IWA International Water Association

Specialist Group Statistics and Economics

Water Economics Group

VNIVERSITAT DE VALÈNCIA

Current Status of Waterworks in Spain

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IWA-JWWA Workshop on Statistics and Economics

Current Status & Financial Strategies of Water Utilities in the World

—Ensuring the Sustainability of Water Supply—

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1. INTRODUCTION

Human water needs

They must be satisfied. such as address the United Nations in the Resolution "The human right to water and sanitation" (A/RES/64/292):

↓

"Recognizes the right to safe and clean drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights".

But, there are a few…

- Climate change
- Investment cost in facilities
- Operating and maintenance cost of facilities
- Environmental protection

All of them affect to the efficiency of urban water system

What issues affect to the Spanish urban water system?

Climate change	⊕	Environmental protection	⊕	Excessive use of water in agriculture (80% of total use)
A progressive increase of temperatures are since 1973		Water demand and quality standards are increasing		The agriculture sector contributes only 4 % to the Spanish GDP.

2. SPANISH WATER MARKET ORGANIZATION

"Member States shall identify the individual river basins lying within their national territory and, for the purposes of this Directive, shall assign them to individual river basin districts" (Article 3 WFD).

How does Spain manage the river basin districts?

Spain is divided in **17 Regional Governments** which have powers within the limits established in the Spanish Constitution (like environmental management)

→ But, the river basins **are shared** among different Regions

There are **11 River Basin Districts**

Who is the responsible of Spanish integral water cycle? **It is a highly complex issue**

