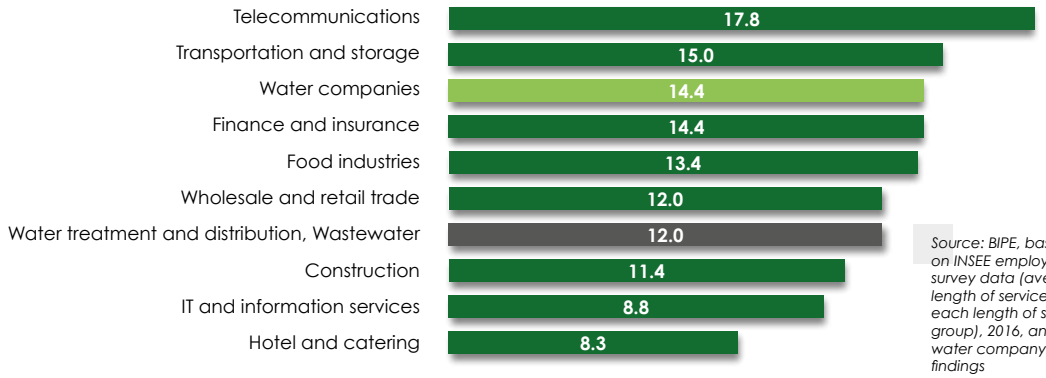


Source: BIPE, based on INSEE employment survey data, 2016, and water company survey findings

The high proportion of open-ended contracts translates into high staff retention rates and helps to keep skills within the company. Average length of service is 14.4 years, higher than in most other sectors and in the sector as a whole. This can be explained by a higher proportion of "seniors" on the workforce, with the over 50s making up 35% of the total workforce compared to 27% in the sector as a whole.

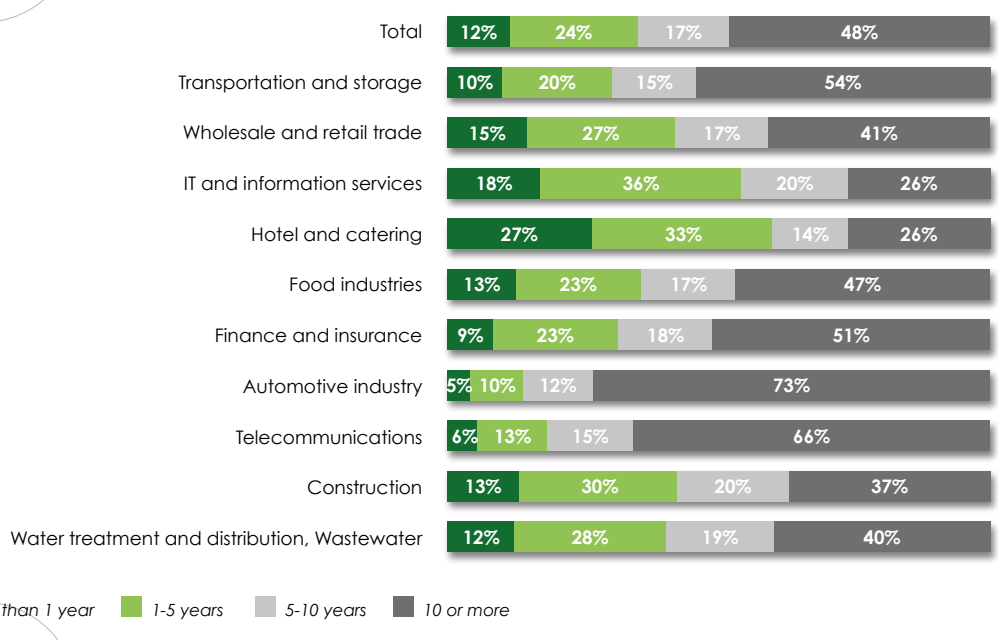
Nearly 64% over the over-50s workforce had attended at least one training program in 2017.

