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# Moving towards a more efficient financing of urban water cycle infrastructures in Spain

From the texts: their authors  
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Water is an essential, scarce and valuable commodity for both citizens and the economic activity of any given sector. In addition, the UN General Assembly recognised the right to water supply and sanitation as a fundamental human right in 2010. Therefore, it is necessary to ensure a safe and reliable supply of water, which should be primarily of high quality, but also sustainable over the long term.

For this purpose, a set of infrastructures to store, purify, distribute, treat and reuse water is required, as is an integrated management model for such infrastructures. This set of infrastructures and its management model is what shall be called “integrated water cycle”.

Regarding the integrated water cycle, this report will focus on urban areas, starting with the abstraction of water for its treatment and subsequent distribution to residential consumers. Following its use, water is collected by means of the urban drainage and sewerage network and conveyed to waste water treatment plants, where it is treated so that its discharge into natural waterways is possible.

The scope of application of this study encompasses those infrastructures that support local and regional water supply and sanitation services; thus, regulation infrastructures that are a matter of water basins’ competence are not covered.

Urban activity only accounts for 14% of total water consumption; however, in terms of economic value and number of consumers, it is the most important segment. Altogether, urban consumers pay over €6,200 M per year for their water consumption<sup>1</sup>. This figure amounts to 87% of the tariff resources of this sector.

The urban water cycle in Spain has undergone a major transformation over the past 30 years, with significant progress having been made in terms of waste water treatment, water quality, or the proportion of the population serviced with water distribution sanitation systems. These developments, along with the participation and cooperation of both the public and private sectors, have enabled Spain to currently present an incredibly high-quality service, regarding both coverage and quality.

However, following the economic crisis, the sector has seen a steep decline in investment concerning new construction, and unfortunately this trend has not been reversed in these recent years of economic recovery. Furthermore, there is consensus on the fact that current investment levels are clearly insufficient to meet the major challenges the sector is facing, such as the renewal of increasingly obsolete networks, or compliance with progressively more stringent regulatory requirements regarding waste water treatment, drinking water treatment and water quality.

This shortage of investment concerning new construction, which is well below previous levels, is largely due to the fact that infrastructure financing capacity via public sector and EU transfers has been greatly reduced in recent years. This situation is expected to continue in the medium to long term.

Therefore, it is necessary to seek solutions that make it possible to address the aforementioned investment deficit. Thus, the main goal of this report is to analyse all possible financing mechanisms, as well as to reach a consensus on a “plan of measures” to revert this trend, while promoting the sustainability of the system in the long run.

Spain is characterised by the coexistence of different urban water management models (public management, both direct management by local governments or delegated management through state-owned companies, public-private companies or private concession models). Therefore, the point of view of the main urban water cycle service providers in Spain has been considered, regardless of their specific models.

In this regard, we would like to express our appreciation for their dedication and cooperation in drafting this report.

This report was commissioned by the Spanish Association of Water Supply and Sanitation (AEAS) and the Spanish Association of Managing Companies of Urban Water Services (AGA), and drafted by PwC, with broad participation from a high-level expert working group, consisting of representatives and members of the aforementioned associations, who are part of public and private service providers, such as: Canal de Isabel II, EMASESA, CABB, EMACSA, Suez, FCC Aqualia, Global Omnium, FACSA and Acciona.

<sup>1</sup> Spanish National Statistics Institute (INE, by its Spanish acronym), 2016.





Currently, the urban water cycle in Spain has incredibly high service coverage and quality levels. This standard has been achieved thanks to major investments undertaken during the last three decades, mainly financed by public authorities and European funds, as well as on the basis of efforts made by service providers, which have contributed business criteria, technological developments and multidisciplinary innovation. This progress has been achieved within a collaborative environment between various sector actors, both public and private.

However, following the economic crisis, there has been a marked decrease in sector investment levels (from €3,800 M per year on average between 2003 and 2008 to €1,700 M between 2012 and 2016). The main cause of such decline lies in a lack of investment by public authorities, which is in turn a consequence of budgetary constraints and reduced European transfers.

Maintaining investment levels as low as they currently are is already having negative consequences on the urban water cycle management; these have started to adversely affect service quality, and will ultimately impact citizens. Currently, these consequences mainly take the form of operating and maintenance costs increases, further infrastructure deterioration, and difficulty in introducing necessary technological developments already existing in the industry. In addition, Spain is the most vulnerable country to the effects of climate change in the European Union, as it already presents a high water stress indicator and is also at risk of desertification. It is equally important that many key activities in the Spanish economy are very water-intensive (tourism, agriculture, etc.).

According to AEAS, annual urban water cycle investment needs are estimated at €4.900 M for the next decade, which would involve a twofold increase in the average annual investment, compared to the previous period.

In a context in which different public authorities will continue to experience budgetary constraints, the most feasible source of financing is a gradual tariff increase to finance new infrastructure. This option is compatible with the various main management models being used in Spain (indirect public management, public-private companies and concession models), and is also the most common practice in Europe, where the principle of cost recovery, by means of appropriate user contributions, is the rule.

Finally, fifteen measures that would improve the economic, social and environmental sustainability of the urban water cycle in Spain have been identified:

- In the short-term, easily implementable measures with a high impact on the sector are proposed; some prominent examples are as follows: (i) creating a public database including technical and financial information on the sector, which would make it possible to assess the efficiency of the urban water cycle in each municipality, and would also help identify investment priorities; (ii) approving a uniform methodology for the calculation of urban water tariffs within the national territory; this measure would be pivotal, as it would be the basis for ensuring that tariffs properly, and according to technical criteria, reflect actual costs of the service; (iii) introducing regulatory changes to ensure that investment tariffs / fees / or charges are allocated in their entirety to the urban water cycle; (iv) amending legislation in order to bring the rate of financial remuneration into line with investment projects; and (v) creating a national fund to finance water infrastructure projects in urban areas.
- In the medium term, various measures have been defined, such as: (i) drafting framework bid specifications aimed at helping municipalities manage services; and (ii) setting purpose-determined tariffs to finance new investments concerning urban water cycle infrastructures.
- In the long term, more profound changes could be considered, such as establishing a regulatory body.





## Historical deficits regarding water infrastructure

As mentioned above, the urban water cycle in Spain has undergone a major transformation over the last 30 years. This transformation has been promoted primarily by the considerable investments made by different Public Authorities (Pas) and by EU funds. Additionally, this period has been characterised by service providers achieving a high level of professionalism, by providing business and efficiency criteria, entrepreneurial logic, technological developments and innovation, in order to perform the multifaceted activities necessary for the provision of such complex urban water cycle services.

However, in recent years, following the onset of the economic crisis, there has been a very significant decrease in investments concerning the urban water cycle, from €3,800 M per year on average in the 2003-2008 period, to €1,700 M per year during the 2012-2016 period. In addition, latest investment figures show no improvement despite the economic recovery. The aforementioned decline is mainly due to lower levels of investment by PAs, which largely stem from budgetary constraints, and a lack of European transfers. By contrast, water providers have shown a more stable trend with regards to their investments, which has led them to attain their current role as the main investment actors in the system.

This drop has caused Spanish investment levels to fall from figures that used to be above the EU average (0.36% vs 0.25% of GDP per year) in 2007 to its current value that is far below those of the major European countries since 2014 (0.14% vs 0.32% of GDP). This under-investment is even more worrying when considering the fact that Spain's geographic and demographic characteristics (i.e. lower population density, complex topography, limited water resources, and great climate disparities between regions...) bring about investment levels that are structurally higher than those in other EU countries.

Structurally, maintaining low investment levels is already having negative consequences on the urban water cycle management; these have started to adversely affect service quality, and will ultimately impact citizens. Nowadays, these consequences mainly take the form of increased maintenance costs, which have reached figures that nearly double European values, in terms of spending per network km. In addition, from an environmental perspective, following major improvements achieved over the last three decades, there has been stagnation in key parameters, such as water losses, waste water treatment processes quality, water stress levels, water availability or network obsolescence.

Consequently, there is consensus on the fact that current investment levels are clearly insufficient to meet the major challenges facing the sector, thus making it necessary to reach an annual investment of €4,900 M, by doubling investment figures from recent years. This estimate includes, besides the investment figures already specified within the River Basin Management Plans (€1,900 M), renewal needs of water distribution and sewerage networks (€ 2,200 M) and operating investment, as well as that stemming from the need to comply with more stringent regulations in a context where water resources quality is worse (€500 M and €300 M).

Structurally,  
maintaining low  
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management



## Feasibility and advantages and disadvantages of potential water infrastructure financing mechanisms

The aforementioned investment deficit may be covered by an increase in public investment, either from Spanish PAs or European bodies; there is also the option of financing it by rising consumer tariffs. Based on the analyses carried out, it is concluded that public investment is limited, and, thus, tariffs should be the main tool for channelling investments, as is the case in countries of northern Europe.

- i) EU funds have played a very important role during the three decades prior to the crisis; however, future availability of these funds is limited to a few regions, exclusively regarding waste water treatment. This is due to the economic convergence achieved by most Spanish regions, even surpassing the EU average, combined with the fact that eastern European countries have joined the EU; these compete for such funds and present greater development needs.
- ii) Despite the economic recovery experienced in recent years, the financial position of central and regional authorities still leaves little scope for increased spending, with public debt levels approaching 100% of GDP and recurring budget deficits. In addition, the growing pressure coming from other budget expenditure items related to the welfare state (healthcare, pensions...) puts severe limitations on the ability of these administrations to return to those investment levels recorded before the crisis.
- iii) Regarding local authorities, their situation is very similar to that of the remaining administrations, due to high levels of public debt. However, there are significant discrepancies depending on the size of municipalities. Thus, large metropolitan areas do indeed have certain degree of flexibility to undertake investments, but small and medium-sized municipalities do not. In addition, the investment required by these small municipalities is much larger when compared to their local budget, partly due to the fact that the economies of scale achieved through its management are smaller, and partly to infrastructures being increasingly rendered obsolete and, therefore, involving higher renewal needs.
- iv) Two comments may be made in relation to the option of financing via an increased indebtedness on service providers' balances. Firstly, these corporations' financial ratios do not allow for significant increases in debt. Secondly, an increase in debt that is not associated with an expansion in service providers'

resources would not be sustainable when considering the scale of investment required.

- v) Finally, the feasibility of a financing model based on tariffs was assessed, by analysing the scope for rises, and an estimate of the extent to which these tariffs should be increased, in order to cover the investment deficit, was made. Thus, it should be noted that Spain presents one of the lowest tariffs in Europe (€2.2/m<sup>3</sup> vs €3.5 €/m<sup>3</sup>). Besides, efforts made by Spanish consumers to pay the water bill, when considering their available income, are below the European average (-30%). Moreover, it has been estimated that, in order to cover this gap, a 50% increase from current levels would be required, which would place the Spanish tariff at a level closer to the European average. Finally, it is worth pointing out that financing water services via tariffs is one of the principles laid down in European water legislation, which defines cost recovery (by means of appropriate user contributions) as one of the necessary pillars for efficient management.

For all these reasons, it is concluded that tariffs should become the main source of financing in the next decade. However, this is a long-term model involving different financing mechanisms coexisting (bonds, bank financing, etc.). Channelling these investments will require Spain to refine its existing regulatory framework, in order to achieve greater security and enhanced visibility for investors.

In general, financing via tariff increases is compatible with all management models, whether public or private. Probably, the only exception to this would be the vast majority of systems directly managed by local governments, without any specialised company, where there is no water activity accounting separation either. However, this model accounts for less than 10% of the Spanish market. Moreover, in the face of a globalised world economy, large public companies and private concession models could benefit, since these are more familiar with fund raising from financial institutions, the use of "Project Finance" mechanisms, and guarantee procedures (i.e. by magnitude, solvency and business references or by using income as collateral).

## International best practices

Before crafting the list of measures proposed for the Spanish case, specific measures and changes implemented by those countries with a better urban water cycle management in terms of efficiency were examined.



It is concluded that public investment is limited, and, thus, tariffs should be the main tool for channelling investments

Thus, the following key conclusions can be drawn based on the above international comparative assessment:

i) countries with better urban water cycle management systems implement centralised, or at least coordinated, investment planning models, ii) these countries also finance their investments via tariffs, in compliance with the principle of cost recovery, and they also iii) use an established methodology for the calculation of urban water tariffs.

All these measures are compatible with the fact that management fall within the competence of municipalities, and these have no impact on whether management models are public or private.

### **Plan of measures to improve the financing of water infrastructures in Spain**

In view of all this, and also taking into account the main concerns of the sector, fifteen measures required to boost sector investment in Spain have been identified; these measures relate to the urban water system planning, financing, and operation. Similarly, a set of cross-cutting and more far-reaching measures has also been defined. These measures can be found below sorted in order based on their urgency (temporal priority):

#### **Short-term measures**

##### **I. Measures targeted at aligning with international best practices in terms of transparency, including:**

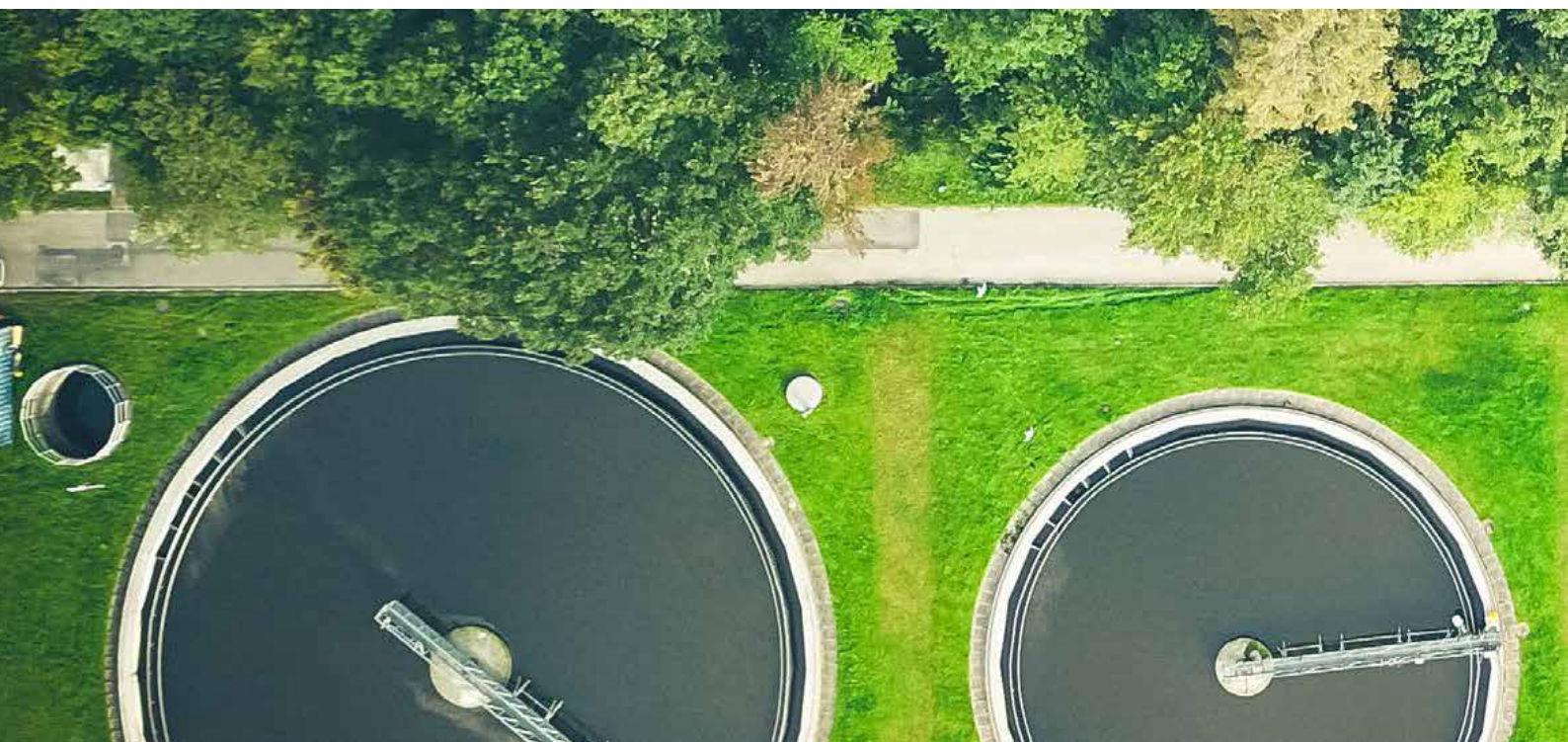
1. Collecting technical and financial information in a public database shared among service providers, which shall facilitate decision-making and the definition of best practices.
2. Approving a methodology for the calculation of tariffs, which shall clearly define which costs are to be included in such tariffs and structure thereof, as well as tariff adjustment processes.

##### **II. Measures aimed at supporting municipalities with infrastructure planning, including:**

3. Helping municipalities define sustainable investment plans.
4. Establishing incentives (i.e. access to grants) for municipalities to aggregate in order to scale up and enabling a more efficient management.
5. Publishing service providers' investment plans and how these relate to their established investment tariffs.



