



# **E 3.3.2 Guideline for the early identification of the needs of the public sector in the scope of water management**

## **Report on GT3**

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**Sudoe**



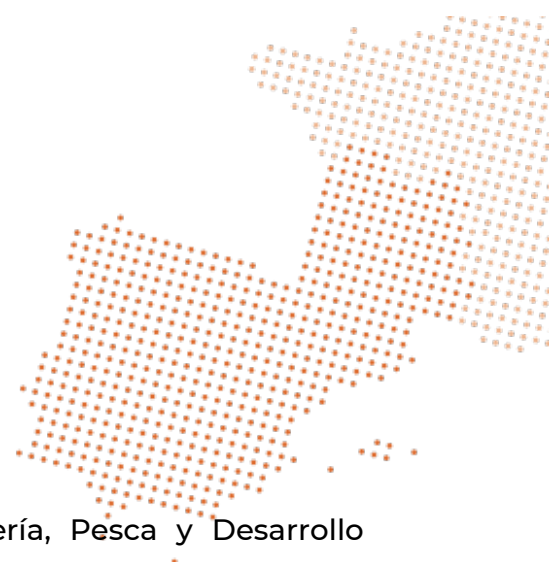
**TWIST**   
European Regional Development Fund





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## 1 PRESENTATION

This guideline aims to facilitate the public sector, in the field of water management, the early identification of needs that could potentially be satisfied through Innovation Public Procurement.

The elaboration of this guideline has had the participation of:

- An expert in innovation, strategy and sustainability, who provides technical assistance services for the development of strategies and technical studies in the field of innovation and sustainability and services for the management and execution of innovation projects.
- Partners involved in the activity 3.3. Development of pilot actions related to Innovation procurement in the water sector: AAC (coordinator), CENTA, OIEAU, UNILIM, IST, ISA, ADTA.

This guideline for the early identification of the needs of the public sector in the field of water management, has three chapters:

### **Chapter 1. Methodology for identifying needs**

Chapter 1 is dedicated to the design and application of a methodology for the identification of needs from the public sector in the field of water, particularly in the field of wastewater and water reuse, according to the scope of the Living - Labs established in TWIST project.

Partners involved in the activity 3.3. have actively participated in the development of this methodology:

- Providing information about experiences on public procurement of innovation in water in their region/country and funding programmes for public procurement of innovation, and strategies, plans and regulations in the field of water
- Reviewing and making comments on the methodology.



This methodology for the identification of needs includes a description of the context and the theoretical framework and a number of annexes that constitute the practical tools for its application (Annex I to Annex IV).

The developed methodology includes the following three stages for its implementation:

- Stage 1°. Preparing the interview and preliminary analysis.

The aim of this stage is to prepare the interviews and to identify and analyse information about the topics that will be addressed in the next step.

The preparation of the interviews facilitates the identification of suitable organizations (potential buyers) and engage them to participate in the application of the methodology. Once organizations for interviews are identified, it is key for a successful interview to develop a preliminary analysis of the several topics that will be addressed.

Annex I. Preparing the interview and preliminary analysis includes the necessary guidelines to develop this stage.

- Stage 2°. Semi-structured interviews.

In this stage, interviews will be conducted with members of each of the organizations identified in stage 1. This stage is the core of the methodology and is designed to explore, by means of different questions, about potential needs from the public water sector. As a semi-structured interview, the interviewer can change the sequence of the questions, adapt questions, etc.

Two tools have been developed to implement this stage:

- 1 Interview questionnaire (Annex II. Interview questionnaire).
- 2 Guidelines for making the Interviews (Annex III. Interview questionnaire guidelines).

- Stage 3°. Semi-structured interviews.

After conducting the interviews, this stage has been aimed at defining and contextualizing the identified needs and prioritize them according to the interviewee, based on the information and results obtained in stage 2.





Annex IV. Needs definition and prioritisation includes a brief guideline and a format of report to develop this stage.

The methodology was applied by project partners to eight organizations:

- 1 Limoges Metropole (interviewed by OIEAU).
- 2 Adour-Garonne Water Agency (interviewed by OIEAU).
- 3 Consejería de Agricultura, Ganadería, Pesca y Desarrollo Sostenible (interviewed by AAC and CENTA).
- 4 Empresa Metropolitana de Abastecimiento y Saneamiento de Aguas de Sevilla, S.A. (interviewed by AAC).
- 5 Empresa Municipal de Agua y Saneamiento de Murcia, S.A. (interviewed by FUERM).
- 6 Service d'assainissement, Bordeaux Metropole (interviewed by UNILIM).
- 7 Instituto Superior Técnico (interviewed by IST).
- 8 Águas do Tejo Atlântico (interviewed by IST).

The questionnaires of the eight organizations interviewed can be consult at Annex 1. Questionnaires of the interviews made.

## **Chapter 2. Identified needs**

Chapter 2 of this guideline is dedicated to the identification of public sector needs in the field of water that could potentially be satisfied through innovation. The application of the different stages of the methodology, explained at chapter 1, has allowed to know, from the eight organizations interviewed:

- A preliminary list of the needs of these organizations in the field of wastewater and water reuse as well as the main reasons that have generated these needs (see Annex 1. Questionnaires of the interviews made).
- A final list of the needs of these organizations in the field of wastewater and water reuse, based on a concise description of the needs that is focused on the challenge to be addressed, and defining the main functions and the





required performance characteristics (see Annex 2. Questionnaires of identified needs).

- An overview of similar needs in the field of wastewater and reuse.

### **Chapter 3. Difficulties and lessons learned**

Chapter 3 is devoted to describing the main difficulties found and lessons learned in the process of applying the methodology.

This section of the guideline has been made based on what was observed by TWIST project partners involved in its activity 3.3. during the application of the methodology, as well as through a specific questionnaire designed for this purpose (Annex 3. Questionnaire of difficulties and lessons learned). This questionnaire was answered by partners in charge of the interviews once the identification of needs had been completed.

The guideline for the early identification of the needs of the public sector in the field of water management, includes the following documents and intermediate results achieved through the application of the methodology designed for this purpose:

1. Methodology for identification of needs
  - Annex I. Preparing the interview and preliminary analysis
  - Annex II. Interview questionnaire
  - Annex III. Interview questionnaire guideline
  - Annex IV. Needs definition and prioritisation
2. Identified needs
3. Main difficulties and lessons learned
  - Annex 1. Interview questionnaires completed
  - Annex 2. Questionnaires on the identified needs completed
  - Annex 3. Questionnaires on the difficulties and lessons learned



## 2 METHODOLOGY FOR IDENTIFICATION OF NEEDS

### 2.1 Introduction

TWIST - Transnational Water Innovation Strategy - is an Interreg Sudoe Project that aims to develop an open model of innovation in wastewater management by giving compliance with the Water Framework Directive and promoting a circular economy model.

TWIST project comprises the following **tasks** (GT):

**GT 1: Stakeholder analysis and characterization of innovation processes at regional level.**

- Identification of stakeholders involved in innovation processes at regional level.
- Analysis of regional innovation opportunities in Smart Specialization.
- TWIST common strategy for capitalization of opportunities in Smart Specialization.

**GT 2: Creation of three Living Laboratories for the management, treatment, recycling and recovery of products in wastewater.**

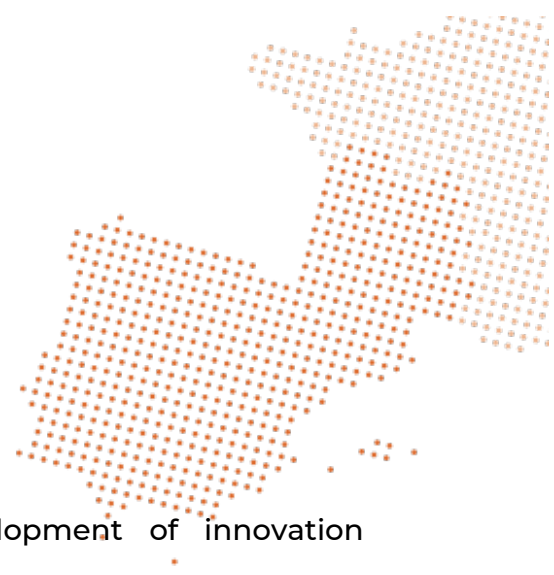
- Common methodology for the creation, implementation and management of three Living Labs.
- Workshops for the co-creation of the Living Labs.
- Research and experimentation in the three Living Labs.

**GT 3: Analysis of results obtained in the Living Laboratories and exploitation of market opportunities.**

- Analysis of market opportunities for tested solutions in the three Living Labs.
- Market study of validated solutions in the three Living Labs.

**GT 4: Capacity building for regional development and job creation.**

- Development of training materials on Innovative Public Procurement.



- Organization of national events for the development of innovation capacities in the water sector.
- Creation of a Transnational Business School for capacity building in innovation.

#### **GT 5: Capitalization and transfer of results to other SUDOE regions.**

- National seminars to develop synergies with other regions.
- Creation of “External Institutes and Utilities Interest Group”.
- Roadmap for future TWIST projects.
- Development of TWIST Market Place, a virtual catalogue with the innovative solutions tested in the Living Labs.

## **2.2 Object**

As part of Task 3, this document proposes a methodology to facilitate public sector the identification of needs in the field of wastewater management and water reuse that could be potentially met by means of innovation procurement. The methodology is designed to be applied in each of the regions participating in TWIST project in order to identify three common needs and carry out pilot actions on innovation procurement within the TWIST project activities, however, the methodology is easily adaptable to be applied in different regions to identify common needs and/or needs from single users.

The methodology covers the following areas, in line with technological areas of the living labs of Task 2:

- Wastewater treatment and regeneration.
- Wastewater treatment and infrastructures management.
- Reuse of wastewater and recovery of resources (water, nutrients and energy).



## 2.3 Why is important to identify and assess specific needs for innovation procurement?

According to the European Commission<sup>1</sup>, innovation procurement is any public procurement that has one or both of the following aspects:

- the purchase of the innovation process (research and development services) with (partial) outcomes,
- the purchase of the outcomes of the innovation created by others.

Two approaches are usually defined to address innovation procurement:

Public Procurement of Innovative solutions (PPI) can be used by procurers when challenges of public interest can be addressed by innovative solutions that are nearly or already in small quantity on the market. PPI can thus be used when there is no need for procurement of new R&D to bring solutions to the market, but a clear signal from a sizeable amount of early adopters/launch customers that they are willing to purchase/deploy the innovative solutions if those can be delivered with the desired quality and price by a specific moment in time.

Pre-Commercial Procurement (PCP) can be used by procurers when there are no near-to-the-market solutions yet that meet all the procurers' requirements and new R&D is needed to get new solutions developed and tested to address the procurement need. PCP can then compare the pros and cons of alternative solutions approaches and de-risk the promising innovations step-by-step via solution design, prototyping, development and first product testing.

**Source:** European Commission<sup>2</sup>.

<sup>1</sup> Commission notice. Guidance on Innovation Procurement (C(2018) 3051 final, 15 may 2018).

<sup>2</sup> Innovation procurement - H2020 Online Manual



One of the main characteristics of innovation procurement is its potential to address challenges of the public sector that cannot be solved by means of products or services available in the market. Therefore, innovation procurement is not about replacing equipment with the same or renewing expired service contracts but about address unmet needs.

In this context, an unmet need can be defined as a requirement that a public buyer has at the present time, or (preferably) one that he will have in the future, that current products, services or arrangements cannot meet, or the cost is excessive or it has an unacceptable risk<sup>3</sup>.

An unmet need may be originated from several causes, some of them are the following:

A problem that negatively impacts the delivery of the service of public interest (e.g. technical issue, budgetary/fiscal change, change in behavioural pattern of citizens that is creating a serious problem to provide the service of public interest with the expected quality and/or efficiency).

A need/desire of a public procurer to improve the quality and/or efficiency of the service of public interest in the future or a new emerging operational requirement to provide new features in the future. Such needs result from regular internal analysis of the procurer about how to improve its daily operations on the mid-to-long term (e.g. desire of hospitals to provide mobile patient monitoring and treatment to save more lives, improve the efficiency of doctor's appointments and reduce hospital admission costs).

Policy objectives to address mid-to-long term societal challenges (e.g. need for procurers to look for greener or more energy efficient solutions to meet the objectives of reducing the carbon footprint of the public sector by a specific percentage in a specific target date in the future).

<sup>3</sup> Delivering best value through innovation. Forward Commitment Procurement. Practical Pathways to Buying Innovative Solutions.



Legislative/regulatory requirements to provide high quality and efficiency services of public interest in the future (e.g. national legislation requiring that a specific percentage of a specific public service offering is made more accessible to citizens with visual/hearing or other physical impairments by a specific date in the future).

**Source** The European Assistance for Innovation Procurement (EAFIP<sup>4</sup>)

The identification of needs is a key previous step to conduct an innovation procurement and allows procurers to guide their procurement strategy at mid and long term.

Once the needs have been identified, it is usual to conduct a prior state of the art analysis (and IPR search), and a market consultation in order to confirm there are not available solutions on the market that meets the needs identified and whether there are IPR related to the needs that could influence the procurement process.

Below, some examples of needs addressed by innovation procurement experiences in the field of water from TWIST regions are described. Smart.met is an experience from France (and other European countries), and the experience focused on sewage sludge is a local experience from Spain (no experiences were identified in Portugal).

An additional experience from Norway focused on sewage treatment facilities is described.

#### **Smart-met Project: Need for an advanced water meter technology (France - Europe)**

In Europe, the management of drinking water supply faces various challenges such as; investment and operating cost management, water losses (unbilled

<sup>4</sup> EAFIP Toolkit.





water) due to leaks and other system failures, and in some regions the scarcity of good quality water resources.

Traditional water meters are limited in their capacity to effectively assist utilities in meeting these challenges.

An important way to improve this situation is to generate, access and use accurate data that the water meters communicating. This approach will allow to reduce operating costs, identify performance problems, improve customer service, better prioritize infrastructure investments.

Smart.met project is a Horizon 2020 project, led by a group of 7 water utilities, aims to develop new technologies to deal with the collection and management of smart metering data, through a joint Pre-Commercial Procurement (PCP).

More information: <http://www.smart-met.eu>

#### **New integrated model for sewage sludge and other waste (Spain)**

Metropolitan Water Supply and Sanitation Company of Seville (EMASESA) carried out a market consultation as part of an innovation procurement process.

EMASESA needs a new integrated model to manage sewage sludge and other organic wastes in order to address operational limitations and to adapt the system to new regional regulation about the use of sewage sludge for agricultural application.

More information: <http://www.emasesa.com/compra-publica-innovadora>

#### **Development of Future Sewage Treatment Facilities (Norway)**

Bergen Municipality and the Agency for Water and Sewage launched a dialogue with relevant industries and interested parties as part of a pre-commercial procurement process.

According to the call for dialogue, "Bergen Municipality will need to construct new secondary treatment facilities in the coming years due to stricter





environmental requirements. Such facilities must be able to handle major climate related variations.”

More information:

<https://ted.europa.eu/TED/notice/udl?uri=TED:NOTICE:317811-2019:TEXT:EN:HTML>

<https://www.mercell.com/en/tender/109520972/utvikling-av-fremtidens-avloepsrenseanlegg---invitasjon-til-dialogkonferanse-tender.aspx>

On the other hand, public procurement of innovation is being implemented in several sectors in Europe through Horizon 2020 programme<sup>5</sup>, and by means of national and regional strategies, as in Andalusia, where the Regional Government identified its main needs that could be addressed through innovation procurement<sup>6</sup>.

## 2.4 Opportunities for innovation in water management

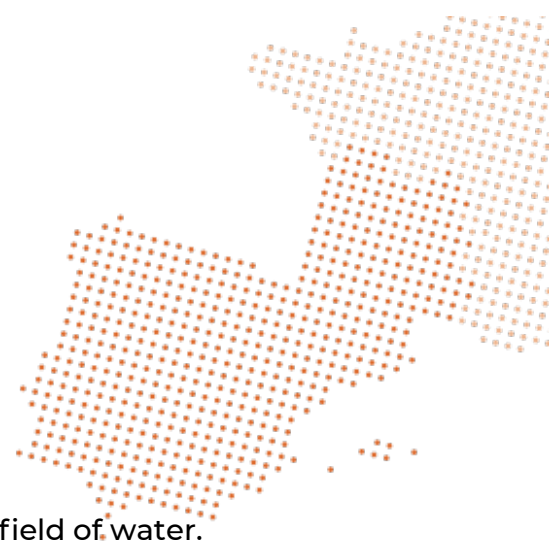
The key role of innovation to safeguard water resources and boost the circular economy in Europe is highlighted by the European Commission in different strategies and plans. In this way, innovation in water is established as one of the priorities within the EU Framework Programme for Research and Innovation, Horizon 2020, covering the following areas<sup>7</sup>:

- Bridging the gap from innovative water solutions to market replication.
- Developing integrated approaches to water and climate change.
- Stepping up EU R&I cooperation in the water sector.
- Harnessing EU water R&I results for industry agriculture policy makers and citizens.

<sup>5</sup> EU funded projects implementing Pre-Commercial Procurements (PCP) or Public Procurement of Innovative Solutions (PPIs).

<sup>6</sup> Demanda de Soluciones Innovadoras de la Consejería de Agricultura, Ganadería, Pesca y Desarrollo Sostenible (CAGPDS).

<sup>7</sup> Water innovation: boosting its value for Europe.



- Strengthening international R&I cooperation in the field of water.

On the other hand, at regional level, the National/Regional Research and Innovation Strategies for Smart Specialisation (RIS3) are integrated, place-based economic transformation agendas aimed at focus policy support and investments on key national/regional priorities, challenges and needs for knowledge-based development<sup>8</sup>.

In Task 1.2 of the TWIST project, the opportunities and synergies in the field of water among the RIS3 of the TWIST regions<sup>9</sup> were analysed. The analysis shows several opportunities related to wastewater management and water reuse that could be initially addressed by public sector using innovation procurement. Some of these opportunities are listed below as an example:

- Evaluation of water needs.
- Impact of climate changes on precipitation.
- Reclaimed water as an alternative water source for different uses (industrial, irrigation, etc.).
- Improvement of facilities and application of tools to improve reclaimed water management in agricultural sector.
- Development of technologies and new processes for water treatment.
- Use of robotics and artificial intelligence on water and wastewater industry.
- Sanitation with valorisation of materials and treated water.
- Use of new technologies to increase the efficiency of water supply and wastewater treatment infrastructures.
- Smart cities (convergence of energy, transport, water, environment and ICT's sectors in the urban context).
- New bio depollution and purification methods.
- Emerging pollutants.

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<sup>8</sup> Guide to Research and Innovation Strategies for Smart Specialisation (RIS 3).

<sup>9</sup> E 1.2.1 Analysis of opportunities in RIS3 and synergies between regions.



## 2.5 Methodology for identifying needs

There are multiple methods that can be applied for identifying needs, as describes the European Assistance for Innovation Procurement in its toolkit:

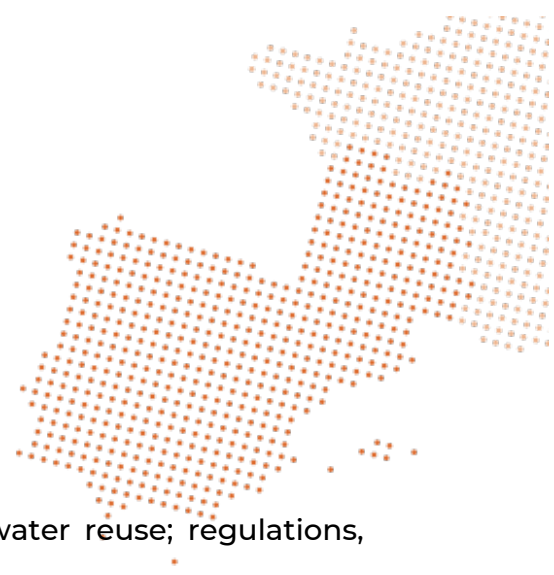
- Internal meetings / informal chats in which only representatives of the public procurer organization participate, as starting point for the brainstorming.
- Meetings and workshops with decision makers , especially necessary from a strategic perspective, in order to receive support and approval for (additional) required financial resources for the procurement.
- Discussions structured into focus groups (targeting, for example, the different types of activities of the public procurer, the policy objectives), which could include both representatives of the public procurer organization, as well as external experts / key stakeholders.
- Surveys conducted by email, phone or post.
- Workshops with customers'/ end-users'.

This document proposes a methodology based on semi-structured interviews and discussions with managers from public bodies involved in water management, which can act as potential buyers of innovations in the field of wastewater and water reuse.

This methodology aims to help public bodies in an initial identification of needs that potentially could be met by means of innovation, however, additional tasks should be done, market consultation and IPR analysis, in order to define accurately the needs identified and ensure the viability of an innovation procurement process.

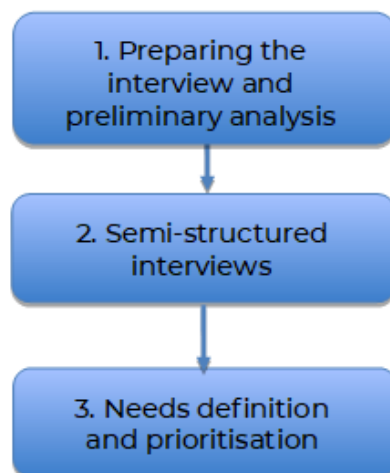
The methodology has been developed on the basis of:

- Knowledge and previous experiences from project partners in public procurement processes.



- Expertise of project partner on wastewater and water reuse; regulations, policies, processes, and innovation.
- Findings of previous tasks of TWIST project.
- Experiences from European projects in public procurement of innovation: PPI4WASTE<sup>10</sup> and SMART SPP<sup>11</sup>.
- General guidelines from the toolkit of the European Assistance for Innovation Procurement (EAFIP Toolkit<sup>12</sup>).
- External advisory consultant services.

The methodology comprises three stages:



### **Stage 1. Preparing the interview and preliminary analysis.**

The aim of this stage is to prepare the interviews and to identify and analyse information about the topics that will be addressed in the next step.

<sup>10</sup> Promotion of Public Procurement of Innovation for Resource Efficiency and Waste Treatment (PPI4Waste).

<sup>11</sup> SMART SPP - innovation through sustainable procurement.