Catchment

GOVERNMENT

Distribution

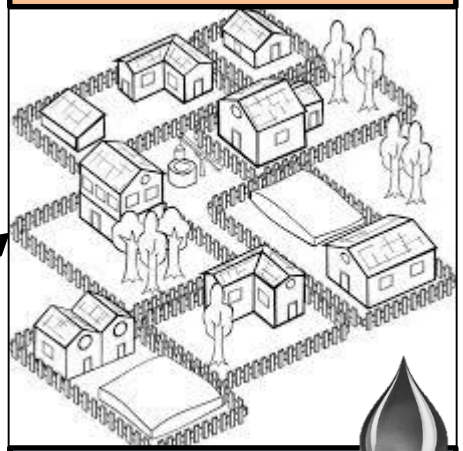
GOVERNMENT

Purification

LOCAL GOVERNMENT

Local distribution

LOCAL GOVERNMENT



Sewer systems

LOCAL GOVERNMENT

Water treatment

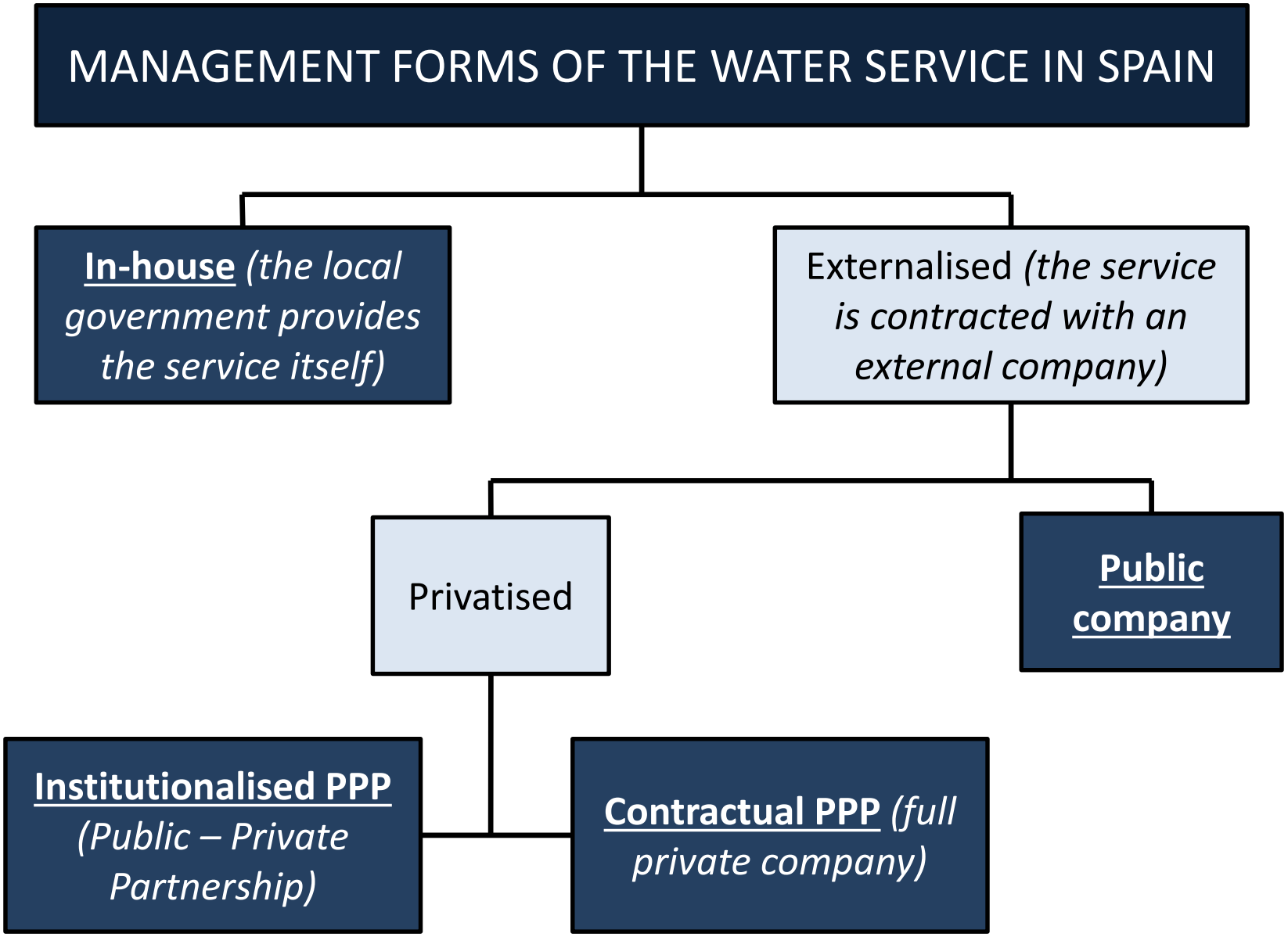
LOCAL/ REGIONAL GOVERNMENT

Water discharge

LOCAL/REGIONAL GOVERNMENT

Receiving waters are under Public Water Domain

GOVERNMENT


MANAGEMENT FORMS OF THE WATER SERVICE IN SPAIN
In-house (the local government provides the service itself)
Externalised (the service is contracted with an external company)
Privatised
Public company
Institutionalised PPP (Public – Private Partnership)
Contractual PPP (full private company)

MANAGEMENT FORMS OF THE WATER SERVICE IN SPAIN

In-house *(the city council provides the service itself)*

Externalised *(the service is contracted-out an external company)*

Local Government must assume all the responsibility:

- Decision making and management.
- Use its own employees.
- Cover production costs with funds from the municipal budget.

Source: Adapted to García – Valiñas et al.. 2013

MANAGEMENT FORMS OF THE WATER SERVICE IN SPAIN

Decentralising the management of the urban water service while maintaining public ownership:

- It allows still being managed by public workers.
- The outsourcing to a public company permits professionalised management of the urban water service (gains in efficiency are obtained).

ernalised *(the service contracted-out an external company)*

Public company

Institutionalised PPP *(Public – Private Partnership)*

Contractual PPP *(full*

- Capital is shared between the private and public sector.
- Local government participation is normally sufficiently significant to guarantee that public objectives will be accomplished.
- Combine public interests (such as universal access and quality standards) with the industry know-how of private management.
- The private partner is mainly responsible for managing these companies, while the political decisions are made by the public partner.