6. Adopting legislation providing that supplementary tariffs/investment fees and charges aimed at such objective are allocated in their entirety to water infrastructures
- III. Measures aimed at attracting private investment, and that from state banks, to the sector, including those measures targeted at amending some pieces of legislation approved in recent years regarding the water sector, as well as introducing other tools to attract private capital or that from the international public banking system:**
7. Firstly, it is proposed that the return rate set out in Law 9/2017, of 8 November, on Public Sector Contracts (*Ley 9/2017, de 8 de noviembre, de Contratos del Sector Público*), currently placed at approximately 3.5%, be adjusted to more adequate levels, in line with the financial risk profile in the water sector (6%-7%).
  8. It is also suggested that a revision of the limitations laid down in Law 2/2015, of 30 March, on the Deindexation of the Spanish Economy (*Ley 2/2015, de 30 de marzo, de desindexación de la economía española*) be conducted, in order to reflect tariffs adjustments to incorporate changes in costs or other operating indicators. In any case, it is proposed that such amendments are provided for in “*ex ante*” contracts.
  9. Creating a national fund to finance water infrastructure projects, with a focus on attracting private or public capital, supported by state guarantees (central government and Autonomous Communities (ACs)) and complying with financing conditions that will allow access to funds from the European Investment Bank (EIB), and similar. The aforementioned fund would be intended to support smaller-scale projects with limited access to financing, typically in small and medium-size municipalities, especially concerning the renewal/extension of eminently local networks and other infrastructures.
- Detailed information on middle-term measures**
10. These measures are aimed at supporting municipalities with the drafting of bid specifications or with grouping processes (association of municipalities or consortia): achieving compliance with the new act on Public Sector Contracts (Act 9/2017, of 8 November, on Public Sector Contracts) is one of the main factors delaying the development of municipal bid specifications. It is proposed to provide support to these municipalities, by contributing technical resources or drafting a



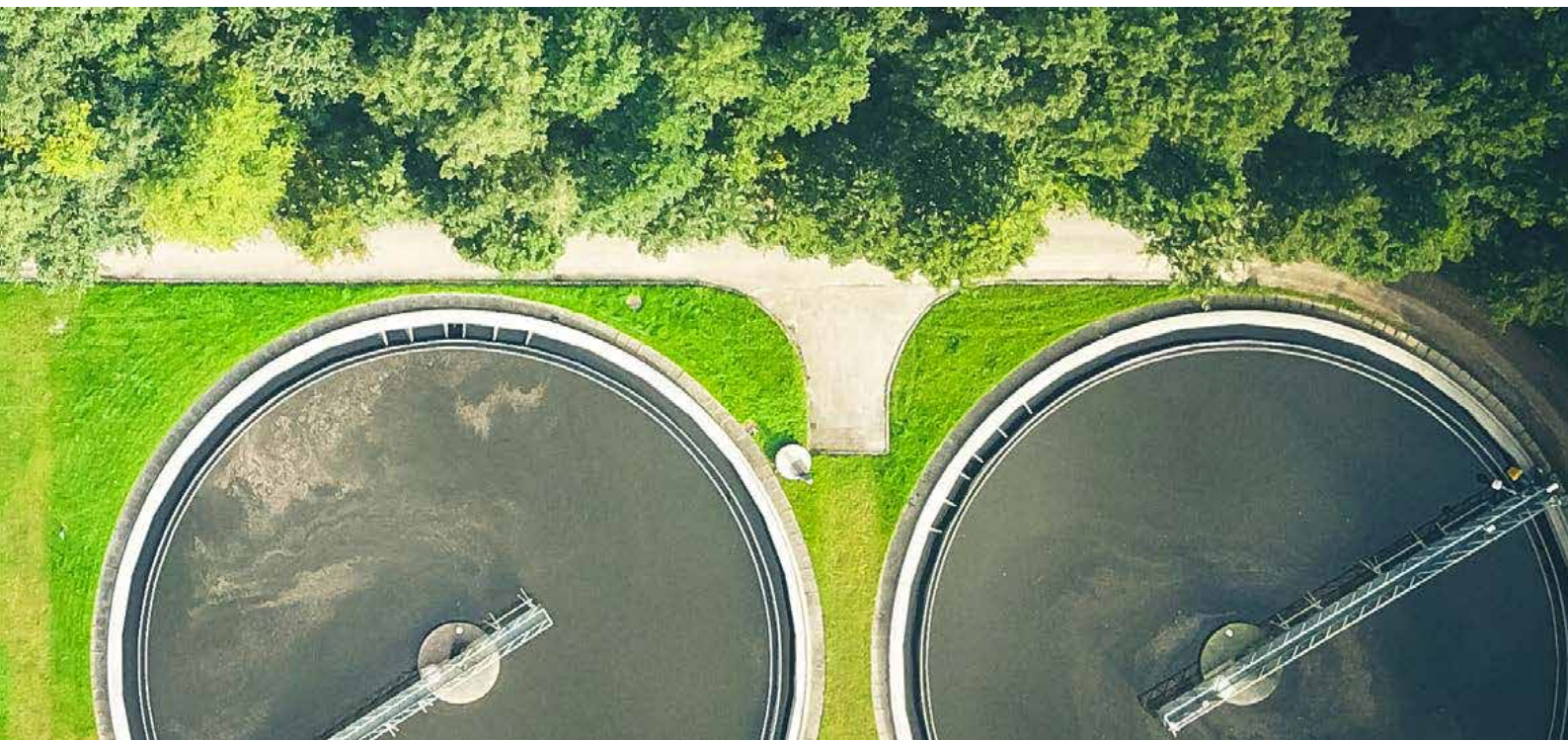


framework contract of reference in the sector, or to voluntary public services grouping processes.

11. Extending the application of investment purpose-determined fees/tariffs to the supramunicipal level, to channel investment towards water distribution and sewerage networks: historically, investment rates and charges at the local level have been primarily associated with water treatment activities and provided by ACs. It is proposed to extend the scope of this model to supramunicipal groups that focus on networks.
12. Regarding concession models, since current legislation results in operational risk being transferred to concession holders, there seems to be little point at present in restricting sub-contracting within their corporate groups. Reviewing this type of restrictions to further promote operating efficiency is proposed.
13. Adjusting the payment of charges according to specific investment needs over the period corresponding to the duration of these concessions or agreements, avoiding concentrating all payments to be granted to the municipality during the first year of the concession.

#### Detailed information on long-term measures

14. Regarding direct management models: Approving the principle of separation of activities and establishing separate accounts for water in those municipalities operating under direct local management models; this measure is aimed at ensuring that the separation of local and “urban water management” accounts is also compulsory under direct local management models, since it is the only way to formulate a more accurate overview of revenues and costs of the system as a whole.
15. Creating a specific water regulatory body. Following the implementation of the remaining measures proposed, it is considered that barriers to the integration of the different responsibilities and competences defined under the scope of a single specific regulatory body would be easier to overcome. Alternatively, one option that might be considered is establishing this body short term, and entrusting it with responsibility for the undertaking of all these measures. However, given the current political and legislative context, it would be preferable to defer the discussion on the establishment of a regulatory body until later (medium to long term).



# 1

## An introduction to the urban water cycle

## 1.1. Phases of the integrated water cycle

The water sector value chain has two different segments: upstream systems and downstream systems.

- Upstream systems include all activities within the value chain regarding water abstraction, storage and transport to water treatment plants for urban use or to end users, such as farmers or large industries, for instance power plants.
- Downstream systems include the remaining components mainly associated with drinking water treatment, water distribution, sewerage and waste water treatment and urban water reuse.

Once it has been transported to urban areas through upstream systems, water is treated in order to be declared fit for human consumption; this is referred to as the “drinking water treatment phase”. Drinking water is stored in storage facilities for its subsequent distribution.

Once water has been used, the sanitation phase begins. Water used by households, urban industries or businesses is conveyed through sewerage and urban drainage networks to waste water treatment plants.

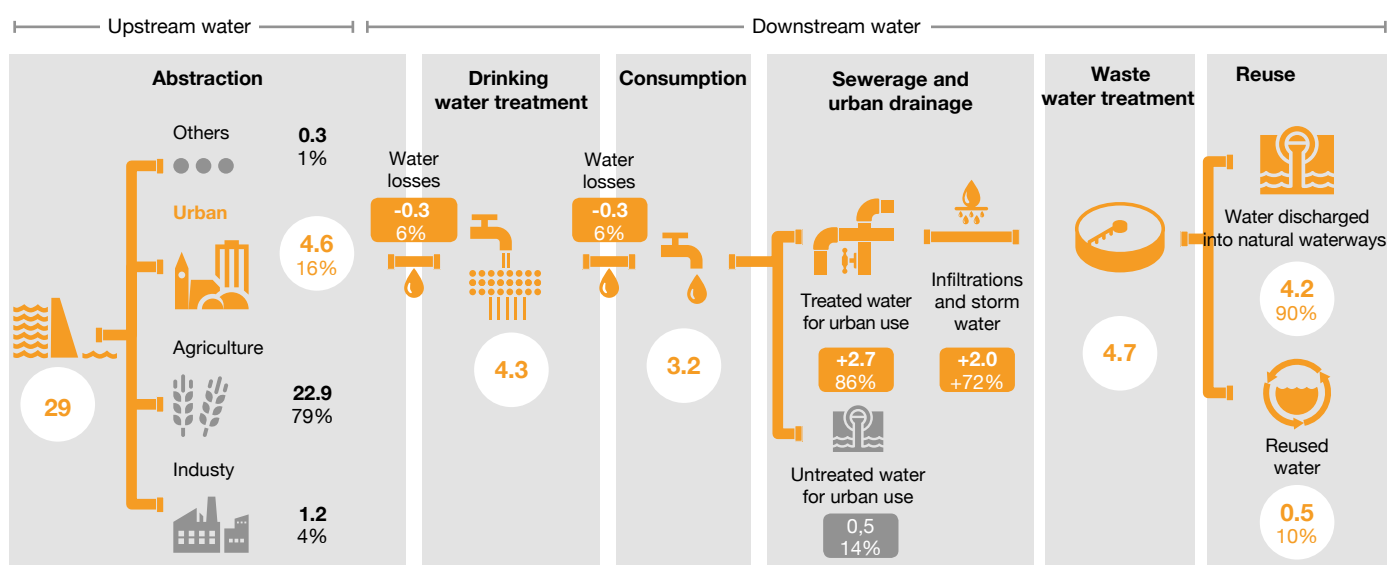
Besides, urban drainage systems collect and channel storm water. All this waste water is treated by means of various technical processes so that its discharge into rivers and natural waterways is possible again, complying with specific quality and environmental compatibility requirements.

Finally, the last phase of the water cycle is known as reuse. This phase is of particular importance in countries, such as Spain, where there is a severe shortage of water. During this part of the value chain, a proportion of treated waste water moves to another final phase, water reclamation, where it is further treated in order to be later used in various activities, such as: garden irrigation, agriculture, etc.

The focus of this document is downstream or urban water systems, thus, the main aspects of the sector, such as consumer profile and different urban water uses, key market figures in terms of consumption and water supply and sanitation, are explained with greater detail in this chapter. The weight of the urban water cycle in the Spanish economy and activity is also analysed. Finally, the main management models existing in Spain are presented.

### Water flow from its abstraction and conveyance to its reuse broken down by phase and process

Miles hm<sup>3</sup>, 2016





## 1.2. Urban water cycle characterisation

As mentioned in the previous section, the urban water cycle begins with water from upstream systems being purified, and subsequently distributed for use among residential consumers. Following its use, water is collected by means of the sewerage network and conveyed to waste water treatment plants, where it is treated before its discharge into natural waterways. Besides residential used water, urban drainage systems also collect and channel storm water for its treatment and discharge into natural waterways.

During this second phase, municipalities and many Autonomous Communities have the main responsibility for developing regulations and defining tariffs paid by users. In addition, monitoring water quality will fall under the competences of Autonomous Communities and requirements across Autonomous Communities shall be harmonised by the Ministry of Health, though the former are the ultimate guarantors of water quality by ensuring it is fit for human consumption.

### Water consumption trends and consumers profile

Generally, it can be observed that there has been a decrease in water consumption (down 2% per year over the period 2008-2016), associated, among many other factors, with an improvement in the efficiency of water distribution network processes, the implementation of water reclamation and reuse systems, a reduction in activity, compared to the period following the economic

crisis, and the achievement of widespread rational use of domestic water.

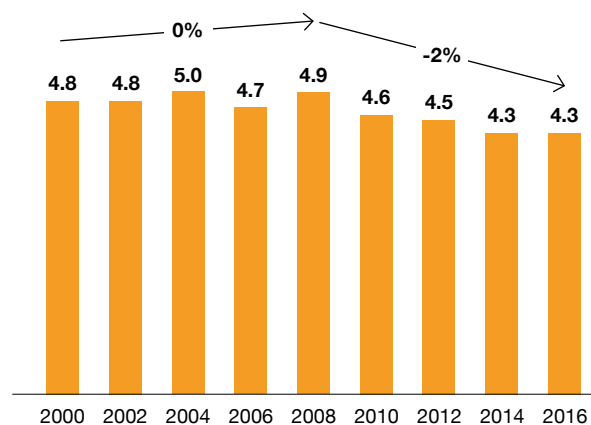
Within the integrated urban water cycle, domestic uses are dominant (72%), while the remaining uses are associated with the consumption of treated water by the industry sector (11%), local use (8%) and services (9%).

In 2016, water supply and sanitation services generated approximately €6,200 M (Spanish National Statistics Institute (INE, by its Spanish acronym). All services related to water supply, both upstream and downstream, shall be financed by this revenue.

Between 2000 and 2016, sustained growth was observed regarding this activity. In the period prior to the crisis, both tariffs and volume of water consumed rose, however, since 2008, tariff appreciation is the main variable explaining such growth. In this regard, it should be noted that Spain has seen a sharp increase in water management quality, by raising the percentage of treated waste water, from below 50% to over 80%, or reaching 10% of treated waste water being reused. This fact has resulted in sanitation amounting to a greater proportion of water costs, from 20% of total cost in 2000 to 40% in 2016.

Payment for water supply services (which includes upstream water costs), drinking water treatment and water distribution to users, reached €3.700 M in 2016, following a period of uninterrupted growth, both during the economic expansion (+5% of Compound annual growth rate (CAGR) in 2000-08) and, at a slower rate, during the recession and subsequent recovery (+3% of CAGR in 2008-16).

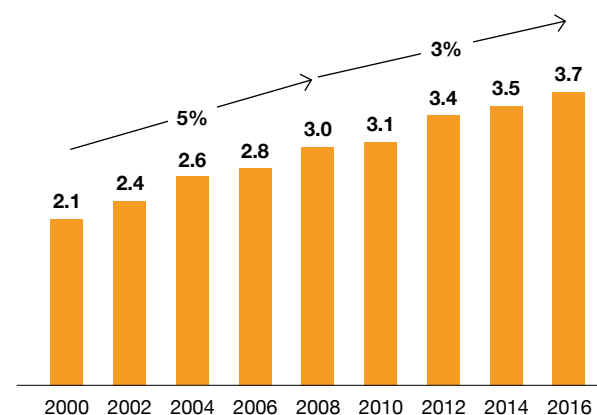
**Volume of water supplied to the urban water supply network, 2000-2016**  
'000hm<sup>3</sup>



Source: Spanish National Statistics Institute (INE)



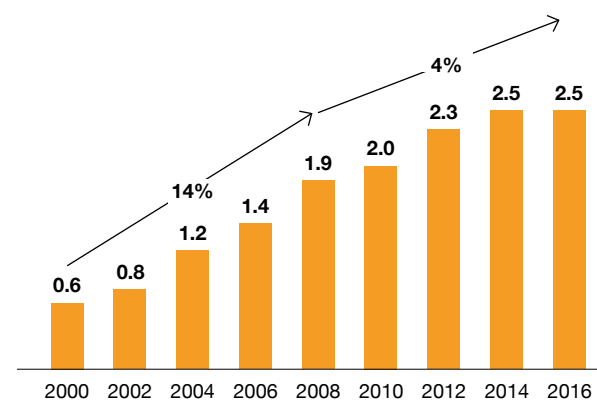
**Amount invoiced for urban water supply '000 m€**



Source: Spanish National Statistics Institute (INE)

In 2016, payment for sewerage and urban waste water treatment activities reached €2.500 M, following a period of uninterrupted growth, both during the economic expansion (+14% of CAGR in 2000-08) and, at a slower rate, during the recession and subsequent recovery (+4% of CAGR in 2008-16).

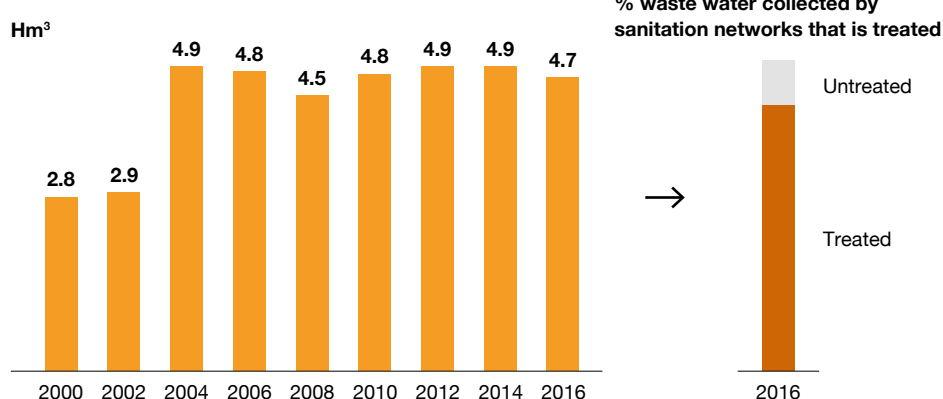
**Amount invoiced for waste water treatment and sewerage '000 m€**



Source: Spanish National Statistics Institute (INE)

This growth is fully consistent with the fact that Spanish sanitation has undergone an enormous transformation in recent years, when water volume grew from 2.8 million m<sup>3</sup> in 2000 to 4.7 million m<sup>3</sup> in 2016.

**Volume of treated waste water, 2000-2014**  
'000 hm<sup>3</sup>, %



Source: Spanish National Statistics Institute (INE): Statistics on water supply and sanitation (2000-2016)

### 1.3. Economic impact of water on the main sectors in Spain

Taking account of the extent of the impact of water on the Spanish economy and activity, water is an essential resource in sectors that currently amount to 20.1% of Gross domestic product (GDP) and account for 20.7% of employment in Spain.

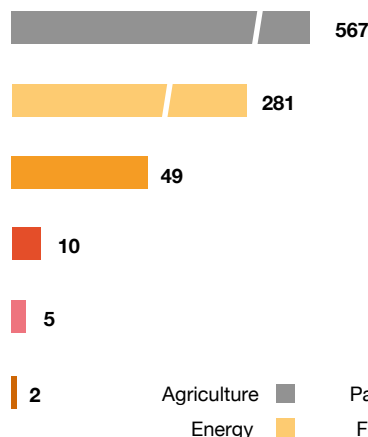
Agriculture remains the most water-intensive sector, by far. However, this impact primarily affects upstream water networks and it is not a strong player in the

economy and employment (2.7% of GDP and 3.8% of employment).

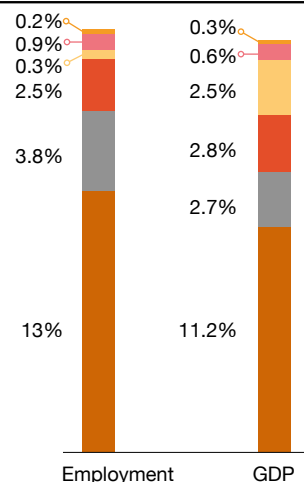
By contrast, tourism is the economic sector involving the greatest impact on the urban water cycle (despite being comparatively far less water-intensive than agriculture or other industries). It amounts to 11.2% of GDP and accounts for 13% of employment in Spain.