Average length of service (years)



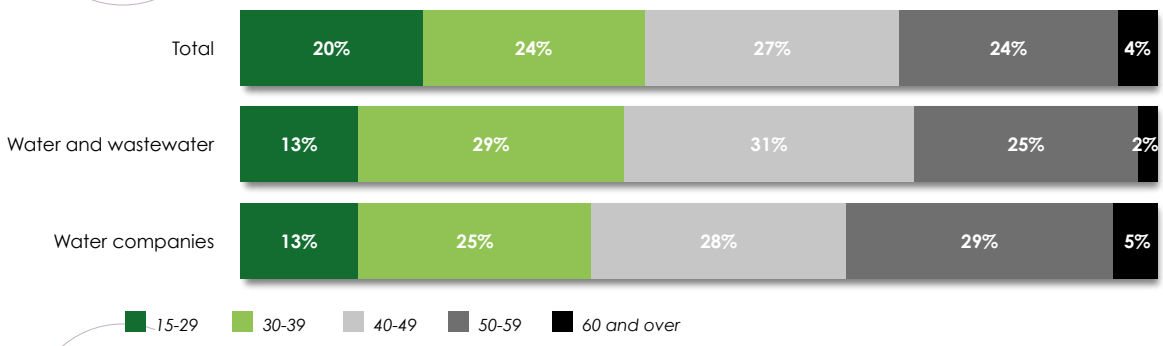
Source: BIPE, based on INSEE employment survey data (average length of service for each length of service group), 2016, and water company survey findings

Average length of service by length of service group



Source: BIPE, based on INSEE employment survey data (average length of service for each length of service group), 2016, and water company survey

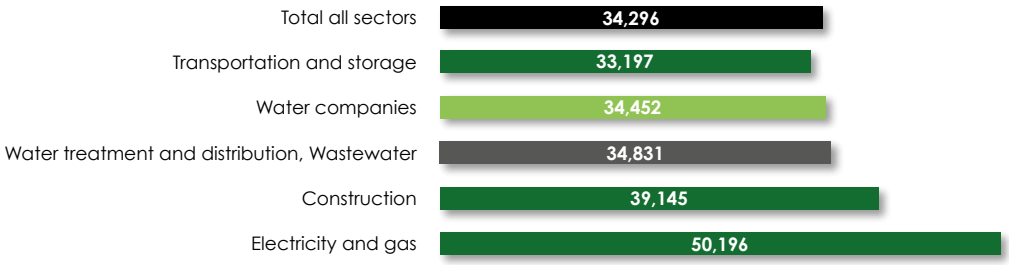
Percentage of employees by age group



Source: BIPE, based on INSEE employment survey data, 2016, and water company survey findings

Average annual pay (€)

(ratio of gross average annual pay to average number of employees)

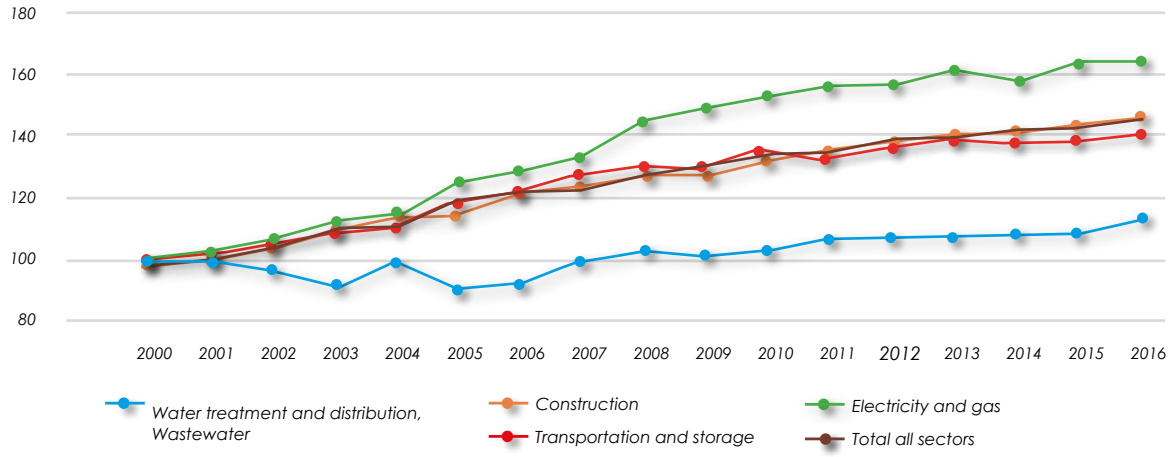


Source: BIPE, based on INSEE employment survey data (not weighted by socio-professional category), 2016, and FP2E data

Since 2008, average annual pay in the sector has grown less rapidly that the all-sectors average (rising by 1.3% a year as compared to 1.8% in all sectors combined). When it comes to average hourly pay, however, the water sector posts higher levels than the all-sectors average, and this among all categories of employees, from management to unskilled workers.