<sup>12</sup> EAFIP Toolkit.



The preparation of the interviews will enable the identification of suitable organizations (potential buyers) and engage them to participate in the application of the methodology.

On the other hand, once organizations for interviews are identified, it is key for a successful interview to develop a preliminary analysis of the several topics that will be addressed.

For this purpose, general guidelines are included in Annex I. Preparing the interview and preliminary analysis.

### **Stage 2. Semi-structured interviews.**

In this stage, interviews will be conducted with members of each of the organizations identified in stage 1.

This stage is the core of the methodology and is designed to explore, by means of different questions, about potential needs from the public water sector.

As a semi-structured interview, the interviewer can change the sequence of the questions, adapt questions, etc.

Two tools have been developed to implement this stage:

- Interview questionnaire (Annex II).
- Interview questionnaire guidelines (Annex III).

### **Stage 3. Needs definition and prioritisation.**

After interviews, this stage aims to define and contextualise the needs identified and to prioritise them with the interviewed on the basis of information and results from Stage 2.

For this purpose, a template and brief guidelines have been developed in Annex IV - Needs definition and prioritisation.

The needs should be defined by describing the main functions and performance specifications sought instead of describing a product or service. A comparative



example between simple description and a description of functional performance specifications is shown below:

The simple description of services	The functional performance specifications
"Delivery and installation of X street lights with X bulbs with an output of X watts."	"X streets must be lit over a period of X hours a day at an illuminative strength of X. The minimum life of the lighting elements must be X days."

Source: KOINNO 2017<sup>13</sup>

<sup>13</sup> KOINNO Public Procurement of Innovation Guide





## 2.5.1 Annex I. Preparing the interview and preliminary analysis

### Identifying potential buyers

The first step is to identify public bodies in the field of water management to be interviewed (potential buyers). They should be public bodies with direct competences in water management, specifically in wastewater management, water reuse and/or related areas.

At least, 3 interviews (3 potential buyers) should be done in order to ensure an adequate and representative data collection in each region.

Recommendations:

- Identify at least 5 public bodies that could be potentially interviewed.
- Identify public bodies with different profiles in order to cover the main areas of the water cycle related to wastewater and water reuse.
  - Regional government, municipalities, public companies.
  - Large/medium/ small size.
  - Organizations with different roles in the water cycle; wastewater treatment, sewage sludge management, water reuse, regulators in the field of water reuse, etc.

Findings from Task 1.1. could be useful for identifying potential buyers in each region.

List of potential buyers identified					
Organization	Type of organization	Role in the water cycle	Contact person	Email	Phone number





## Contacting

When contacting, it is important to inform about the main objectives of the TWIST project and the purpose of the interview focused on innovation procurement in areas related to wastewater management and water reuse.

It will be also important to inform about the suitable profile of interviewees, the duration of the interview and about the kind of information and questions that will be addressed (see Annex II).

**Profile of interviewees** (1 - 3 interviewees). It is recommended interviewees have duties/knowledge on the following areas:

- Innovation.
- Planning and strategy in the organization.
- Regulations and policies.
- Processes and technologies implemented and their performance.

**Profile of interviewers** (1 - 2 interviewer). It is recommended interviewers with knowledge in the following areas:

- Integrated water cycle and specifically in wastewater processes and technologies (trends, opportunities, barriers, etc.).
- Regulations in the field of wastewater management and water reuse.
- Organization of the water sector in the region (main actors, competent authorities, etc.).
- Research and innovation process.
- Main concepts regarding innovation procurement.



**Means to conduct the interview**

The interview may be conducted by any means (on-site, telephone, mail, etc.) although it is highly recommended to hold face to face interviews in order to facilitate the interaction between interviewer and interviewee.

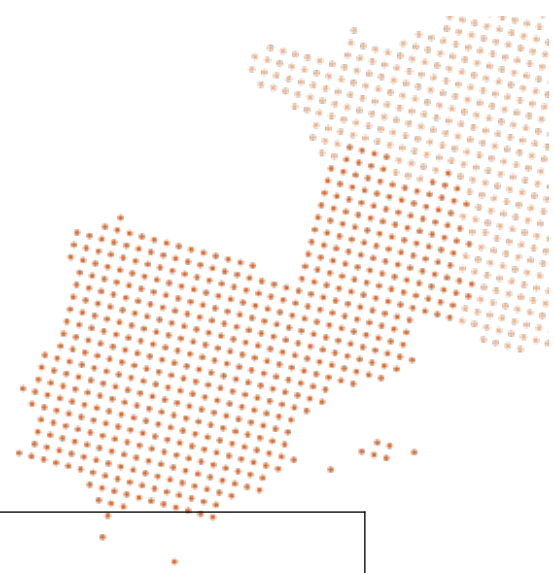
The duration of the interview will vary depending on the means selected. It is estimated about 1,5 – 2 h for face to face meetings.

**Information gathering and analysing**

It is highly recommended to prepare the interview gathering and analysing information and data about the topics that will be addressed during the interview (see Annex II and Annex III).

<b>Funding programmes for innovation procurement in your region and country</b>
Prior to the interview, the interviewer should try to identify if exists funding programmes for innovation procurement available.
<i>Text...</i>

<b>Role of the organisation in the management of the water cycle</b>
Prior to the interview, the interviewer should try to identify the main areas of intervention of each organization in the water cycle and specifically in wastewater and water reuse related areas.
<b>Organization 1</b>
<i>Text...</i>
<b>Organization 2</b>
<i>Text...</i>
<b>Organization 3</b>



*Text...*

<b>Goals and ambitions</b>
Prior to the interview, the interviewer should try to identify and analyses strategies and plans influencing the activities and objectives of each organization regarding wastewater treatment and water reuse.
<b>Organization 1</b>
<i>European/national/regional/internal plans and strategies.</i> <i>Objectives/goals associated.</i>
<b>Organization 2</b>
<i>European/national/regional/internal plans and strategies.</i> <i>Objectives/goals associated.</i>
<b>Organization 3</b>
<i>European/national/regional/internal plans and strategies.</i> <i>Objectives/goals associated.</i>

<b>Regulations</b>
Prior to the interview, the interviewer should try to identify and analyses the main regulations in the field of wastewater, water reuse and related areas.
<b>Organization 1</b>
<i>European Directives/national, regional laws and other regulations in the field of wastewater, water reuse, sewage sludge treatment and valorisation, use of reclaimed water for agriculture, industry, etc.</i> <i>Main requirements associated.</i>
<b>Organization 2</b>



*European Directives/national, regional laws and other regulations in the field of wastewater, water reuse, sewage sludge treatment and valorisation, use of reclaimed water for agriculture, industry, etc.*

*Main requirements associated.*

**Organization 3**

*European Directives/national, regional laws and other regulations in the field of wastewater, water reuse, sewage sludge treatment and valorisation, use of reclaimed water for agriculture, industry, etc.*

*Main requirements associated.*

**Processes and technologies in wastewater management and water reuse**

Prior to the interview, the interviewer should try to investigate about the processes and technologies for wastewater, water reuse and related areas implemented by the organization.

**Organization 1**

*Brief description and scheme of processes and technologies implemented.*

**Organization 2**

*Brief description and scheme of processes and technologies implemented.*

**Organization 3**

*Brief description and scheme of processes and technologies implemented.*



## 2.5.2 Annex II. Interview questionnaire

### Introduction

Dear interviewee,

This interview is carried out as part of TWIST project activities.

#### **TWIST PROJECT**

TWIST - Transnational Water Innovation Strategy is an Interreg Sudoe Project that aims to develop an open model of innovation in wastewater management by giving compliance with the Water Framework Directive and promoting a circular economy model.

One of the objectives of the project is to promote innovation procurement in the field of water as a tool to boost innovation from the demand side while address challenges of the public sector and improves the delivering of public services.

#### **OBJECTIVE**

The purpose of this interview is to discuss about potential challenges/needs of public water sector that could be potentially solved by means innovation procurement in the field of wastewater management and water reuse.

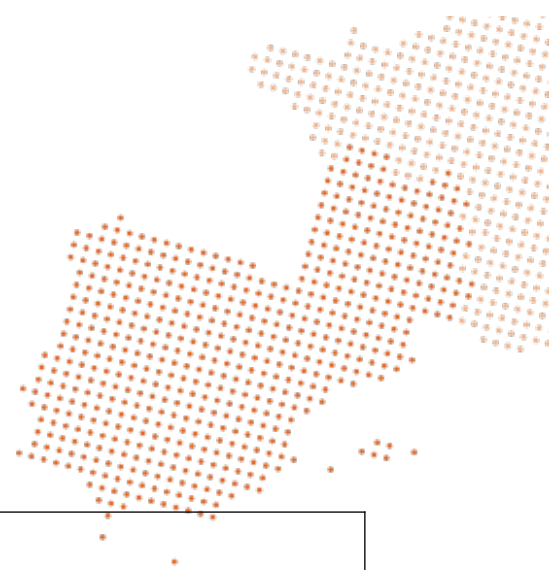
#### **INNOVATION PROCUREMENT**

According to the European Commission<sup>14</sup>, innovation procurement is any procurement that has one or both of the following aspects:

- buying the process of innovation (research and development services) with (partial) outcomes,
- buying the outcomes of innovation created by others.

Two approaches are usually defined to address public procurement of

<sup>14</sup> Commission notice. Guidance on Innovation Procurement (C(2018) 3051 final, 15 may 2018).



innovation:

PUBLIC PROCUREMENT OF INNOVATIVE SOLUTIONS (PPI<sup>15</sup>) can be used by procurers when challenges of public interest can be addressed by innovative solutions that are nearly or already in small quantity on the market. PPI can thus be used when there is no need for procurement of new R&D to bring solutions to the market, but a clear signal from a sizeable amount of early adopters/launch customers that they are willing to purchase/deploy the innovative solutions if those can be delivered with the desired quality and price by a specific moment in time.

PRE-COMMERCIAL PROCUREMENT (PCP<sup>16</sup>) can be used by procurers when there are no near-to-the-market solutions yet that meet all the procurers' requirements and new R&D is needed to get new solutions developed and tested to address the procurement need. PCP can then compare the pros and cons of alternative solutions approaches and de-risk the promising innovations step-by-step via solution design, prototyping, development and first product testing.

One of the main characteristics of innovation procurement is its potential to address challenges of the public sector that cannot be solved by means products or service Available from the market (at least at large scale). Therefore, innovation procurement is not about replacing equipment with the same or renewing expired service contracts but about address unmet needs.

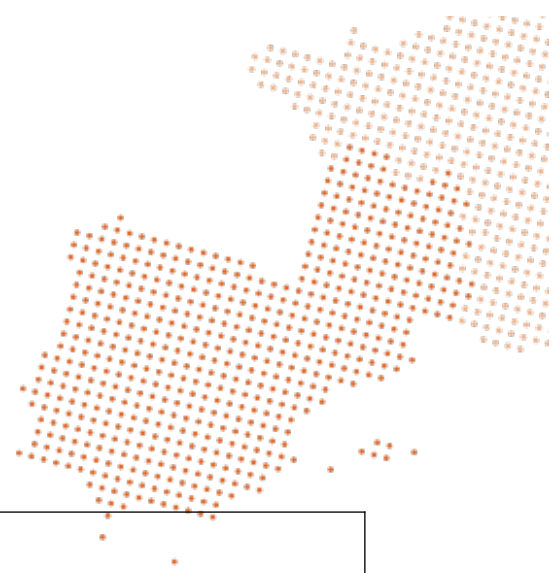
In this context, an unmet need can be defined as a requirement that a public buyer has at the present time, or (preferably) one that he will have in the future, that current products, services or arrangements cannot meet, or can only do so at excessive cost or with unacceptable<sup>17</sup>.

An unmet need may be originated from several causes, some of them are the

<sup>15</sup> Innovation procurement - H2020 Online Manual.

<sup>16</sup> Innovation procurement - H2020 Online Manual.

<sup>17</sup> Delivering best value through innovation. Forward Commitment Procurement. Practical Pathways to Buying Innovative Solutions.



following:

- A problem that negatively impacts the delivery of the service of public interest.
- A need/desire of a public procurer to improve the quality and/or efficiency of the service of public interest in the future or a new emerging operational requirement to provide new features in the future.
- Policy objectives to address mid-to-long term societal challenges.
- Legislative/regulatory requirements to deliver higher quality/efficiency services of public interest in the future.

The identification of needs is a key previous step to conduct an innovation procurement and allows procurers to guide their procurement strategy at mid and long term.

Once the needs have been identified, it is usual to conduct a prior art analysis (and IPR search), and a market consultation in order to confirm there are not available solutions on the market that meets the needs identified and whether there are IPR related to the needs that could influence the procurement process.

#### **FUNDING PROGRAMMES FOR PUBLIC PROCUREMENT OF INNOVATION**

Based on the information collected in stage 1 (Annex I of the methodology), the user of the methodology should complete this table with a brief description of the European, national, regional and local financing programs to which the interviewed organization could apply.





## Interview questions

### 1. Contact

Organization	
Name of the contact person	
E-mail	
Phone number	

### 2. Interviewees

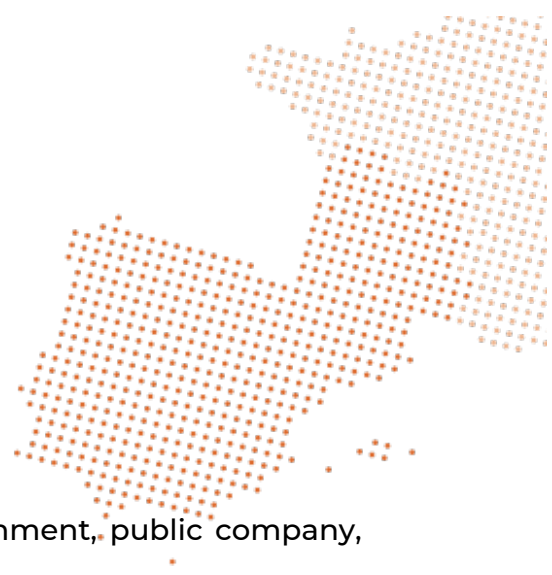
Position	
Brief description of duties	
Full name	
E-mail	

Position	
Brief description of duties	
Full name	
E-mail	

Position	
Brief description of duties	
Full name	
E-mail	

### 3. Role of your organization in the management of the water cycle

Please describe the role of your organization in the field of water management addressing the following questions:



- Type of organisation (municipality, regional government, public company, etc.).
- Responsibilities in water management.
- Links with other organizations in the field of water management in your region (please describe and draw a scheme about the water management bodies and competent authorities in your region/municipality).

#### 4. Goals and ambitions

Please describe the main mid and long-term goals in your region (strategies and plans in the field of water management).

#### 5. Regulations

Please identify and describe the main policies and regulations influencing water management in your region. Please consider:

- European directives and national and regional laws related to Water Framework Directive.
- Policies and regulations in the field of sanitation, agriculture, environment, etc. influencing water uses.



## 6. Existing and/or potential gaps

Please (if applicable) identify:

- Gaps between the current status of water management in your region/municipality and current goals, objectives, etc. in regulations, plans and strategies.
- Potential gaps between the current status of water management in your region/municipality and future goals, objectives, etc. in regulations, plans and strategies.

## 7. Processes and technologies in wastewater management and water reuse

Please describe briefly and draw a scheme of the main processes managed by your organization and the main technologies implemented related to wastewater management and water reuse (if applicable).

Please, considering the processes and technologies implemented, identify and describe problems and areas for improvement, for instance:

- Energy consumption.
- Pollutant removal efficiency.
- Waste produced.
- Cost effectiveness issues.
- Control and monitoring issues.



**8. Investment**

Does your organization have plans for investment in water management? Please describe briefly the planned investments.

**9. Preliminary definition of needs**

On the basis of previous questions, please could you list 5 needs from your organization and indicate briefly the main reason why you have these needs

	Needs	Reasons (regulations, plans, operational, customer requirements, etc.)
1		
2		
3		
4		
5		



### **2.5.3 Annex III. Interview questionnaire guidelines**

This document aims to provide general guidelines for conducting the interviews following the questionnaire in Annex II.

The questionnaire template is designed to conduct a semi-structured interview. This means the interviewer can change the sequence of questions, prioritize questions or indeed adapt questions if necessary.

#### **Introduction**

This section aims to contextualize the objective of the interview introducing the following information:

- overall objective of the project,
- main concepts about innovation procurement,
- opportunities in the field of innovation procurement (regional, national, European funds, enabler for innovation, etc.).

#### **Interview questions**

##### **1. Contact**

At least one person should be identified as a contact person, preferably one the interviewees.

##### **2. Interviewees.**

Through this question, the interviewer will know the profile of interviewees; duties, expertise, etc. This information would be important to pilot the interviewee and to analyse the results obtained.

##### **3. Role of your organization in the management of the water cycle.**

This question aims to know the competences and activities of the organisation regarding the water cycle. This information will help the interviewer to identify potential areas of procurement in the field of wastewater and water reuse. It is recommended to explore the role of the organization previous to the interview.



#### **4. Goals and ambitions.**

This question aims to gather information about objectives and goals for the organisation arise from internal and/or external strategies and plans influencing the present and/or future activities, processes, etc.

Through this question, it begins a reflection process to identify potential needs. It is recommended to try to identify and analyse, previous to the interview, strategies and plans in the field of water management (specially in wastewater and water reuse) that could affect the organisation.

#### **5. Regulations.**

This question aims to identify regulations and policies directly related to the water cycle (and specifically wastewater and water reuse related areas) that the organization should meet.

It is also recommended to tray identify and analyses regulations and policies previous to the interview.

#### **6. Existing or potential gaps.**

Based on findings from above sections (Goals and ambitions, Regulations), this section aims to explore gaps between current status of water management (and more specifically in wastewater and water reuse related areas) and current and upcoming goals, objectives, etc. according to strategies, plans, policies and regulations influencing the performance of the organization.

In this section, it is expected a preliminary identification of potential needs.

#### **7. Processes and technologies in wastewater management and water reuse.**

The aim of this sub-section is to gather information about the processes and technologies in the field of wastewater and water reuse implemented by the organization. For this purpose, it is recommended to draw a scheme about process and technologies implemented.

On the basis of the above information, the aim of this sub-section is to explore potential needs by identifying problems and/or areas for improvement. For that, it would be important to encourage reflection about key issues such as:



- Pollutants removal.
- Cost effectiveness issues.
- Waste production and management.
- Energy consumption.
- Control and monitoring systems.

If applicable, you can try to link goals and objectives in section 4 and 5, and gaps from section 6 with areas for improvement in this section, in order to identify potential needs.

#### **8. Investment.**

The aim of this section is to identify investments planned by the organization in wastewater and water reuse areas and to analyse if innovation procurement could be applied. For that, you would discuss with interviewees about:

- Main functions of the planned investment.
- Performance requirements.
- Availability of different solutions in the market (including innovative solutions).

#### **9. Preliminary definition of needs.**

This is the sections for conclusions in which at least 5 needs should be identified on the basis of the questions addressed previously.

It is recommendable to note potential needs throughout the interview, rather than wait until the end to fill this section.





## 2.5.4 Annex IV. Needs definition and prioritisation

### Needs definition

After the interview, the interviewer analyses the information and data gathered and define and contextualise the needs (at least 5) in a brief report.

The needs description should be concise focusing on the challenge and defining the required main functions and performance characteristics.

The brief report for each organization should have the following sections:

Type of organisation (role in wastewater and water reuse related areas):

Need 1	<i>Title</i>
Brief description	<i>Functions, performance characteristics (see section 5, stage 3, of the Methodology main document)</i>
Contextualization	<i>Reason</i>

Need 2	<i>Title</i>
Brief description	<i>Functions, performance characteristics (see section 5, stage 3, of the Methodology main document)</i>
Contextualization	<i>Reason</i>

Need 3	<i>Title</i>
Brief description	<i>Functions, performance characteristics (see section 5, stage 3, of the Methodology main document)</i>
Contextualization	<i>Reason</i>



### Needs prioritisation

Once needs are defined, the interviewer should send the report to each organisation and ask them to confirm and prioritise needs by means of the following question and matrix:

Need	1	2	3	4	5
(Yes/No)					
Does your organisation have plans to invest in this need?					
As far as you know, are there in the market solutions to address this need?					
Do you think innovation procurement could be a way to address this need?					
Need	1	2	3	4	5
(1: low, 5: high)					
How likely do you think it is that your organisation will invest in this need within two years' time?					
How likely do you think it is that your organisation will invest in this need after two years' time?					
To what extent is this need addressed by the current plans/strategies of your organisation?					
According to you, how important is it to solve this need?					



### 3 IDENTIFIED NEEDS

The application of the methodology of identification of public sector needs in the field of water has allowed to know, from the eight organizations interviewed:

1. A preliminary list of the needs of these organizations in the field of wastewater and water reuse as well as the main reasons that have generated these needs (see Annex 1. Interview questionnaires completed, in Chapter 5).
2. A final list of the needs of these organizations in the field of wastewater and water reuse based on a concise description and, focused on the challenge and defining the main functions and performance characteristics required (see Annex 2. Questionnaires on the identified needs completed, in Chapter 6).
3. A brief of similar needs in the field of wastewater and water reuse.

The methodology has allowed identify a total of 33 needs that potentially can be cover by Innovation Procurements. Among these needs, several needs were identified in common areas of interest, such as:

- Management of sludge produced in wastewater treatment plants. The needs in this area are mainly motivated by the emergence of new regulations, both European and regional.
- New solutions for water reuse. The needs in this area are motivated by various reasons:
  - 1 Water deficit at the regional level for agriculture.
  - 2 Search for efficient use of water resources.
  - 3 New regulations in the field of water reuse in the near future.
- Improve the management of sanitation networks through monitoring and control systems. The needs in this area are motivated, among other reasons, by water leaks, operational cost and prevention of overflow.



- New solutions in the field of emerging pollutants (detection, monitoring, and treatment). The needs in this area are mainly motivated by future regulations currently under development.