Despite its significance, water urban services (water supply and sanitation) account for only 0.6% of annual GDP, and the cost for average families does not exceed 0.9% of family income.

**Water utilisation ratio by industry**  
m³/GVA<sup>(1)</sup> 000 €



**Water utilisation ratio by industry**  
%, 2016



Note: (1) GVA: Gross Value Added

Source: EUROSTAT, the Spanish National Statistics Institute (INE), the Spanish Tourism Satellite Account (by its Spanish acronym, CSTE), Strategy & Assessment



## 1.4. Management models

Regarding the urban water cycle, there are different management models depending on the entity, company or group of companies in charge of the management of infrastructure and service provision, since infrastructures (drinking water treatment plants, water distribution and sewage networks, as well as waste water treatment plants) primarily remain the property of local authorities and Autonomous Communities.

Delegated management models involving only public participation (public companies, associations of municipalities or consortia) are governed by Law 40/2015, of October 2, on the Legal Regime of the Public Sector (*Ley 40/2015, del 2 de octubre, del Régimen Jurídico del Sector Público*) and are considered to be included within public sector bodies.

Direct management models (municipalities own infrastructures and also manage those services within the municipality) currently serve 10% of the Spanish population, mainly in small and medium-sized municipalities that are geographically isolated from major urban centres (with some exceptions).

Delegated management models are dominant in Spain (90% of the population), due to their efficiency and scope for technological developments, and differ from direct management models since in the former case companies manage infrastructures and provide services, but the ownership of networks, and other infrastructures, remains with PAs. Private sector contributions to the urban water management account for up to 50% of supply activities (both regarding public-private and private companies), though these are also present in other management

models implemented to provide technical, operating and maintenance services. Regarding waste water treatment activities, private contributions are more prevalent (90%) due to the high technical and operational complexity of processes involved; however, in terms of ownership and administrative management, waste water treatment assets remain in the public sector.

Spain is a point of reference worldwide for the coexistence of different management models, both entirely public and private or public-private ones, nationwide.

In addition, the many success stories resulting from public-private cooperation implemented in Spain over the last 30 years should be highlighted, such as Valencia Public-Private Water Company (EMIVASA, by its Spanish acronym), or Santa Cruz de Tenerife Public-Private Water Company (EMMASA, by its Spanish acronym), which have successfully developed reliable water infrastructures with great coverage and the highest standards of service quality, especially if considering that the water resource these companies rely on is extremely limited and of increasingly compromised quality. These cases are just two examples among many others existing in Spain (22% of the population served in Spain).

Similarly, another example of public-private cooperation among service providers to be highlighted is that of AEAS and AGA associations. Both associations are a clear example of the understanding and cooperation between all service providers involved, regardless of their shareholding structure, and they currently lead the collection of information, analysis and publishing processes related to the sector, help pool best practices in the sector and articulate, on an aggregate basis, service providers' needs to relevant actors.

	Delegated management		
Direct management	Public company	Public-Private Company	Private company
<ul style="list-style-type: none"> <li>• Small municipalities directly managing water.</li> <li>• No independent public company is established.</li> </ul>	<ul style="list-style-type: none"> <li>• Public company managing water at the local or regional level.</li> <li>• Large number of customers.</li> <li>• Public Administrations are the sole shareholders.</li> </ul>	<ul style="list-style-type: none"> <li>• Management at the regional level, which tends to be expanded.</li> <li>• Large number of clients and network size.</li> <li>• Company in which both PAs and private entities hold stakes.</li> </ul>	<ul style="list-style-type: none"> <li>• Its presence is more dispersed at the local level depending on concessions.</li> <li>• Private companies, specialising in water infrastructure management.</li> </ul>
<b>Downstream water: (% of population served)</b>			
<b>10%</b>	<b>34%</b>	<b>22%</b>	<b>34%</b>
<b>Source:</b> Understanding the challenges for infrastructure finance – BIS (2014); Infrastructure Financing Instruments and Incentives – OECD (2015); Strategy & Assessment.			

It is also important to highlight public-public cooperation between different levels of government, such as Sanitation Boards or Bodies (Public Waste Water Sanitation Body of the Regional Government of Valencia or Catalan Water Agency), which have allowed for the development and planning of sanitation systems within their regions at the supramunicipal level, prioritising measures and aggregating the needs of smaller

municipalities (without budgetary capacity), thus achieving economies of scale.

All these examples of cooperation between public and private service providers and different levels of the government have enabled Spain to achieve incredibly high service coverage and quality levels regarding the urban water cycle; however, these are currently, as well as in the short to mid-term, compromised.

### **An introduction to the urban water cycle: Key Concepts**

- The integrated water cycle consists of upstream water systems (water abstraction, storage and transport) and downstream water systems (drinking water treatment, distribution, sewerage, waste water treatment and reuse).
- The urban water cycle involves different downstream water activities (water supply and sanitation) related to residential, commercial, and industrial consumption and discharges, which fall under the competences of municipalities.
- In 2016, water supply and sanitation services generated €6,200 M (Spanish National Statistics Institute (INE)).
- Spain has incredibly high service coverage and quality levels regarding the urban water cycle, on a par with those of the best European countries, due to large investments undertaken in the sector (i.e. between 2000 and 2016, the percentage of treated waste water rose from below 50% to approximately 85%, reaching 10% of treated waste water being reused). These investments have been financed by European, state and regional funds, as well as, to some extent, by means of the progressive increase in water supply and sanitation urban tariffs.
- Taking account of the extent of the impact of water on the Spanish economy and activity, water is an essential resource in sectors that currently amount to 20.1% of GDP and account for 20.7% of employment in Spain (tourism, agriculture, etc...).

“All these examples have enabled Spain to achieve incredibly high coverage and quality levels; however, these are currently, as well as in the short to midterm, compromised.”





# 2

## Historical deficit regarding water infrastructure

## 2.1. Analysis of investment in the Spanish urban water cycle

Urban water cycle investments mainly cover:

- Drinking Water Treatment Plants (DWTPs), distribution and storage networks that reach users, and sewerage networks. These infrastructures are mainly local and their management remains with water service providers, regardless of whether these are public, public-private or private.
- Waste Water Treatment Plants (WWTP). These infrastructures may be locally or regionally managed, depending on the circumstances and size of the municipality. In general, a large proportion of waste water treatment structures was financed by means of EU transfers made by the State or Autonomous Communities, partially contributing their own budgets.

On average, urban water cycle investment reached €2,900 M over the period 2003-2016.

Investment associated with network maintenance and DWTPs, made by service providers, followed the most stable trend over the period analysed from 2003 to 2016; however, it has declined in recent years.

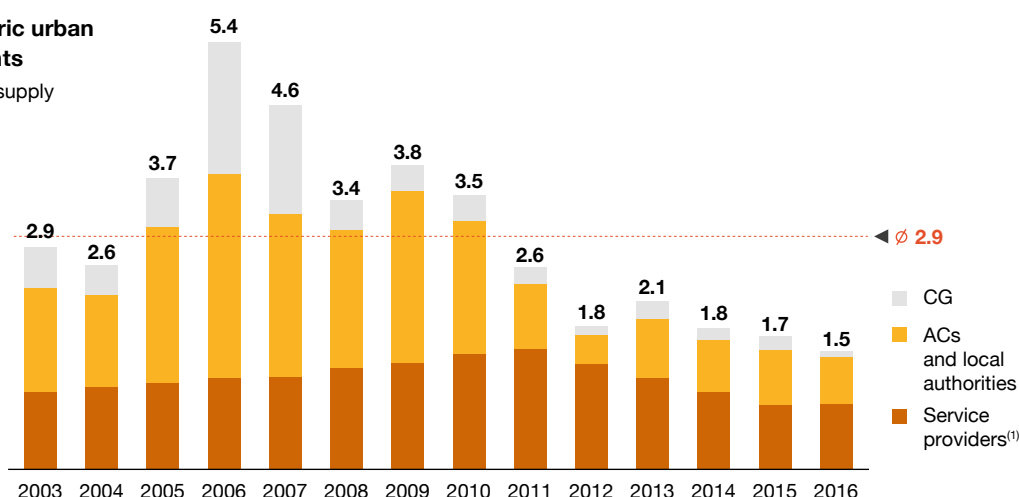
- Average investment by service providers over the period 2003-2016 reached approximately €1,200 M, showing an upward trend over 2003- 2011, peaking at €1,500 M. This upturn in service providers' investment was associated with: an increase in water demand resulting from population growth, which, together with tariff increases, made it possible to undertake investments. In addition, many concessions were granted and began its validity period over these years and, normally, system investments are concentrated in the initial years of these concessions. Beginning in 2011, tariffs being contained, and the lack of new concessions, explain the moderate drop observed (approximately €700 M in 2016).

Regarding public investment, it follows a far more irregular and asymmetrical progression, with the decline in public investment being the main reason behind the current deficit.

- This trend, involving lower investments in the water sector by public authorities, is consistent with the global trend whereby infrastructure investments by PAs have been reduced from 3% of GDP in 2006 to a level below 1% of GDP in 2012.
- Most noteworthy is the severe reduction in investments directly financed by the central government, which has

### Evolution of historic urban sector investments

[Trillion euros, water supply and sanitation]



<sup>(1)</sup> Investments by service providers were estimated based on an analysis of the main service providers' annual accounts (75% of the market), these results were later extrapolated to the remaining service providers. Acquisitions of intangible assets associated with concessions, concession contracts and rights of use for 2007, 2011, 2015 and 2017 were considered. Investment during intervening years was estimated by interpolating obtained results between these years.

**Source:** Ministry of Infrastructures and Transport Statistical Yearbook of tenders, annual accounts, Strategy & Assessment

taken place in recent years. In 2006 and 2007, the central government financed investments in the urban sector amounting to €1,500 M. However, this figure is currently very low. This drastic reduction is not associated with a transfer of funds to Autonomous Communities, since, as shown above, investment by the whole of the public regional and national government has been reduced from €4,200 M in 2006 to €660M in 2016.

- One of the main reasons behind this fall in investment is that, despite the fact that PAs undertook major investments in the sector during the period prior to the crisis, most part of the funds came from the EU (€11,000 M between 2000 and 2017, which were primarily targeted at financing new WWTPs). The fact that new countries with greater infrastructure financing needs have joined the EU, combined with the improvement experienced in Spain, explains the drastic cut in transfers and why Spain is no longer a priority recipient of these funds.

#### Comparison of Spanish urban cycle investments with those of other European countries

A decade ago, water infrastructure investments in Spain were slightly higher than those in the main European countries (0.36% of GDP vs 0.25%); this is justified by structural reasons related to Spain's geography and socio-demography, such as a scarce water resource and its extreme seasonal availability, its large surface combined with low population density and very dispersed consumption points. This historic investment effort allowed achieving major milestones:

- Increasing the volume of waste water treated from 50% to over 80% of the water consumed in the period

2000-2014, by increasing waste water treatment levels from primary to secondary and later to tertiary.

- Water reuse has also shown an exponential growth, increasing from 6% of the treated waste water in 2002 to 10% in 2016; this figure has remained stable since then.
- Policies on the protection of water bodies have been aligned with European legislation on this area.

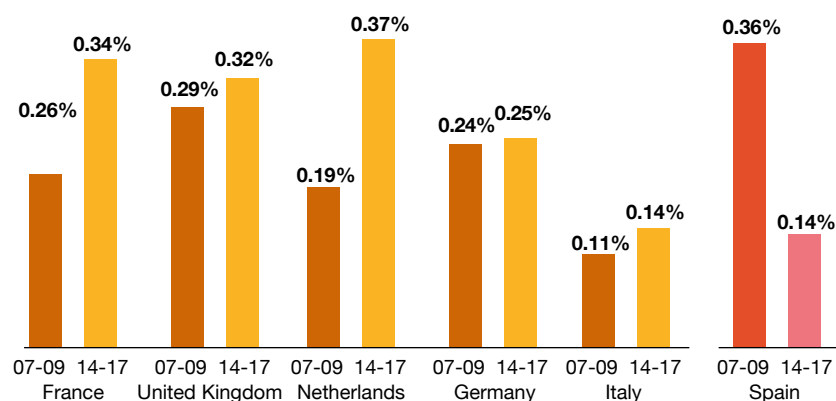
However, following the economic crisis, and especially over the last 3 years, investments in the sector have fallen dramatically to levels similar to those of less developed countries, which present obvious shortcomings in their system.

Moreover, this trend is particularly worrying, since it moves in the opposite direction to what every country in our vicinity is doing, by substantially increasing their investments in the sector to comply with more stringent legislation, and to adapt to the challenges of climate change and environmental sustainability (countries in our vicinity have increased investment from 0.25% of GDP on average over 2007-2009 to 0.32% of GDP on average nowadays, while Spain has reduced its investment to 0.14%).

In addition, these low investment levels have also resulted in infrastructure replacement levels (1%) that are well below those recommended by service providers and experts (2%) (In line with those implemented by other European countries, such as Switzerland, Germany and Slovakia).

Additionally, this problem has been exacerbated by the onset of the recession, and data suggest this situation is not being reversed, even within the current context of recovery.

#### Evolution of historic water investments [%GDP]



Source: GWI Eurostat, Ministry of Public Works and Transport, Strategy & Annual accounts



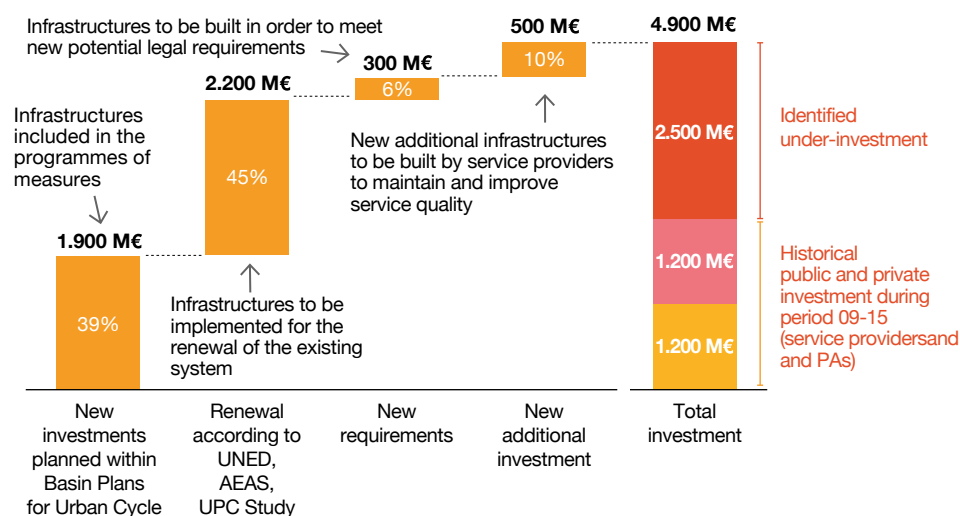
## 2.2. Investment needs concerning the urban water cycle

Moreover, according to a recent study conducted by AEAS<sup>2</sup>, asset renewal investment needs (Urban Water Cycle) in Spain amount to €2,200 M per year, which added to the remaining investment needs (planned new constructions, or those arising from quality requirements) yields a total of €4,900 M, nearly double the average over the last 15 years and more than three times the current investment levels (€1,500 M in 2016):

- Of this amount, approximately 40% (€1,900 M) is already provided for within Water River Basin Management Plans<sup>3</sup>, and essentially includes new waste water treatment and sewerage infrastructures (mainly new systems for water management and discharge in rainy weather).

- Additionally, it is estimated that another €2,200 M per year, associated with infrastructure renewal, would be required, especially for sewerage and distribution networks. This investment is particularly needed in small and medium-sized municipalities with very large, old and poorly maintained networks.
- Moreover, service providers estimate that another €500 M to be invested in new urban cycle infrastructures and operating equipment have not been fully recorded within River Basin Management Plans.
- Finally, an investment item amounting to €300 M per year has been estimated, and it would be aimed at covering aspects, such as: (i) addressing impacts resulting from more demanding regulations on water treatment, within a context of water quality deterioration, and (ii) digitalising and modernising management.

### Annual investment needs estimated for the urban water cycle during the next 10 years [\* Million euros/year]



**Note:** Infrastructure investment in new construction networks carried out by service providers has not been considered, since these expenses are covered by real estate developers.

**Fuente:** SEOPAN Reports, Ministry of Public Works and Transport, AEAS, Strategy & Assessment

<sup>2</sup> "Analysis of renewal investment needs of the urban water cycle in Spain", in collaboration with the UNED (National University of Distance Education) (AQUAE Professorship (Cátedra AQUAE)) and the Polytechnic University of Catalonia (UPC).

<sup>3</sup> Including River Basin Management Plans of the 25 river basin districts in Spain and covering measures planned for 2015-2021, MITECO.

### Consequences of lack of investment in water infrastructure

This under-investment has a negative impact on the sustainability of the system, for numerous reasons:

- i) Firstly, lower investment increases network operating and maintenance costs due to a higher incidence of system failures. Moreover, these system failures end up negatively affecting those services provided to citizens.
- ii) Secondly, under-investment aggravates negative impacts of climate change on water resources and hinders the achievement of the environmental sustainability objectives we have set as a society.

### Higher operating and maintenance costs (O&M), and worse service quality for citizens

As the comparative analysis of various European countries has evidenced, investment deficits (CAPEX - Capital Expenditure) lead to increased O&M system costs (Opex - Operating Expenses).

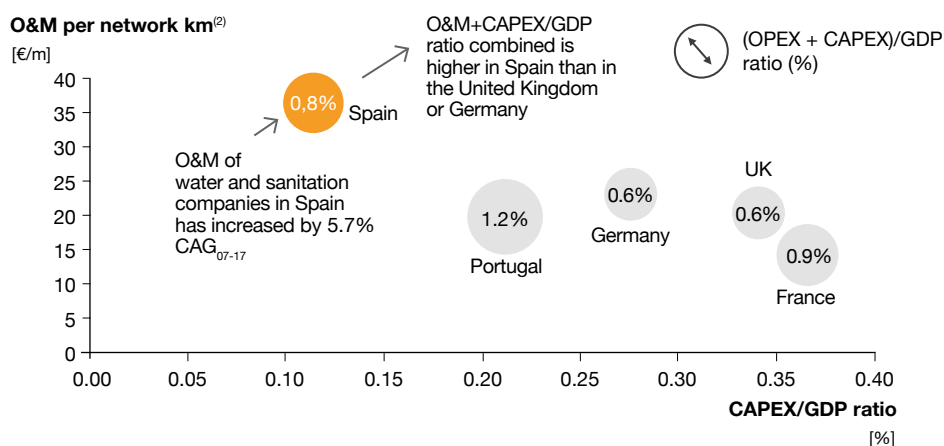
The Spanish case is probably the most blatant example among neighbouring countries. As can be seen in the

graph below, Spain is the country with the lowest investment over 2014-2017 (0.14% vs 0.32% on average), while it has the highest spending on network operation (€36/m vs the European average of €19/m). Moreover, this trend is also worrying, since the following can be noted when comparing the period 2007-2009 and the period 2014-2017: (i) Spain was the country with the highest reduction in investment, while the remaining countries increased it on average, and (ii) in Spain, O&M costs grew by 5.7% annually vs an average growth of 1.8% in other comparable countries.