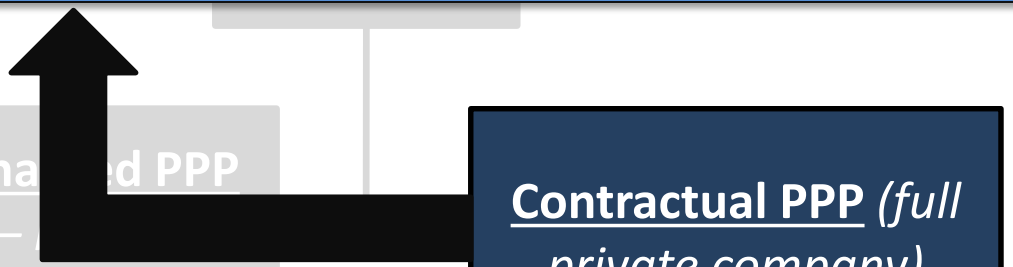
Institutionalised PPP
(Public – Private Partnership)

Contractual PPP *(full private company)*

MANAGEMENT FORMS OF THE WATER SERVICE IN SPAIN

They are the most widespread form of privatising public services in Spain.

- Concessions are made official by contract (for a limited period), whereby the local government entrusts a corporation (legal entity) the management of the service, but retains ownership.
- At the end of the contract, local governments decide how to be managed for a new period.



Institutiona ed PPP *(Public – Partnership)*

Contractual PPP *(full private company)*

It is worth highlighting that in the Spanish legislation:

Only is contemplated privatising the **management of the service**

Facilities remains public property

Its is very important to establish clear criteria for maintenance and renovation of facilities

Main consequence

Atomization of services

Are there a different water utility for each municipality?

Joint management

325 groupings of municipalities provide wholesale or retail water services

Examples of groupings promoted by the public administration are the Bilbao Water Consortium and the Association of Municipalities in the Pamplona Region

There are about 2.000 water operators for 8.119 municipalities

Spanish urban water sector in figures

Contractual and institutional public–private partnerships operate in **medium or large-sized municipalities**

Public sector management operate in **small-sized municipalities**

AGBAR* and **Aqualia*** manage **67%** of water services in the municipalities that have privatized their urban water service

*AGBAR is a subsidiary enterprise of Suez Environment
*Aqualia belongs to Fomento de Construcciones y Contratas (FCC)

3. WATER TARIFF IN SPAIN

How does the Spanish urban system recover costs?

Water tariffs associated with each part of the water cycle guarantee….

- Quality
- Service
- Quantity
- Sustainability

Spanish urban water tariffs aim…

Cost recovery

Environmental sustainability

Responsible consumption

*"The **principle of recovery of the costs** of water services. including environmental and resource costs associated with **damage** or negative impact on the aquatic environment **should be taken into account** in accordance with. in particular. the polluter-pays principle. An **economic analysis of water services** based on long-term forecasts of supply and demand for water in the river basin district will be necessary for this purpose"* (Principle nº 38. WFD).

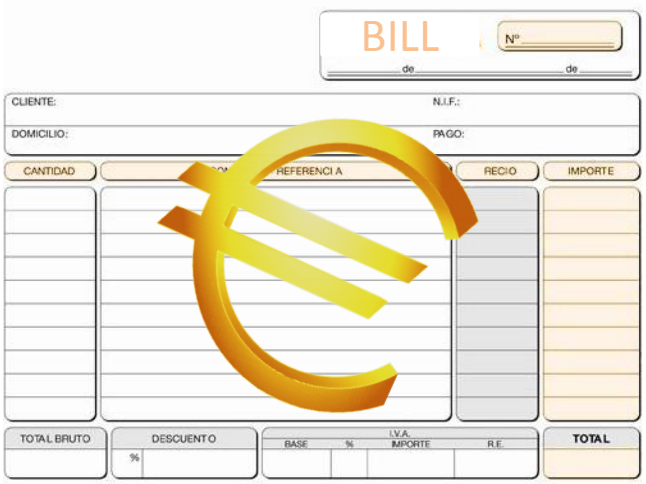
What kind of tariffs exist in Spain?