The 33 needs identified that could potentially be cover by innovation are:



## 3.1 Limoges Metropole

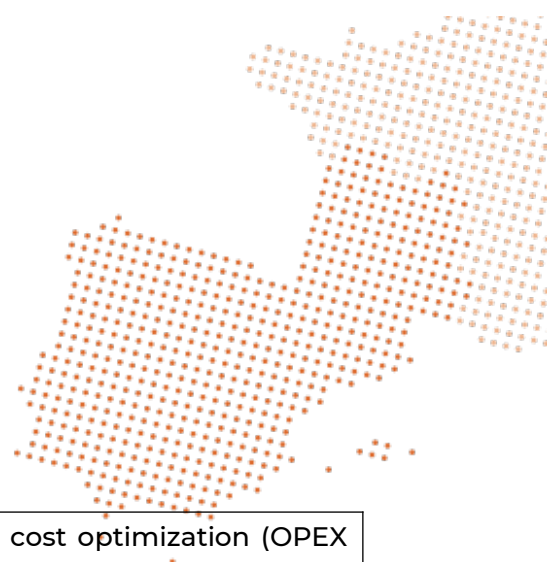
Interviewer: OIEAU

Need 1	Break prediction models
Brief description	To improve network asset management, it will be necessary to set up a modelling tool that integrate an artificial intelligence module to predict the areas that have the greatest risk of breakage.
Contextualization	Legislation, environmental protection, cost optimization (OPEX and CAPEX)

Need 2	Reliable pipe inspection
Brief description	To improve network asset management, there is a need for faster and more reliable pipe inspection techniques with better shape/breakage recognition
Contextualization	Legislation, environmental protection, cost optimization (OPEX and CAPEX)

Need 3	Improve and speed up the acceptance phases of work and interventions
Brief description	To improve network asset management, it will be necessary to improve and speed up the acceptance phases of work and interventions carried out on the network.
Contextualization	Legislation, environmental protection, cost optimization (OPEX and CAPEX)

Need 4	Prevent combined sewer overflows of incoming pollutants
Brief description	Improve network monitoring to limit combined sewer overflows to 5% of incoming pollutant flows. For this, it will be necessary new solutions such as measurement and data acquisition system as well as IT infrastructure for data storage and processing that is affordable for Limoges Metropole.



Contextualization	Legislation, environmental protection, cost optimization (OPEX and CAPEX)
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Need 5	Improve resiliency of sewage system against combined sewer overflows
Brief description	If the pollutant releases by CSO (combined sewer overflow) exceed 5% of the incoming pollutant load, it will be necessary to determine the work to be carried out. Need for affordable infrastructure for Limoges Metropole
Contextualization	Legislation, environmental protection, cost optimization (OPEX and CAPEX)





## 3.2 Adour-Garonne Water Agency

Interviewer: OIEAU

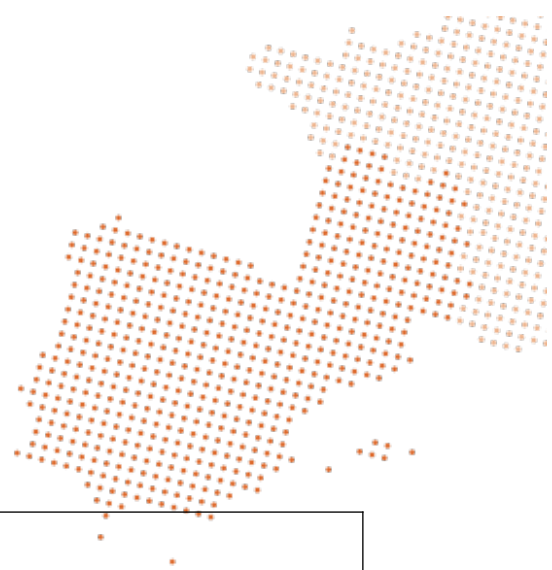
Need 1	Phosphorus valorisation
Brief description	New solutions to treat and valorise phosphorus from wastewater, including in small wastewater treatment plants
Contextualización	Compliance with legislation, protection of the environment and water resources, recovery of a limited resource (phosphorus)

Need 2	Circular economics of wastewater nutrients
Brief description	Recycling and valorisation of nutrients during the wastewater treatment and sludge management phases
Contextualization	Protection of the environment and water resources, recovery of a limited resources

Need 3	Diagnosis of the sewerage network
Brief description	New solutions for a permanent diagnosis of the sewerage network => need of solution for real time monitoring, data collection and data treatment
Contextualization	Compliance with legislation, protection of the environment and resources, cost optimization (OPEX and CAPEX)

Need 4	Water reuse
Brief description	New and adapted solutions to reuse of treated wastewater in rural areas
Contextualization	Protection of the environment and water resources

Need 5	Decentralized systems
Brief description	New models to change the system from a centralized to a decentralized system. The idea is to no longer seek to convey all wastewater from a territory to a single treatment point. The



	following can be used: <ul style="list-style-type: none"><li>• Separate toilets,</li><li>• Local treatment of combined sewers overflows,</li><li>• Local re-infiltration of rainwater,</li></ul>
Contextualization	Protection of the environment and water resources



### 3.3 Consejería de Agricultura, Ganadería, Pesca y Desarrollo Sostenible

Interviewers: AAC and CENTA

Need 1	Reduce water leaks
Brief description	There is a need for new solutions to monitor urban and irrigation water networks for efficient detection of water leaks
Contextualization	Water losses in distribution networks are a great challenge for efficient water use. In 2016, real water losses in Andalusia accounted for 20% of the water supplied to the public supply network, according to data from the National Statistics Institute.

Need 2	Optimization of water management
Brief description	There is a need for new decision-making support tools in water management that enable sustainable use within the water cycle, for example, joint use of conventional and unconventional resources (reuse, desalination, satellite observation techniques, etc.).
Contextualization	The fact that Andalusia is one of the regions with the greatest water- stress in Europe, together with the relevance of the agricultural activity, makes it necessary to optimize the use of water in the territory.

Need 3	New solutions for wastewater treatment in small communities
Brief description	There is a need for new solutions to reduce cost of wastewater treatment in small communities.
Contextualization	There are small communities where the treatment of wastewater is carried out inefficiently what is risky for keeping the state of the water bodies and the soil quality.



Need 4	New solutions to facilitate the use of reclaimed water in agriculture
Brief description	New solutions are needed to reduce the cost of reclaimed water and to increase the guarantee of its use (level of user confidence regarding the quality of this resource) for agricultural and recreational uses (gardens, golf courses).
Contextualization	Regenerated water appears as a solution of great interest to address the hydrographic deficit in Andalusia, however, its cost, as well as issues related to the perception about its quality, hinder its implementation in the agricultural sector.

Need 5	Water quality control
Brief description	There is a need of new techniques to detect and monitor the presence or new pollutants in water bodies.
Contextualization	Improve the control of water bodies and to comply with the Water Framework Directive.



### 3.4 Empresa Metropolitana de Abastecimiento y Saneamiento de Aguas de Sevilla, S.A.

Interviewer: AAC

Need 1	New integrated model for sewage sludge and other waste
Brief description	There is a need for a new sewage sludge management model that enables the proper sanitation of sludge
Contextualization	<p>It is envisaged to have a model based on the agricultural valorisation of sludge (direct application, composting and co-composting with plant biomass). The current system presents operational limitations and produces some minor environmental effects on the surrounding population.</p> <p>Besides, the new legal regulation from the regional government establishes new restrictions on the agricultural valorisation of sewage sludge to which EMASESA must meet.</p>
Need 2	New solutions to remove emerging pollutants in water purification processes
Brief description	It will be necessary new solutions for the removal of emerging pollutants in the purification processes in a near future.
Contextualization	<p>The concern of public administrations about the presence of emerging pollutants (or micro-pollutants in water) in water, has led them to develop NCA - Environmental Quality Standards more restrictive in this area and to expand the lists of substances (latest extension: Commission Execution Decision (EU) 2018/840 of June 5, 2018).</p> <p>There are drafts of European Directives that will further tighten the current regulations for emerging pollutants, in view to change the wastewater model in the next 20-30 years.</p>
Need 3	New solutions to remove emerging pollutants in wastewater treatment processes



Brief description	It will be necessary new solutions for the removal of emerging pollutants in the wastewater treatment processes in a near future.
Contextualization	<p>The concern of public administrations about the presence of emerging pollutants (or micro-pollutants in water) in water, has led them to develop NCA - Environmental Quality Standards more restrictive in this area and to expand the lists of substances (latest extension: Commission Execution Decision (EU) 2018/840 of June 5, 2018).</p> <p>There are drafts of European Directives that will further tighten the current regulations for emerging pollutants, in view to change the wastewater model in the next 20-30 years.</p>

Need 4	New solutions to detect and measure emerging pollutants
Brief description	It will be necessary new solutions to detect and measure emerging pollutants for the quality control of water.
Contextualization	<p>The concern of public administrations about the presence of emerging pollutants (or micro-pollutants in water) in water, has led them to develop NCA - Environmental Quality Standards more restrictive in this area and to expand the lists of substances (latest extension: Commission Execution Decision (EU) 2018/840 of June 5, 2018).</p> <p>There are drafts of European Directives that will further tighten the current regulations for emerging pollutants, in view to change the wastewater model in the next 20-30 years.</p>

Need 5	New solutions for floating waste
Brief description	New alternative solutions to valorise floating waste of wastewater treatment plants.
Contextualization	Compliance with the principles of the Circular Economy and the legal requirements established in Decree 73/2012 of waste from Andalusia. The valorisation of floating waste together with other waste produced in the wastewater treatment plant will enable to turn this facility into urban biorefineries.





## 3.5 Empresa Municipal de Agua y Saneamiento de Murcia, S.A.

Interviewer: FUERM

Need 1	New solutions for reclaimed water
Brief description	It will be necessary new advanced treatments aimed to ensure the removal of emerging pollutants from the reclaimed water.
Contextualization	<p>It is expected that future European regulations on water reuse will establish quality levels that could not be reached by the systems currently implemented.</p> <p>The treatment plants currently in service are not designed to remove emerging pollutants.</p>

Need 2	New solutions to manage sewer sludge
Brief description	It will be necessary to develop new sanitation treatments to meet the future requirements for the use of sewer sludge in agriculture.
Contextualization	Nowadays, the destination of sewer sludge is for agricultural purposes, however, it is expected that future European regulations will set up high-quality levels for the use of sludge that the current systems cannot reach.



## 3.6 Service D'Assainissement, Bordeaux Metropole

Interviewer: UNILIM

Need 1	Control of rainwater and fight against flooding
Brief description	<p>Loading of sewerage systems is important to deal with the capacity for additional flows and loads during rainy weather.</p> <p>Parasitic waters have the drawback of diluting the effluents of wastewater and of reducing the transport capacity available in sewerage networks and treatment plants.</p>
Contextualization	<p>-The average rate of permanent parasitic clear water * (ECP) in metropolitan France is 44% of wastewater and the rate of meteoric parasitic clear water * (ECPM) is 20 %.</p> <p>-Risks associated an uncontrolled overflow of the network during rainy events due to the intrusion of clear, parasitic meteoric waters.</p> <p>-Degradation of the natural environment by soliciting network overflows, and consequently non-compliance with regulations.</p>

Need 2	Collecting, transporting and treating wastewater
Brief description	<p>Immediate needs are based on the current systems, their operational maintenance and improvement. The biological treatment of wastewater is carried out by fixed culture processes for the most important stations, (activated sludge for the Cailhocs and Lille stations). Current investments include:</p> <ul style="list-style-type: none"> <li>-the implementation of optimization equipment and dealing with issues such as the reuse of water and treatment of micropollutants,</li> <li>-creation of an activated sludge treatment system for certain stations and a sludge dewatering system,</li> <li>-reinforcement of the capacity.</li> </ul>
Contextualization	<p>For the treatment of its wastewater, the Bordeaux Métropole territory is organized into six major networks that collect and transport effluents to six metropolitan treatment plants. These networks equip 124 sub-catchment basins of which 37 are</p>



	connected by gravity and 87 by pumping. The sections with a transport function accumulate a length of 233 km, or 9% of the collectors (wastewater and unit).
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Need 3	Operational and strategic asset management
Brief description	<p>One of the objectives of the wastewater master plan is to determine the risks of malfunctioning on the wastewater networks in order to anticipate and prioritize preventive and corrective actions at the scale of the collection basins. Risks can be associated with the difficulty of evacuating the wastewater connected to the network, due to its too high loading (accentuated for example by the presence of clear parasitic permanent water or induced by an increase in population). Uncontrolled overflow of the network, outside of rainy periods. The saturation rate of pumping stations expressed as a percentage of saturation (for stations with a rate higher than 80%).</p>
Contextualization	<p>In the last 5 years, Bordeaux Métropole has spent a budget of around € 40m a year on sanitation works, about two-thirds of which (€ 26m) is spent on wastewater. For this type of effluent, the works are divided between the extensions of networks for new housing services (€ 3.5M/year) and network renewal (€ 7.5M/year), the remainder being devoted to structuring networks (including deviations for tramway works) or treatment plants. Directly linked to the increase in population in Bordeaux. (at this time the capacities of the stations increased by 60,000 pe) For the year 2010 (date of availability of census data), the total equivalent population of the agglomeration stood at 930,000 pee, including a domestic population of 720 000 EqH and a non-domestic population of 210,000 EqH2.</p>



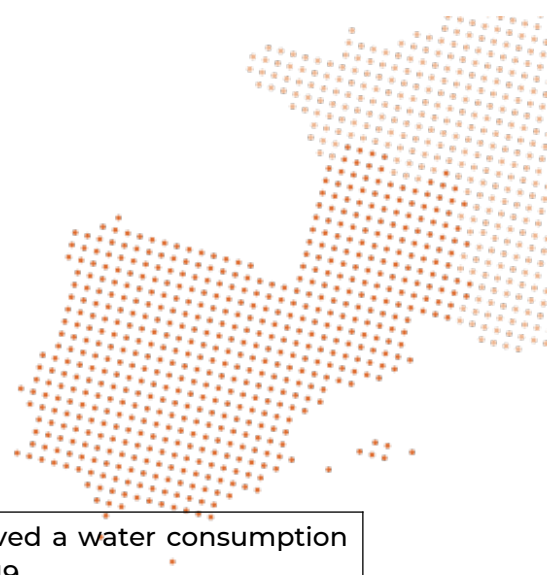
## 3.7 Instituto Superior Técnico

Interviewer: Instituto Superior Técnico

Need 1	Water leaks detection
Brief description	There is a need for new solutions to model and track the water balance in Campus, as well as in the field of monitoring, to detect the location of leaks and optimise water consumption.
Contextualization	IST is strongly committed to reduce its water consumptions and wastewater generation and has achieved a water consumption reduction of 59% between 2010 and 2019.

Need 2	Water reuse
Brief description	There is a need for new solutions to regenerate water to use in activities that do not require potable water (drip irrigation, floor washes, etc).
Contextualization	<p>IST is strongly committed to reduce its water consumptions and wastewater generation and has achieved a water consumption reduction of 59% between 2010 and 2019.</p> <p>New legislation in the field of water of water reuse (Law Decree 119/2019 of August 21st) establishes the legal regime for the production of water for reuse, obtained from wastewater treatment, as well as from its use.</p> <p>The National Program for Efficient Water Use – implementation 2012-2020 has as one of its objectives to minimize the use of drinking water in activities that may perform as well with waters of alternative quality and from sources other than the public drinking water network by promoting the use of rainwater and the eventual reuse of treated wastewater.</p>

Need 3	Rainwater use
Brief description	There is a need of innovative solutions to enable the use of rainwater for irrigation
Contextualization	IST is strongly committed to reduce its water consumptions and



wastewater generation and has achieved a water consumption reduction of 59% between 2010 and 2019.

The National Program for Efficient Water Use – implementation 2012-2020 has as one of its objectives to minimize the use of drinking water in activities that may perform as well with waters of alternative quality and from sources other than the public drinking water network by promoting the use of rainwater and the eventual reuse of treated wastewater.



## 3.8 Águas do Tejo Atlântico

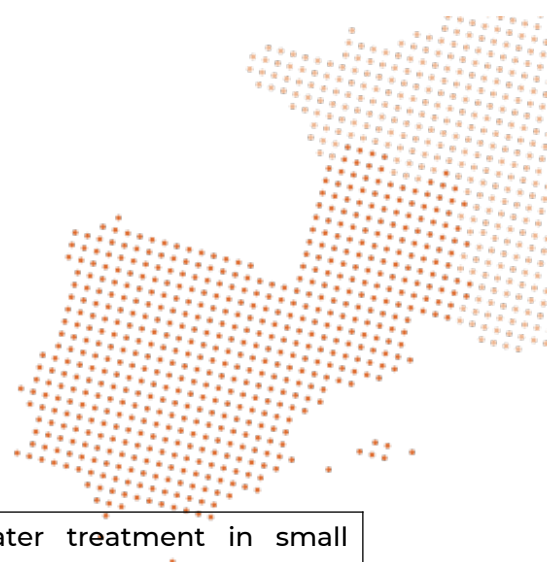
Interviewer: Instituto Superior Técnico

Need 1	Water reuse
Brief description	There is a need for new solutions to regenerate water from wastewater plants for different uses in a cost-effective way
Contextualization	<p>New legislation in the field of water of water reuse (Law Decree 119/2019 of August 21st) establishes the legal regime for the production of water for reuse, obtained from wastewater treatment, as well as from its use.</p> <p>The National Program for Efficient Water Use – implementation 2012-2020 has as one of its objectives to minimize the use of drinking water in activities that may perform as well with waters of alternative quality and from sources other than the public drinking water network by promoting the use of rainwater and the eventual reuse of treated wastewater.</p>

Need 2	Stormwater management
Brief description	There is a need for new solutions for stormwater management in a cost-effective way.
Contextualization	Stormwater systems are under the responsibility of municipalities, but few are managed properly since they do not generate income.

Need 3	Energy efficiency in wastewater
Brief description	There is a need for innovative solutions to improve the energy efficiency in wastewater treatment plants in order to reach energy neutrality.
Contextualization	Energy efficiency will contribute to reach objectives of the Strategic Plan for Water Supply and Wastewater Sanitation 2020 in the field of efficient resource management and optimization and economic, financial and social sustainability.





Need 4	Cost-effective solutions for wastewater treatment in small communities
Brief description	There is a need for new solutions for wastewater treatment in small communities in a cost-effective way.
Contextualization	For conventional treatment the costs are recovered for medium-large systems, but it is difficult to recover costs for small system. The implementation of advanced treatment makes more difficult the cost recovery and urges the need for new business models and regulation.



## 4 DIFFICULTIES AND LESSONS LEARNED

The main difficulties found and lessons learned in the implementation of the methodology have been identified based on the observed during the application of the methodology by TWIST project partners involved in its activity 3.3., as well as through a specific questionnaire designed for this purpose (Annex 3. Questionnaire of difficulties and lessons learned). This questionnaire was answered by partners in charge of interviews once they had completed the identification of needs.

### Difficulties:

- For all partners were difficult to arrange dates for meetings with the organizations to be interviewed. To solve this matter, partners combined several means to interview each organization (email, telephone and face to face meetings).
- It was not possible to involve staff members with different profiles and responsibilities within the organization for the majority of interviews (as recommend the Annex I of the methodology).
- It took an additional effort to interview those organizations with low knowledge about public procurement of innovation (this was especially in Portugal where the public procurement of innovation is at an early stage of development).
- In the cases where the interview was previously prepared (following the Annex I of the methodology; identifying and analysing the role of the organization, the applicable regulations, etc.) the process to identify needs was more fluent in contrast with cases in which the interview was not prepared.
- It was difficult for partners and organizations interviewed to describe needs in terms of functional characteristics.



### Lessons learned:

- The interview preparation (identifying and analysing information on the role of the organization, etc.) is a key step that enables the right development thereof, facilitating the reflection process to identify needs in the medium-long term.
- Although some of the organizations interviewed know public procurement of innovation, and in some cases are implementing projects, it was not easy to identify needs that could be addressed by this type of procurement.
- In most cases, the main reason found for needs that could be addressed by public procurement of innovation is meeting the requirements of future regulations. Additionally, the operational improvement is also an important area for innovation procurement to reduce costs, improve asset management and avoid risks.
- To describe needs according to its functions is a new concept that should be adequately explained for the right comprehension of innovation procurement.
- In most cases, innovation procurement is seen as a complex process.
- Although in many cases the entities interviewed are aware of the challenges they have in the long term, it is not evident that they consider the public purchase of innovation as an instrument to face these challenges.
- All the organizations interviewed showed interest in public procurement of innovation. Some of them showed a high interest, specifically:
  - 1 Águas do Tejo Atlântico (have a high interest in innovation procurement and they desire to carried projects in this field) although in Portugal this kind of procurement is in an early stage).



- 2 Empresa Metropolitana de Abastecimiento y Saneamiento de Aguas de Sevilla, S.A. (is currently involved in an innovation procurement process).
- 3 Empresa Municipal de Agua y Saneamiento de Murcia, S.A. (is currently involved in an innovation procurement process).
- 4 Consejería de Agricultura, Ganadería, Pesca y Desarrollo Sostenible (is currently involved in an innovation procurement process).
- 5 Adour-Garonne Water Agency.



**5 ANNEX 1. INTERVIEW QUESTIONNAIRES COMPLETED**

**5.1 Annex 1.1. Limoges Metropole**

**Interview questions**

**1. Contact details**

Organisation	OIEau
Name of the contact person	BERLAND Jean-Marc
E-mail	Jm.berland@oieau.fr
Phone number	+33.5.55.11.47.87

**2. Interviewees**

Position	Director of the Water Cycle and Natural Spaces Quality of Life Division Limoges Métropole – «Urban community»
Brief description of duties	Propose and implement public policies relating to drinking water and sanitation, aquatic environment management and flood prevention, natural areas and biodiversity conservation
Name	Marie Crouzoulon
E-mail	-

**3. Role of your organization in the management of the water cycle**

Please describe the role of your organization in the field of water management addressing the following questions:

- Type of organisation (municipality, regional government, public company, etc.).



- Responsibilities in water management.
- Links with other organizations in the field of water management in your region (please describe and draw a scheme about the water management bodies and competent authorities in your region/municipality).

The collective sanitation competence, exercised by Limoges Métropole, is a public service of an industrial and commercial nature. It is divided into two business segments:

Wastewater management, which aims to preserve water resources and protect the environment in order to control the impact of human activity, but also to address public health and safety issues through the implementation of environmentally friendly technologies.