By contrast, countries with higher investment levels, such as France, the United Kingdom and Germany, which have remained stable at 0.3% of GDP (doubling Spanish levels), have contained the growth of operating costs.

While no problems have been identified yet in Spain regarding service quality, due to infrastructure inertia, service providers agree that if current policies are maintained, sustaining current performance will be very difficult, as well as undertaking the improvements required by increasingly more demanding regulation, within a context of lower quality water resources as a result of climate change and the high water demand in Spain.

**O&M<sup>(1)</sup> per network km vs CAPEX/GDP ratio of comparable countries**  
[2015-17 average]



<sup>(1)</sup> It includes all system operating costs; <sup>(2)</sup> Length of the drinking water network.

Source: GWI, EurEau, Strategy & Assessment



### Consequences in terms of environmental impact and adaptation to climate change

Spain faces significant environmental challenges and water management, especially in the urban sector, is one of the most pressing ones. In this regard, it should be noted that Spain is the most vulnerable European country to the effects of climate change, as water resources already present a high stress indicator. In such a context, investment in water infrastructure is key to solve this problem.

- **High water stress levels:** defined as the ratio between the volume of water consumed and the volume of renewable water resources generated annually (mainly rainfalls). Spain presents the highest water stress indicator among the major European countries (~50%) over the last 30 years. Given this situation, service providers are forced to abstract water from more expensive and lower quality sources, which reduces service quality and increases system costs. The main causes are:
  - Lower precipitation levels resulting from the hot and dry climate prevalent throughout most of Spain<sup>4</sup>.
  - High levels of per capita upstream water consumption, partly caused by the fact that the agricultural sector in Spain plays a more important role compared to other European countries.
- **Increasing risk of desertification:** Spain, due to its geographical location, is one of the European countries at a higher risk of desertification. Currently, almost half of Spain's surface is at risk of desertification, and forecasts published by technicians of the Ministry responsible for environmental issues, and other expert sources, estimate that, by the end of the century, the area at risk could surpass 70% of the total. This fact is

mainly caused by low rainfall levels and greatly scattered rain due to the country's large climate variety.

- **Water availability:** periods of drought cyclically occur in Spain and have already caused supply shortages in some regions; this, combined with the fact that only a low proportion of total treated waste water is reused (10%<sup>5</sup>), results in some regions of Spain experiencing structural risks regarding water availability. This situation is of particular concern in the urban sector, as some municipalities may suffer water supply interruptions during times of drought if the necessary measures are not undertaken.
- **Extensive water losses within the network:** water losses are defined as the difference between the volume of water injected into the water network and the volume of water recorded by end users' water meters. These inaccuracies are technically referred to as non-revenue water (NRW), which involves two types of losses, real losses and apparent ones. The level of water losses in Spain currently stands at 22%<sup>6</sup> of consumption, well above that of the main comparable European countries, such as Germany, France and Portugal, with losses at 7%, 19% and 18%, respectively. This situation indicates that water supply and distribution networks are not in top-notch quality, increasing system operating costs. Currently, there is considerable disparity in terms of the level of losses between regions and municipalities. For example, large conurbations show lower levels of losses (below 10%) thanks to their great technological developments and infrastructure quality, while in rural areas this figure may reach 50%. It is important to note that technological progress is providing for efficient optimisation of this parameter, without necessarily undertaking all new investments.

<sup>4</sup> AEMET Data and Climate-Data Database.

<sup>5</sup> Spanish National Statistics Institute (INE), 2016.

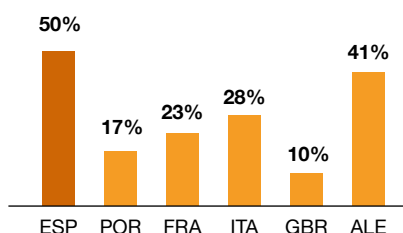
<sup>6</sup> 15th National Study, 2018 AEAS-AGA.



- **Network obsolescence:** In Spain, water supply and sewerage networks are generally and progressively deteriorating. Regarding the latter, especially in metropolitan areas, more than 50% of the network is over 30 years old. Increasing network obsolescence and the deterioration of their condition exacerbate issues associated with the aforementioned high levels of water losses, or with environmental impacts, thus increasing the already high operation and maintenance costs. If this situation is not reversed, this problem will be further compounded and its solution increasingly more expensive, which can result in a very negative vicious circle regarding future service quality. In addition, in the case of urban drainage networks, existing storm water management systems are not prepared for heavy rainfall events within a short period of time, which are associated with climate change and are already occurring across Spain.
- **Failure to comply with the European waste water treatment Directive:** Spain does not comply with tertiary water treatment objectives laid down in European legislation. With compliance on this matter only at 40%, Spain lags far behind other comparable European countries. It is estimated that Spain should increase its number of existing WWTPs by 25%. Blatant and repeated failure to comply with the aforementioned Directive may trigger sanctions, as has already happened in Spain, which has already received adverse judgements and been fined (e.g. ECJ ruling on Spain's failure to comply with waste water treatment in 39 agglomerations with a population equivalent of over 10,000 inhabitants). Beyond sanctions, failure to comply with the Urban Waste Water Treatment Directive is a major concern in terms of the environmental sustainability of national riverbeds, which already present a high stress indicator.

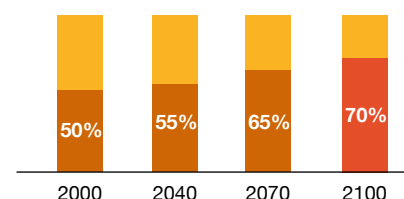
### High levels of water stress<sup>(1)</sup>

Spain presents the highest water stress indicator among the major European countries



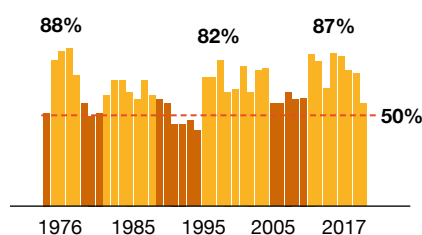
### Increasing risk of desertification

Currently, 50% of the national area is at risk and this figure is projected to reach 70% by the end of the century



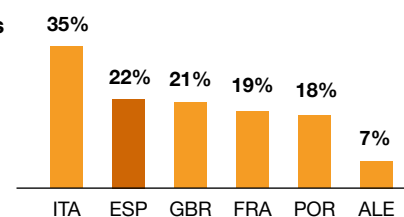
### Water availability<sup>(2)</sup>

Periods of drought cyclically occur in Spain, which results in supply shortages



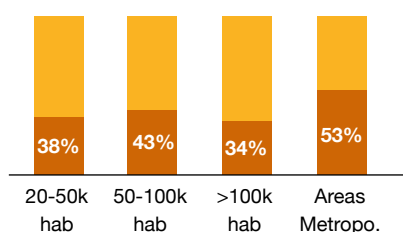
### Extensive water losses within the network

Water losses in Spain currently amount to the equivalent of 22% of consumption



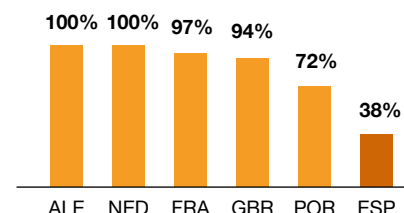
### Network obsolescence

In Spain, sewage networks are generally and progressively deteriorating (>30 years).



### Low water treatment level

Spain only meets 38% of the tertiary water treatment goals set by the EU



(1) Ratio between the volume of water consumed and the volume of renewable water resources generated annually (mainly rainfall); (2) Measured using the average reservoir level in Spain.

Source: MITECO, MITECO, Eurostat, Aquastat, AEAS, Strategy & Assessment

### 2.3. Socio-economic impact associated with investment needs of the urban water cycle

Under-investment in infrastructures, which are increasingly obsolete, has negative impacts on system efficiency and, therefore, on water supply costs, and jeopardise the maintenance of quality levels regarding water supply and sanitation services. The estimated increase in sector investments, measured at €2,500 M per year over the next 10 years, would have a very positive effect on the national economy as a whole and, especially, on employment.

Studies on the socio-economic impact of previously undertaken urban water cycle investments were used as a basis for determining the estimated increase

in the volume of employment required to address this investment deficit.

According to available estimates, a total of 14 full-time equivalents (FTE) job positions, with a duration of one

year, would be generated for every million euros invested in the water sector.

Therefore, projected investments will make it possible to generate approximately 350,000 FTE jobs, that is 35,000 permanent FTE jobs over the next 10 years. This increase would amount to 0.2% of the total national FTE employment<sup>7</sup>.

This impact on employment would spread throughout the country, being especially relevant in those areas that directly attract a proportion of these investments. In many cases, implementing this type of investments may give a boost to the labour market of certain areas with high unemployment rates.

On a sectoral basis, a wide range of sectors would benefit; specifically the construction one, due to its very labour-intensive nature and the fact that it would attract further investment. In addition, sectors such as those of machinery and equipment, engineering and wholesale trade, would also greatly benefit in terms of job creation.

### Historical deficits regarding water infrastructure: Key Concepts

- Following the onset of the economic crisis, there has been a marked decrease in investments concerning the urban water cycle, from €3,800 M per year on average over 2003-2008 to approximately €1,700 M per year on average from 2012 to 2016.
- This drop has caused Spanish investment levels to fall from figures that used to be above the EU average (0.36% vs 0.25% of GDP per year) in 2007 to its current value, that is far below those of the major European countries since 2014 (0.14% vs 0.32% of GDP).
- The main reasons behind the aforementioned decline are lower levels of investment by PAs, which largely stem from budgetary constraints, and a lack of European transfers (e.g. ERDF programmes).
- Structurally, maintaining low investment levels is already having negative consequences on the urban water cycle management; these compromise service quality and, currently, mainly take the form of operating and maintenance costs increases, which have reached figures that nearly double European values, in terms of spending per network km.
- In addition, Spain is the most vulnerable European country to the effects of climate change, as it already presents a high water stress indicator; thus, water infrastructure investments have been, and will be, essential to address this issue.
- According to AEAS, annual urban water cycle investment needs are estimated at €4.900 M (with €1,900 M already provided for within River Basin Management Plans, €500 M aimed at additional new investments, €2,200 M targeted at asset renewal and €300 M earmarked for covering new regulatory requirements), which would involve a twofold increase in the average annual investment over the last decade (€2,900 M).
- The estimated impact on the Urban Water Cycle, resulting from undertaking these investments, would take the form of an increase in employment by approximately 35,000 jobs per year over the next 10 years throughout the country.

<sup>7</sup> Calculated on the basis of the average number of FTE jobs in Spain in 2018.

# 3

## Feasibility, and advantages and disadvantages of potential water infrastructure financing mechanisms



Having established that Spain is suffering from under-investment, the next step involves identifying which possible investment mechanisms have the potential to reverse the current trend. For this purpose, all possible mechanisms have been separately reviewed, assessing their advantages and disadvantages, as well as their feasibility. Such mechanisms are as follows:

- i) EU transfers through cohesion funds/ERDF or other equivalent mechanisms.
- ii) Budgets of national and regional authorities.
- iii) Budgets of local authorities and county councils, or other local entities.
- iv) Water service providers' increased indebtedness.
- v) Tariff increases.

### 3.1. EU transfers

Spain has been the recipient of EU transfers amounting to over €11,000 M since 2000. However, these transfers have been exponentially reduced during different periods (i.e. €8,000 M in 2000-06, €2,300 M in 2007-14 and €700 M in 2014-20) due to two factors: on the one hand, the fact that eastern European countries, with higher financing needs, have joined the Union; and on the other hand, the economic convergence achieved by many Spanish regions, even surpassing the EU average, which limits access to these funds (displaying a shift of status from net receivers to net senders). Thus, access to EU funds has been restricted to regions with a lower economic convergence, such as Andalusia, Extremadura, the Canary Islands and Castille-La Mancha.

In addition, the €700 M in transfers projected for the period 2014-20 solely focus on waste water treatment and access thereto shall be subject to compliance with objectives rather than being actively granted as direct financing, which makes financing more complicated, especially for those assets with limited effect on objectives (such as waste water treatment plants in small municipalities).

EU transfers are not expected to play a significant role in the future. Given the following factors, adopting a conservative approach regarding the possibility of new water infrastructures being financed by EU funds is proposed:

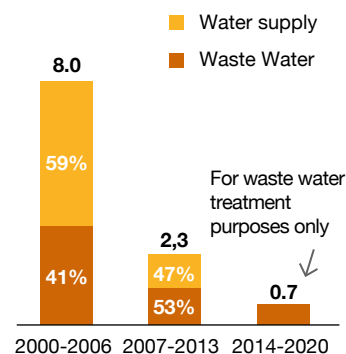
- The EU budget for the 2020-26 period is currently being discussed, and it is expected to maintain substantial continuity with the current one regarding total costs.

- The estimated impact of Brexit on the EU's coffers will amount to, at least, €16,500 M (7.6% of the 2020 budget). This fact would force Spain to contribute an additional €1.482 M to that budget.
- Spain has advanced in terms of economic convergence achieved and, for the first time, it is expected to be a net contributor.
- The largest share of the infrastructure budget still prioritises Eastern European countries.
- This new budget covers new priorities, such as immigration and border defence, large infrastructure projects, like the high speed rail line across Baltic countries, or the European aerospace programme.
- Community legislation establishes the principle of full cost recovery (including environmental costs associated), under the Water Framework Directive (WFD). Thus, it conceptually indicates that sector financing shall be achieved via tariffs, rather than through public budgets.
- A significant proportion of the investment deficit is associated with urban distribution, sewerage and urban drainage networks, which generally have not been a priority issue for European financing.

This perspective is also widely accepted in the sector, since 85% of service providers consulted considered that EU funds will decrease in the future.



### European funds for water infrastructures [trillion euros]



### Distribution of European funds broken down by Autonomous Community in Spain [Intensity of aid expressed in %, 2014-2020]



Source: SEOPAN, INE, River Basin Management Plans Synthesis, Ministry of Finance, Strategy & Assessment

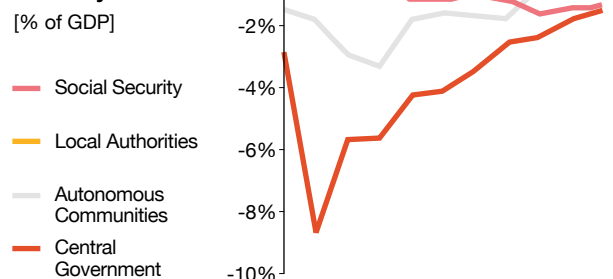
## 3.2. Budgets of national and regional authorities

In order to understand the feasibility of how national and regional financing can reach the level required to finance needed infrastructures via tariffs, an analysis was conducted on the evolution of available resources by these PAs, and the progression of other expenditure items

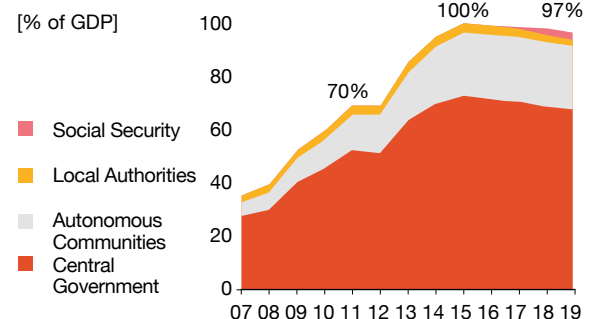
that may “compete” with water infrastructure at the time of public resources being allocated.

When analysing resource availability, the first conclusion is that, despite the economic recovery experienced in recent years (approximately 3% annual growth in GDP since 2014), Spain continues recording public deficits close to 3%, thus limiting its ability to increase spending or to pay off public debt, still at record levels (+100% of GDP in 2015).

### Spain's government deficit trends and forecasts broken down by PAs [% of GDP]



### Spain's public deficit trends and forecasts [% of GDP]

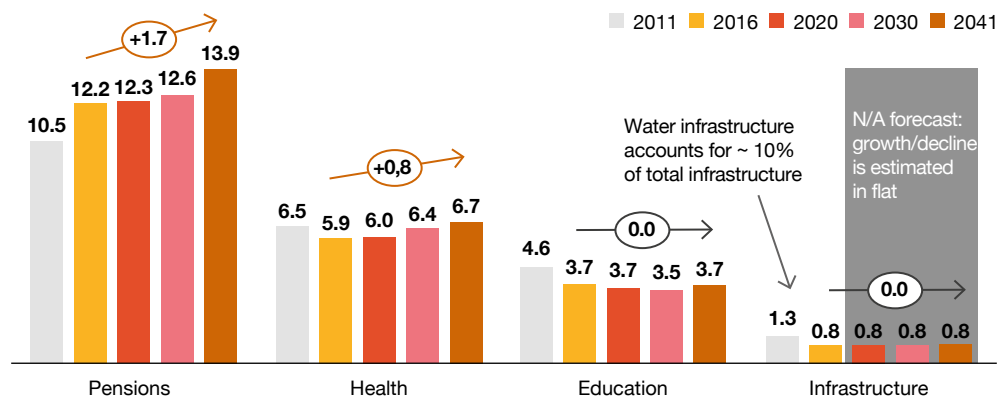


Source: Bank of Spain, Strategy & Assessment

Moreover, historically budget headings related to social spending (education, pensions and health), which typically take preference due to their greater visibility and impact on public opinion, have been prioritised. Besides, these items will be progressively increased as the rate of population ageing accelerates in Spain (the proportion of citizens over 65 will increase from 19% of the population in 2017 to 35% in 2050, +16pp), which will pose a

constraint on the public sector's ability to commit resources towards infrastructure in general, and to water infrastructures in particular. This situation occurs against a background of extremely low interest rates, which, if reversed in the short to medium term, would further stress public budgets (higher costs associated with debt interest).