Regulation tariff	It covers services of surface water catchment and reservoir
Water usage tariff	It covers services of surface water transport
Servicing tariff	This serves to recover the costs of services purification and distribution water through distribution networks
Irrigation community tariff	Covering the costs of distributing water to irrigators
Sewer tariff	For covering the costs of collection services of urban wastewater
Sanitation tariff	For covering the costs of wastewater treatment
Dumping tariff	This serves to cover the costs of discharged control service to Public Water Domain

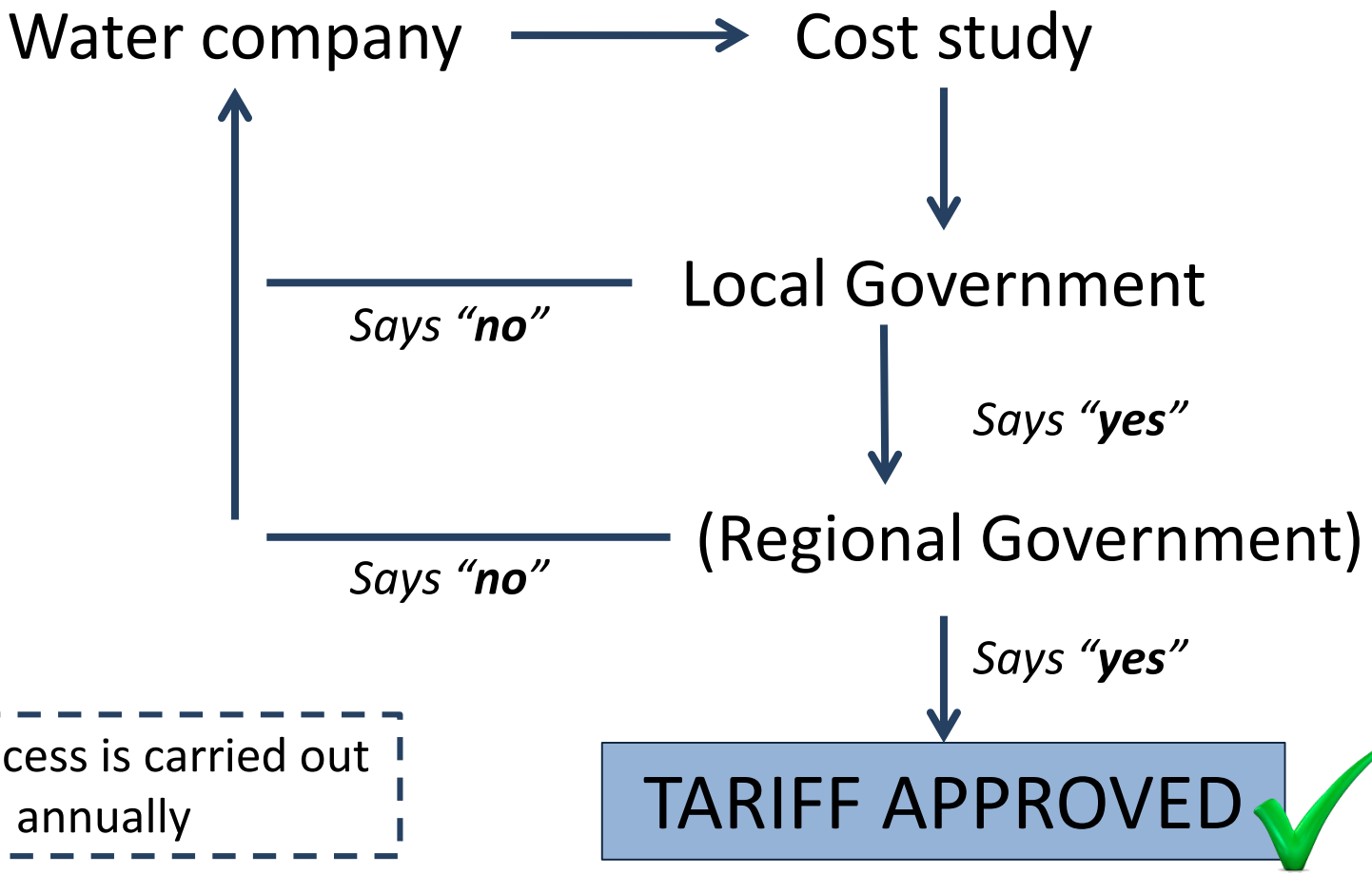
What kind of tariffs exist in Spain?