Stormwater management to prevent the impact of the increase in impermeable surfaces (floods, pollution) linked to urbanization and to promote it, but also to improve collective wastewater treatment by separating networks aimed at reducing the volumes entering treatment plants

These skills are implemented by studying the territory in order to define the techniques to be developed according to different choice criteria (urbanization, soil qualification, population density, cost of work).

Limoges Métropole directly manages and operates the collection and purification systems of 14 municipalities: Aureil, Bonnac la Côte, Condat sur Vienne, Eyjeaux, Feytiat, Isle, Le Palais-sur-Vienne, Le Vigen, Limoges, Peyrilhac, Rilhac Rancon, Saint Gence, Solignac and Veyrac.

For the 4 other municipalities of Limoges Métropole: Boisseuil, Panazol, Saint-Just le Martel and Verneuil sur Vienne (since 1 January 2011), these missions are entrusted to SAUR within the framework of public service delegation contracts:

- until the end of 2013 for Boisseuil and Saint-Just le Martel.
- until the end of 2014 for Panazol and Verneuil sur Vienne.

#### KEY FIGURES 2017

- 187,003 inhabitants served
- 1770 km of networks including 226 km of unitary networks, 822 km of wastewater and 692 km of rainwater
- 50,787 connections
- 54 treatment installations (activated sludge treatment plant, lagoons, rhizospheres, biological disks, bacterial filters, etc.) located in Limoges Metropolitan France equivalent to nearly 302,545 p.e. including an activated sludge treatment plant in Limoges of 285,000 p.e.



- 92 rainwater retention basins, 79 of which are directly managed by the Espages Sanitation Department
- 6.6 km of pipes replaced
- 2.6 km of extended pipes
- 1,770 linear metres of lined pipes
- 67 new connections were made on a direct basis in all the municipalities of the Urban Community
- 29.08 km of networks inspected by camera
- 9,408,329 m<sup>3</sup> of wastewater collected and invoiced
- 77,158 invoices issued

No diagram available

#### 4. Goals and ambitions

Please describe the main mid and long-term goals in your region (strategies and plans in the field of water management).

Limoges Métropole's strategy with regard to sanitation is characterised by the following points

- continue to develop the quality approach
- develop energy savings
- recover the heat produced
- develop self-monitoring of sanitation networks
- guarantee safety at work (very important issue; big resources must be devoted to it)
- coordination between the services of the metropolitan Limoges (roads, drinking water, sanitation, other underground technical networks...)
- risks analysis (update)
- upgrading of the main wastewater treatment plant
- data management
- network asset management





## 5. Regulations

Please identify and describe the main policies and regulations influencing water management in your region. Please consider:

- European directives and national and regional laws related to Water Framework Directive.
- Policies and regulations in the field of sanitation, agriculture, environment, etc. influencing water uses.

*WFD*

*Urban wastewater treatment directive*

All texts here (in French): <https://www.collectivites-locales.gouv.fr/lois-et-reglementation-sur-leau-et-lassainissement>

For agriculture: Arrêté du 8 janvier 1998 fixant les prescriptions techniques applicables aux épandages de boues sur les sols agricoles pris en application du décret n° 97-1133 du 8 décembre 1997 relatif à l'épandage des boues issues du traitement des eaux usées/

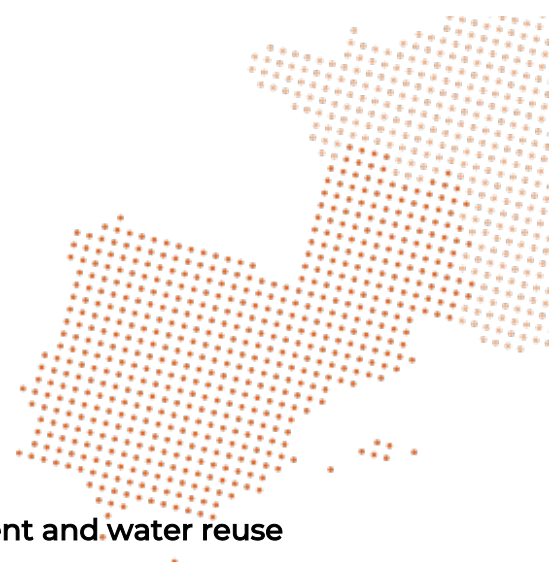
(Order of 8 January 1998 establishing the technical requirements applicable to the spreading of sludge on agricultural land adopted pursuant to Decree No. 97-1133 of 8 December 1997 on the spreading of sludge from waste water treatment): <https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000000570287>

## 6. Existing and/or potential gaps

Please (if applicable) identify:

- Gaps between the current status of water management in your region/municipality and current goals, objectives, etc. in regulations, plans and strategies.
- Potential gaps between the current status of water management in your region/municipality and future goals, objectives, etc. in regulations, plans and strategies.

This is no gap right now but, for the future, all points mentioned in point 4 need to be improved



## 7. Processes and technologies in wastewater management and water reuse

Please describe briefly and draw a scheme of the main processes managed by your organization and the main technologies implemented related to wastewater management and water reuse (if applicable).

The main wastewater treatment plant is an activated sludge (around 90% of the population)

There are 51 other little wastewater treatment plants.

The techniques used are:

- Reeds beds
- Constructed wetlands
- Trickling filter
- Biodisk
- Biofilter

The sewerage network is essentially combined sewer

Please, considering the processes and technologies implemented, identify and describe problems and areas for improvement, for instance:

- Energy consumption.
- Pollutant removal efficiency.
- Waste produced.
- Cost effectiveness issues.
- Control and monitoring issues.

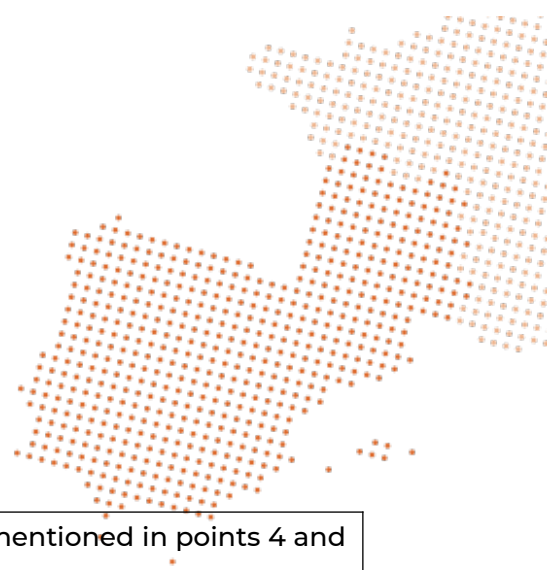
All the points mentioned above will continue to be improved in the near future.

Reactant consumption will continue to be optimized.

In the same way, a data storage and processing system will be set up to better monitor the performance of the sanitation system and coordinate work with the other technical services of Limoges Metropole.

## 8. Investment

Does your organization have plans for investment in water management? Please describe briefly the planned investments.



Significant investments will be made to improve the points mentioned in points 4 and 7b.

## 9. Preliminary definition of needs

On the basis of previous questions, please could you list 5 needs from your organization and indicate briefly the main reason you have these needs?

	Needs	Reasons (regulations, plans, operational, customer requirements, etc.)
1	Improved network asset management -Need 1: For this, it will be necessary to set up a modeling tool that integrate an artificial intelligence module to predict the areas that have the greatest risk of breakage.	Legislation, environmental protection, cost optimization (OPEX and CAPEX)
2	Improved network asset management -Need 2: need to develop faster and more reliable pipe inspection techniques with better shape/breakage recognition.	Legislation, environmental protection, cost optimization (OPEX and CAPEX)
3	Improved network asset management -Need 3: Improve and speed up the reception phases of work and interventions carried out on the network	Legislation, environmental protection, costs optimization (OPEX and CAPEX)
4	Improve network monitoring to limit combined sewer overflows to 5% of incoming pollutant flows – Need 1: Set up a measurement and data acquisition system	Legislation, environmental protection
5	Improve network monitoring to limit combined sewer overflows to 5% of incoming pollutant flows – Need 2: Establish IT infrastructure for data storage and processing that is affordable for Limoges Metropole (207,986 inhabitants)	Legislation, environmental protection
6	If the unit releases exceed 5% of the incoming pollutant load, it will be necessary to determine the work to be carried out. Need for affordable infrastructure for Limoges Metropole	Legislation, environmental protection, costs optimization (OPEX and CAPEX)



## 5.2 Annex 1.2. Adour Garonne Water Agency

### Interview questions

#### 1. Contact details

Organisation	OIEau
Name of the contact person	BERLAND Jean-Marc
E-mail	Jm.berland@oieau.fr
Phone number	+33.5.55.11.47.87

#### 2. Interviewees

Position	Project Manager
Brief description of duties	Agence de l'eau Adour-Garonne - Département des services publics de l'eau et des entreprises Adour-Garonne Water Agency - Department of Public Water Services and Companies
Name	Jocelyne Di MARE (with the help of Ariette SOURZAC)
E-mail	ariette.sourzac@eau-adour-garonne.fr jocelyne.di-mare@eau-adour-garonne.fr

#### 3. Role of your organization in the management of the water cycle

Please describe the role of your organization in the field of water management addressing the following questions:

- Type of organisation (municipality, regional government, public company, etc.).
- Responsibilities in water management.
- Links with other organizations in the field of water management in your region (please describe and draw a scheme about the water management bodies and competent authorities in your region/municipality).



Created by the 1964 Water Law, the Adour-Garonne Water Agency is a public institution of the State. Its missions are to fight pollution and protect water and aquatic environments.

There are six water agencies in France. With legal personality and financial autonomy, they are placed under the dual supervision of the Ministry of Ecological and Solidarity Transition and the Ministry of Economy and Finance.

#### Democratic water management

Water democracy is exercised in an original way: large river basins. For nearly 50 years, debates have been organized within the basin committee, for which the Agency provides the secretariat.

The Agency implements, in the Adour-Garonne basin, the objectives and provisions of the master plan for water development and management (SDAGE and its local versions, the SAGEs), by promoting balanced and economical management of water resources and aquatic environments.

#### A lever for financial action

The Administrative Board (emanating from the Basin Committee) steers the Agency's activity and defines its policy in multiannual intervention programmes. The 11th programme organises the Agency's grants and fees from 2019 to 2024.

The Agency levies fees for water pollution and water abstractions according to the "polluter-pays" and "withdrawer-pays" principles.

Thanks to this money, it provides financial assistance to project owners and water stakeholders (local authorities, companies, farmers, associations, individuals) to help them equip themselves with facilities for depollution, the creation of water resources or to encourage them to save water.

The other missions: production and management of water data (SIE), information and awareness-raising, research and foresight in the water sector.

#### A transversal approach

Agency objectives: to contribute to the achievement of good status for all waters in the Adour-Garonne basin and to seek a balance between available resources and water needs.

Its main lines of action are as follows:

- improve water quality (priority to drinking water supply),
- reduce the impact of human activities on aquatic environments,
- ensure the natural functionalities of aquatic environments,
- place water at the centre of spatial planning,
- master the quantitative management of rivers, especially in summer,
- sustainable groundwater management.



### Action at the territorial level

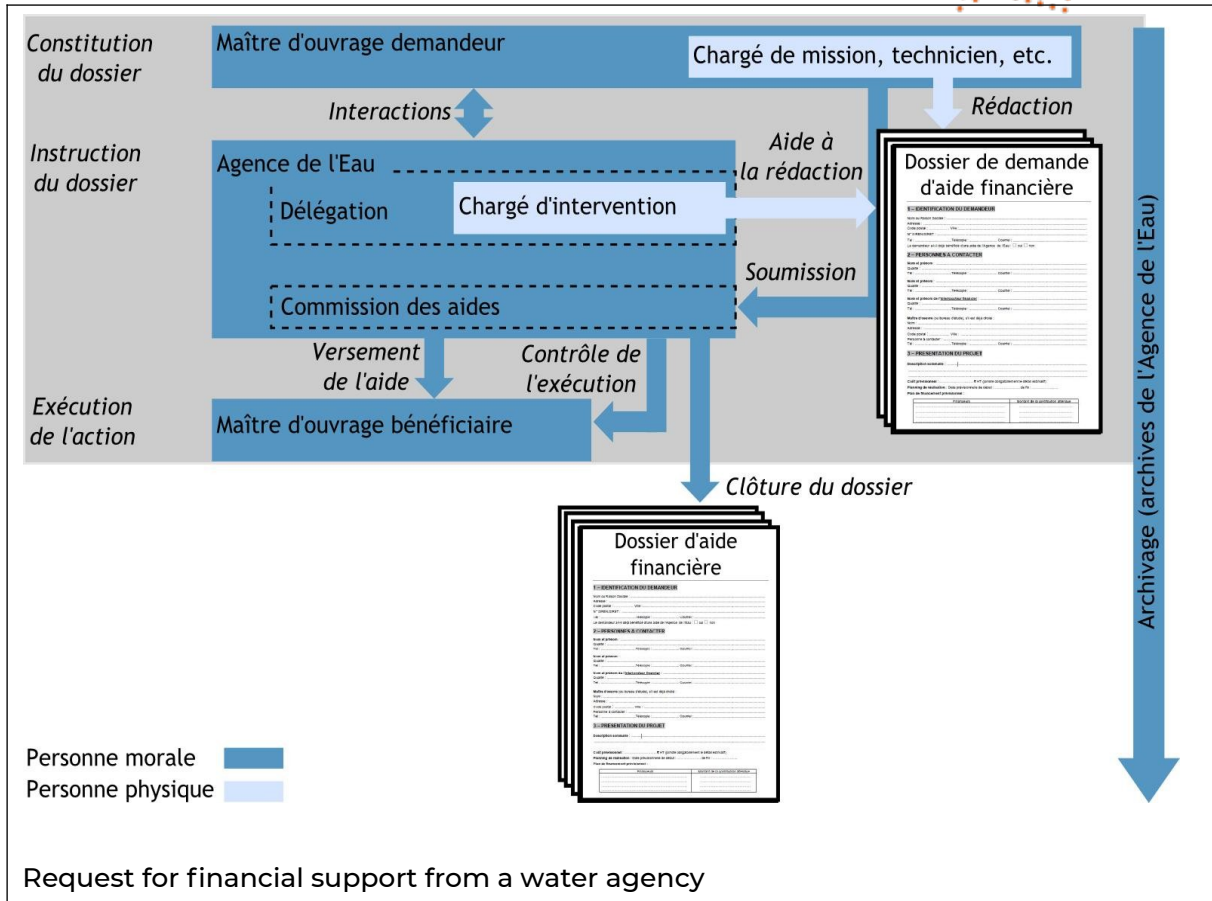
The Adour-Garonne Water Agency has 280 staff spread over the entire hydrographic basin. Located in Toulouse, it has set up over the years delegations, close to the field and local partners:



- Bordeaux/Brive
- Pau
- Rodez/Toulouse

Source : <http://www.eau-adour-garonne.fr/fr/qui-sommes-nous.html>





#### 4. Goals and ambitions

Please describe the main mid and long-term goals in your region (strategies and plans in the field of water management).

The 11<sup>th</sup> programme also prepares the future of the Adour-Garonne basin and positions itself in the face of the major challenge: Adaptation to climate change and its impacts. The implementation of the measures of the climate change adaptation plan (pacc) aims to ensure:

- The best resilience of aquatic environments,
- Economic and agricultural transition,
- Sustainable use of all water resources.

Faced with this strategic challenge, territorial solidarity for water, between dense and sparsely populated territories, urban and rural, is reaffirmed. The 11<sup>th</sup> programme sets out the scope of the project, particularly in the context of rural revitalisation areas.





*Sustainable efficiency*

Reinforced principles guide the intervention program to promote the deployment of structuring actions for water.

The programme is intended to be both simpler and more selective, in order to promote the effectiveness of aid.

Maintaining incentive rates on major objectives is accompanied by synergies with regulatory tools and the search for co-financing. National plans and water resource managers will be systematically solicited.

Finally, priority is given to grouped actions. The aid will be refocused on operations with stakes, known as investment operations.

Source: <http://www.lleme-adour-garonne.fr/>

## 5. Regulations

Please identify and describe the main policies and regulations influencing water management in your region. Please consider:

- European directives and national and regional laws related to Water Framework Directive.
- Policies and regulations in the field of sanitation, agriculture, environment, etc. influencing water uses.

WFD

Urban wastewater treatment directive

All texts here (in French): <https://www.collectivites-locales.gouv.fr/lois-et-reglementation-sur-leau-et-lassainissement>

For agriculture: Arrêté du 21 juillet 2015 relatif aux systèmes d'assainissement collectif et aux installations d'assainissement non collectif, à l'exception des installations d'assainissement non collectif recevant une charge brute de pollution organique inférieure ou égale à 1,2 kg/j de DBO5

(Order of 21 July 2015 on collective sanitation systems and non-collective sanitation facilities, with the exception of non-collective sanitation facilities receiving a gross organic pollution load less than or equal to 1.2 kg/day of BOD5)

Link (in French): <https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000031052756&categorieLien=id>



## 6. Existing and/or potential gaps

Please (if applicable) identify:

- Gaps between the current status of water management in your region/municipality and current goals, objectives, etc. in regulations, plans and strategies.
- Potential gaps between the current status of water management in your region/municipality and future goals, objectives, etc. in regulations, plans and strategies.

The challenges for the future of water are as follows

- Continue to improve the organisation of stakeholders, taking into account regulatory developments,
- Reduce pollution (domestic, industrial, agricultural),
- Ensure balanced quantitative management of water resources in a context of climate change,
- Rehabilitate the functionalities of aquatic environments in order to improve their resilience.

Figures:

- 50% of water bodies (rivers, lakes, estuaries, coastlines) are in good ecological status
- 89% of the measured surface water bodies are in good chemical status.
- 65.5% of free groundwater and 100% of deep groundwater are in good chemical status.
- 89% of free aquifers and 78% of captive aquifers are in good quantitative condition.
- 19.3% of surface water bodies are under significant pressure from discharges from municipal sanitation systems (800 sanitation systems).
- Discharges from industrial activities not connected to the local authorities' sewerage network cause significant pressure on 7.6% of surface water bodies.
- 38% of surface water bodies and 40% of free groundwater bodies have significant phytosanitary pressure.
- Overall, 34% of surface water bodies and 27% of free groundwater bodies have a significant diffuse nitrogen pressure of agricultural origin.
- 18.8% of water bodies under significant pressure due to withdrawals for irrigation
- 1.3% of water bodies are under significant pressure due to withdrawals for drinking water.



## 7. Processes and technologies in wastewater management and water reuse

Please describe briefly and draw a scheme of the main processes managed by your organization and the main technologies implemented related to wastewater management and water reuse (if applicable).

The largest wastewater treatment plants are activated sludge (around 90% of the population)

The techniques used for rural communities' little wastewater treatment plants could be the following:

- Reeds beds
- Constructed wetlands
- Trickling filter
- Biodisk
- Biofilter

In the old town centres sewerage networks are essentially combined sewer. In other areas the networks are separate with storm sewer and wastewater sewer.

Please, considering the processes and technologies implemented, identify and describe problems and areas for improvement, for instance:

- Energy consumption.
- Pollutant removal efficiency.
- Waste produced.
- Cost effectiveness issues.
- Control and monitoring issues.

The challenges for Wastewater Treatment Plant and Wastewater Management are as follows:

- the emission of greenhouse gases;
- reduce the ecological footprint (life cycle analysis);
- to treat and valorise phosphorus, including in small wastewater treatment plants
- finding an alternative to treatment with ferric chloride
- treat micropollutants (no miracle treatment)



- reduction of pollutants at source
- change the model from a centralized to a decentralized model
- treatment of combined sewers overflows
- promote the emergence of separate toilets (urine separated from faeces)
- reliability of self-monitoring of sanitation networks (real gap in terms of monitoring)

## 8. Investment

Does your organization have plans for investment in water management? Please describe briefly the planned investments.

### *The main figures of the 11th programme*

To protect the water of the Southwest, the Agency will mobilize 1.6 billion euros over 6 years, or an average of 250 million euros per year in aid, including:

- 80 M€ for the reduction of domestic pollution: Reduce pollution from local authorities' sanitation systems by financing work on sewerage stations and networks
- 38 million for drinking water quantity and quality: Restructuring of drinking water supply, protection of water abstractions, water treatment, network renewal
- 16 M€ for the reduction of industrial pollution: Promotion of clean technologies, reduction of toxic pollution
- 40 M€ for the preservation of aquatic environments: Fostering the adaptation of biodiversity to climate change, promoting the logic of the catchment area, restoring ecological continuity and fish migration
- 27 M€ for the reduction of agricultural pollution: Support for low-input agricultural sectors and conversion to organic farming, protection of water abstractions subject to agricultural pollution
- 20 million for knowledge and water quality monitoring networks
- 18 M€ for water resource management and water savings: Restoring the balance between water needs and available quantity by promoting water savings, good management of existing reserves, creation of reserves if necessary
- 3.50 M€ for planning and consultation: Initiation of territorial initiatives
- 2 million on communication and public awareness, including the Climate Change Adaptation Plan
- 1.50 M€ for aid for international cooperation



11<sup>ème</sup> programme de l'agence: <http://www.eau-adour-garonne.fr/fr/sdage-et-programme-d-intervention-de-l-agence/un-outil-le-programme-d-intervention-de-l-agence-1.html>

### 9. Preliminary definition of needs

On the basis of previous questions, please could you list 5 needs from your organization and indicate briefly the main reason you have these needs?