**Projections for 2016-2040 regarding main government expenditure items [% of GDP]**



Despite the economic recovery in recent years, Spain continues recording public deficits close to 3%, thus limiting its ability to increase spending or to pay off public debt



### 3.3. Financing via local public authorities

Local public governments, and in particular municipalities, show very substantial differences, both in terms of investment needs and financing capacity, depending on the size of municipalities. Therefore, in order to adequately assess the financing capacity of these authorities, it is necessary to separately analyse municipalities grouped by their population size. However, it should be noted that Spain presents a highly fragmented municipal structure (8,131 municipalities<sup>8</sup>), with a convoluted responsibility and administrative structure, generally making it difficult to achieve the appropriate economies of scale to manage urban cycles (unlike most European countries).

Overall, since the implementation of the Budgetary Stability Law, local debt issuance capacity has been very limited. This fact has especially affected small and medium-sized municipalities (less than 50,000 inhabitants), which have been forced to sharply reduce their deficit levels during the crisis.

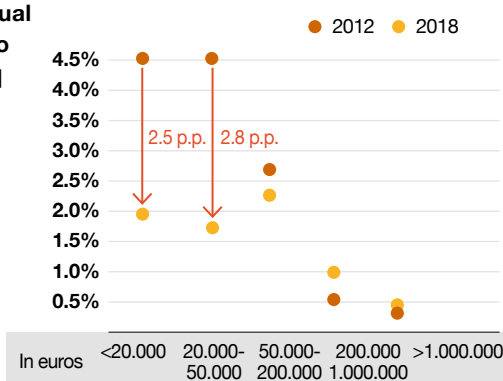
In addition, the capacity for debt of these municipalities is much more limited than that of other municipalities, which prevents water infrastructures from being funded via deferred financing from local budgets.

In addition, small municipalities exhibit greater investment needs per capita (€48.5 vs €44.0/person, only in renewal) due to smaller economies of scale achieved and to generally lower-quality and more obsolete infrastructures, when compared to those in large metropolitan areas. This, combined with the fact that small municipalities generally have lower per capita budgets (€972 vs €1047/person), is the reason why the budgetary impact of undertaking required investments is greater there than that in larger municipalities.

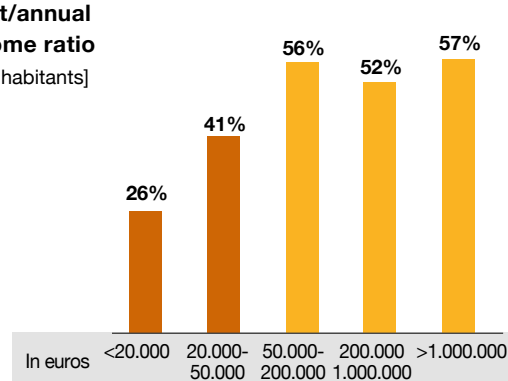
However, assuming that large municipalities can undertake required water investments via budgets appears not to be plausible, as this would involve creating a new item for this purpose amounting to 4% of their budgets.

- In 2018, municipalities achieved a balanced budget for the first time in a long time. Thus, this measure would imply reducing expenditure on other items.
- Approximately 4% -5% of these budgets accounts for relevant expenses, such as primary social assistance and employment or mobility programmes, which are given political priority.

**Deficit/ annual income ratio**  
[% inhabitants]



**Debt/annual income ratio**  
[% inhabitants]



<sup>8</sup> Data from the Spanish National Statistics Institute (INE), 2018.





### 3.4. Financing via service providers and regional or national institutions

Finally, the capacity for additional debt of different service providers, based on their capital adequacy and balances, without considering tariff increases, was assessed.

Firstly, it should be noted, that financing through an increase in indebtedness of service providers is not a sustainable solution over time. This is due to the fact that indefinitely putting companies into debt is not possible; besides, regarding water, increases apply to sustained investments over the long-term (this study only covers the next 10 years, but renewal needs are constant and perpetual).

Moreover, service providers being able to partially finance additional investment needs for one or two years does not even appear to be feasible under current conditions. This

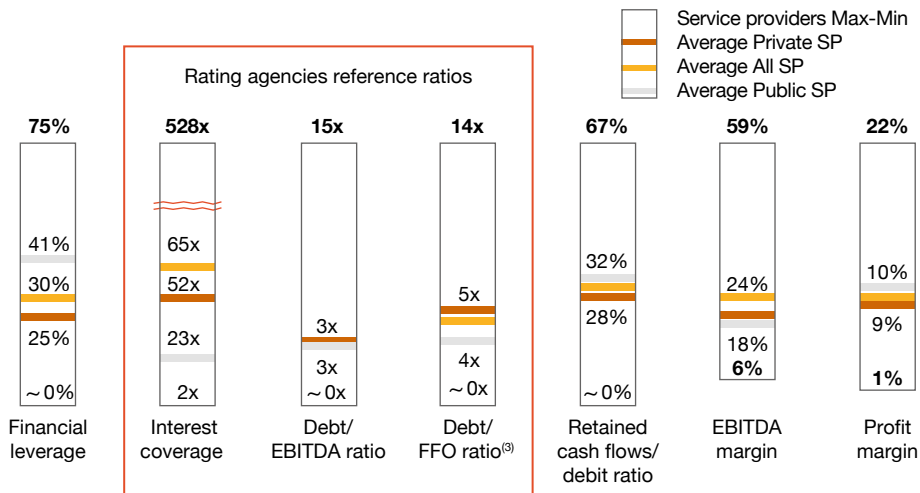
conclusion can be drawn from an analysis of the main financial ratios of sector companies.

- On average, debt/EBITDA (earnings before interest, taxes, depreciation, and amortization) and operating cash flow/debt ratios show values of 3x and 5x, respectively. Given these figures, considering greater indebtedness is not feasible.

Additionally, there is little incentive to finance through balances, especially for private service providers, since it does not involve an increase in activity income, reduces net profits and raises the financial risk associated with concessions.

The ability to finance water infrastructures through an increase in indebtedness of service providers is very limited. Only a few large public service providers within large metropolitan areas would have some room for manoeuvre. Furthermore, additional investment capacity barely covers the needs for some years.

#### Main solvency ratios<sup>(1)</sup> of water management companies<sup>(2)</sup> [% , m euros]



<sup>(1)</sup> These ratios have been calculated based on average figures recorded over the last three years;

<sup>(2)</sup> It includes all public companies, with the exception of Aquavall, and the following private service providers: FCC Aqualia, Acciona Agua, Aguas de Valencia (Valencia Water Company), FACSA, Aguas de Barcelona (Barcelona Water Company), Sorea, Hidrogea and Hidralia; <sup>(3)</sup> Working capital funds.

Source: Annual Accounts, Strategy & Assessment

### 3.5. Feasibility of the model of financing via tariffs

In order to assess the feasibility of an increase in water tariffs, understanding how Spain compares with its European peers in terms of tariffs is essential; subsequently, the extent to which these tariffs should be increased to finance greater investments shall be analysed; and finally, the feasibility of implementing these increases under the different management models existing in Spain is to be studied.

#### Comparison of Spain's average water tariff vs the European average

Firstly, the conclusion drawn from the comparison of Spanish tariffs with the European average is that the former fall well below the latter (-45%). Furthermore, Spain has one of the lowest domestic water tariffs in the EU (€2/m<sup>3</sup> vs. €3-4/m<sup>3</sup> in France, UK or Germany).

These tariff discrepancies are not due to differences in purchasing power. On the basis of user efforts regarding

water bill payments<sup>9</sup>, Spain presents the second lowest indicator of effort regarding the urban water bill in the EU (0.52% of income vs 0.74% of the EU average), 220bps (basis points) below the EU average.

This situation contrasts with other areas of expenditure on “utilities”, such as electricity or telephone, for which Spain registers a 23% and 25% spending above the EU average, respectively.

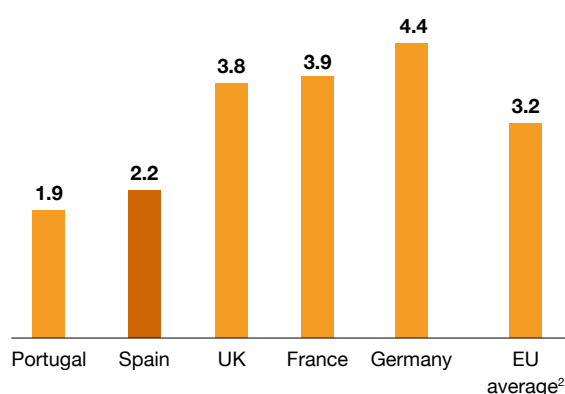
Therefore, differences between Spanish tariffs and those of other European countries stem from the fact that Spain does not comply with the principle of cost recovery, has financed investments and part of operating costs through public budgets and transfers that are not expected to be repeated in the future, and identified deficits regarding infrastructure are not being addressed (new construction and renewal of existing infrastructure).

In conclusion, from a comparative perspective, both at the international and sectoral levels, it is observed that there is scope for financing via tariff increases in Spain.

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#### Water price<sup>(1)</sup> in major European cities, 2017

€/m<sup>3</sup>, price of several major cities in each



<sup>(1)</sup> This price includes charges for drinking water, waste water treatment, environmental costs, VAT and other taxes; <sup>(2)</sup> Price average of available countries.

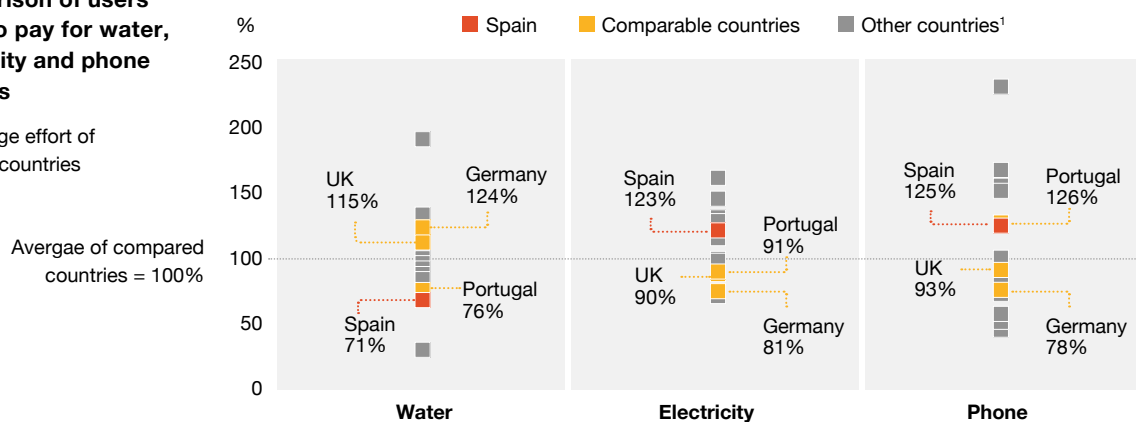
**Source:** International Water Statistics, OECD, Strategy & Assessment

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<sup>9</sup> Understood as the percentage of the annual income available represented by the water bill.

### Comparison of users' effort to pay for water, electricity and phone services

%, average effort of selected countries



<sup>(1)</sup> Other countries: Denmark, Slovakia, Belgium, Hungary, Finland, Austria, the Netherlands, Cyprus, Poland, Lithuania, Norway, Sweden, Italy.

**Source:** General Council of Spanish Colleges of Economists "Water management in cities", AQUAE Papers "Study on the price of water". Strategy& Assessment

### Impact from using deferred financing via tariffs for funding required water investments.

The next issue to be addressed is whether there is sufficient scope for covering the existing investment deficit (approximately €2.900 M per year), considering that Europe is setting very ambitious targets in terms of water quality and environmental protection, which may result in increased investment needs in the future.

In order to address this concern, an estimate has been made of the extent to which this tariff should be increased over the next 10 years to cover this investment deficit. For this purpose, the tariff increase has been divided in 4 components:

- Increases in operating costs: historically, system operating costs have been going up, reaching a point slightly above CPI (consumer price index), mainly due to contracted consumption, as well as to the increased deterioration of networks, which leads to higher maintenance and repair costs. This tariff increase would take place regardless of whether such investment is made or not and it is estimated at +€0.7/m<sup>3</sup>.
- Moreover, if this investment was to be undertaken, an increase in costs, associated with its repayment during the service life of the infrastructure (40 years), would take place. This increase shall cover, on the one hand, the depreciation of the asset and, on the other hand, the financial remuneration associated

with the financing of the investment. This component would lead to an increase of +€1.1/m<sup>3</sup>.

- Additionally, this new investment would require a certain raise in operating costs associated with the operation of new infrastructures, particularly regarding waste water treatment; this would lead to an increase of +€0.1/m<sup>3</sup>.
- Finally, the renewal of distribution and sewage networks would entail an improvement in system operating costs. This improvement is estimated to account for 15% of current costs (according to a survey conducted in the sector), which would lead to a discount of -€0.5/m<sup>3</sup> on the tariff.

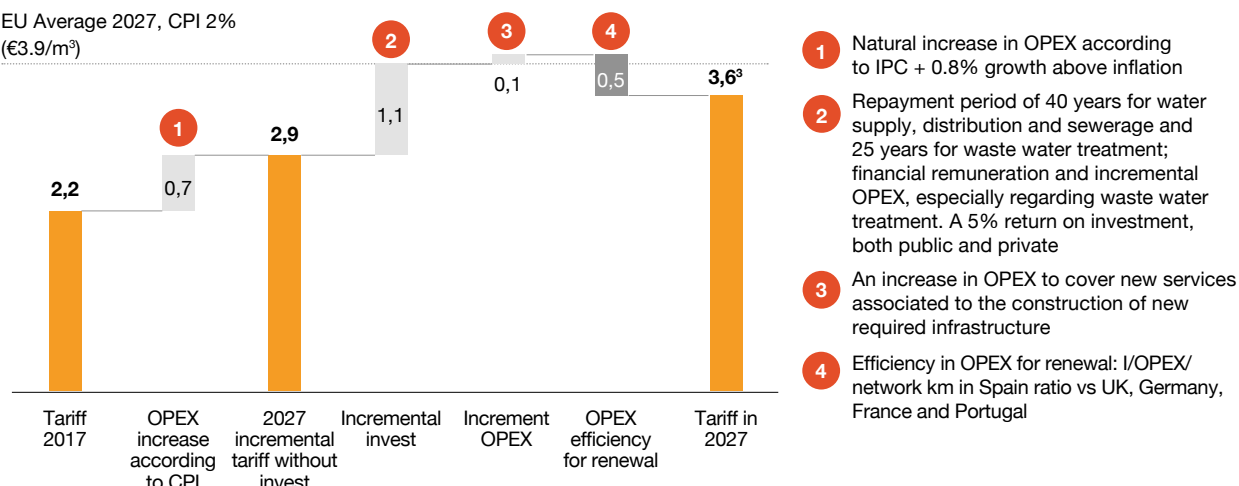
Together, these effects entail a 3.1 pp (percentual points) rise above the CPI over the next 10 years, from €2.2/m<sup>3</sup> to €3.62/m<sup>3</sup>. This increase in tariffs seems attainable because:

- In this scenario, Spain is in line with the average of the European Union in terms of tariffs and citizens' financial efforts, but still below regarding both aspects.
- Historically, Spain has already registered increases in the water tariff reaching a point above inflation (4.2pp above the CPI from 2000 to 2008).
- It does not compromise the UN principle establishing that water must be affordable, set at 3% of household available income, since currently Spain stands at 0.9%.

## Water price evolution<sup>1</sup> 2017-2027, investment meets 100% of needs<sup>2</sup>

€/m<sup>3</sup>

EU Average 2027, CPI 2%  
(€3.9/m<sup>3</sup>)



<sup>(1)</sup> This price includes drinking water and environmental charges, VAT and other taxes;

<sup>(2)</sup> Estimate of required annual water investment for the next 10 years: €4.9 trillion;

<sup>(3)</sup> Should investment cover less than 100% of needs, water prices would increase in 2026.

Source: Strategy & Assessment

Thus, it is observed that there is room for further increases, since Spain presents one of the lowest tariffs in Europe (€2.2/m<sup>3</sup> vs €3.5 €/m<sup>3</sup>).

Moreover, the estimated increase required to cover the gap (up 50% from current levels over a 10-year period) has been shown to be feasible, since it would place the Spanish tariff at a level closer to the European average.

In addition, financing via tariffs promotes transparency and compliance with the principle of cost recovery.

For all these reasons, it is concluded that tariffs should become the main source of financing in the next decade, given that there are also considerable barriers associated with the remaining financing sources analysed.

European funds	Central and regional authorities	Local authorities	Other financing instruments
<ul style="list-style-type: none"> <li>• <b>EU transfers</b> are not expected to play a significant <b>role in the future</b>.</li> <li>• Spain has been the recipient of <b>EU transfers</b> amounting to over €11,000 M since 2000. However, these have been <b>exponentially reduced</b> between different periods (i.e. €8 trillion in 2000-06, €2.3 trillion in 2007-14 and €0.7 trillion in 2014-20) and are solely <b>targeted</b> on waste water treatment and at a very limited number of regions.</li> </ul>	<ul style="list-style-type: none"> <li>• The Central Government and Autonomous Communities need yet <b>to correct the deficit</b> in order to meet the convergence objectives set by the EU.</li> <li>• In addition, their <b>spending priorities</b> are related to areas with a greater impact on the <b>public opinion</b> (pensions, unemployment, etc.).</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Small and mid-size municipalities</b> present <b>budgetary and solvency constraints</b>.</li> </ul>	<ul style="list-style-type: none"> <li>• Most <b>public service providers</b> present <b>bad solvency ratios</b> and <b>limited capacity for additional debt</b>; besides, they are not expected to <b>be able to</b> undertake required investments.</li> <li>• <b>Private operators</b> are <b>not interested</b> in financing investments with low remuneration rates.</li> <li>• Other actors have very limited budgetary resources.</li> </ul>



# It appears that the most sustainable way of addressing the necessary rise in investment to take place in the coming 10 years is via tariff increases



## **Feasibility of financing water investments via tariff increases under the different management models existing in Spain.**

Once it has been concluded that tariffs appear to be the most appropriate tool to cover infrastructure deficits, the question arises of whether this financing process is feasible under existing management models (direct management, public companies, public-private companies, or private/concession models).

In this case, feasibility means that in all instances, an external funder will provide the financing required to implement the concerned infrastructures, and will later be paid via tariff increases. It is clear that from the perspective of the funder not all management models provide the same degree of certainty and security.

A number of different key variables have been analysed to see how these behave under each management model.