Trends in gross average annual pay

(base 100 = 2000) (ratio of gross average annual pay to average number of employees)



Source: BIPE, based on INSEE employment survey data, 2016

Gross average hourly pay by category

(base 100 = all sectors by category)

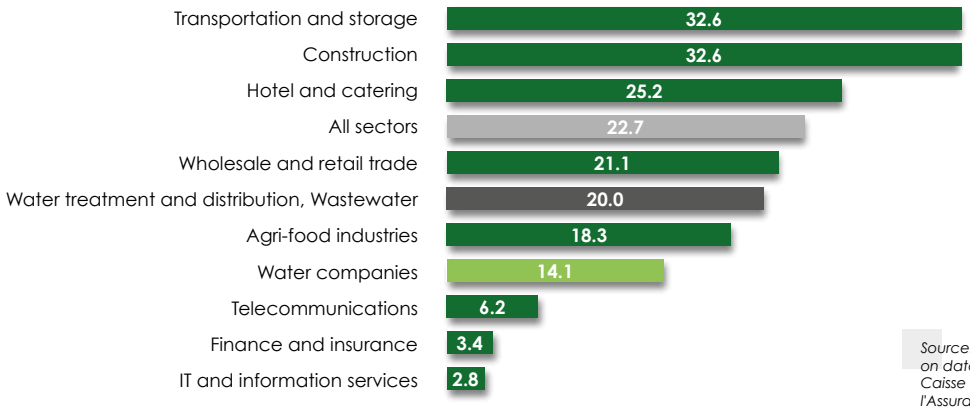
Source: BIPE, based on INSEE annual declaration of social data (DADS), 2015

Accident prevention

Workplace accidents are relatively rare among the water companies, despite the technical nature of many jobs. The severity of accidents is also lower than the French average. These performances are down to the highly pro-active risk management policies adopted by water companies.

Workplace accident rates

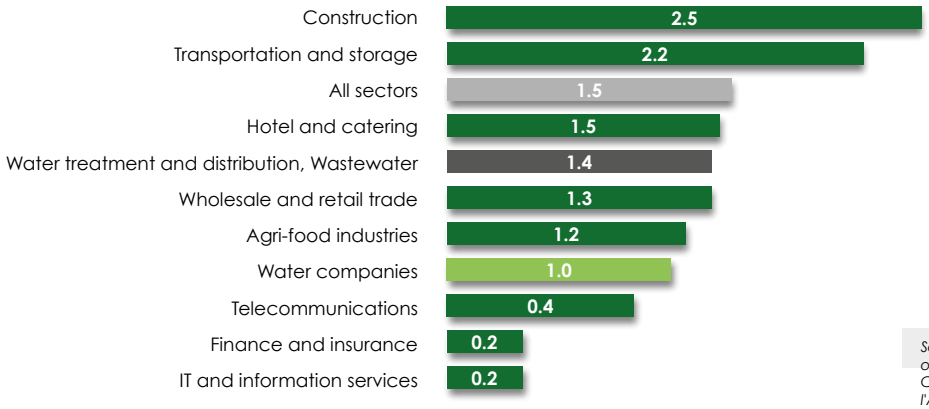
(number of accidents per million hours worked (accidents giving rise to a first compensation payment))



Source: BIPE, based on data from the Caisse Nationale de l'Assurance Maladie, 2016, and water company survey

Accident severity rates

(number of days of temporary incapacity for work per 1,000 hours worked)