	Needs	Reasons (regulations, plans, operational, customer requirements, etc.)
1	To treat and valorise phosphorus, including in small wastewater treatment plants	Compliance with legislation, protection of the environment and water resources, recovery of a limited resource (phosphorus)
2	Circular economics of wastewater nutrients	Protection of the environment and water resources, recovery of a limited resources
3	Permanent diagnosis of the sewerage network	Compliance with legislation, protection of the environment and resources, recovery of a limited resource (phosphorus) cost optimization (OPEX and CAPEX)
4	Reuse of treated wastewater in rural areas (with wastewater treatment plants adapted for this aim)	Protection of the environment and water resources
5	Change the model from a centralized to a decentralized model (Separate toilets treatment of combined sewers overflows)	Protection of the environment and water resources



## 5.3 Annex 1.3. Consejería de Agricultura, Ganadería, Pesca y Desarrollo Sostenible

### Interview questions

#### 1. Contact

Organization	Consejería de Agricultura, Ganadería, Pesca y Desarrollo Sostenible (CAGPDS)
Name of the contact person	Arturo Fernández-Palacios Carmona
E-mail	arturo.fernandezpalacios@juntadeandalucia.es
Phone number	(+34) 955.62.58.61

#### 2. Interviewees

Position	Technical Advisor for the Área de Información, Evaluación, Análisis Ambiental y Fondos Europeos
Brief description of duties	The role of Technical Advisor is to assist the Secretaría General de Medio Ambiente in coordination, promotion and monitoring of strategic projects and lines of action. He is currently developing this profile for the definition and execution of the environmental R&D strategy, and, specifically, in the promotion of IP in the SGMAACC as one of the fundamental instruments for the promotion of innovation. He is currently leading the IP pilot project on environmental information Cloud_IA.
Full name	Arturo Fernández-Palacios Carmona
E-mail	arturo.fernandezpalacios@juntadeandalucia.es

Position	Editorial Manager at Oficina de Planificación Hidrológica
Brief description of duties	Drafting and control of the Hydrological Plans of the Andalusian Internal Basins.





Full name	Manuel López Rodríguez
E-mail	manuel.lopez.rodriguez@juntadeandalucia.es

### 3. Role of your organization in the management of the water cycle

Please describe the role of your organization in the field of water management addressing the following questions:

- Type of organisation (municipality, regional government, public company, etc.).
- Responsibilities in water management.
- Links with other organizations in the field of water management in your region (please describe and draw a scheme about the water management bodies and competent authorities in your region/municipality).

**\*TYPE OF ORGANISATION/COMPETENCES IN WATER MANAGEMENT:**

The Statute of Autonomy for Andalusia attributes in Article 50.1 the exclusive competence to the Autonomous Community in matters of waters that run entirely through Andalusia, including in its paragraph c) of said section, the participation of users (BOJA nº 240 of 14/12/2015 <https://juntadeandalucia.es/boja/2015/240/3>).

The Ministry of Agriculture, Livestock, Fisheries and Sustainable Development (CAGPDS) of the Regional Government of Andalusia is the public body of the Andalusian government that is responsible for water issues in the region of Andalusia, and therefore, issues related to "water resources in Andalusia, both those coming from the natural environment - surface water and aquifers - and those resulting from human intervention on the environment, through desalination, reuse of treated water or water transfers" (Source: <https://juntadeandalucia.es/temas/medio-ambiente/recursos/agua.html>)

According to Decree 477/2015, of 17 November, "the Andalusian Water Administration consists of the following collegiate bodies, all of which are attached to the Regional Ministry responsible for water:

- The Andalusian Water Council.
- The Water Observatory.
- The Commission of Competent Authorities.
- The Monitoring Commission for the Prevention of Urban Floods.
- The Water Councils of the Hydrographical Districts.





- f) The Commissions for the Management of Drought.
- g) The Management Committees.
- h) The Permanent Cabinet.
- i) The Commission for the Exploitation of the Guadiaro-Guadalete water transfer system.

(BOJA n.º 240 de 14/12/2015 <https://juntadeandalucia.es/boja/2015/240/3>)

Likewise, the CAGPDS has in its functional structure:

\*The Oficina de Planificación Hidrológica: coordination attached to the Dirección General de Planificación y Gestión del Dominio Público Hidráulico under the Secretaría General de Medio Ambiente y Cambio Climático. Its competences in water matters include the drafting and control of the hydrological plans of the Andalusian Internal Basins.

\*The Área de Información, Evaluación, Análisis Ambiental y Fondos Europeos: department attached to the General Secretaría General de Medio Ambiente, Agua y Cambio Climático. Among its competences is the coordination of the activity of the Technical Office of Innovation Procurement (IP) of the CAGPDS in environmental matters, which will aim to detect the technological demands of the different departments of the Regional Ministry and consolidate the IP in the Regional Ministry.

**\*RELATIONSHIP WITH OTHER BODIES RESPONSIBLE FOR WATER MANAGEMENT IN THE REGION**

The Commission of Competent Authorities encompasses all the authorities with competence in water uses. It includes the State, the Autonomous Community and the Local Authorities and especially controls the Programme of Measures of the Hydrological Plans and thus the investment effort of the different administrations.

#### 4. Goals and ambitions

Please describe the main mid and long-term goals in your region (strategies and plans in the field of water management).



The CAGPDS is awaiting the approval of the new EU regulation on water reuse which aims to harmonise "the regulation on reuse across the European Union and the consequent establishment of common minimum requirements that will ensure the quality of reclaimed water and its monitoring, guarantee a level playing field for all countries and increase confidence in the practice of water reuse, thus boosting its use".

(Source: <https://www.iagua.es/noticias/aedyr/reutilizacion-agua-europa-regulacion-comun>)

The CAGPDS considers that it is necessary to implement measures that make it possible for reuse to become a reality, given the long delay in the incorporation of these resources among water users, especially in deficit systems.

## 5. Regulations

Please identify and describe the main policies and regulations influencing water management in your region. Please consider:

- European directives and national and regional laws related to Water Framework Directive.
- Policies and regulations in the field of sanitation, agriculture, environment, etc. influencing water uses.

### EUROPEAN REGULATIONS:

\*Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment "concerns the collection, treatment and discharge of urban waste water and the treatment and discharge of waste water from certain industrial sectors. The objective of the Directive is to protect the environment from the adverse effects of the abovementioned waste water discharges."

(<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31991L0271> )

\*Directive 2000/60/EC: framework for Community action in the field of water policy: "It sets out rules to halt deterioration in the status of European Union (EU) water bodies and achieve 'good status' for Europe's rivers, lakes and groundwater by 2015".

(<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0060> )

\*Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council: "This Directive lays down environmental quality



standards (EQS) for priority substances and certain other pollutants as provided for in Article 16 of Directive 2000/60/EC, with the aim of achieving good surface water chemical status and in accordance with the provisions and objectives of Article 4 of that Directive.”

(DOUE n.º 348 de 24/12/2008 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0105> )

\* Commission Directive 2009/90/EC of 31 July 2009 laying down, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, technical specifications for chemical analysis and monitoring of water status: “This Directive lays down technical specifications for chemical analysis and monitoring of water status in accordance with Article 8(3) of Directive 2000/60/EC. It establishes minimum performance criteria for methods of analysis to be applied by Member States when monitoring water status, sediment and biota, as well as rules for demonstrating the quality of analytical results.”

(DOUE n.º 201 de 01/08/2009 <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32009L0090> )

#### SPANISH REGULATIONS:

\*Real Decreto Legislativo 1/2001, de 20 de julio, por el que se aprueba el texto refundido de la Ley de Aguas: the objective of this law is "the regulation of the public water domain, the use of water" "as well as "the establishment of the basic rules for the protection of inland, coastal and transitional waters, without prejudice to their legal classification and the specific legislation applicable to them...". Inland surface waters, as well as renewable groundwaters, all of which are integrated into the hydrological cycle...".

(BOE n.º 176 de 24/07/2001 <https://www.boe.es/buscar/act.php?id=BOE-A-2001-14276>)

\*Real Decreto 1620/2007, de 7 de diciembre, por el que se establece el régimen jurídico de la reutilización de las aguas depuradas: "Its purpose is to establish the legal regime for the reuse of treated water, in accordance with Article 109.1 of the revised text of the Water Act, approved by Royal Legislative Decree 1/2001 of 20 July 2001.

(BOE n.º 294 de 08/12/2007 <https://www.boe.es/buscar/doc.php?id=BOE-A-2007-21092>)

\*Real Decreto 60/2011, de 21 de enero, sobre las normas de calidad ambiental en el ámbito de la política de aguas: "aims to transpose all aspects contained in Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008. It also incorporates the technical requirements on chemical analysis set out in Commission Directive 2009/90/EC of 31 July 2009.... Both legislative texts are thus incorporated into Spanish domestic law". (BOE n.º 19, de 22/01/2011 <https://www.boe.es/buscar/doc.php?id=BOE-A-2011-1139>)

#### ANDALUSIAN REGULATIONS:

\*Ley 9/2010, de 30 de julio, de Aguas de Andalucía: the purpose of the Law is to



guarantee the basic water use needs of the population and to make the economic and social development of Andalusia compatible with the good state of the aquatic and terrestrial ecosystems". (BOJA n° 155 de 09/08/2010 <https://juntadeandalucia.es/boja/2010/155/1>)

\*Decreto 357/2009, de 20 de octubre, por el que se fija el ámbito territorial de las demarcaciones hidrográficas de las cuencas intracomunitarias situadas en Andalucía: "the purpose of this Directive is to establish the territorial scope of the river basin districts corresponding to the intra-Community basins located in Andalusia, the functions and services of which have been transferred". (BOJA n° 208 de 23/10/2009 <https://juntadeandalucia.es/boja/2009/208/3>)

\*Planificación Hidrológica 2015-2021 (<https://juntadeandalucia.es/temas/medio-ambiente/recursos/agua.html>):

1. Plan Hidrológico Guadalete-Barbate 2009-2015
2. Plan Hidrológico del Tinto, Odiel y Piedras 2015-2021
3. Plan Hidrológico de las Cuencas Mediterráneas Andaluzas 2009-2015

\*Planificación Hidrológica 2021-2027: en desarrollo (more information in <http://www.juntadeandalucia.es/medioambiente/site/portalweb/vgn-ext-templating/v/index.jsp?vgnnextchannel=10d0a06b85221610VgnVCM1000001325e50aRCRD&vgnnextoid=10d0a06b85221610VgnVCM1000001325e50aRCRD>)

## 6. Existing and/or potential gaps

Please (if applicable) identify:

- Gaps between the current status of water management in your region/municipality and current goals, objectives, etc. in regulations, plans and strategies.
- Potential gaps between the current status of water management in your region/municipality and future goals, objectives, etc. in regulations, plans and strategies.

Not applicable for Regional Ministry.



## 7. Processes and technologies in wastewater management and water reuse

Please describe briefly and draw a scheme of the main processes managed by your organization and the main technologies implemented related to wastewater management and water reuse (if applicable).

Not applicable for Regional Ministry.

Please, considering the processes and technologies implemented, identify and describe problems and areas for improvement, for instance:

- Energy consumption.
- Pollutant removal efficiency.
- Waste produced.
- Cost effectiveness issues.
- Control and monitoring issues.

There are mainly 3 challenges or possible areas for improvement:

1. The problem of water treatment in small towns, minimising costs: this is not dealt with in the Water Directives. It is necessary to obtain reused water at a low cost, and to do so, it would be necessary to act on two axes:

\*reduce the costs of water supply services: the cost of obtaining reused water must be equal to or less than the cost of obtaining natural water.

\*minimising the costs of applicable technologies: water reuse technologies exist, but they are expensive, so the cost of these technologies should be reduced.

2. The hydrographic deficit of the Mediterranean basin: water reuse is an alternative to the use of natural water but it will not be implemented until the cost between natural water and reused water is so disparate.

Irrigation communities should be replacing natural water with reused water, but its higher cost (vs. natural water) and the fear that it could generate a bad image for their products outweighs the possible advantages of using quality reused water. A possible solution could be a 'single box' supplying water to irrigation communities that does not distinguish between natural and reused water, as was once the case with GMOs.

3. Creation of continuous water quality monitoring networks: although water quality monitoring is not the direct responsibility of the Regional Ministry but of a third party, it would be interesting to have networks that monitor water quality throughout its life cycle, not at specific measurement points.





## 8. Investment

Does your organization have plans for investment in water management? Please describe briefly the planned investments.

The CAGPDS is responsible for coordinating all water-related policies, for which it has a specific budget.

The Andalusian Hydrological Plans (Plan Hidrológico Guadalete-Barbate, Plan Hidrológico del Tinto, Odiel y Piedras, and Plan Hidrológico de las Cuencas Mediterráneas Andaluzas) are strategies for the implementation of policies related to the water cycle that have a specific budget.

## 9. Preliminary definition of needs

On the basis of previous questions, please could you list 5 needs from your organization and indicate briefly the main reason why you have these needs

	Needs	Reasons (regulations, plans, operational, customer requirements, etc.)
1	Water monitoring to: *avoidance of urban/agricultural network losses *water optimisation	Comply with current regulations
2	Optimisation of water use. Satellite control and techniques to increase efficiency of use.	Comply with current regulations
3	Alternatives to the problem of water treatment in small towns, minimising costs.	Comply with current regulations
4	Alternatives to water reuse in the face of the hydrographic deficit in the Mediterranean basin.	Comply with current regulations
5	Continuous water quality control networks.	Comply with current regulations



## 5.4 Annex 1.4. Empresa Metropolitana de Abastecimiento y Saneamiento de Aguas de Sevilla, S.A.

### Interview questions

#### 1. Contact

Organization	Empresa Metropolitana de Abastecimiento y Saneamiento de Aguas de Sevilla, S.A. (EMASESA)
Name of the contact person	Benigno López Villa
E-mail	BLopez@emasesa.com
Phone number	(+34) 955.47.79.22

#### 2. Interviewees

Position	Head of Environment Division
Brief description of duties	-
Full name	Benigno López Villa
E-mail	blopez@emasesa.com

#### 3. Role of your organization in the management of the water cycle

Please describe the role of your organization in the field of water management addressing the following questions:

- Type of organisation (municipality, regional government, public company, etc.).
- Responsibilities in water management.
- Links with other organizations in the field of water management in your region (please describe and draw a scheme about the water management bodies and competent authorities in your region/municipality).





**\*TYPE OF ORGANISATION/COMPETENCES IN WATER MANAGEMENT:**

EMASESA (Empresa Metropolitana de Abastecimiento y Saneamiento de Aguas de Sevilla, S.A. ) is a publicly owned commercial company whose corporate purpose is "to carry out all activities related to planning, programming, projects and research, development cooperation, training, consultancy, construction, operation, maintenance and management of water resources and services in all phases of the complete water cycle, from production, acquisition and adjudication, treatment and distribution of flows, to evacuation, discharge, sanitation, purification, elimination and recycling of liquid waste and sludge, as well as the commercialisation of all these products and services [...] the provision of public drinking water supply, sewerage and wastewater treatment services for all the local councils that are members, as well as participation in the coordination and/or provision of drinking water supply, sewerage and wastewater treatment services in the supra-municipal area when such actions are the responsibility of the member local councils by agreement, delegation or authorisation of the local, regional or state body that is responsible for them in accordance with the provisions of the applicable regulations". (Source: art. 2.1. EMASESA Articles of Association).

**\*RELATIONSHIP WITH OTHER BODIES RESPONSIBLE FOR WATER MANAGEMENT IN THE REGION**

EMASESA is responsible for managing the integral water cycle in Seville and its metropolitan area under a sustainable approach.

EMASESA manages the direct supply of drinking water to the city of Seville and the towns of Camas, Dos Hermanas, Alcalá de Guadaíra, Mairena de Alcor, San Juan de Aznalfarache, Coria del Río, La Puebla del Río, Alcalá del Río, La Rinconada, El Garrobo and El Ronquillo. It also supplies raw (untreated) water to the 29 towns located in the Aljarafe area of Seville and to Guillena - Las Pajanosas. It is also responsible for the public sewerage and water treatment services in Seville, Alcalá de Guadaíra, Camas, La Rinconada, San Juan de Aznalfarache, Coria del Río, La Puebla del Río, Alcalá del Río, Mairena del Alcor, Dos Hermanas and El Ronquillo. (Source: <https://www.emasesa.com/conocenos/quienes-somos/>)

#### 4. Goals and ambitions

Please describe the main mid and long-term goals in your region (strategies and plans in the field of water management).

**\*Strategic Plan: Sustainable Public Management (2017-2021)**

In 2016 EMASESA approved a strategic plan for Sustainable Public Management, with a time horizon covering 2017-2021, the aim of which is to "move towards efficient



management that meets the needs of current generations without affecting the capacity of future generations, promoting economic and social progress, while respecting cultural and environmental heritage".

EMASESA wants to contribute with its "strategy to achieve the Sustainable Development Goals and to comply with the OECD Water Governance Principles."

(Source: <https://www.emasesa.com/conocenos/plan-estrategico-gestion-publica-sostenible-2017-2021/>)

\*EMASESA's Actions and Challenges in contributing to the OECD Sustainable Development Goals (SDGs)

EMASESA "is firmly committed to the vision, spirit and implementation of the 2030 Agenda, with the will to make the Sustainable Development Goals a reality."

EMASESA responds to all of the OECD's SDGs, although its most relevant contribution to achieving them "revolves around a major axis that inspires our actions: Clean water and sanitation (SDG6), working from policies of transparency and alliances, contributing to the care and conservation of natural resources, as well as improving the quality of life of all:

- Access to safe drinking water
- Access to sanitation and hygiene services
- Water quality
- Pollution and wastewater
- Efficient use of water resources

Integrated water resources management -Water-related ecosystems

Water-related ecosystems

- Management capacity building
- Involvement of local communities".

(Source: <https://www.emasesa.com/conocenos/plan-estrategico-gestion-publica-sostenible-2017-2021/emasesa-y-los-ods/>)

\*Water Observatory

EMASESA is committed to a model of "participatory, open and transparent governance and management. Models in which dialogue and the search for common and shared spaces with society allow for effective responses to the great challenges and responsibilities to be faced in the management of water resources".

EMASESA has therefore designed and implemented "the EMASESA Water Observatory, which is the new advisory and participatory body on water issues, enabled in its competent territorial area, directly linked to each of the objectives of our Strategic Plan for Sustainable Public Management, GPS (2017-2021)."

(Source: <https://www.emasesa.com/conocenos/observatorio-del-agua/>)



## 5. Regulations

Please identify and describe the main policies and regulations influencing water management in your region. Please consider:

- European directives and national and regional laws related to Water Framework Directive.
- Policies and regulations in the field of sanitation, agriculture, environment, etc. influencing water uses.

### EUROPEAN REGULATIONS:

\*Council Directive 86/278/EEC of 12 June 1986 on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture: “the purpose of this Directive is to regulate the use of sewage sludge in agriculture in such a way as to prevent harmful effects on soil, vegetation, animals and man, thereby encouraging the correct use of such sewage sludge” (DOUE n.º L 181 de 04/07/1986: <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex:31986L0278>)

\*Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment “concerns the collection, treatment and discharge of urban waste water and the treatment and discharge of waste water from certain industrial sectors. The objective of the Directive is to protect the environment from the adverse effects of the abovementioned waste water discharges.” (DOUE n.º L 135 de 30/05/1991: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31991L0271>)

\*Directive 2000/60/EC: framework for Community action in the field of water policy: “It sets out rules to halt deterioration in the status of European Union (EU) water bodies and achieve ‘good status’ for Europe’s rivers, lakes and groundwater by 2015”. (<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0060>)

\*Decisión n.º 2455/2001/CE del Parlamento Europeo y del Consejo, de 20 de noviembre de 2001, por la que se aprueba la lista de sustancias prioritarias en el ámbito de la política de aguas, y por la que se modifica la Directiva 2000/60/CE: “The list of priority substances including substances identified as priority hazardous substances, provided for in Article 16(2) and (3) of Directive 2000/60/EC, is hereby adopted. This list, as it appears in the Annex to this Decision, shall be added to Directive 2000/60/EC as Annex X.” (DOUE n.º L 331 de 15/12/2001: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32001D2455>)

\*Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC,



84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council: “This Directive lays down environmental quality standards (EQS) for priority substances and certain other pollutants as provided for in Article 16 of Directive 2000/60/EC, with the aim of achieving good surface water chemical status and in accordance with the provisions and objectives of Article 4 of that Directive.” (DOUE n° 348 de 24/12/2008 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0105> )

\*Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions a blueprint to safeguard Europe's water resources: “Its long-term aim is to ensure the sustainability of all activities that impact on water, thereby securing the availability of good-quality water for sustainable and equitable water use. This goal is already enshrined in the WFD in various ways. The Blueprint will help us achieve the goal by identifying obstacles and ways to overcome them..” (COM(2012) 673 final: <https://eur-lex.europa.eu/legal-content/ES/TXT/?uri=CELEX:52012DC0673>)

\*Directive 2013/39/EU of the European Parliament and of the Council of 12 August 2013 amending Directives 2000/60/EC and 2008/105/EC as regards priority substances in the field of water policy: expands the list of Priority Pollutants to 45, including a more restrictive revision of the EQS - Environmental Quality Standards (DOUE n.º L 226 de 24/08/2013 <https://eur-lex.europa.eu/legal-content/ES/ALL/?uri=CELEX:32013L0039>)

\*Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Closing the loop - An EU action plan for the Circular Economy: “Circular Economy Action Plan to reinvigorate jobs, growth and investment and develop a carbon-free, resource-efficient and competitive economy” (COM (2015) 614final: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015DC0614> )

\*Commission Implementing Decision (EU) 2018/840 of 5 June 2018 establishing a watch list of substances for Union-wide monitoring in the field of water policy pursuant to Directive 2008/105/EC of the European Parliament and of the Council and repealing Commission Implementing Decision (EU) 2015/495: repeals Implementing Decision (EU) 2015/495 and includes new list of monitoring substances (DOUE n.º L 141 de 07/06/2018: <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:32018D0840>)

#### SPANISH REGULATIONS:

\*Real Decreto 1310/1990, de 29 de octubre, por el que se regula la utilización de los lodos de depuración en el sector agrario (BOE n.º 62, de 01/11/1990 <https://www.boe.es/boe/dias/1990/11/01/pdfs/A32339-32340.pdf>)

\*Libro Blanco del Agua en España (2000): aims to provide the basis for, after describing the current situation, estimating the foreseeable evolution and the establishment of water use options and priorities. (<http://hispagua.cedex.es/node/66958>)



\*Real Decreto Legislativo 1/2001, de 20 de julio, por el que se aprueba el texto refundido de la Ley de Aguas: the objective of this law is "the regulation of the public water domain, the use of water" "as well as "the establishment of the basic rules for the protection of inland, coastal and transitional waters, without prejudice to their legal classification and the specific legislation applicable to them...". Inland surface waters, as well as renewable groundwaters, all of which are integrated into the hydrological cycle...".