- The first variable involves prior existing experience under each model. The conclusion that has been drawn is that financing via tariff increases is very common in concession models, both private and public/private ones. There is background information on public company models in large municipalities. Regarding direct local management, there are virtually no precedents for such mechanisms.
- The second variable is the cost of financing. In general, it can be stated that costs associated with concession models will be slightly higher, since these models seek benefits in exchange of securing financing and leveraging their experience, but these have advantages due to efficiencies stemming from competition and their adaptability. However, it should be noted that public management models may involve high costs for small and mid-sized municipalities, since their solvency is usually worse than that of large private service providers.
- “Bankability” was the third element assessed. This concept evaluates how solvency and legal certainty associated with financing processes are perceived by funders. The conclusion that has been drawn is that concession models are the most appropriate for providing reassurance to funders, since, on the one hand, their legal framework is well known, and, on the other hand, private entities entering into these contracts are used to managing these processes. However, in the case of (i) public-private companies entering well-defined contracts and conditions with competent authorities, and (ii) large and creditworthy public companies, attracting external financing via tariff increases would also be feasible.
- The fourth variable analysed was risk transfer. In this case, what was analysed was which entity assumes

the management operating risks. From the point of view of PAs, concession management contracts are the structure that transfers risks to a greater extent.

- Finally, an analysis of impacts on the public sector in terms of accounting has been conducted. It has been concluded that both concession models and large public companies (with certain exceptions) minimise these impacts, since, in no case shall their debt be recorded as public debt. Depending on the circumstances, the same situation may occur regarding public-private companies. Moreover, only “market producers” public companies (for which over 50% of their revenue comes from the market, in this case, tariffs paid by users), and under European System of Accounts (ESA) 2010 methodology<sup>10</sup>, do not consolidated their debt using that of the authority holding these companies, so their debt is also not recorded as public debt. However, regarding the models of public companies that are not “market producers” and companies under direct local management, there are no accounting advantages.

There is also the possibility of introducing purpose-determined charges/fees/tariffs to meet specific urban needs. Following Germany and France’s example, a charge that is proportional to the impermeable surface of each owner can be introduced to reflect costs associated with storm water management. This way, not only are investment costs and needs proportionally distributed, but using new technologies to reduce drainage networks run-off is also promoted. Thus, taking into account climate change and the increased frequency of extreme climate events, these services are to become more critical and relevant.

By way of conclusion, it can be stated that:

- Financing models via tariffs are compatible with virtually all management models existing in Spain, whether public or private, only proving somewhat complex for those municipalities without separated activity accounts, which provide resources and transparency when undertaking financing (these municipalities account for less than 10% of the sector, in terms of population served).
- In the case of large public service providers, concession management contracts, and public-private companies, there are few differences in terms of the feasibility of attracting investments via tariff increases.
- However, in accordance with the evolution of global and worldwide economic conditions and with practical experience, it appears that concession models present some benefits in terms of securing the financing of large investments. It also allows PAs to transfer risk to a greater extent and minimise accounting effects in terms of debt and deficit. On the contrary, it may involve slightly higher costs, at least theoretically.

This section has shown that financing via tariffs is the most feasible way to finance investments required to ensure the sustainability of the system in the long run. In addition, it has been proven that there is sufficient scope for undertaking necessary tariff increases and that existing mechanisms are flexible enough to do so, regardless of the management model concerned.

<sup>10</sup> REGULATION (EU) No 549/2013 of the European Parliament and of the Council of 21 May 2013 on the European System of National and Regional Accounts in the European Union.





## Feasibility and advantages and disadvantages of potential water infrastructure financing mechanisms: Key Concepts

- After analysing the different funding mechanisms, it has been concluded that tariff increases are the most appropriate mechanism to finance required investments in a layered manner. This is due to the fact that: i) required tariff increases are acceptable since these would result in Spain's tariffs reaching the European average in 10 years, without affecting, in a significant manner, the "efforts" made by Spanish consumers to pay them; ii) this mechanism is aligned with the principle of full service cost recovery laid down in European legislation, and with adequate contribution by users, via tariffs; and iii) the remaining mechanisms have major limitations:
  - EU funds, which have played a very significant role during the period prior to the crisis, are not expected to be a viable financing source due to Spain's changing status within the EU. The country's development, together with the fact that eastern European countries with higher infrastructure investment needs have joined the EU, has meant that Spain has received less funds dedicated to infrastructure.
  - Budget financing by national and regional authorities is also expected to be very limited since, despite the economic recovery, debt and deficit levels are still high. In addition, social expenditure items tend to grow structurally and are perceived as being more critical by society. This reduces PAs' scope for spending in water infrastructure.
  - Local governments' ability to finance new investments is insufficient, since, besides being subject to budgetary constraints due to the Law on Budgetary Stability, town councils often present high debt levels.
  - Service providers' indebtedness has also been ruled out as a financing mechanism. This is because most service providers have little scope to increase their debt (i.e. considering financial ratios); in addition, this mechanism is not adequate for introducing sustained investment increases over long periods of time, as is the case in Spain.

# 4

## Global best practices in terms of urban water governance



Since Spain lacks an effective investment implementation or investment promotion programme regarding the urban water cycle, an analysis on international best practices has been included within the methodology used, to formulate proposals, which is the main objective of this report.

In order to carry out this process, a three-stage methodology was followed:

1. The first stage involved identifying those countries that currently house the best and most advanced water infrastructures; with a special focus on urban water supply and sanitation.
2. Subsequently, such countries have been analysed in order to assess whether there is a link between their regulatory framework, their operating model or the application of certain principles and the development of improved water infrastructures.
3. Finally, based on results obtained, a summary of water sector international best practices has been produced and later compared with the specific case of Spain.

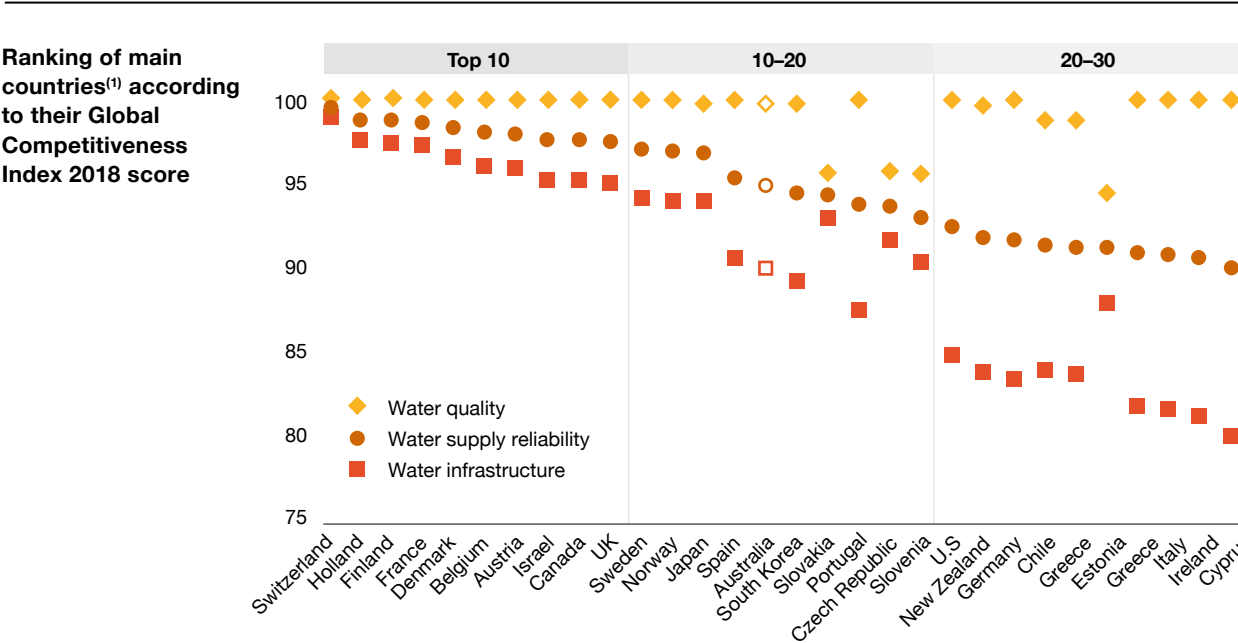
4.1. Top-rated countries regarding their integrated water cycle management model

Since 2017, the World Economic Forum has included a specific indicator to classify water infrastructures in each country according to the “Global Competitiveness Index” included within its prestigious and renowned Global Competitiveness Report. This indicator seeks to quantify infrastructure quality and reliability in a standardised manner and to allow for comparisons to be made between different countries.

This indicator assesses the following elements:

- **Water supply system reliability:** this element measures water infrastructure quality based on various parameters, such as the proportion of population connected to supply networks, interruptible service, network capacity and level of water losses.
- **Population exposure to low-quality water:** under this element, the proportion of population exposed to different levels of compounds with a harmful effect on health is weighted. It is based on standards and measurements compiled by the Institute for Health Metrics and Evaluation (IHME).

The top 30 countries in terms of water infrastructure are shown below.



**Note:** (1) The following countries were excluded from the ranking since they cannot be compared with Spain, neither in terms of size, nor population or water resources: Iceland (2), Singapore (5) and Luxembourg (10).

**Source:** Global Competitiveness Index 2018, World Economic Forum, World Bank, Strategy & Assessment



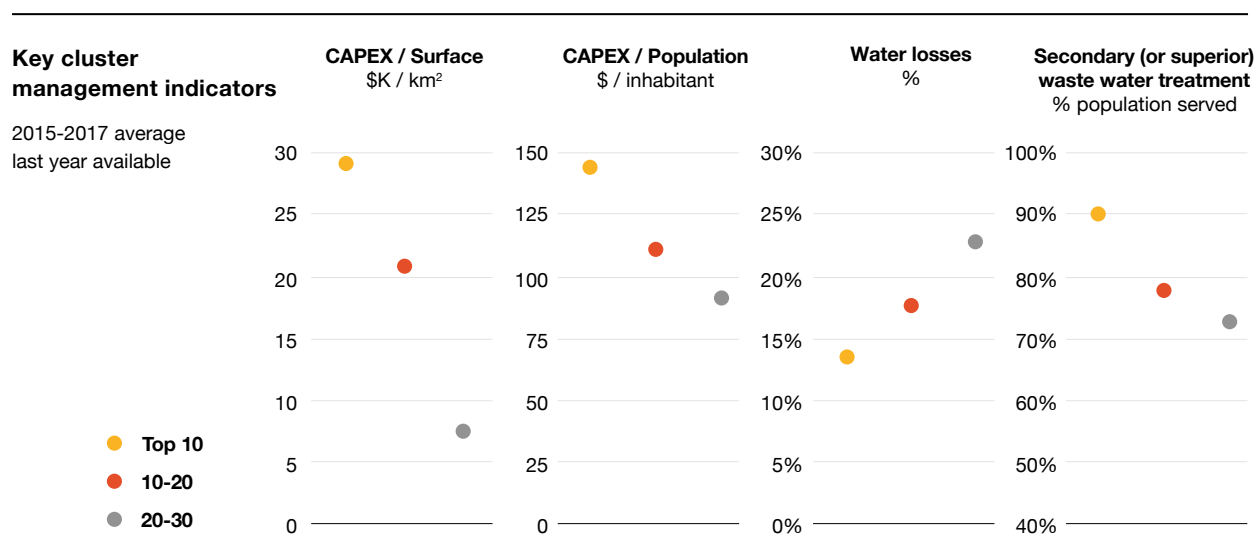
Spain is currently ranked 17th in the index ranking, in which the most developed countries, especially European ones, are very well positioned. It should be noted that among southern European countries, Spain is the best-positioned one.

A detailed analysis of the top 10 countries reveals that all of them stand out because of their high levels of investment in water infrastructures, low water losses in their networks and high coverage rates, both in terms of waste water treatment and network access.

- The countries which score top positions in the water infrastructure ranking present indicators of per capita and surface investment that are generally over the average of lower-ranked countries. It is observed that this trend is especially marked regarding these two

indicators. Thus, it can be stated that country size or population alone should not, by themselves, affect infrastructure quality.

- In addition, countries with better water infrastructures exhibit a level of urban water losses that is lower than those of countries further down the ranking. Average losses in the top 10 countries stand at 14%, while in top 20 and top 30 countries the average is 23%. This indicator shows that better infrastructures are larger and more reliable, as well as more efficient and environmentally sustainable.
- Finally, the countries which score top positions in the ranking also house advanced waste water treatment systems (higher levels of waste water treatment) with higher coverage than those in lower-ranked countries.



Source: GWI, World Bank, Eurostat, EurEau, Strategy & Assessment

## 4.2. Best practices implemented by top-rated countries

Following the analysis of top 10 countries' framework and policies, it can be concluded that there are 3 essential elements explaining their proper functioning:

### Investment financing via tariffs

In 80% of Top-10 countries, investments are entirely financed by means of tariffs paid by users. However, this percentage drops to less than 20% when analysing countries with worse scores.

### Centralised investment planning

It can be observed that 70% of Top-10 countries implement centralised planning, so that a given organisation helps prioritise projects, operating independently from the PA that has competence over this matter.

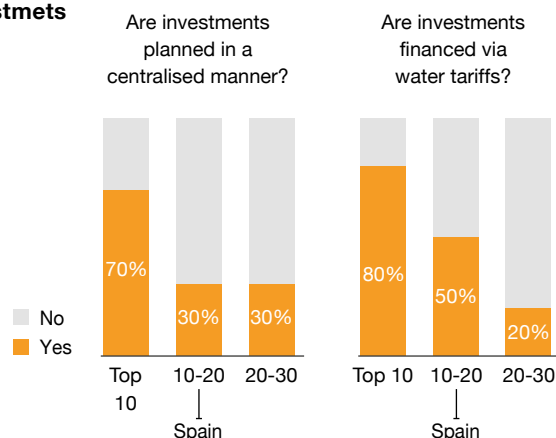
### National methodology for the calculation of urban tariffs

It is found that 70% of Top-10 and Top-20 countries implement a calculation methodology for urban tariffs that ensures the achievement of a uniform structure. This fact does not mean that these tariffs are the same across all municipalities, nor is their approval, which may not be centralised; this statement simply implies that throughout the country attention is given to which costs are to be considered and how to estimate them.

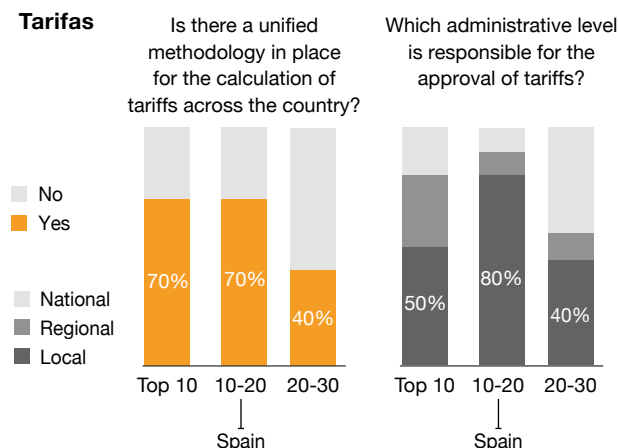
### Other lessons learned from the analysis of international best practices are as follows:

- The management model chosen to carry out the service is not relevant in achieving a "Top" ranking position. Public and private models coexist in many countries.
- Establishing a specific regulatory body appears not to be too relevant, as long as there are monitoring, planning and methodology development processes in place to calculate tariffs. It is, however, true that among OECD countries there is an increasing trend towards establishing a specific regulatory body (from 14 in 2000 to 34 in 2017).
- Finally, while conducting audits, or integrating transparency policies, is increasingly common, there appears to be little correlation between these specific measures and good performance.

### Investments



### Tariffs



Among southern European countries, Spain is the best positioned one within the water infrastructure ranking

#### 4.3. Spain's position based on these criteria

As can be seen in the table below, Spain is not complying with key success factors aimed at reaching a good position in terms of urban water cycle management, since

the country is neither using tariffs as an infrastructure financing mechanism, nor establishing a methodology for the calculation of urban tariffs; in addition, centralised infrastructure planning is not being implemented, or at least there is no harmonised procedural framework.

#### Comparison of Spain with the best practices in the sector

	Best Practices	Impact	Spanish setting	Compliance
Investment	Top-30 countries normally plan the investment needed mid and long-term on a centralised basis.		While upstream water investments are implemented in a centralised manner, these are independently undertaken by PAs and service providers, with significant deficits in many regions.	X
Tariff	There is a clear trend towards unifying the structure and methodology for the calculation of tariffs and including all service costs, including investments, therein.		Both the structure and methodology for the calculation of tariffs vary significantly among municipalities and service providers.	X
Management	There is no clear link between management models and the quality of infrastructures; besides, there are numerous instances of countries actively encouraging service providers' consolidation.		In Spain, all existing management models have traditionally coexisted and the consolidation level regarding delegated management models (amounting to 90% of the sector) is generally high, in terms of its scale.	✓
Regulatory body	The presence of an independent regulatory body does not offer significant advantages provided that their arbitration and monitoring duties are being carried out by any given government agency.		There is no sector supervisory body, which is neither independent from nor dependent on the government, with significant competence at the national level.	X
Est. Quality	In Top-20 countries, there is a trend towards sector quality criteria and operating standards being established at the national level to standardise services nationwide.		Water quality standards are defined by national legislation; however service operating and quality criteria are specified by each municipality.	✓
Transparency	Although control, monitoring and transparency practices among service providers cannot be directly related to better management, these practices are widespread among the best-rated countries.		Currently, there is no public database containing technical, economic and financial information on the sector. In addition, recurrent audits are not carried out and benchmarking between service providers is not established.	X



## Global best practices in terms of urban water governance: Key Concepts

- Spain is currently ranked 17th regarding water infrastructure quality according to the Global Competitiveness Index 2018. It is verified that those countries that score top positions in this ranking are characterised by:
  - High investment ratios.
  - Limited water losses within the network:
  - High penetration of advanced waste water treatment technologies.
- Based on a detailed analysis of the quality of governance among these countries, it can be concluded that the keys to success are:
  - Countries with better urban water cycle management systems implement centralised, or at least coordinated, investment planning models, in order to prioritise measures.
  - These countries also finance their sector investments via urban water tariffs, in compliance with the principle of cost recovery and appropriate contribution by users.
  - Moreover, most of them use an established methodology for the calculation of urban water tariffs. This does not mean, however, that tariffs are the same; rather, the same regulations apply.
- All these measures are compatible with the fact that management fall within the competence of municipalities, and they have no impact on which management model is the most common in the country.