Servicing tariff	This serves to recover the costs of services purification and distribution water through distribution networks
Sewer tariff	For covering the costs of collection services of urban wastewater
Sanitation tariff	For covering the costs of wastewater treatment

These are the tariffs that are included in the urban water bill



What is the mechanism in Spain for approving water tariffs?



This process is carried out annually

How is structured the Spanish water tariff?

Binomial formula

$$P = F + a \times Q + b \times Y$$

F → Fixed component of water services contracted

a → Price per cubic meter of water consumed (€/m^3)

Q → Total amount of water consumed (m^3)

b → Price per cubic meter of wastewater produced (€/m^3)

Y → Total amount of wastewater (m^3)

Binomial tariff

Fixed component

This part of the tariff guarantees a level of revenue per user to cover the associated fixed costs of supplying the service.
This component is charged regardless of water is used or not

Variable component

This **part is associated to water amount consumed**. The **increasing block rates** (prices are progressively higher with increasing water consumption), try to promote the efficient use of water

Binomial tariff (Increasing block rates)

Service tariff	
Water meter of 13 mm	11.43 €/quarter
Water meter of 15 mm	11.43 €/quarter
Water meter of 20 mm	19.36 €/quarter
Water meter of 25 mm	30.77 €/quarter
Water meter of 30 mm	44.39 €/quarter
Water meter of 40 mm	88.58 €/quarter
Water meter of 50 mm	132.83 €/quarter
Water meter of 65 mm	154.74 €/quarter
Water meter of 80 mm	176.64 €/quarter

Consumption tariff	
Until 15 m^3/quarter	0.1855 €/m^3
Between 16 - 40 m^3/quarter	0.2783 €/m^3
Over 40 m^3/quarter	0.9275 €/m^3

Binomial tariff in figures

95% of the municipalities in Spain use binomial tariffs charged from the first cubic meter of water consumed

5% of the municipalities in Spain use fixed component including a free minimum allowance

Variable component			
58% of the municipalities set three consumption blocks	**29%** of the municipalities apply four consumption blocks	**11%** of the municipalities use two blocks	**2%** of the municipalities apply a flat rate

Average price of water in Spain = **1.59 €/m³** (207 JPY/m3 aprox.)

- **0.92 €/m³** refer to water supply (58% of total price)
- **0.67 €/m³** refer to wastewater treatment (42% of total price)