(BOE n.º 176 de 24/07/2001 <https://www.boe.es/buscar/act.php?id=BOE-A-2001-14276>)

\*Real Decreto 1620/2007, de 7 de diciembre, por el que se establece el régimen jurídico de la reutilización de las aguas depuradas: "its purpose is to establish the legal regime for the reuse of treated water, in accordance with Article 109.1 of the revised text of the Water Act, approved by Royal Legislative Decree 1/2001 of 20 July 2001.

(BOE n.º 294 de 08/12/2007 <https://www.boe.es/buscar/doc.php?id=BOE-A-2007-21092>)

\*Real Decreto 60/2011, de 21 de enero, sobre las normas de calidad ambiental en el ámbito de la política de aguas: "aims to transpose all aspects contained in Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008. It also incorporates the technical requirements on chemical analysis set out in Commission Directive 2009/90/EC of 31 July 2009.... Both legislative texts are thus incorporated into Spanish domestic law".

(BOE n.º 19, de 22/01/2011 <https://www.boe.es/buscar/doc.php?id=BOE-A-2011-1139>)

\*Real Decreto 817/2015, de 11 de septiembre, por el que se establecen los criterios de seguimiento y evaluación del estado de las aguas superficiales y las normas de calidad ambiental: includes a separate list of substances called Preferred Substances that pose a significant risk to Spanish surface waters.

(BOE n.º 219, de 12/09/2015 <https://www.boe.es/buscar/pdf/2015/BOE-A-2015-9806-consolidado.pdf>)

\*Plan Nacional de Depuración, Saneamiento, Eficiencia, Ahorro y Reutilización (Plan DSEAR): "Its priority objective is to review the intervention strategies designed in the second cycle hydrological plans, in five main areas: treatment, sanitation, efficiency, saving and reuse. Therefore, its main strategy is to organise, clarify and prioritise the measures that Spain is obliged to carry out in the aforementioned areas in order to achieve alignment with the ecological transition required by our economy and, synergistically, to meet our legal obligations in the EU without further delay". (Sources: <https://www.bioazul.com/tag/economia-circular/> y <https://www.miteco.gob.es/es/agua/temas/planificacion-hidrologica/planificacion-hidrologica/planes-programas-relacionados/>)

\*Estrategia Española de Economía Circular, "España Circular 2030" (Draft): The strategic framework and essential action framework to facilitate and promote the transition towards the circular economy based on the collaboration between the





General State Administration, the Autonomous Communities, local entities and the other agents involved, especially producers and consumers of goods. This Strategy incorporates the first Action Plan 2018-2020 with the following lines of action on which the policies and instruments of the Strategy will focus: production, consumption, waste management, secondary raw materials, and water reuse (line 8.2.5). ([https://www.miteco.gob.es/images/es/180206economicircular\\_tcm30-440922.pdf](https://www.miteco.gob.es/images/es/180206economicircular_tcm30-440922.pdf))

\*Current river basin management plans: the Real Decreto 1/2016, of 8th January, "approves the revision of the Hydrological Plans of the Western Cantabrian, Guadalquivir, Ceuta, Melilla, Segura and Júcar River Basin Districts, and of the Spanish part of the Eastern Cantabrian, Miño-Sil, Duero, Tagus, Guadiana and Ebro River Basin Districts" (<https://www.miteco.gob.es/es/agua/temas/planificacion-hidrologica/planificacion-hidrologica/planes-cuenca/>)

Drought management plans: The Orden TEC/1399/2018, of 28th November, "approves the revision of the Special Drought Plans for the Western Cantabrian, Guadalquivir, Ceuta, Melilla, Segura and Júcar river basin districts; for the Spanish part of the Miño-Sil, Duero, Tagus, Guadiana and Ebro river basin districts; and for the Spanish part of the Eastern Cantabrian river basin district." (<https://www.miteco.gob.es/es/agua/temas/observatorio-nacional-de-la-sequia/planificacion-gestion-sequias/>)

\*Libro Verde de la Gobernanza del Agua en España: under preparation (<http://www.librogobernanzagua.es/>)

#### ANDALUSIAN REGULATIONS:

\*Ley 9/2010, de 30 de julio, de Aguas de Andalucía: the purpose of the Law is to guarantee the basic water use needs of the population and to make the economic and social development of Andalusia compatible with the good state of the aquatic and terrestrial ecosystems". (BOJA nº 155 de 09/08/2010 <https://juntadeandalucia.es/boja/2010/155/1>)

\*Decreto 357/2009, de 20 de octubre, por el que se fija el ámbito territorial de las demarcaciones hidrográficas de las cuencas intracomunitarias situadas en Andalucía: "the purpose of this Directive is to establish the territorial scope of the river basin districts corresponding to the intra-Community basins located in Andalusia, the functions and services of which have been transferred". (BOJA nº 208 de 23/10/2009 <https://juntadeandalucia.es/boja/2009/208/3>)

\*Planificación Hidrológica: refers to three plans:

1. Plan Hidrológico Guadalete-Barbate
2. Plan Hidrológico del Tinto, Odiel y Piedras
3. Plan Hidrológico de las Cuencas Mediterráneas Andaluzas

Hydrological Planning 2021-2027 is currently under development





<http://www.juntadeandalucia.es/medioambiente/site/porta/web/vgn-ext-templating/v/index.jsp?vgnnextchannel=10d0a06b85221610VgnVCM1000001325e50aRCRD&vgnnextoid=10d0a06b85221610VgnVCM1000001325e50aRCRD>

\*Plan Especial de Sequía (PES): are intended to allow for planning in situations of alert and possible drought, with the delimitation of its phases, measures applicable in each of them to the exploitation systems and limitations of uses, with the objective of reducing water consumption

<http://www.juntadeandalucia.es/medioambiente/site/porta/web/menuitem.220de8226575045b25f09a105510e1ca/?vgnnextoid=76709f5c10bc6410VgnVCM2000000624e50aRCRD&vgnnextchannel=dbe6fa43596d4310VgnVCM2000000624e50aRCRD>

\*Orden de 6 de agosto de 2018, por la que se regula la utilización de lodos tratados de depuradora en el sector agrario: The purpose of the Order is to update and improve the monitoring and control mechanisms on the use of treated sewage sludge in the agricultural sector in the Autonomous Community of Andalusia, complying with the provisions of Royal Decree 1310/1990, of 29 October, which regulates the use of sewage sludge in the agricultural sector, and adapting the information to be provided by the various operators, according to Order AAA/1072/2013, of 7 June, on the use of sewage sludge in the agricultural sector, to the conditions of time and form established in this Order for the use of treated sewage sludge in the territory of the Autonomous Community of Andalusia, guaranteeing adequate recovery in agricultural land.

<https://www.juntadeandalucia.es/boja/2018/156/2>

#### LOCAL REGULATIONS:

\*Ordenanza Municipal de Vertidos Domésticos o No Domésticos (comercial, industrial, servicios) managed by EMASESA: approves the modifications introduced in:

-Regulations regulating the economic considerations to be received by EMASESA for domestic drinking water supply services, sewerage (discharge and treatment) and other activities related to the same.

-Regulation on the provision of domestic drinking water supply services and other related activities.

-Regulations governing the provision of the sewerage service (discharge and treatment).

(BOP n.º 81 de 09/04/2016  
<https://www.dipusevilla.es/system/modules/com.saga.sagasuite.theme.diputacion.sevilla.corporativo/handlers/download-bop.pdf?id=4c1cfd87-c2bb-11e6-b7a4-0050569fe27b>)



## 6. Existing and/or potential gaps

Please (if applicable) identify:

- Gaps between the current status of water management in your region/municipality and current goals, objectives, etc. in regulations, plans and strategies.
- Potential gaps between the current status of water management in your region/municipality and future goals, objectives, etc. in regulations, plans and strategies.

1. What is not being complied with and what should be complied with in the different current regulations?

"The Order of 6 August 2018, jointly issued by the Regional Ministry of Agriculture, Fisheries and Rural Development and the Regional Ministry of Environment and Territorial Planning, regulates the use of treated sewage sludge in the agricultural sector, establishes new controls and requirements for activities involving the application of sewage sludge to agricultural soils."

This regulation "establishes a transitional period of 3 years to facilitate the adaptation of activities and installations. The new restrictions imposed on the direct field application of sewage sludge, together with the environmental effects on the population caused by the composting activity in the sludge treatment plant".

EMASESA is currently technically unable to comply with these new legal requirements, and therefore "faces a risk of impossibility of legal compliance in July 2021. For this reason, EMASESA is forced to implement a new or significantly improved sewage sludge management system. This new sewage sludge management system of EMASESA must be suitable for the long term, sustainable in its three dimensions (social, economic and environmental) and must facilitate a correct closure of the urban water cycle".

(Source: [https://www.emasesa.com/wp-content/uploads/2019/05/EMASESA\\_Bases-Convocatoria-CPM-vf.pdf](https://www.emasesa.com/wp-content/uploads/2019/05/EMASESA_Bases-Convocatoria-CPM-vf.pdf))

2. What will have to be complied with in future regulations or strategies that are currently difficult to comply with?

The concern of public administrations about the presence of emerging pollutants or micropollutants in water (pesticides, pharmaceuticals, personal hygiene products, drugs, etc.) has led them to develop increasingly restrictive EQS - Environmental Quality Standards in this area and to extend the lists of substances (latest extension: Commission Implementing Decision (EU) 2018/840 of 5 June 2018).



There are draft European Directives that will further tighten existing regulations on emerging pollutants, with a view to changing the wastewater model in the next 20-30 years.

Emerging pollutants are present at both the water supply and sanitation levels:

\*At the supply level, although the basin attached to Seville is highly protected it is not possible to prevent antibiotics excreted by animals from reaching the basin, even at the micro level.

\*In terms of sanitation, the situation is further complicated by the fact that the treatment plants are not ready and the supply systems will have to be changed in the near future.

All this creates a problem to be solved: technologies are needed to quantify the level of emerging pollutants in water, as well as technologies to eliminate these micro-pollutants both at the level of supply plants and at the level of wastewater treatment plants.

## 7. Processes and technologies in wastewater management and water reuse

Please describe briefly and draw a scheme of the main processes managed by your organization and the main technologies implemented related to wastewater management and water reuse (if applicable).

EMASESA's mission is to develop an activity in all areas related to the integral water cycle by providing a quality public service to citizens, with the maximum efficiency of all employees and an action based on management criteria that allow sustainable development.

EMASESA has 6 wastewater treatment plants (<https://www.emasesa.com/conocenos/nuestras-infraestructuras/depuracion/>).

EMASESA has a complex sewage network that ensures the collection of all wastewater and transports it to one of our wastewater treatment plants (WWTP): San Jerónimo, Copero, Ranilla, Tablada, Mairena-El Viso or El Ronquillo. (<https://www.emasesa.com/conocenos/nuestras-infraestructuras/saneamiento/>)

EMASESA is committed to the reuse of treated water in all activities where possible, such as the irrigation of its own facilities and golf courses or the cooling of certain industrial equipment and facilities.

(<https://www.emasesa.com/compromiso-social/gestion-sostenible-del-ciclo-integral-del-agua/>)



Please, considering the processes and technologies implemented, identify and describe problems and areas for improvement, for instance:

- Energy consumption.
- Pollutant removal efficiency.
- Waste produced.
- Cost effectiveness issues.
- Control and monitoring issues.

1. Energy consumption: the challenge is self-sufficiency. EMASESA currently produces 80% of what it consumes.

2. Treatment performance for certain pollutants: Its wastewater treatment plants meet the requirements of the discharge regulations.

3. Waste generated: EMASESA gives a second use to the waste it generates:

- \*Sludge: it is returned to agriculture, biogas is produced and transformed into energy.
- \*Sand: used as a raw material on construction sites.
- \*Floats (mostly plastics): in the pipeline
- \*Wastes: cannot be recycled

Applying the essence of the circular economy, EMASESA uses the waste it generates in its wastewater treatment plants, transforming it into raw materials, with the exception of sludge.

4. Efficiency in terms of costs: the greater the reuse of waste, the greater the reduction in costs.

5. Aspects related to control and monitoring: the Seville treatment plants are automated and the parameters are online at plant level.

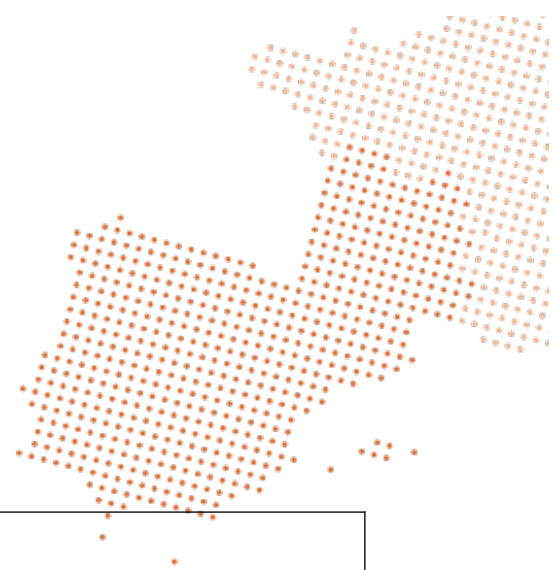
## 8. Investment

Does your organization have plans for investment in water management? Please describe briefly the planned investments.

\*Non-own funds: the Regional Ministry of Agriculture, Livestock, Fisheries and Sustainable Development (CAGPDS) has earmarked €65 million in its budget for the Copero Wastewater Treatment Plant (WWTP) to meet EU environmental criteria for nitrogen removal.

\*Own funds: EMASESA plans to make the following investments:

1. Eliminate 2 WWTPs (San Jerónimo and La Ranilla) by diverting their flows to the



Copero WWTP: budget €18.5 million.

2. Renovation of the piping networks in the city of Seville.

3. Extend the sewerage network with new storm tanks to regulate the flow of water collected after heavy rainfall and also to prevent contamination of the receiving watercourse.

## 9. Preliminary definition of needs

On the basis of previous questions, please could you list 5 needs from your organization and indicate briefly the main reason why you have these needs

	Needs	Reasons (regulations, plans, operational, customer requirements, etc.)
1	EMASESA in its role as an administrator that has to comply with the regulations for the management of sewage sludge and other organic waste. (MITLOP project: <a href="https://www.emasesa.com/wp-content/uploads/2019/05/EMASESA_Bases-Convocatoria-CPM-vf.pdf">https://www.emasesa.com/wp-content/uploads/2019/05/EMASESA_Bases-Convocatoria-CPM-vf.pdf</a> )	Comply with current regulations: *Draft of Estrategia Española de Economía Circular *Orden de 6 de agosto de 2018, conjunta de la Consejería de Agricultura, Pesca y Desarrollo Rural y de la Consejería de Medio Ambiente y Ordenación del Territorio, por la que se regula la utilización de lodos tratados de depuradora en el sector agrario
2	EMASESA in its role as an administrator that has to comply with future regulations on emerging pollutants.	Future regulation
3	EMASESA, in its role as a service provider, has to look for new solutions to the floating waste from the treatment process.	Future regulation



## 5.5 Annex 1.5. Empresa Municipal de Agua y Saneamiento de Murcia, S.A.

### Interview questions

#### 1. Contact

Organization	EMPRESA MUNICIPAL DE AGUA Y SANEAMIENTO DE MURCIA, S.A. (EMUASA)
Name of the contact person	Eva Mena Gil
E-mail	eva.mena@emuasa.es
Phone number	+34 968 27 80 00

#### 2. Interviewees

Position	Head of Innovation
Brief description of duties	Coordination of research, development and innovation projects.
Full name	Eva Mena Gil
E-mail	eva.mena@emuasa.es

#### 3. Role of your organization in the management of the water cycle

Please describe the role of your organization in the field of water management addressing the following questions:

- Type of organisation (municipality, regional government, public company, etc.).
- Responsibilities in water management.
- Links with other organizations in the field of water management in your region (please describe and draw a scheme about the water management bodies and competent authorities in your region/municipality).





**\*TYPE OF ORGANISATION/COMPETENCES IN WATER MANAGEMENT:**

Empresa Municipal de Agua y Saneamiento de Murcia, S.A., a mixed company created in 1989 with 51% of Murcia City Council and 49% of Hidrogea, a company that carries out the integral water cycle service in the municipality of Murcia, from catchment, to the return of reused water to the natural environment.

**\*RELATIONSHIP WITH OTHER BODIES RESPONSIBLE FOR WATER MANAGEMENT IN THE REGION**

- Entidad de Saneamiento y Depuración de la Región de Murcia
- Confederación Hidrográfica del Segura
- Dirección General del agua

#### 4. Goals and ambitions

Please describe the main mid and long-term goals in your region (strategies and plans in the field of water management).

The main objectives of EMUASA, and also of the municipality of Murcia, is the possibility of being able to comply with the new Directive on reused water, which will come into force in a few years.

As well as the new directives for the agricultural application of sludge.

#### 5. Regulations

Please identify and describe the main policies and regulations influencing water management in your region. Please consider:

- European directives and national and regional laws related to Water Framework Directive.
- Policies and regulations in the field of sanitation, agriculture, environment, etc. influencing water uses.

**EUROPEAN REGULATIONS:**

\*Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment “concerns the collection, treatment and discharge of urban waste water and the treatment and discharge of waste water from certain industrial sectors. The objective of the Directive is to protect the environment from the adverse effects of the abovementioned waste water discharges.”



(<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31991L0271> )

\*Directive 2000/60/EC: framework for Community action in the field of water policy: "It sets out rules to halt deterioration in the status of European Union (EU) water bodies and achieve 'good status' for Europe's rivers, lakes and groundwater by 2015".

(<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0060> )

\*Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council: "This Directive lays down environmental quality standards (EQS) for priority substances and certain other pollutants as provided for in Article 16 of Directive 2000/60/EC, with the aim of achieving good surface water chemical status and in accordance with the provisions and objectives of Article 4 of that Directive."

(DOUE n° 348 de 24/12/2008 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0105> )

\* Commission Directive 2009/90/EC of 31 July 2009 laying down, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, technical specifications for chemical analysis and monitoring of water status: "This Directive lays down technical specifications for chemical analysis and monitoring of water status in accordance with Article 8(3) of Directive 2000/60/EC. It establishes minimum performance criteria for methods of analysis to be applied by Member States when monitoring water status, sediment and biota, as well as rules for demonstrating the quality of analytical results."

(DOUE n.º 201 de 01/08/2009 <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32009L0090> )

#### SPANISH REGULATIONS:

\*Real Decreto Legislativo 1/2001, de 20 de julio, por el que se aprueba el texto refundido de la Ley de Aguas: the objective of this law is "the regulation of the public water domain, the use of water" "as well as "the establishment of the basic rules for the protection of inland, coastal and transitional waters, without prejudice to their legal classification and the specific legislation applicable to them...". Inland surface waters, as well as renewable groundwaters, all of which are integrated into the hydrological cycle...".

(BOE n.º 176 de 24/07/2001 <https://www.boe.es/buscar/act.php?id=BOE-A-2001-14276>)

\*Real Decreto 1620/2007, de 7 de diciembre, por el que se establece el régimen jurídico de la reutilización de las aguas depuradas: "Its purpose is to establish the legal regime for the reuse of treated water, in accordance with Article 109.1 of the revised text of the Water Act, approved by Royal Legislative Decree 1/2001 of 20 July 2001.



(BOE n.º 294 de 08/12/2007 <https://www.boe.es/buscar/doc.php?id=BOE-A-2007-21092>)

\*Real Decreto 60/2011, de 21 de enero, sobre las normas de calidad ambiental en el ámbito de la política de aguas: "aims to transpose all aspects contained in Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008. It also incorporates the technical requirements on chemical analysis set out in Commission Directive 2009/90/EC of 31 July 2009.... Both legislative texts are thus incorporated into Spanish domestic law". (BOE n.º 19, de 22/01/2011 <https://www.boe.es/buscar/doc.php?id=BOE-A-2011-1139>)

REGIONAL REGULATION:

It is governed by national regulations.

LOCAL REGULATION:

It is governed by national regulations.

## 6. Existing and/or potential gaps

Please (if applicable) identify:

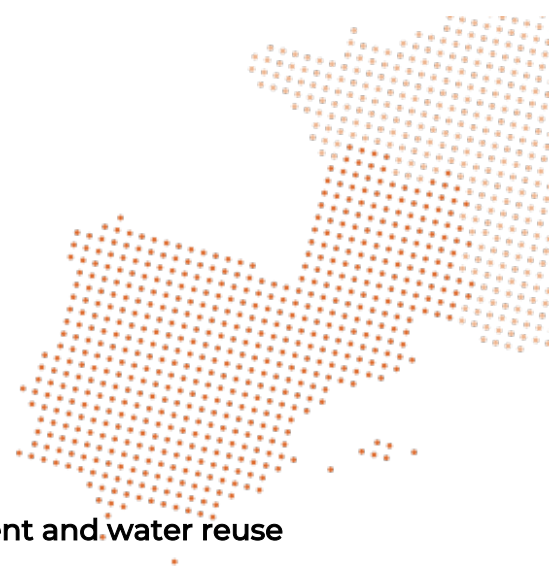
- Gaps between the current status of water management in your region/municipality and current goals, objectives, etc. in regulations, plans and strategies.
- Potential gaps between the current status of water management in your region/municipality and future goals, objectives, etc. in regulations, plans and strategies.

1. What is not being complied with and what should be complied with in the different current regulations?

The current regulations are very general and should be more specific for each population.

2. What will need to be complied with in future regulations or strategies that are currently difficult to comply with?

At present, the drafts of the future regulations for reused water and sludge are going to request certain qualities that many installations will not be able to comply with at present, which makes it necessary to think about future investments that nobody is taking into account.



## 7. Processes and technologies in wastewater management and water reuse

Please describe briefly and draw a scheme of the main processes managed by your organization and the main technologies implemented related to wastewater management and water reuse (if applicable).