# 5

## Plan of measures to improve the financing of water infrastructures in Spain

This section introduces and prioritises a number of measures covering different regulatory and urban water cycle issues, aimed at solving specific problems confining the sector to a situation of deadlock in terms of investment growth.

Moreover, we also have the objective of proposing a roadmap that allows for the prioritisation and temporal arrangement of such measures.

## 5.1. Description of proposed measures

The measures have been grouped into 4 segments:

- Measures that support investment planning.
- Measures that support the financing of new investment projects.
- Measures that support efficient long-term operation.
- Cross-cutting measures.

**Measures that support investment planning:** As stated above, one of the main characteristics of those countries implementing international best practices is that Urban Cycle investment planning is conducted. Therefore, different measures aimed at improving local investment planning concerning the urban water cycle have been defined:

- **(1) Ensuring that water investment tariffs/fees/charges are allocated to those investments for which they were adopted.** In Spain, historically, it has been noted that many tax items are not allocated to their ultimate goal. This situation is also true for concession charges, if any, which have been exclusively used to finance water infrastructure, and, therefore, no appropriate planning has been conducted from a technical point of view. Under this measure, it is established that concession charges shall be purpose-determined and directed towards improving water infrastructures, and that all taxes on water shall be aimed at building water supply, sanitation or reuse infrastructures, systems and services.
- **(2) Helping municipalities define investment plans,** especially those with limited technical resources. This proposal could be articulated in a number of ways: (i) creating public entities, (ii) providing specific resources to municipalities to develop these plans, or (iii) even promoting service procurement via specialised companies that can develop these plans where no qualified service providers are available.
- **(3) Developing framework contracts or introducing taxes to facilitate the development of contract specifications or the creation of grouping processes (association of municipalities or consortia) and stimulate investment activity.** One of the bottlenecks limiting investment is the lack of investment capacity of many public managing bodies, as well as the absence of new concession contracts (a large proportion of investments is made in the early years of concessions). Difficulty in drafting bid specifications including the provisions laid down in the new Law 9/2017, of 8 November, on Public Sector Contracts is one of the reasons why the activity is slowing down. In addition, many small and mid-size municipalities have limited resources. Therefore, it would be appropriate for any national or developing standard bid specifications to expedite processes, and in carrying out procedures to facilitate the grouping of municipalities for the provision of these services. This function is usually performed by regulatory bodies (e.g. Portugal). In particular, it is important to note that Law 9/2017, of 8 November, on Public Sector Contracts, introduces greater flexibility for water sector concession contracts (water supply and sanitation) by establishing mechanisms for revision of prices. Clearly, this type of concession contracts is not confined to periodic and predetermined revision (which has been shown to be an ineffective, costly and difficult mechanism to be implemented locally), since it can also be based on periodic and non-predetermined or non-periodic revision mechanisms. This increased flexibility (resulted from EU legislation on this type of concession contracts) should offer greater facilities to municipalities for defining revision mechanisms, and continued use of traditional “cost studies”, which are supervised and validated by local governments, in an attempt to monitor the actual evolution of service prices.
- **(4) Applying the principle of segregation of local water activities.** The implementation of this measure would require the mandatory establishment of separated accounts for water activities at the municipal level. This would be the first step towards achieving adequate planning in municipalities under direct local management models.
- **(5) Establishing incentives for municipalities to aggregate to achieve economies of scale that ensure the economic reasonableness investment projects.** Making the capture of public funds conditional on the establishment of an association of municipalities would be an option to articulate this measure. Another alternative would be to introduce legislation that favours management models allowing for service providers in large municipalities to also assume/deal with the management of other smaller municipalities.



**Measures that support the financing of new investment projects.** This set of measures proposes regulatory changes and steps that fundamentally promote the capture of funds. The first two proposals are aimed at improving legislation in terms of concession contracts, and the following two focus on attracting resources for urban network systems in small and mid-sized municipalities.

- **(6) Reviewing return rates for investments.** Currently return rates in the water sector are not competitive compared to other sectors with similar risk profiles, limiting its access to private investment, and even to that from international public banks. Thus, an adequate rate is essential to boost investment. This fact will become particularly relevant in the coming years to cover financing of new waste water treatment plants within a context of limited EU funds, and to develop new urban cycle concession contracts. In this regard, it is proposed that rates be fixed on the basis of similar methodologies as those used in other regulated sectors, such as natural gas or electricity networks, so that rates are aligned with the risk profiles and complexity of activities, as is already the case regarding the aforementioned sectors.
- **(7) Increasing flexibility at the time of updating tariffs.** Following the entry into force of Law 2015, of 30 March, on the Deindexation of the Spanish *Economy*, tariff adjustment mechanisms appear to be confusing for many contracting entities. Assuming a level of risk that is impossible to manage is not feasible for long-term investors, since visibility (the extent to which future performance can be estimated) over the long-term is very complex regarding some items, such as energy or external costs associated with future regulatory changes (new quality or environmental requirements) that are neither known at present, nor included within bid specifications. Service providers' efficiency shall be encouraged by devising mechanisms under which cost reduction is rewarded, overshooting of objectives or targets is appreciated, and the risk of inexperienced and uncreditworthy companies being granted concessions with bids that are hardly sustainable over the long run shall be prevented. As mentioned above, this possibility does not involve any amendment to legislation being made, since it is already feasible according to current regulations, under Law 9/2017, of 8 November, on Public Sector Contracts.
- **(8) Establishment of a national water fund.** It is proposed to create a public-private fund, mainly consisting of private resources, although open to public contributions, which would be supported by government guarantees (State and Autonomous Communities) and allow citizens and other social actors' participation through micro-financing mechanisms. In addition, this fund shall meet financing conditions that determine access to EIB (European Investment Bank) funds or similar ones. This fund is to prioritise investments in small and mid-sized municipalities, especially for local infrastructure and network renewal/extension. In order to meet EIB access requirements, this fund shall meet economic reasonableness and cost recovery criteria through tariffs, preventing, in any case, these tariffs from reaching non-market levels.
- **(9) Proposing the introduction of mandatory purpose-defined tariffs/fees regarding urban tariffs to finance urban cycle investments.** It is proposed





that municipalities and associations of municipalities set mandatory purpose-determined tariffs/fees, estimated based on a prior planning exercise for each municipality. The concept behind this tariff would involve investing the revenue obtained from each system, although the possibility of revenue from large municipalities being used to finance small ones (territorial solidarity) could also be considered.

#### **Measures that support efficient long-term operation.**

This group includes those measures supporting system operating sustainability in the long term, either through efficient and transparent management or by ensuring investments over the long term.

- **(10) Creating a public database on both a technical/operating and an economic/financial level.** Prior to this, it is proposed that a model of voluntary self-regulation, promoted by system service providers, be developed. Building on this initiative, creating a database to collect best practices among service providers and systems is suggested. This would also help establish common measurement standards within the system.
- **(11) Adapting the criteria for sub-contracting private service providers to risk transfer levels.** Current concession models already transfer operating risks, and also provide visibility regarding the evolution of tariffs. Therefore, hindering the outsourcing of companies within service providers' groups mainly leads to a situation where achieving efficiencies and economies of scale is far more difficult. Currently, there is clear conflict, since it is required that quality analysis be conducted by external laboratories, but this activity cannot be subcontracted due to a regulatory obstacle in this respect. In addition, this measure is aligned with the provisions of Directive 2004/25/EU, on procurement by entities operating in special sectors, which lays down that those entities that agree to provide such activities on the basis of a public tendering procedure (tenderers) shall not issue tenders, which these have entered into with third parties (the intent to subcontract).
- **(12) Adapting the characteristics of charges paid to municipalities by concessionaires (companies that have been awarded concessions) to the investment characteristics of concessions.** It is proposed to move towards models under which charges are more evenly distributed over the term of concessions, to better respond to the investment needs projected over those periods. The aim of this measure is to prevent part of the charges paid by concessionaires from being allocated to other areas unrelated to water; although, it is true that defining investments at the beginning of the

term of concessions would be more appropriate. This measure would not be as necessary if the purpose-defined nature of charges was ensured.

#### **Finally, there are some measures that are considered to be cross-sectional, due to their high impact.**

Generally, these are measures that involve more comprehensive changes to regulatory models, thus, affecting both planning and financing, as well as operation.

- **(13) Establishing a uniform methodological framework for the calculation of urban water tariffs nationwide.** It is proposed that a tariff methodology, providing a common framework for defining the evolution of tariffs, be established. This measure would allow Spain to align with the vast majority of countries with best practices regarding the urban water cycle management. Moreover, as shown in the previous section, establishing a national methodology for urban tariffs is not incompatible with a model falling under the competence of municipalities. This measure will also be essential for the implementation of the remaining ones, providing an overall framework for the sector, since it would result in increased financial traceability and transparency within the sector (i.e. reporting information regarding costs/undertaking investments to move them towards tariffs); besides, it would also establish a reference framework within the sector for smaller municipalities with limited resources.
- **(14) Transparency regarding service providers and levels of compliance with investment implementation.** As an additional measure, it is proposed that all service providers disclose measure programmes and committed investments associated with established investment tariffs and fees. In addition, it is suggested that these plans are updated annually to include, in sufficient detail, the extent to which investment implementation objectives are being met. This measure would be immediately followed by other measures associated with greater transparency, such as ensuring that investment tariffs/fees/charges are allocated to those areas for which they were adopted, establishing a public sector-wide database or defining investment plans.
- **(15) Establishing of regulatory body.** Similarly to the previous case, this measure could serve as an umbrella measure for addressing the remaining ones, including the establishment of a tariff methodology. Moreover, as shown in the section above, establishing a regulatory body is not essential provided that key activities (i.e. investment planning, pricing, data collection...) are performed by other bodies falling under the competence of the central government.

**List of measures to  
improve water financing  
and infrastructures in Spain**

Scope	Issue	Measure
<b>Planning</b>	Investment fees/tariffs that are not dedicated to water investment.	<b>1.</b> Ensuring that <b>water investment tariffs/fees are allocated</b> to those <b>investments</b> for which they were adopted.
	Limited support for local planning.	<b>2.</b> Helping municipalities define economically, socially and environmentally sustainable <b>investment plans</b> .
	Lack of local experience in drafting bid specifications.	<b>3.</b> Developing <b>framework contracts</b> to facilitate the development of <b>contract specifications or the implementation of grouping processes</b> .
	Limited cost/tariff traceability per value chain phase.	<b>4.</b> Applying <b>the principle of segregation of local water activities</b> .
	High levels of municipality atomization (local decentralisation).	<b>5.</b> Establishing incentives <b>for municipalities to</b> achieve economies of scale.
<b>Financing</b>	Inappropriate investment return rate.	<b>6.</b> <b>Reviewing return rates</b> for water investments.
	Tariff revision mechanisms to promote efficiency and predictability.	<b>7.</b> Increasing flexibility at the time of updating tariffs.
	Limited financial resources to undertake new investments.	<b>8.</b> Creating a <b>national fund</b> to finance water infrastructure projects.
	Absence of investment fees/tariffs concerning water distribution.	<b>9.</b> <b>Introducing mandatory purpose-defined tariffs/ fees</b> regarding urban tariffs <b>to finance urban cycle investments</b> .
<b>Operation</b>	Lack of public alternative among service providers.	<b>10.</b> Creating a public <b>database</b> on a <b>technical/operating and an economic/financial level</b> .
	Barriers to outsourcing activities.	<b>11.</b> <b>Adapting the criteria for outsourcing private service providers</b> to risk transfer levels.
	Low investment in short-term concessions.	<b>12.</b> <b>Adapting</b> the characteristics of <b>charges</b> paid to municipalities by concessionaires (companies that have been awarded concessions) to <b>the investment characteristics of concessions</b> .
<b>Cross-cutting</b>	Tariff dispersion among municipalities/ ACs.	<b>13.</b> Establishing a <b>uniform methodological framework</b> for the <b>calculation of urban water tariffs</b> nationwide.
	Ignorance of investment programmes and of the extent to which these are being fulfilled.	<b>14.</b> <b>Periodically disclosing</b> all <b>investment programmes</b> committed under concession contracts and the <b>extent to which these are being fulfilled</b> .
	Lack of transparency, predictability and harmonisation within the sector.	<b>15.</b> Establishing a <b>regulatory body with extensive powers</b> .

# Main service providers in the sector contributed their point of view to this process



## 5.2. Establishing a roadmap for the implementation of the proposed measures

In order to establish a roadmap prioritising measures and defining their time horizons, each proposal has been analysed based on the following criteria:

- Firstly, the feasibility of different measures was analysed from a (i) legal perspective, that is, how difficult it is to legally implement proposed changes, (ii) regarding policy barriers, that is, the estimated political consensus surrounding the measure concerned, and, finally, (iii) in terms of costs regarding required financial resources; here, a distinction was made between measures requiring some investment by PAs to build structures and those that do not.
- Secondly, impacts from different measures have been assessed in terms of: (i) their significance in achieving the goal of improving infrastructure financing, (ii) those management models that would be affected by them (i.e. public / public-private / private service providers) and (iii) the type of assets that would be impacted by these measures; here, a distinction was made between measures focused on the construction and operation of new infrastructures, or those aimed at attracting investment to renew existing infrastructures.
- Finally, it should be noted that the point of view of the main sector service providers, which have given their

opinion regarding the prioritisation of measures, has been considered throughout this process.

Generally, and by way of conclusion, the approach followed to prioritise measures can be described as follows:

- Prioritising, in the short-term, highly feasible and impactful measures, as well as some measures considered to be strategic by the sector, which, despite being difficult to implement, would be essential to forward the remaining ones (i.e. establishing a uniform methodological framework for the calculation of urban water tariffs).
- Subsequently, in the medium term, it is proposed that less impactful, but still highly feasible, measures be addressed.
- Finally, those measures whose implementation is more difficult, due to lack of political consensus or to the fact that these are facing legal barriers, are suggested to be carried out in the long term. (i.e. creating a sector-specific regulatory body).

The following table shows the sequence of these measures within different time horizons. Measures proposed within each time horizon are defined in greater detail in the following sections, with a special focus on short-term ones.

Time horizon	Planning	Financing	Operation	Cross-cutting
<b>Short-term</b> 	<p><b>Ensuring that water investment tariffs are allocated to those investments for which they were adopted.</b></p> <p>This measure is of paramount importance because, within a context of under-investment, the fact that financial resources intended for water activities may end up being allocated to other areas, is particularly serious.</p> <p><b>Providing support for the definition of sustainable investment plans and introducing incentives for municipalities to aggregate.</b></p> <p>These measures seek to lay the foundations for more coordinated planning by combining the demand for investments of small municipalities to achieve economies of scale that ensure economic reasonableness.</p>	<p><b>Establishing a public-private national fund mainly focused on the private sector and the EIB and complemented by government guarantees.</b></p> <p>This measure aims at providing financial support to small municipalities fulfilling EIB's economic reasonableness criteria.</p> <p><b>Reviewing return rates, Complying with the new Law 9/2017, of 8 November, on Public Sector Contracts and Reviewing restrictions imposed on tariff increases based on cost and indicators.</b></p> <p>These measures seek to break the deadlock in the issue of private concessions, making the sector more attractive to private investors by means of greater certainty and returns aligned with sector risk.</p>	<p><b>Creating a public database including technical and financial information to assess management within each municipality.</b></p> <p>This measure would bring transparency into the market and provide a reference to improve operational efficiency among different service providers.</p> <p>In addition, this measure would be complementary to the other proposed measures, since, on the one hand, it would promote economic transparency regarding revenue and investment, and, on the other hand, it would provide detailed information on prices, making it possible to clearly outline the huge disparity that exists in Spain in relation to tariffs, both in quantitative and methodological terms.</p>	<p><b>Establishing a uniform methodological framework for the calculation of urban water tariffs, harmonising them nationwide.</b></p> <p>If this methodology was to be implemented, criteria for updating tariffs would be introduced on the basis of different key variables, such as operating indicators, index-linked costs or a deferred assessment of extra-contractual investments.</p> <p><b>Disclosing investment programmes and the extent to which these are being fulfilled.</b></p> <p>This measure aims at disclosing the investment plans of all systems in order to be able to define the activities performed and the level of compliance achieved.</p>
<b>Medium term</b> 	<p><b>Supporting local governments by developing framework bid specifications.</b></p> <p>This measure is comprised within the group of measures aimed at supporting municipalities and seeks to remove legal and administrative barriers to new concessions, by establishing framework contracts within the sector and/or providing municipalities with support resources for drafting bid specifications.</p>	<p><b>Supramunicipal entities establishing purpose-determined fees/tariffs focused on the urban cycle.</b></p> <p>It is proposed to extend the scope of the waste water treatment tariff model to networks. This measure would be a natural continuation of the one mentioned in the previous section, which was aimed at ensuring that this type of fees are truly purpose-determined.</p>	<p><b>Adapting the payment of charges to the investment time horizons required under the terms of concessions and Reviewing the restrictions imposed on the outsourcing of activities by concessionary companies.</b></p> <p>The aim of this measure is to introduce amendments to the concession model to develop a more balanced and efficient one.</p>	
<b>Long term</b> 	<p><b>Approving the principle of segregation of local activities and establishing accounts separated by activity.</b></p> <p>This measure seeks to ensure that the separation of local and "urban water management" accounts is also compulsory under direct local management models. Thus, the required information for the aforementioned database would be comprehensive, covering the entire (100%) sector.</p>			<p><b>Creating a regulatory body with extensive powers.</b></p> <p>From the perspective of the sector, while promoting the establishment of a regulatory body would expedite many of the proposed measures, in reality, most of them can be introduced without it. Therefore, a regulatory body has not been considered to be a priority measure in the short term.</p>



### 5.3. Detailed information on short-term measures

In the short term, the following set of measures should be highlighted:

- 1) Measures targeted at aligning with international best practices in terms of transparency and market unity:** the implementation of such measures is generally difficult; however, these are essential to carry out required structural changes in the sector. In addition, these measures would define a broader framework for the sector, under which the remaining proposed measures may be promoted and incorporated.

Thus, these measures include (i) collecting technical and financial information to create a public database among service providers, enhancing decision-making and helping identify best practices and (ii) adopting a methodology for the calculation of tariffs.

The first of these measures, involving the creation of a public database among service providers, is, probably, the easiest one to implement, due to widespread consensus among service providers, limited political costs and lower fragmentation of competences in this regard. This measure would bring transparency into the market and make a reference available for improving operational efficiency among different service providers. In the short term, within a scenario characterised by central or autonomous PAs' failure to act, it is proposed that service providers should voluntarily take the necessary steps to implement this initiative, promoting a model of "self-regulation" that has already proven effective in other countries and sectors.