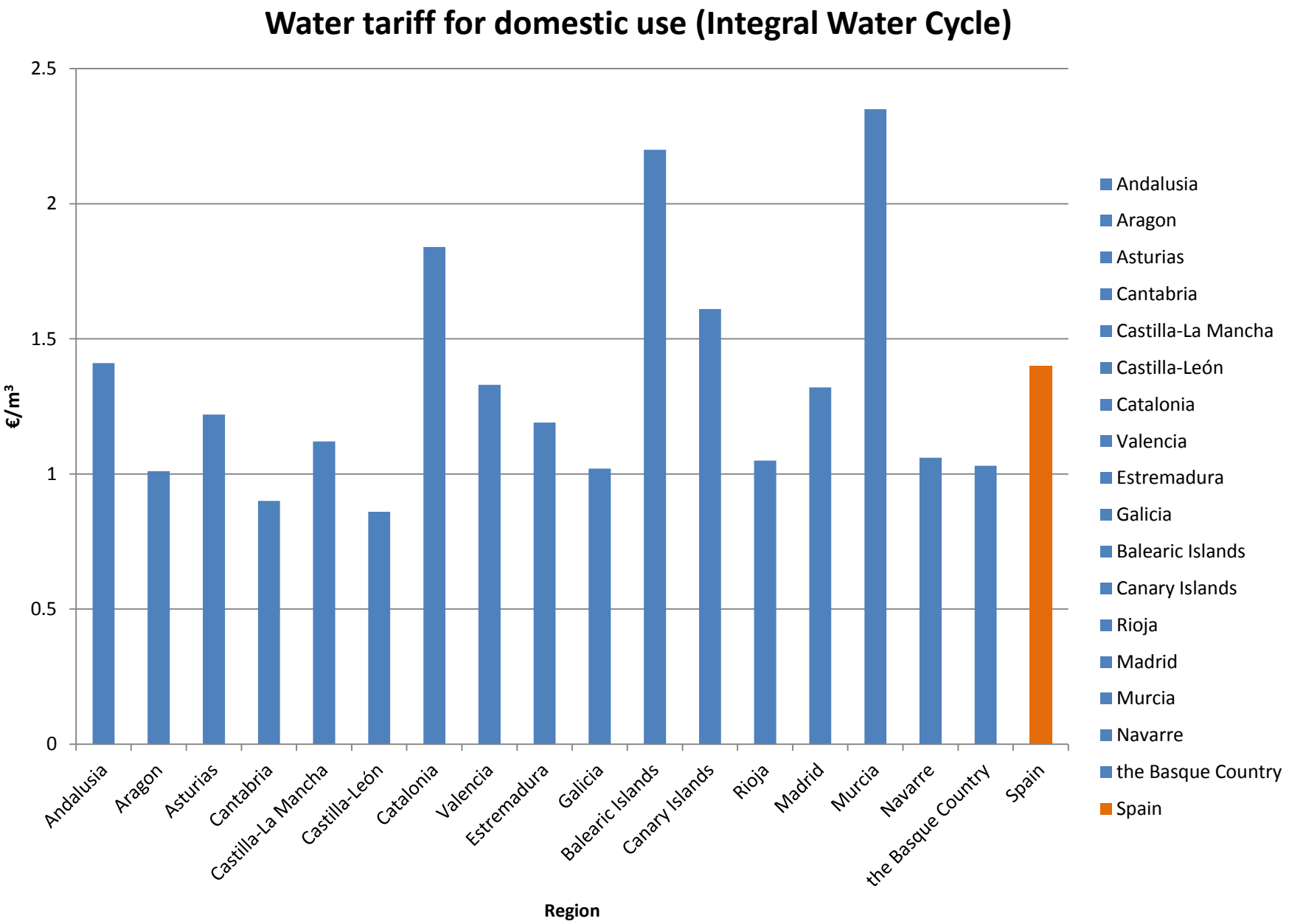
These prices do not guarantee the cost recovery

→ The cost recovery percentage is between **65 – 96%**

Water tariff by Spanish Regions (€/m³)

	Water supply		Wastewater treatment		Integral Water Cycle		
Region	Domestic	Industrial	Domestic	Industrial	Domestic	Industrial	Joint
Andalusia	0.83	1.11	0.58	0.64	1.41	1.75	1.50
Aragon	0.55	1.12	0.46	0.97	1.01	2.09	1.28
Asturias	0.6	0.9	0.62	0.78	1.22	1.57	1.31
Cantabria	0.55	1.38	0.36	0.53	0.9	1.91	1.15
Castilla-La Mancha	0.68	0.83	0.43	0.52	1.12	1.34	1.17
Castilla-León	0.44	0.66	0.42	0.53	0.86	1.18	0.94
Catalonia	1.12	1.62	0.72	0.83	1.84	2.45	1.99
Valencia	0.74	0.87	0.58	0.66	1.33	1.53	1.38
Extremadura	0.83	1.03	0.36	0.47	1.19	1.5	1.27
Galicia	0.61	0.96	0.4	0.68	1.02	1.64	1.17
Balearic Islands	1.38	2.5	0.81	1.49	2.2	3.99	2.65
Canary Islands	1.02	2.23	0.34	0.33	1.61	2.56	1.85
Rioja	0.52	0.57	0.53	0.53	1.05	1.09	1.06
Madrid	0.79	0.86	0.53	0.68	1.32	1.53	1.37
Murcia	1.06	1.57	0.68	0.72	2.35	2.29	2.34
Navarre	0.44	0.57	0.62	0.72	1.06	1.29	1.11
the Basque Country	0.54	0.79	0.5	0.74	1.03	1.53	1.16
Spain	0.85	1.12	0.56	0.69	1.4	1.81	1.59