The main characteristics of the WWTPs operated by EMUASA are shown below:

- Baños y Mendigo WWTP: Prolonged aeration biological treatment with anoxic stage. Direct reuse for agricultural use.
- Barqueros WWTP: Extended aeration biological treatment. Direct reuse for agricultural use.
- Cabezo de La Plata WWTP: Extended aeration biological treatment.
- Nueva Corvera WWTP: Biological treatment using a biological carousel.
- La Murta WWTP: Extended aeration biological treatment with anoxic stage.
- Los Cañares WWTP: Membrane bioreactors. Direct reuse for urban use.
- Hacienda Riquelme WWTP: Membrane Bioreactors. Direct reuse for sports use.
- El Valle WWTP: Membrane Bioreactors. Direct reuse for sports use.
- El Escobar WWTP: Biological treatment by biological carousel. Direct reuse for sports use.
- Martínez del Puerto WWTP: Extended aeration biological treatment. Direct reuse for agricultural use.
- El Raal WWTP: Active sludge with anoxic and oxic reactors and aerobic digestion. Direct reuse for environmental use.
- Nueva Sucina WWTP: Biological treatment by means of biological carousel. Direct reuse for agricultural and sports use.
- Casas Blancas WWTP: Extended aeration biological treatment with anoxic stage. Direct reuse and agricultural use.
- Murcia East WWTP: A2O activated sludge with anaerobic digestion and cogeneration stage from biogas. Indirect reuse in public watercourse.
- Mosa Trajectum WWTP: Biological treatment using the Orbal system.

In 2018, 10.8% of treated water was directly reused in accordance with Royal Decree 1620/2007. If direct and indirect reuse is taken into account, the % of water reused would be 99.4%.

Please, considering the processes and technologies implemented, identify and describe problems and areas for improvement, for instance:

- Energy consumption.
- Pollutant removal efficiency.
- Waste produced.



- Cost effectiveness issues.
- Control and monitoring issues.

EMUASA has been committed to innovation for more than 20 years, which means that every year we see strategic plans and projects that are in line with current concerns. EMUASA has spent the last 5 years with a strategic plan and sustainable development plans directly linked to the circular economy, where we carry out projects and are committed to:

- Valorisation of effluents.
- Sludge recovery.
- Waste recovery.
- Biogas recovery.
- Energy efficiency projects.

We must continue to make progress along lines that provide a way out of climate change.

### 8. Investment

Does your organization have plans for investment in water management? Please describe briefly the planned investments.

EMUASA, being a mixed company, is governed by a Board of Directors that annually approves investment plans (annual, bi-annual or tri-annual) both for investments to improve infrastructures and for the improvement of new technologies, but always subject to the acceptance of the company's Board of Directors.

### 9. Preliminary definition of needs

On the basis of previous questions, please could you list 5 needs from your organization and indicate briefly the main reason why you have these needs

	Needs	Reasons (regulations, plans, operational, customer requirements, etc.)
1	Investment in infrastructure	New regulations, different operational treatments, etc...



## 5.6 Annex 1.6. Bordeaux Metropole

### Interview questions

#### 1. Contact details

Organization	L'UNIVERSITÉ DE LIMOGES
Name of the contact person	Midgley, Stephen Deluchat, Veronique
E-mail	stephen.midgley@unilim.fr veronique.deluchat@unilim.fr
Phone number	+33 5 55 45 77 73

#### 2. Interviewees

Position	Technician, Water Department, Bordeaux Métropole
Brief description of duties	In charge of the control of the delegatee of the public sanitation service
Full name	POULY Nicolas
E-mail	n.pouly@bordeaux-metropole.fr

#### 3. Role of your organization in the management of the water cycle

Please describe the role of your organization in the field of water management addressing the following questions:

- Type of organisation (municipality, regional government, public company, etc.).
- Responsibilities in water management.
- Links with other organizations in the field of water management in your region (please describe and draw a scheme about the water management bodies and competent authorities in your region/municipality).





As the organizing authority of the public service for the management of wastewater and urban storm water, Bordeaux Métropole is constantly ensuring the provision of a quality service to all its users and means of respecting the environment, in the compliance with current regulations and the water policy adopted by the Community Council of December 2011. Bordeaux Métropole thus takes charge of public sanitation service installations: definition of the territorial equipment policy, financing and construction of the water collection and treatment systems, renovation/maintenance of the system.

Bordeaux Métropole has delegated the operation of the public sewerage sanitation service on the metropolitan territory, with the exception of the municipality of Martignas-sur-Jalle, and rainwater management throughout the metropolitan area, as part of a leasing contract, at SABOM (Bordeaux-Metropole Sanitation Company) from 01/01/2019.

Bordeaux Métropole has implemented a very important program of fight against the floods with the realization of specific works in particular:

- 44 basins of spreading and retention (with a total capacity of 2 150 000 m<sup>3</sup>)
- 49 lift stations and pumping stations
- 1980 km of pipelines for collection
- 1 telecontrol center, RAMSES, which monitors sanitation equipment and works 24 hours a day and controls their regulation in real time to fight against floods.
- "Offset solutions" for stormwater remediation at nearly 450 sites. By this, you can understand the techniques used to defer the evacuation of rainwater by storing them locally, thanks to the use of porous materials.

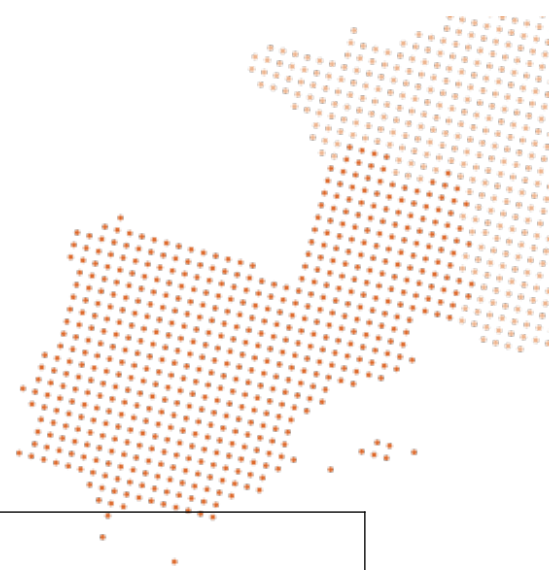
In parallel, Bordeaux Métropole has developed a large network of 1500 km of wastewater collectors that join 10 wastewater treatment plants.

#### 4. Goals and ambitions

Please describe the main mid and long-term goals in your region (strategies and plans in the field of water management).

The policy for water services of Bordeaux Metropole is based on 5 themes:

1. To preserve and rebuild the water quality in the region, whilst providing water resources to over 1 million people.
2. To preserve the natural environment and its biodiversity
3. To affirm the role of responsible authority and assure a balanced approach for its services, responding to the needs of the users



- 4. To develop a participative management approach
- 5. To give water its place within the urban projects

## 5. Regulations

Please identify and describe the main policies and regulations influencing water management in your region. Please consider:

- European directives and national and regional laws related to Water Framework Directive.
- Policies and regulations in the field of sanitation, agriculture, environment, etc. influencing water uses.

-All texts here (in french): <https://www.collectivites-locales.gouv.fr/lois-et-reglementation-sur-leau-et-lassainissement>

For agriculture: Arrêté du 8 janvier 1998 fixant les prescriptions techniques applicables aux épandages de boues sur les sols agricoles pris en application du décret n° 97-1133 du 8 décembre 1997 relatif à l'épandage des boues issues du traitement des eaux usées/

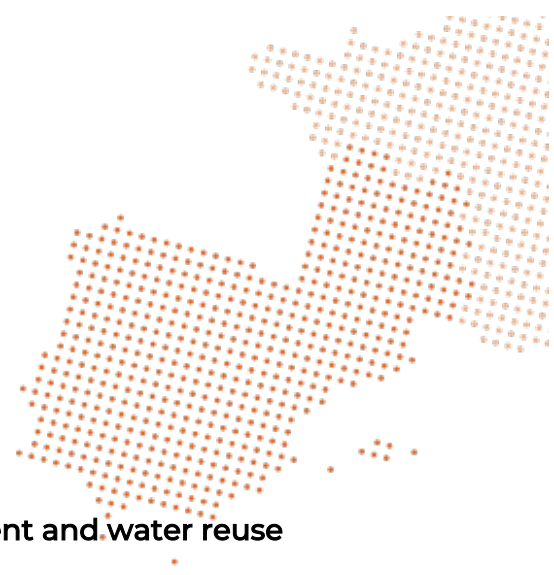
(Order of 8 January 1998 establishing the technical requirements applicable to the spreading of sludge on agricultural land adopted pursuant to Decree No. 97-1133 of 8 December 1997 on the spreading of sludge from waste water treatment): <https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000000570287>

## 6. Existing and/or potential gaps

Please (if applicable) identify:

- Gaps between the current status of water management in your region/municipality and current goals, objectives, etc. in regulations, plans and strategies.
- Potential gaps between the current status of water management in your region/municipality and future goals, objectives, etc. in regulations, plans and strategies.

-



## 7. Processes and technologies in wastewater management and water reuse

Please describe briefly and draw a scheme of the main processes managed by your organization and the main technologies implemented related to wastewater management and water reuse (if applicable).

The principal treatment processes are plate settling tanks and biofiltration. Treatment of the sediments is via digestion, centrifugation and drying. Water reuse is performed at certain stations, to be reused within the station. Energy recovery is also performed at certain stations.

The biological treatment of wastewater is carried out by fixed culture processes for the most important stations (activated sludge for the Cailhocs and Lille stations).

For the treatment of sludge, all treatment plants have a dehydration system and the two main stations (Louis Fargue and Clos-de-Hilde), thermal dryers. The main destination of sludge is the composting of sludge with green waste for agricultural valorization. All these stations are equipped with deodorization to release as little as possible odorous air.

These stations produce energy through the installation of digesters that generate biogas. This gas is upgraded, thermally, on a local scale or by reinjection into an urban network (project in progress at Clos de Hilde), but also in the production of electricity by a cogeneration process (Louis Fargue).

Please, considering the processes and technologies implemented, identify and describe problems and areas for improvement, for instance:

- Energy consumption.
- Pollutant removal efficiency.
- Waste produced.
- Cost effectiveness issues.
- Control and monitoring issues.

\*Reducing the level of parasitic waters - The exploitation of the data collected during 4 years shows that 64% of the water flowing to the entrance of Bordeaux Métropole wastewater treatment plants are Clear Waters.

\*Energy optimization - a project of valorization of the biogas produced by the purification station of Clos-de-Hilde will be launched.

\*Reduction of odour pollution - For the treatment of sludge, all treatment plants have a dehydration system and the two main stations (Louis Fargue and Clos-de-Hilde),



thermal dryers. The main destination of sludge is the composting of sludge with green waste for agricultural valorization. All these stations are equipped with deodorization to release as little as possible odorous air. Investments are foreseen at a later date, as other issues are higher priority at this stage.

\*Reduction of carbon footprint. Two stations produce energy through the installation of digesters that generate biogas. This gas is upgraded, thermally, on a local scale or by reinjection into an urban network (project in progress at Clos de Hilde), but also in the production of electricity by a cogeneration process (Louis Fargue).

## 8. Investment

Does your organization have plans for investment in water management? Please describe briefly the planned investments.

Bordeaux benefits from a wastewater collection and transport network functional in dry weather and the equipment program in treatment plants is completed, in accordance with the 1998 master plan. However, risks of saturation of certain transport and treatment are identified in the medium term. In particular, the processing capacities will reach their limits no later than 2035 and several pumping stations are already close to saturation. Consequently, the demographic growth of the metropolis expected on the horizon 2030, as well as the risk situations already identified in some structuring works, imply starting a program of reconnaissance and studies on certain works for the transport and treatment of waste. To date, an investment program has been planned for more than € 90M including tax to prevent the risks already identified and the definition of the works treatment capacity expansion kits must be initiated without delay. A limitation of the discharges of unit water in rainy weather is also necessary to meet new regulations that protect the quality of natural environments.

## 9. Preliminary definition of needs

On the basis of previous questions, please could you list 5 needs from your organization and indicate briefly the main reason you have these needs?

	Needs	Reasons (regulations, plans, operational, customer requirements, etc.)
1	Wastewater very diluted by parasitic clear water	The average rate of permanent parasitic clear water * (ECP) in metropolitan France is 44% of wastewater and the rate of meteoric parasitic clear water * (ECPM) is 20 %. They have the drawback of diluting the effluents of wastewater and of reducing the transport



		capacity available in sewerage networks and treatment plants.
2	Estimation of the risks of dysfunction in wastewater networks	<p>The notion of risk of failure or malfunction of a wastewater network is difficult to qualify. This notion can be defined as follows:</p> <ul style="list-style-type: none"> <li>-an impossibility or the difficulty of evacuating the wastewater connected to the network, due to its too high loading (accentuated for example by the presence of clear parasitic permanent water or induced by an increase in population);</li> <li>-an uncontrolled overflow of the network, outside of rainy periods;</li> <li>-an uncontrolled overflow of the network during rainy events due to the intrusion of clear, parasitic meteoric waters;</li> <li>-degradation of the natural environment by soliciting network overflows, and consequently non-compliance with regulations.</li> </ul>
3	The hazard on collection and transport works	<p>EU structural complaints (from the metropolitan database): number of complaints by watershed.</p> <ul style="list-style-type: none"> <li>-The saturation rate * of pumping stations expressed as a percentage of saturation (for stations with a rate higher than 80%).</li> <li>-The rate of meteoric parasitic clear water * (ECPM) of wastewater and selective pumping stations expressed as a percentage of parasitic clear water. For a pumping station, the ECPM rate is the ratio between the annual volume of ECPM and the total annual volume pumped. The ECPM rates are assigned to each sub-watershed</li> </ul>
4	Capacity increase	<p>Directly linked to the increase in population in Bordeaux. (at this time the capacities of the stations increased by 60,000 pe) For the year 2010 (date of availability of census data), the total equivalent population of the agglomeration stood at 930,000 pee, including a domestic population of 720 000 EqH and a non-domestic population of 210,000 EqH2</p>



## 5.7 Annex 1.7. Instituto Superior Técnico

### Interview questions

#### 1. Contact details

Organisation	Instituto Superior Técnico
Name of the contact person	Ana Galvão
E-mail	Ana.galvao@tecnico.ulisboa.pt
Phone number	00351218418369

#### 2. Interviewees

Position	-
Brief description of duties	-
Name	Mário Matos
E-mail	mario.matos@tecnico.ulisboa.pt

#### 3. Role of your organization in the management of the water cycle

Please describe the role of your organization in the field of water management addressing the following questions:

- Type of organisation (municipality, regional government, public company, etc.).
- Responsibilities in water management.
- Links with other organizations in the field of water management in your region (please describe and draw a scheme about the water management bodies and competent authorities in your region/municipality).

Instituto Superior Técnico (IST) is a Higher Education Institution. Its position in the water cycle is mostly as an end user, having consumptions equivalent to domestic users, consumption associated with laboratories and also associated to the several restaurants and snack-bars inside the campus.





IST is strongly committed to reduce its water consumptions and wastewater generation and has achieved a water consumption reduction of 59% between 2010 and 2019.

#### 4. Goals and ambitions

Please describe the main mid and long-term goals in your region (strategies and plans in the field of water management).

##### Strategic Plan for Water Supply and Wastewater Sanitation 2020

It sets a Strategic Framework, organized in 5 axes and 19 operational objectives. It also defines an Action Plan designed through a set of 48 measures supported by 135 actions that aim to achieve the operational objectives.

The 5 axes are:

- environmental protection and improve the quality of water bodies;
- improve the quality of services provided;
- efficient resource management and optimization;
- economic, financial and social sustainability;
- basic and transversal conditions

##### National Program for Efficient Water Use – implementation 2012-2020

It has as Specific Objectives (topic related):

Urban Sector: Minimize the use of drinking water in activities that may perform as well with waters of alternative quality and from sources other than the public drinking water network by promoting the use of rainwater and the eventual reuse of treated wastewater;

Industrial sector: Reduction of water consumption and wastewater volumes generated through the adequacy of procedures, more efficient use of equipment and devices and the adoption of water reuse/recirculation systems;

##### National Action Plan for the Circular Economy

Includes a set of macro, meso and micro actions to promote the Circular Economy Model in the country.

It aims to develop new economically viable and environmentally efficient products and services based on ideally perpetual upstream and downstream conversion cycles. The results are minimizing resource extraction, maximizing reuse, increasing efficiency and developing new business models.

##### National Smart Specialization Strategy

Research and Innovation Strategy for Intelligent Specialization (EI&I) is an integral part



of Portugal's multilevel strategy. Portugal's Research and Innovation Strategy includes, in addition to the national strategy, the seven regional strategies and the components of inter-strategy alignment at the thematic and policy mix levels and contains a common governance space.

One of the axis is related to Natural Resources and Environment where the water topic is included.

## 5. Regulations

Please identify and describe the main policies and regulations influencing water management in your region. Please consider:

- European directives and national and regional laws related to Water Framework Directive.
- Policies and regulations in the field of sanitation, agriculture, environment, etc. influencing water uses.

### ***Main European plans and strategies***

#### Closing the loop - An EU action plan for the Circular Economy

In 2015, the European Commission adopted the EU Circular Economy Action Plan, which includes measures aimed to stimulate Europe's transition towards a circular economy.

The EU Action Plan for the Circular Economy establishes measures to "closing the loop" of product lifecycles through greater recycling and re-use, and bring benefits for both the environment and the economy. In particular, it committed to develop a number of actions to promote further uptake of water reuse at EU level. These actions are focused on overcoming the main barriers to the untapped potential for water reuse. Some of these actions are:

- Recommendations on how to better integrate water reuse in water planning and management within the EU policy framework and taking into account underlying environmental and socio-economic benefits ([Guidelines on Integrating Water Reuse into Water Planning and Management in the context of the Water Framework Directive](#))

Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on minimum requirements for water reuse. This proposal aims to establish a common legislative framework for water reuse in Europe.

### ***Other European plans and strategies***



### European Innovation Partnership Water - Strategic Implementation Plan (Sip)

The Strategic Implementation Plan (SIP) is a milestone in developing Europe's strategy with regard to water and innovation, combining a long term perspective with concrete short term actions. The SIP presents the views of the Steering Group of the European Innovation

Partnership (EIP) on Water with regard to its priorities and the actions to be taken to achieve the aims of the EIP Water to:

- Facilitate, support and speed up the development and deployment of innovative solutions to water challenges; and
- Create market opportunities for these innovations both inside and outside of Europe

It sets as a headline target by 2020: Identify, test, scale up, disseminate and stimulate the uptake of innovative solutions by the market and society for 10 major water related challenges.

It identifies the following priority areas of work:

- Water reuse and recycling;
- Water and wastewater treatment, including recovery of resources;
- Water-energy nexus;
- Flood and drought risk management;
- Ecosystem services.

In addition, cross-cutting priorities have been identified that address framework conditions, promote connections between the different priority areas of work, and are enablers for all other actions:

- Water governance;
- Decision support systems and monitoring;
- Financing for innovation.

Furthermore, "smart technology" has been identified to be of key relevance as an enabling factor within all other priorities.

### COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS - A Blueprint to Safeguard Europe's Water Resources

The "Blueprint" outlines actions that concentrate on better implementation of current water legislation, integration of water policy objectives into other policies, and filling the gaps in particular as regards water quantity and efficiency. The objective is to ensure that a sufficient quantity of good quality water is available for people's needs, the economy and the environment throughout the EU.



One of the Specific Objectives of the document is the maximisation of water reuse.

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE, THE COMMITTEE OF THE REGIONS AND THE EUROPEAN INVESTMENT BANK Investing in a smart, innovative and sustainable Industry A renewed EU Industrial Policy Strategy

This Communication outlines the main direction and priorities of that comprehensive industrial policy strategy – a strategy that empowers industries to create jobs and growth, that defends its regions and workers most affected by industrial change and that reinforces and protects Europe's leadership role, competitiveness and technological cutting-edge. The strategy provides an important point of reference and will enable a more coherent approach in the way we design, develop and implement our policies, regulation and financial programmes.

It focusses on promoting industrial competitiveness through a set of major initiatives, working towards EU industry for a modern, clean and fair economy.

It is aimed to 1) empower citizens by providing skills for industry, 2) revitalise regions through the development of clusters and the Smart Specialisation Platform, and 3) have the best technologies by supporting the digital transformation of industry and Key Enabling Technologies and promoting ICT standards

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS "Preparing for our future: Developing a common strategy for key enabling technologies in the EU"

In its 2009 Communication, 'Preparing for our future: Developing a common strategy for key enabling technologies in the EU', the Commission identified KETs that strengthen the EU's industrial and innovation capacity to address societal challenges and proposed measures to improve framework conditions. The Communication is part of the development of EU industrial policy and the preparation for the new European plan for innovation.

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL Addressing the challenge of water scarcity and droughts in the European Union

Highlights the need for the following challenges be addressed:

Ineffective water pricing policies which generally do not reflect the level of sensitivity of water resources at local level. The 'user pays' principle is hardly implemented beyond the sectors of drinking water supply and wastewater treatment. Introducing this principle at EU level would put an end to needless losses or waste, ensuring that water remains available for essential uses across Europe, including all parts of transboundary river basins. In other words, it would encourage efficient water use.



### Guidance document on adaptation to climate change in water management

This document identifies a number of sectoral adaptation measures that may positively interact with the WFD environmental objectives. One of the measures identified is:

Supply management and increase reuse and alternative sources e.g. development of water infrastructure, rainwater and greywater harvesting, appropriate use of irrigation reservoirs, matching different water qualities to different uses.

#### ***National plans and strategies (Portugal)***

##### Strategic Plan for Water Supply and Wastewater Sanitation 2020

It sets a Strategic Framework, organized in 5 axes and 19 operational objectives. It also defines an Action Plan designed through a set of 48 measures supported by 135 actions that aim to achieve the operational objectives.

The 5 axes are:

- environmental protection and improve the quality of water bodies;
- improve the quality of services provided;
- efficient resource management and optimization;
- economic, financial and social sustainability;
- basic and transversal conditions

##### National Program for Efficient Water Use – implementation 2012-2020

It has as Specific Objectives (topic related):

Urban Sector: Minimize the use of drinking water in activities that may perform as well with waters of alternative quality and from sources other than the public drinking water network by promoting the use of rainwater and the eventual reuse of treated wastewater;

Industrial sector: Reduction of water consumption and wastewater volumes generated through the adequacy of procedures, more efficient use of equipment and devices and the adoption of water reuse/recirculation systems;

##### National Action Plan for the Circular Economy

Includes a set of macro, meso and micro actions to promote the Circular Economy Model in the country.

It aims to develop new economically viable and environmentally efficient products and services based on ideally perpetual upstream and downstream conversion cycles. The results are minimizing resource extraction, maximizing reuse, increasing efficiency and developing new business models.