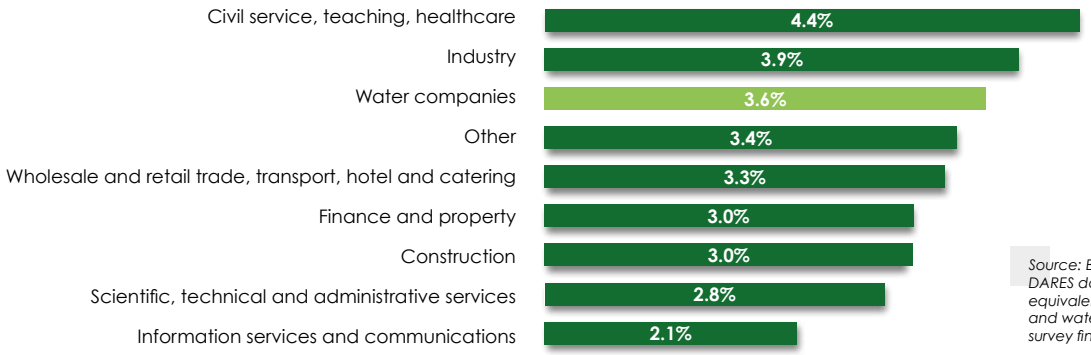


Source: BIPE, based on data from the Caisse Nationale de l'Assurance Maladie, 2016, and water company survey

Disability inclusion

The proportion of water company employees with a disability has remained stable in recent years (3.6% in 2017 as in 2013).

Percentage of employees with a disability



Source: BIPE, based on DARES data (full-time equivalent jobs), 2015, and water company survey findings

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

The water companies had more than 2,500 employee representatives in 2017 (including union members, staff delegates, works council members and members of health, safety and working conditions committees) - 9% of the total workforce.

Social dialogue is thriving: whereas the total number of jobs fell between 2012 and 2017, the number of employee representatives grew by over 250.

In 2017 the water companies signed more than 30 labor-related agreements:

- 18 on pay;
- 6 on social dialogue;
- 3 on health, safety and working conditions.

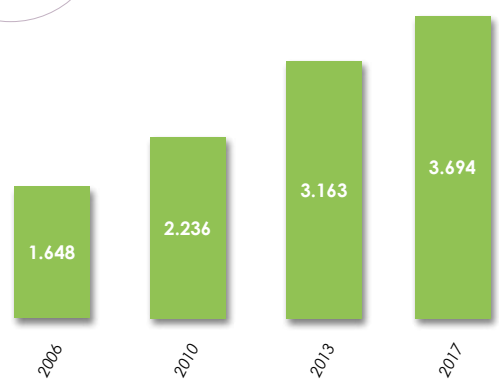
A limited environmental footprint

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 2017, 79% of water company business was generated in ISO 14001-certified activities.** Progress in this area has been continuous and significant for several years now.

The water companies have also been proactive when it comes to implementing energy management systems. One company for example has obtained ISO 50001 certification in four regions of France and is aiming to achieve this in the other seven regions in the near future. In 2016 non-fuel energy use by the water companies was assessed at 74 kWh per person – the equivalent of the annual energy consumption of a square meter of home heated by electricity.

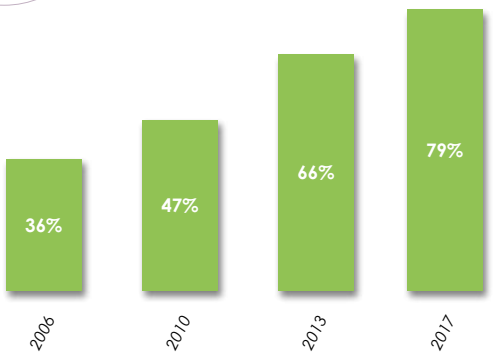
In their efforts to reduce their greenhouse gas emissions, **the water companies are increasingly turning to renewable energy.** In 2016 this accounted for **13% of their total energy usage**, climbing by two percentage points in four years. Moreover, 20% of the renewable energy used by the water companies is self-generated.