3. Water tariffs in Spain



The water bill represents **0.8%** of the household budget and is one of the lowest in Europe

Tariff should be increased for achieve the cost recovery

These prices do not guarantee the cost recovery

The recovery percentage is between **65 – 96%**

4. FUTURE SCENARIO: POTENTIAL OF WATER REUSE

47 millions inhabitants

⊕

2,920 WWTPs

=

1,464,261 m^3/day of wastewater in Spain

High availability of treated water!

↓

Promoting the **use of reclaimed water** would contribute to mitigate the negative effects of climate change and water scarcity

Current use of reclaimed water in Spain in figures

14% of total Spanish wastewater is reused

71% of current volume of reclaimed water is used for **irrigation**

18% of current volume of reclaimed water is used for **environmental protection**

7% of current volume of reclaimed water is for **recreational uses**

4% of current volume of reclaimed water is for **urban uses**

Not all Regions require the use of reclaimed water.
The Mediterranean regions and those with relevant presence of agriculture are the main users.

Current use of reclaimed water in Spain in figures

The use of reclaimed water has legal requirements

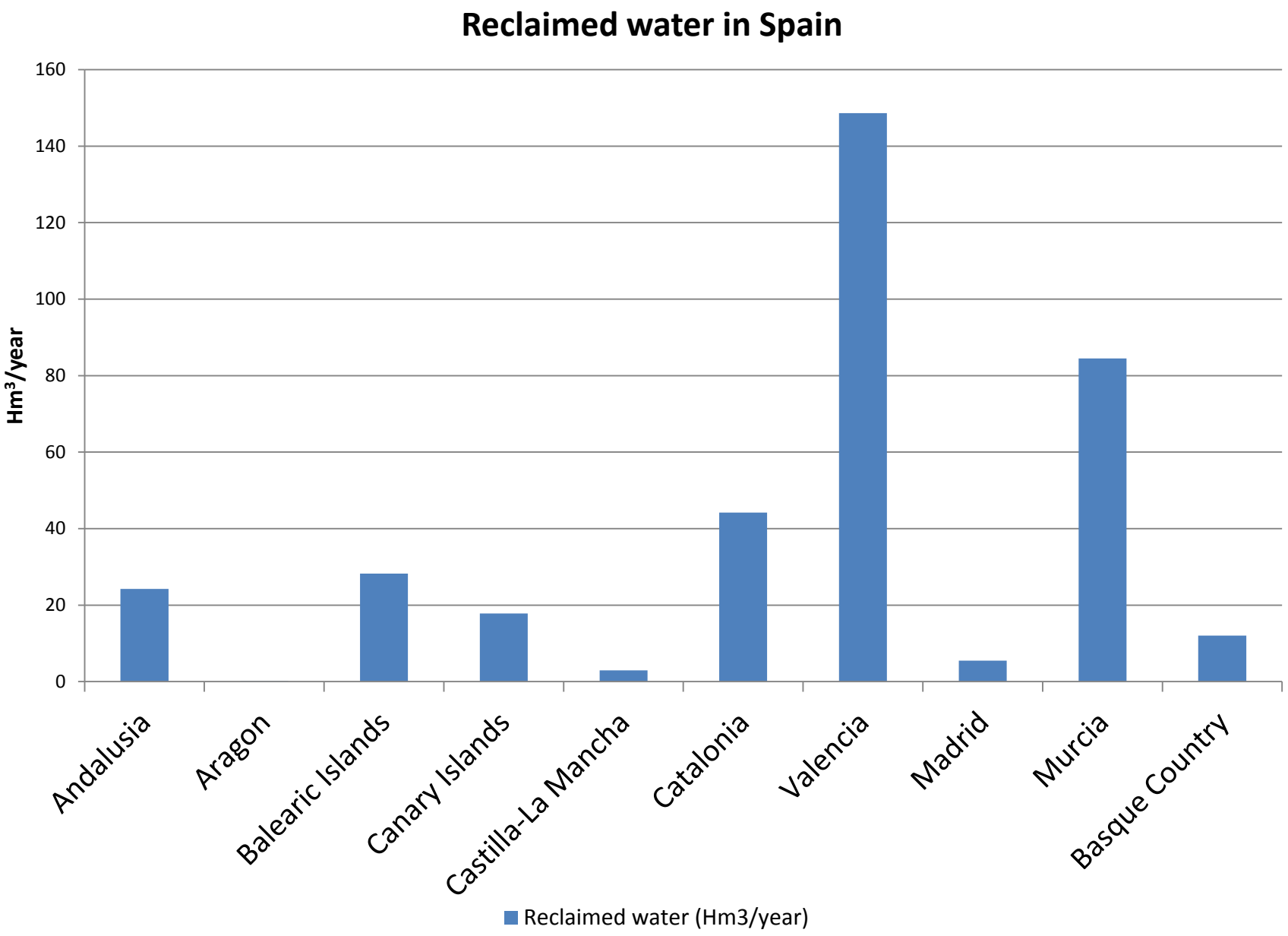
71% of current volume of reclaimed water is used in