In addition, this measure would be complementary to the other proposed ones, since, on the one hand, it would encourage economic transparency regarding revenue and investment, and, on the other hand, it would provide detailed information on prices, making it possible to clearly outline the huge disparity that exists in Spain in relation to tariffs, both in quantitative and methodological terms. The greatest obstacle would lie in properly outlining the accounting of direct local management systems; although measures to address this point are also proposed in the long term.

At a later phase, this measure could also serve as a tool for carrying out a structured and mandatory inventory of existing assets to identify those areas with greater needs.

Secondly, establishing a tariff methodology is proposed. If this methodology was to be implemented,

criteria for updating tariffs would be introduced on the basis of different key variables, such as operating indicators, index-linked costs (i.e. upstream water price, energy, wage increases associated with agreements...) or a deferred assessment of extra-contractual investments approved by municipalities (i.e. based on specific return rates and repayment periods). This measure is clearly dominant in those countries with higher infrastructure quality and there are several examples of countries recently undergoing changes and pursuing this approach, such as the Netherlands, France, the United Kingdom, Belgium or Japan. In the United Kingdom, the government established in 1983, within a set of measures geared at ensuring the financial viability of the sector, the requirement for water tariffs to include all system costs. In addition, following the complete privatisation of the sector and the creation of an independent regulatory body in 1989, uniform calculation methodologies were established for all users in the sector.

- 2) Measures aimed at supporting municipalities with infrastructure planning:** these include helping municipalities define sustainable investment plans and incentives for municipalities to aggregate, in order to scale up. Together, these measures would unlock the "demand" for infrastructure by municipalities that currently have neither technical resources nor an economy of scale big enough to justify needed investments. In general, economic costs in terms of resources are very limited, while impacts are very significant, since this type of municipalities account for >50% of the investment needed (i.e. considering municipalities with fewer than 50,000 inhabitants). In general, many countries have followed similar policies to enhance the efficiency of their urban water systems, as has been the case in the US, the UK, the Netherlands and Israel, where steps were taken to centralise planning; these frequently involved a reduction in the number of service providers and consequently led to an improvement in the economies of scale.

This set of measures also includes ensuring that water investment tariffs/fees/charges are allocated to those investments for which these were adopted, given that if this principle is not met, there is little point in planning and its justification, based on the principle of recovery of costs resulting from establishing such tariffs, is overthrown. In order to implement this measure, promoting transparency in tariff-investment terms would be key (i.e. it would be complementary to the creation of the database proposed above); however, this is likely to be met with some political resistance, since it would limit the leverage effect of

financing costs in municipalities facing economic hardship.

As a precursor to the above measure, it is proposed that service providers should, regardless of their management model, disclose investment programmes associated with concession contracts/agreements and investment tariffs/fees established to undertake such programmes. In addition, it is also proposed that these plans are updated regularly by adding new measures taken and the extent to which the agreed program is being fulfilled.

**3) Measures aimed at increasing private investment in the sector:** As mentioned above, this group includes those measures aimed at introducing amendments to certain water sector pieces of legislation approved in recent years (Law 9/2017, of 8 November, on Public Sector Contracts and Law 2/2015, of 30 March, on the Deindexation of the Spanish Economy, which have reduced the sector's appeal to private investors.

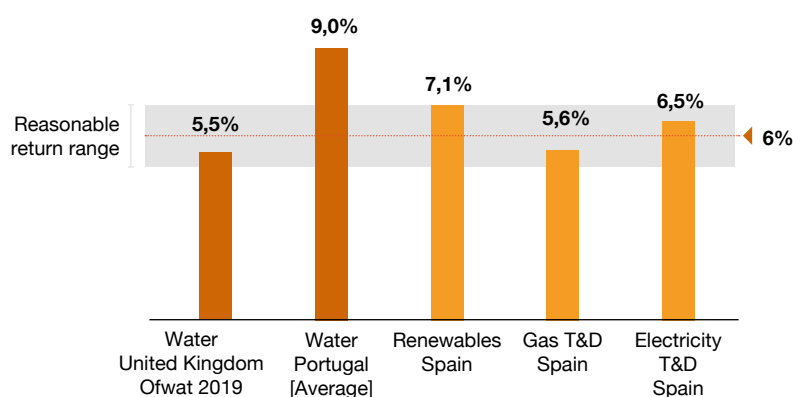
In particular, adjusting the return rate laid down in Law 9/2017, of 8 November, on Public Sector Contracts, which is at approximately 3.5% (i.e. considering the current methodology that adds 200bps to the interest

rate of the 10-year Treasury bond, which has stood at approximately 1.5% in recent years) to levels more appropriate to the risk profile of water sector concession activities.

Thus, the methodology for the calculation of return rates should be aligned with those established by the National Commission on Markets and Competition (CNMC, by its Spanish acronym) for other similar regulated sectors, such as gas and electricity networks, for which remuneration is based on a WACC (weighted average cost of capital) model of approximately 5-7%, considering both debt costs and market premiums associated with inherent risks of the activity. This model would also be in line with those used in other countries, such as the UK.

In addition, this would lead to levels in line with those private service providers consider to be needed for water services to be competitive compared to other sectors (between 5% and 7%) when allocating financial resources. Alternatively, it is proposed to liberalise the return rate and allow service providers to compete by offering the lowest possible rates, as already happens in other sectors that efficiently attract capital.

**Comparison of returns broken down by infrastructure sectors**



**Source:** Ofwat, ERSAR, National Commission on Markets and Competition (CNMC), Strategy & Assessment

Moreover, restrictions on tariff revisions to incorporate corrections based on changes in costs or other indicators, associated with Law 2/2015, of 30 March, on the Deindexation of the Spanish Economy, make it very difficult for service providers to take part in such contracts, since these introduce greater uncertainty regarding cost components beyond the control of concession holders, such as energy or new quality, environmental or security requirements, among many others.

Thus, in the current situation, having visibility regarding cash flows of projects is extremely complex, which significantly hinders their “bankability”. Moreover, the inability to develop incentive-based models associated with performance indicators limits stimulus regarding operating efficiency or reduces investment increases.

#### 4) Creating a national fund to finance water

**infrastructure projects:** As mentioned above, this measure is based on the creation of a public-private fund, focused on attracting private capital, but supported by government guarantees (Central Government and Autonomous Communities), and complying with financing conditions that will allow access to funds from the European Investment Bank (EIB). This fund seeks to support smaller projects with limited independent access to other investment sources, usually small to mid-sized municipalities, especially concerning the renewal/ extension of distribution networks. In order to meet EIB access requirements, this fund shall meet criteria on economic reasonableness and cost recovery through tariffs, preventing, in any case, these tariffs from reaching non-market levels. In addition, it is proposed that this fund should allow citizens and other social actors’ participation through micro-financing mechanisms.

#### Comparison of returns broken down by infrastructure sectors

Financing model	Target recipients	Conditions for access
<p>This fund should consist of national or regional public funds (or public guarantees), and be focused on attracting funds from the EIB and supported by private financing from large institutional investors.</p> <p>Public guarantees may be an appropriate solution to indirectly contribute public funds.</p> <p>In order to meet EIB requirements, this fund shall be aligned with EU targets.</p>	<p>The ultimate objective of this fund is to provide PAs/service providers with limited market access with access to financing.</p> <p>In this regard, it seems reasonable that small municipalities and county councils willing to promote municipal grouping should be the first to benefit from it.</p> <p>This projects should be aligned with EIB’s environmental sustainability (climate change) or infrastructure development objectives.</p>	<p>The main criteria to be considered would be the economic reasonableness of the project and the capacity to repay via tariffs within a reasonable period.</p> <p>In this regard, the pursuit of economies of scale will be essential to undertake such project without involving disproportionate tariff increases.</p> <p>Financing conditions should be aligned with BEI’s requirements in terms of duration and rates.</p>
▼	▼	▼
<p><b>Establishing a public (supported by government guarantees)-private (institutional investors and citizen participation) fund aimed at fulfilling EIB’s requirements to access financing.</b></p>	<p><b>It is proposed that this fund should focus on water distribution and sanitation networks in small municipalities capable of achieving efficient economies of scale.</b></p>	<p><b>The main criteria to be proposed are the economic reasonableness of the project and its capacity to recover costs via tariffs, without these reaching non-market levels.</b></p>

Source: Strategy & Assessment



#### 5.4. Detailed information on middle-term measures

In the medium term, the adoption of the following measures, which generally have a less prominent impact but are reasonably feasible, is proposed.

- 1) Measures aimed at supporting municipalities with the drafting of bid specifications: the new Law 9/2017, of 8 November, on Public Sector Contracts, has significantly increased the number of local specifications being drafted, which has resulted in municipalities with limited technical resources experiencing delays or directly avoiding getting involved therein. It is proposed to provide support to these municipalities by means of technical resources or the creation of a contract framework within the sector. This measure is complementary to the first set of measures aimed at supporting municipalities (planning and grouping) proposed in the previous section and it is also in line with the adoption of a tariff methodology that shall be laid down within the framework contract to be defined.
- 2) Extending the application of investment purpose-determined fees/tariffs to the supramunicipal level, in order to address network needs: historically, supramunicipal investment fees and charges have been associated with waste water treatment activities and set by ACs. It is proposed to extend the scope of this model to supramunicipal groups that focus on networks. This measure would be a natural continuation of the one mentioned in the previous section, which was aimed at ensuring that this type of fees are truly purpose-determined; besides, it is also compatible with the creation of a national fund, with these charges possibly being a mechanism to ensure the recovery of costs and economic reasonableness.
- 3) Measures related to concessionary companies matters: this group includes some amendments to the concession model, such as (i) lifting restrictions imposed on concessionary companies in terms of sub-contracting within the same group and (ii)

adjusting the payment of charges according to specific investment needs over the term of such concessions.

The former seeks to promote vertical integration and corporate complexity in the private sector. For this purpose, it is proposed to foster transparency concerning transfer prices among companies within the same group, which would be complementary to the creation of a public database on an operating/technical level, as proposed in the previous section.

The latter is in line with the policy of linking payments to investment (i.e. purpose-defined charges), in this case concerning payments made by concessionary companies to municipalities, which, historically, have been concentrated over the first years after the concession is granted. This has had two implications, on the one hand, this practice encouraged investment via private concessionaires, given its nature as an attractive model for municipalities with limited financial resources, but, on the other hand, it drained resources from the sector to other areas of expenditure within such municipalities, since the entire charge paid to these municipalities was not fully allocated to water investments. In this regard, it is proposed to limit payments during the first years of the term of concessions to ensure the economic reasonableness of the project, as is the case in other countries with charge-based models, like Portugal.

#### 5.5. Detailed information on long-term measures

Finally, in the long term, it is proposed to address those measures that are difficult to implement, with more limited impacts.

- 1) Approving the principle of segregation of activities and establishing separated water accounts in municipalities operating under direct local management models: this measure seeks to ensure that the separation of local and “urban water management” accounts is also compulsory under direct local management models. As





mentioned above, this measure could be implicitly included in the creation of the above-mentioned public database if municipalities operating under this management model were also required to report information on the matter. However, considering that such municipalities account for a small percentage of the sector (10%) and that this measure would have political costs, it is sought to prevent this measure from delaying or halting the implementation of the previous one; thus, having this database covering 90% of the market associated with the remaining concession models is adequate in the short term.

- 2) Creating a regulatory body with extensive powers. Following the implementation of the remaining measures proposed, it is considered that barriers to the amalgamation of the different responsibilities and competences defined under the scope of a single specific regulatory body would be easier to overcome. Alternatively, the various measures proposed could be addressed based on the creation of a regulatory body; however, the situation in Spain in terms of competence and political context makes this a less viable option. From the perspective of the sector, while promoting the establishment of a regulatory body would expedite many of the proposed measures, in reality, most of them can be introduced without this figure. Therefore, a regulatory body has not been considered to be a priority measure in the short term.

## 5.6. Requirements for the implementation of such measures

Finally, an assessment of these different measures regarding legal requirements / competence issues faced during their implementation has been included. Thus, measures can be grouped into four categories:

1. Measures primarily aimed at allocating economic resources or creating organisational structures, both with limited costs, as in the case of (2) support for municipal planning or (3) drafting framework contracts; or with higher financial needs, as in the case of the

above-mentioned (8) national fund or (5) incentives for municipalities to aggregate.

2. Measures that fall within the competence of the central government and are not expected to be met with opposition by other PAs; these measures include those more related to concession models, such as (6) reviewing return rates, (11) liberalisation of outsourcing within groups and (7) adjusting tariffs to costs or indicators. Moreover, the establishment of the proposed operational and financial database would also be included (10) here.
3. Measures that should fall under the competence of the Central Government, but may, however, be met with opposition by other PAs, especially at the local level; these measures include those that seek to transparently link payments to investment, primarily (1) ensuring that purpose-determined fees paid by users are allocated to investment, which would be accompanied by the measure (14) associated with disclosing investment plans and the extent to which these are being fulfilled over the term of concessions. Measures seeking to ensure that charges paid by concessionaires to municipalities are allocated to water activities and to (12) guarantee that such charges and the investment characteristics of such are in the same vein concessionaires (instead of payments being concentrated during the first years of the term of concessions). This group would also include (4) the mandatory establishment of separated accounts for water activities under direct local management systems.
4. Finally, measures covering the different public authorities and all management models are included; these measures are expected to be a case of clashed interests, which will be a significant barrier to their implementation, which might, for instance, be the case when dealing with previously introduced impactful measures, such as (13) the establishment of a tariff methodology and (15) the creation of one or more regulatory bodies.

The following table shows the sequence of these measures within different time horizons.

Scope	Issue	Measure	Competence
Economic resources	2 Helping municipalities define economically and <b>environmentally sustainable investment plans</b> .	DIR PUB MIX PRV BRW	<ul style="list-style-type: none"> <li>Measures primarily aimed at allocating economic resources or creating organisational structures that fall within the competence of the central government.</li> </ul>
	3 Developing <b>framework contracts</b> to facilitate the developemnt of <b>contract specifications</b> or the implementation of <b>grouping processes</b> .	MIX PRV GRE	
	5 Establishing incentives for <b>municipalities to aggregate</b> to achieve economies of scale.	DIR PUB MIX PRV GRE BRW	
	8 Creating a <b>national fund</b> to finance water infrastructure projects.	DIR PUB MIX PRV GRE BRW	
Regulatory changes facing no barriers to their implementation	6 <b>Reviewing return rates</b> for water sector investments.	MIX PRV GRE	<ul style="list-style-type: none"> <li>Measures that fall within the competence of the central government and are not expected to be met with opposition by other PAs.</li> <li>These measures include those more related to concession models.</li> </ul>
	7 <b>Increasing flexibility</b> when updating tariffs.	PUB MIX PRV GRE	
	10 Creating a <b>public database</b> on both a <b>technical/operating</b> and an <b>economic/financial level</b> .	DIR PUB MIX PRV GRE BRW	
	11 Providing <b>private service providers</b> with <b>flexibility</b> regarding outsourcing.	MIX PRV GRE BRW	
Regulatory changes facing potential barriers to their implementation	1 Ensuring that <b>water investment tariffs/fees</b> are <b>allocated to those investments</b> for which they were adopted.	DIR PUB MIX PRV BRW	<ul style="list-style-type: none"> <li>Measures that should fall under the competence of the central government, but may, however, be met with opposition by other PAs, especially at the local level.</li> </ul>
	4 Applying the <b>principle of segregation</b> of local water activities.	DIR BRW	
	9 Introducing mandatory <b>purpose-defined tariffs/fees</b> regarding urban tariffs to <b>finance urban cycle investments</b> .	DIR PUB MIX PRV BRW	
	12 <b>Adapting</b> the characteristics of <b>charges</b> paid to municipalities by concessionaires (companies that have been awarded concessions) <b>to the investment characteristics of the concession</b> .	PRV GRE	
	14 Periodically <b>disclosing all investments programmes</b> committed and the <b>extent to which these are being fulfilled</b> .	DIR PUB MIX PRV GRE BRW	
Cross-cutting regulatory changes	13 Establishing a <b>uniform methodological framework for the calculation of urban water tariffs</b> .	DIR PUB MIX PRV GRE BRW	<ul style="list-style-type: none"> <li>These cover all PAs and management models (clashed interests) that will be a significant barrier to their implementation.</li> </ul>
	15 Establishing a <b>regulatory body with extensive powers</b> .	DIR PUB MIX PRV GRE BRW	

DIR	Public direct management	PUB	Public indirect management	MIX	Public-private company management	PRV	Private indirect management	GRE	New concessions	BRW	Existing concessions
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## Plan of measures to improve the financing of water infrastructures in Spain: Key Concepts

Based on the current situation in Spain and conclusions drawn from international benchmarking, 15 measures have been proposed to improve the financing of water infrastructures in Spain. These have been grouped into measures related to planning, financing and sector operation, as well as cross-cutting measures. Such measures have been prioritised in the short, medium and long term, based on a feasibility and impact study.

In the short-term, priority is given to measures aimed at:

- Aligning with international best practices, such as (1) Creating a public database to gather sector operating and financing information and (2) Adopting a uniform methodology for the calculation of urban water tariffs nationwide.
- Supporting municipalities with infrastructure planning by (3) Defining sustainable investment plans, (4) Introducing incentives for municipalities to aggregate, (5) Publishing service providers' investment plans and how these relate to established tariffs and (6) Ensuring that water investment tariffs/fees and water charges are allocated to those investments for which they were adopted.
- Attracting private investment, and that from state banks, to the sector; (7) Adjusting current return rates to investment risk levels, or, if applicable, to the risk profile of water sector concession activities, (8) Allowing greater flexibility in the way tariffs are adjusted based on changes in costs or other operating indicators and (9) Creating a national participatory fund to finance water infrastructure projects.

In the medium-term, the following measures would be prioritised:

(10) Providing support to municipalities for drafting specifications by means of framework contracts, or aggregation agreements in the case of supramunicipal entities, (11) Extending the application of investment purpose-determined fees/tariffs to the supramunicipal level, in order to channel investment towards water distribution and sewerage networks, as well as other local infrastructures, (12) Allowing greater flexibility for service providers to outsource certain activities to optimise efficiencies and (13) Adjusting the payment of charges according to specific investment needs over the period corresponding to the duration of such concessions or public-public agreements.

Finally, the following measures are suggested to be carried out in the long-term:

- (14) Applying the principle of segregation of local water activities and  
(15) Creating a specific water regulatory body.

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