Water company revenues generated from ISO 14001-certified delegated management activities (€ million)

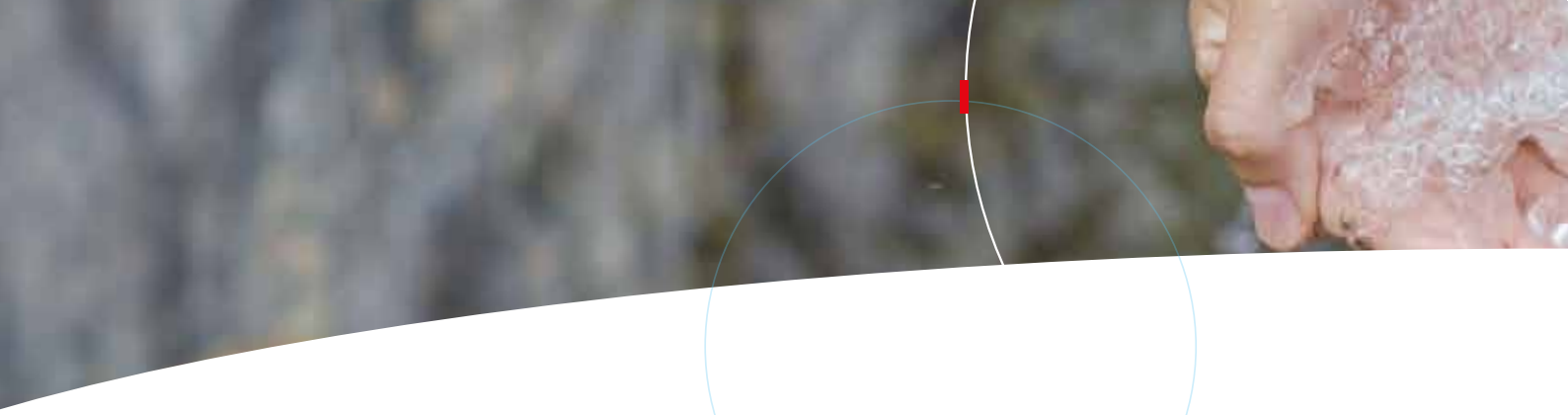


Source: BIPE, based on water company survey data

Percentage of water company revenues generated from ISO 14001-certified delegated management activities



Source: BIPE, based on water company survey data



FP2E

The FP2E, the Federation of French Water Companies, set up in 1938, represents the majority of water companies selected by tender to operate water and wastewater services in France.

Its members are:

- Aqualter Exploitation
- Derichebourg Aqua
- Saur
- Société des Eaux de Fin d'Oise
- Sogedo
- Suez
- Veolia

The Federation works to bring stakeholders - elected representatives, environmental organizations, user associations, NGOs 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 implementing capital investment projects, operating the facilities, and managing customers and relations with local administrations. It fulfils its remit with the help of seven commissions (economic & legal, scientific & technical, social, customer relations, European Affairs, and health and safety) staffed by experts from member companies.

BIPE BDO

Founded in 1958, the BIPE is an organization providing economic and strategic consultancy services to major private companies and public authorities. The BIPE's work covers all of the key economic sectors. Its expertise, which ranges from sub-regional to international in scope and extends to issues like economic contribution, environmental impact, strategic foresight, market forecasts and strategic marketing, helps inform the decisions of its clients.

To address issues of growing complexity, the BIPE draws on multidisciplinary skills and methods underpinned by data science and a respect for facts, scientific rigor and innovation. The BIPE and BDO, the world's fifth largest audit and consulting network, teamed up in 2018.

Methodology

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

- various national and international public agencies, as cited herein;
- an exhaustive survey among FP2E member companies.

The public sources of data include data from the national performance monitoring system SISPEA, as made available in September 2018. Service performance data covering a long period (from 2009 to 2016) were processed as part of a highly selective procedure using only those data that had been checked, validated and published. This process flagged up many cases of low population representativeness of the indicators despite improvements in recent years. For this reason BIPE-BDO has decided not to publish some of the data and in other cases to urge caution in interpreting the indicator values.

The aim of the FP2E and the BIPE-BDO is to progressively improve the quality and quantity of information available. Indeed, the field of water is constantly changing and the key institutional players are striving to secure 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.

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