18% of current volume of reclaimed water is used for

Royal Decree 1620/2007 establish the legal framework for the reuse of treated wastewater

need to use reclaimed water. Mainly use it the f the Mediterranean area and those with strong agricultu

Region	Reclaimed water (Hm^3/year)
Andalusia	24.21
Aragon	0.17
Balearic Islands	28.24
Canary Islands	17.8
Castilla-La Mancha	2.96
Catalonia	44.16
Valencia	148.66
Madrid	5.48
Murcia	84.52
Basque Country	12
	368.2


Reclaimed water in Spain
160
140
120
100
80
60
40
20
0
Hm3/year
Andalusia
Aragon
Balearic Islands
Canary Islands
Castilla-La Mancha
Catalonia
Valencia
Madrid
Murcia
Basque Country
Reclaimed water (Hm3/year)

Water reuse requirements

- **Social acceptance**
  - Social awareness
    - People should understand the benefit of its use
- **Real demand**
  - It is necessary to justify the investment
- **Guarantee required quality**
  - To avoid health risks
- **Storage and distribution infrastructure**
  - To ensure appropriate management of the service

The quality of the effluent of the WWTP is covered by the current tariff. **However, subsequent improvements in quality will be paid by users**

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Hence… first of all, for implementing reclaimed water in Spain it is required

Feasibility study

Including:

- **Economic costs and benefits**
- **Environmental costs and benefits**

It is needed to determine the real feasibility of reclaimed water use in any territorial area.

Benefits of reclaimed water

Increase available water resources	It is not necessary build large infrastructure to increase water supply
Reducing the arrival of pollutants to water bodies	The use of reclaimed water ensures supply regularity
Its use improves water management → Replacement of conventional uses	Irrigation uses are favored by the presence of natural nutrients

Main limitations for reclaimed water

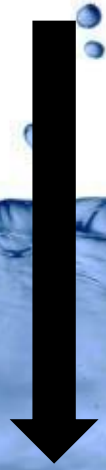
Uncontrolled industrial discharges

Increased salinity in the wastewater pipe system

Adaptation of supply infrastructure

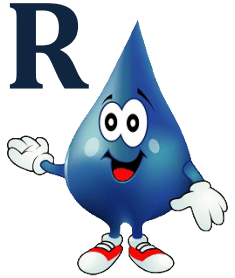
Lack of market for reclaimed water

Spain is the European country with the greatest potential for the use of reclaimed water



Water reuse is the future but we must work very hard to achieve it

THANK YOU FOR YOUR ATTENTION



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