##### National Smart Specialization Strategy

Research and Innovation Strategy for Intelligent Specialization (EI&I) is an integral part of Portugal's multilevel strategy. Portugal's Research and Innovation Strategy includes,





in addition to the national strategy, the seven regional strategies and the components of inter-strategy alignment at the thematic and policy mix levels and contains a common governance space.

One of the axes is related to Natural Resources and Environment where the water topic is included.

### ***Regulations***

#### ***European Regulations***

Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (Water Framework Directive)

Establishes a framework for Community action in the field of water policy.

The purpose of this Directive is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater which:

- (a) prevents further deterioration and protects and enhances the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystems;
- (b) promotes sustainable water use based on a long-term protection of available water resources;
- (c) aims at enhanced protection and improvement of the aquatic environment, inter alia, through specific measures for the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emissions and losses of the priority hazardous substances;
- (d) ensures the progressive reduction of pollution of groundwater and prevents its further pollution, and
- (e) contributes to mitigating the effects of floods and droughts.

Directive 91/271/EEC on Urban Wastewater Treatment amended by the Directive 98/15/EC

Council Directive 91/271/EEC concerning urban wastewater treatment was adopted on 21 May 1991 to protect the water environment from the adverse effects of discharges of urban wastewater and from certain industrial discharges. On 27 February 1998 the Commission issued Directive 98/15/EC amending Directive 91/271/EEC to clarify the requirements of the Directive in relation to discharges from urban wastewater treatment plants to sensitive areas which are subject to eutrophication.

This Directive concerns the collection, treatment and discharge of urban wastewater and the treatment and discharge of wastewater from certain industrial sectors. The objective of the Directive is to protect the environment from the adverse effects of the above mentioned wastewater discharges.

Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL





on minimum requirements for water reuse. This proposal aims to establish a common legislative framework for water reuse in Europe.

COUNCIL DIRECTIVE of 12 June 1986 on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture as amended

The Sewage Sludge Directive 86/278/EEC seeks to encourage the use of sewage sludge in agriculture and to regulate its use in such a way as to prevent harmful effects on soil, vegetation, animals and man. To this end, it prohibits the use of untreated sludge on agricultural land unless it is injected or incorporated into the soil. Treated sludge is defined as having undergone "biological, chemical or heat treatment, long-term storage or any other appropriate process so as significantly to reduce its fermentability and the health hazards resulting from its use"

***National Regulations (Portugal)***

Law Decree 130/2012, of June 22nd (Amends and republished the Law58/2005, December 29<sup>th</sup>)

Transposes to internal law the Water Framework Directive

Law Decree 152/97, of June 19<sup>th</sup> (as amended)

Establishes the collection, treatment and discharge of urban wastewater in the aquatic environment.

Law Decree 236/98, of August 1st

It lays down quality standards, criteria and objectives for the purpose of protecting the aquatic environment and improving the quality of the water according to its main uses.

Law Decree 119/2019 of August 21st

Establishes the legal regime for the production of water for reuse, obtained from wastewater treatment, as well as from its use.

Law decree 276/2009, of October 2nd

Transposes to internal law the Sludge Directive

## 6. Existing and/or potential gaps

Please (if applicable) identify:

- Gaps between the current status of water management in your region/municipality and current goals, objectives, etc. in regulations, plans and strategies.



- Potential gaps between the current status of water management in your region/municipality and future goals, objectives, etc. in regulations, plans and strategies.

Not applicable for IST.

## 7. Processes and technologies in wastewater management and water reuse

Please describe briefly and draw a scheme of the main processes managed by your organization and the main technologies implemented related to wastewater management and water reuse (if applicable).

Currently most of the wastewater generated at IST is drained directly to the city's drainage system, which is mostly a combined sewer system.

At Alameda Campus the South Tower, which hosts the Chemical and Biotechnology Departments, has multiple laboratories and because of that has a small Wastewater Treatment Plant (WWTP) where the effluents are collected in a tank to adjust the pH and only after that the wastewaters are delivered to the municipal drainage system.

At the campus "Tecnológico e Nuclear", near Loures, there was a nuclear reactor installed for research purposes and the drainage system also delivered the wastewater in tanks to analyse and neutralize any existing radiation. These effluents were considered industrial effluents by the water utility that manages wastewater in Loures. The reactor has been deactivated now.

Please, considering the processes and technologies implemented, identify and describe problems and areas for improvement, for instance:

- Energy consumption.
- Pollutant removal efficiency.
- Waste produced.
- Cost effectiveness issues.
- Control and monitoring issues.

There is no equipment involved in wastewater management in Alameda campus.

The only equipment in Alameda campus is related to water supply and are water booster pumps installed in both Towers and the Physics building, but the energy needs are low.



There is no information regarding the WWTP efficiency of the South Tower nor its energy needs.

There the only control and monitoring of wastewater flow is through the control of water supply consumptions.

## 8. Investment

Does your organization have plans for investment in water management? Please describe briefly the planned investments.

Most of the investments were made regarding the water supply system. Alameda Campus has three separate water supply networks: one for the Civil Engineering Building, another for “Complexo Interdisciplinar” building and another for the rest of the campus.

There is automatic metering for the Civil Engineering building with a water metering software, WaterBeep, which registers water consumptions at a 15 minutes interval. There is also an automatic water metering for the Main building but in a different web platform (EnergIST). The rest of the buildings have individual water meters, but readings are not automatic.

The remaining water meters are being updated to install automatic meters. Records from each meter, with a measurement frequency up to 1 second, will be linked to the web platform EnergIST that allows campus managers to follow water consumptions daily. The link to the platform will have a cost of 20000€, and the expected payback period is of 1 year.

The daily monitoring of water consumptions will allow to detect abnormal consumptions and potential leaks on a larger number of buildings in the campus and act on them, thus also potentially reducing wastewater flows.

## 9. Preliminary definition of needs

On the basis of previous questions, please could you list 5 needs from your organization and indicate briefly the main reason you have these needs?

	Needs	Reasons (regulations, plans, operational, customer requirements, etc.)
1	Individual automatic metering in all buildings	To identify the different consumptions in the campus and track more easily the location of leaks. The estimated water



		savings are around 10%
2	A tool to model and track the water balance in Campus	To allow for accurate identification of leaks
3	Improve irrigation and build an independent irrigation system	The municipality is considering to allow water meters dedicated to irrigation purposes to differentiate the water price
4	Access/production of treated wastewater to use in activities that do not require potable water (drip irrigation, floor washes, etc.)	Close the water cycle locally to improve sustainability
5	Collection of rainwater to use it in irrigation	Reduced water consumption and close the water cycle locally



## 5.8 Annex 1.8. Águas do Tejo Atlântico

### Interview questions

#### 1. Contact details

Organisation	Águas do Tejo Atlântico
Name of the contact person	Rita Alves
E-mail	Rita.alves@adp.pt
Phone number	+351213107900

#### 2. Interviewees

Position	Asset Management Director
Brief description of duties	Responsible for the asset management department including risk analysis, drainage system management, GIS, IT and R&D and innovation, WRRF project manager
Name	Pedro Póvoa
E-mail	p.povoa@adp.pt

#### 3. Role of your organization in the management of the water cycle

Please describe the role of your organization in the field of water management addressing the following questions:

- Type of organisation (municipality, regional government, public company, etc.).
- Responsibilities in water management.
- Links with other organizations in the field of water management in your region (please describe and draw a scheme about the water management bodies and competent authorities in your region/municipality).

Águas do Tejo Atlântico, public company, is a leading company operating in the environmental sector in Portugal and its mission is to contribute to the pursuit of national objectives in the wastewater collection and treatment within a framework of



economic, financial, technical, social and environmental sustainability.

Águas do Tejo Atlântico has the responsibility to manage and operate the wastewater multi-municipality system of the Great Lisbon and West, guaranteeing the quality, continuity and efficiency of the water public services, in order to protect the public health, populations' welfare, the accessibility to the public services, the environmental protection and economic and financial sustainability of the sector, in a framework of equity and tariff stability, contributing also to the regional development and planning.

Águas do Tejo Atlântico exploits now a system that includes 103 Water Resource Recovery Facilities (WRRF), 268 pumping stations and 1093 km of main sewage system, and treats around 194 Mm<sup>3</sup>/yr, serving a population of 2,3 million inhabitants (served 23 municipalities: Alcobaça, Alenquer, Amadora, Arruda dos Vinhos, Azambuja, Bombarral, Cadaval, Caldas da Rainha, Cascais, Lisboa, Loures, Lourinhã, Mafra, Nazaré, Óbidos, Odivelas, Oeiras, Peniche, Rio Maior, Sintra, Sobral de Monte Agraço, Torres Vedras e Vila Franca de Xira) and a covered area of 4.145km<sup>2</sup>.

Águas do Tejo Atlântico develops R&D activities in partnership with other institutions, companies and universities in a wide range of subjects, including novel treatment processes and implementation of management and simulation tools for optimizing wastewater treatment and collection. R&D activities include participation in several national as well as in European projects and international awards recognition, by International Water Association (IWA) with a Global Honour Award for the project "AQUASAFE" developed in partnership with an European SME, which is related to operational platform for decision support systems in Lisbon sewage system.

#### 4. Goals and ambitions

Please describe the main mid and long-term goals in your region (strategies and plans in the field of water management).

##### Strategic Plan for Water Supply and Wastewater Sanitation 2020

It sets a Strategic Framework, organized in 5 axes and 19 operational objectives. It also defines an Action Plan designed through a set of 48 measures supported by 135 actions that aim to achieve the operational objectives.

The 5 axes are:

- environmental protection and improve the quality of water bodies;
- improve the quality of services provided;
- efficient resource management and optimization;
- economic, financial and social sustainability;
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National Program for Efficient Water Use – implementation 2012-2020

It has as Specific Objectives (topic related):

Urban Sector: Minimize the use of drinking water in activities that may perform as well with waters of alternative quality and from sources other than the public drinking water network by promoting the use of rainwater and the eventual reuse of treated wastewater;

Industrial sector: Reduction of water consumption and wastewater volumes generated through the adequacy of procedures, more efficient use of equipment and devices and the adoption of water reuse/recirculation systems;

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Includes a set of macro, meso and micro actions to promote the Circular Economy Model in the country.

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National Smart Specialization Strategy

Research and Innovation Strategy for Intelligent Specialization (EI&I) is an integral part of Portugal's multilevel strategy. Portugal's Research and Innovation Strategy includes, in addition to the national strategy, the seven regional strategies and the components of inter-strategy alignment at the thematic and policy mix levels and contains a common governance space.

One of the axes is related to Natural Resources and Environment where the water topic is included.

## 5. Regulations

Please identify and describe the main policies and regulations influencing water management in your region. Please consider:

- European directives and national and regional laws related to Water Framework Directive.
- Policies and regulations in the field of sanitation, agriculture, environment, etc. influencing water uses.

***Main European plans and strategies***

Closing the loop - An EU action plan for the Circular Economy



In 2015, the European Commission adopted the EU Circular Economy Action Plan, which includes measures aimed to stimulate Europe's transition towards a circular economy.

The EU Action Plan for the Circular Economy establishes measures to "closing the loop" of product lifecycles through greater recycling and re-use and bring benefits for both the environment and the economy. In particular, it committed to develop a number of actions to promote further uptake of water reuse at EU level. These actions are focused on overcoming the main barriers to the untapped potential for water reuse. Some of these actions are:

- Recommendations on how to better integrate water reuse in water planning and management within the EU policy framework and taking into account underlying environmental and socio-economic benefits ([Guidelines on Integrating Water Reuse into Water Planning and Management in the context of the Water Framework Directive](#))

Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on minimum requirements for water reuse. This proposal aims to establish a common legislative framework for water reuse in Europe.

#### ***Other European plans and strategies***

##### European Innovation Partnership Water - Strategic Implementation Plan (Sip)

The Strategic Implementation Plan (SIP) is a milestone in developing Europe's strategy with regard to water and innovation, combining a long term perspective with concrete short term actions. The SIP presents the views of the Steering Group of the European Innovation

Partnership (EIP) on Water with regard to its priorities and the actions to be taken to achieve the aims of the EIP Water to:

- Facilitate, support and speed up the development and deployment of innovative solutions to water challenges; and
- Create market opportunities for these innovations both inside and outside of Europe

It sets as a headline target by 2020: Identify, test, scale up, disseminate and stimulate the uptake of innovative solutions by the market and society for 10 major water related challenges.

It identifies the following priority areas of work:

- Water reuse and recycling;
- Water and wastewater treatment, including recovery of resources;
- Water-energy nexus;
- Flood and drought risk management;



- Ecosystem services.

In addition, cross-cutting priorities have been identified that address framework conditions, promote connections between the different priority areas of work, and are enablers for all other actions:

- Water governance;
- Decision support systems and monitoring;
- Financing for innovation.

Furthermore, "smart technology" has been identified to be of key relevance as an enabling factor within all other priorities.

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS - A Blueprint to Safeguard Europe's Water Resources

The "Blueprint" outlines actions that concentrate on better implementation of current water legislation, integration of water policy objectives into other policies, and filling the gaps in particular as regards water quantity and efficiency. The objective is to ensure that a sufficient quantity of good quality water is available for people's needs, the economy and the environment throughout the EU.

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COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE



## COMMITTEE OF THE REGIONS "Preparing for our future: Developing a common strategy for key enabling technologies in the EU"

In its 2009 Communication, 'Preparing for our future: Developing a common strategy for key enabling technologies in the EU', the Commission identified KETs that strengthen the EU's industrial and innovation capacity to address societal challenges and proposed measures to improve framework conditions. The Communication is part of the development of EU industrial policy and the preparation for the new European plan for innovation.

## COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL Addressing the challenge of water scarcity and droughts in the European Union

Highlights the need for the following challenges be addressed:

Ineffective water pricing policies which generally do not reflect the level of sensitivity of water resources at local level. The 'user pays' principle is hardly implemented beyond the sectors of drinking water supply and wastewater treatment. Introducing this principle at EU level would put an end to needless losses or waste, ensuring that water remains available for essential uses across Europe, including all parts of transboundary river basins. In other words, it would encourage efficient water use.

### Guidance document on adaptation to climate change in water management

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### ***Regulations***

#### ***European Regulations***

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Establishes a framework for Community action in the field of water policy.

The purpose of this Directive is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater which:

(a) prevents further deterioration and protects and enhances the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystems;

(b) promotes sustainable water use based on a long-term protection of available water resources;



(c) aims at enhanced protection and improvement of the aquatic environment, inter alia, through specific measures for the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emissions and losses of the priority hazardous substances;

(d) ensures the progressive reduction of pollution of groundwater and prevents its further pollution, and

(e) contributes to mitigating the effects of floods and droughts.

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Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on minimum requirements for water reuse. This proposal aims to establish a common legislative framework for water reuse in Europe.

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***National Regulations (Portugal)***

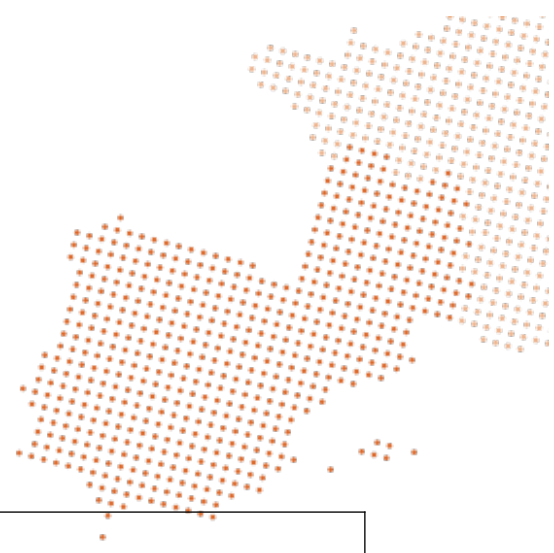
Law Decree 130/2012, of June 22nd (Amends and republished the Law58/2005, December 29<sup>th</sup>)

Transposes to internal law the Water Framework Directive

Law Decree 152/97, of June 19<sup>th</sup> (as amended)

Establishes the collection, treatment and discharge of urban wastewater in the aquatic environment.





### Law Decree 236/98, of August 1st

It lays down quality standards, criteria and objectives for the purpose of protecting the aquatic environment and improving the quality of the water according to its main uses.

### Law Decree 119/2019 of August 21st

Establishes the legal regime for the production of water for reuse, obtained from wastewater treatment, as well as from its use.

### Law decree 276/2009, of October 2nd

Transposes to internal law the Sludge Directive

## 6. Existing and/or potential gaps

Please (if applicable) identify:

- Gaps between the current status of water management in your region/municipality and current goals, objectives, etc. in regulations, plans and strategies.
- Potential gaps between the current status of water management in your region/municipality and future goals, objectives, etc. in regulations, plans and strategies.

-The management of industrial wastewater needs to be improved. Currently the licensing of industrial discharges is made by the municipality, but since industries create jobs, there can be a conflict of interests in this situation. One solution could be the creation of a regulation entity specific to industrial wastewater, since the Portuguese Environment Agency cannot fill this position.

-stormwater represents another gap since they lack a business model. Stormwater systems are under the responsibility of municipalities, but few are managed properly since they do not generate income. Incentives should be created to apply fees to stormwater management and define a business model. Water reuse would also be included in this business model.

-at the municipality level there is a lack of good practices to be applied in cities against climate change. Water has a very strong role in cities, but there is a lack of a plan to adapt to climate change for each municipality.

-private wells below 5 horsepower capacity do not need licensing. This leads land owners to consider the water as theirs, but this contradicts the Water Law that considers water from public domain.





## 7. Processes and technologies in wastewater management and water reuse

Please describe briefly and draw a scheme of the main processes managed by your organization and the main technologies implemented related to wastewater management and water reuse (if applicable).

In AdTA most of the WWTP have a secondary treatment based in Activated Sludge. Large plants > 50000 inhabitants have anaerobic digestion. Water reuse for internal uses (inside the WWTP) is achieved through microfiltration followed by UV disinfection and sodium hypochlorite. In a very short time range new projects for WW reuse are planned, where ultrafiltration will be introduced as the final treatment step.

Please, considering the processes and technologies implemented, identify and describe problems and areas for improvement, for instance:

- Energy consumption.
- Pollutant removal efficiency.
- Waste produced.
- Cost effectiveness issues.
- Control and monitoring issues.

### -Energy consumption

Activated sludge are energy intensive process but recent developments in granular AS and mainstream anammox and combination with physico-chemical process aligned with anaerobic digestion are changing the plants to energy neutral. Moreover, side stream treatments and centralization of the sludge system are contributing to the energy neutrality in the WW sector

### -Pollutant removal efficiency

Related with carbon, nitrogen and phosphorus, the processes and technologies implemented in AdTA's WWTP can achieve more than 95% of efficiency removal.

Regarding micropollutants studies show efficiency removal ranges between 15% to more than 90%, depending on the pollutant, and more information is needed to put more physical barriers in the system such as nanofiltration and ultrafiltration.

To achieve even higher removal rates for standard pollutants like organic matter, advanced oxidation treatment such as ozone or UV with hydrogen peroxide need to be



used.

-Waste produced

All AS configurations have significant sludge production and recent developments with high rate anaerobic digestion increase the solids reduction by about 20%

Nevertheless, the sludge is being seen more and more as a resource rather than a waste due to its nitrogen and phosphorus content.

-Cost effectiveness issues

For conventional treatment the costs are recovered for medium-large systems but it is difficult to recover costs for small system. The implementation of advanced treatment makes more difficult the cost recovery and urges the need for new business models and regulation

Costs with non-stabilized sludge (with microorganism) have doubled in the last year

-Control and monitoring issues

WW matrix is not an easy environment and leads to a quick degradation of sensors and consumables. Nevertheless, typical monitoring is related with flow, pH, and some advances in spectrophotometric probes.

Control of activated sludge is based on oxygen and nitrogen but requires a lot of human maintenance.

**8. Investment**

Does your organization have plans for investment in water management? Please describe briefly the planned investments.

AdTA has a concession contract until 2045 and the investment plans are related with revamping and upgrading the 370 infrastructures (WWTP, pumping systems and sewers)

**9. Preliminary definition of needs**

On the basis of previous questions, please could you list 5 needs from your organization and indicate briefly the main reason you have these needs?

	Needs	Reasons (regulations, plans, operational, customer requirements, etc.)
1	Water reuse funding	Difficult access to funds



2	Stormwater	Lack of regulation
3	Funding for innovation in energy efficiency in wastewater	Only internal funding exists. EU has a lot of funding in the energy sector, especially for cities but not for WWTP specifically
4	Reform Public procurement – reduce bureaucracy	Regulation and transparency



## 6 ANNEX 2. QUESTIONNAIRES ON THE IDENTIFIED NEEDS COMPLETED

### 6.1 Annex 2.1. Limoges Metropole

#### Potential needs for public procurement of innovation

Organization:

Limoges metropole.

Description:

The collective sanitation competence, exercised by Limoges Métropole, is a public service of an industrial and commercial nature. It is divided into two business segments:

- Wastewater management, which aims to preserve water resources and protect the environment in order to control the impact of human activity, but also to address public health and safety issues through the implementation of environmentally friendly technologies.
- Stormwater management to prevent the impact of the increase in impermeable surfaces (floods, pollution) linked to urbanization and to promote it, but also to improve collective wastewater treatment by separating networks aimed at reducing the volumes entering treatment plants.

These skills are implemented by studying the territory in order to define the techniques to be developed according to different choice criteria (urbanization, soil qualification, population density, cost of work).

Limoges Métropole directly manages and operates the collection and purification systems of 14 municipalities: Aureil, Bonnac la Côte, Condat sur Vienne, Eyjeaux, Feytiat, Isle, Le Palais-sur-Vienne, Le Vigen, Limoges, Peyrilhac,



Rilhac Rancon, Saint Gence, Solignac and Veyrac. 4 The other 4 municipalities of Limoges Métropole: Boisseuil, Panazol, Saint-Just le Martel and Verneuil sur Vienne are entrusted to SAUR within the framework of public service delegation contracts.

Identified needs:

Need 1	Break prediction models.
Brief description	To improved network asset management, it will be necessary to set up a modelling tool that integrate an artificial intelligence module to predict the areas that have the greatest risk of breakage.
Contextualization	Legislation, environmental protection, cost optimization (OPEX and CAPEX).

Need 2	Reliable pipe inspection.
Brief description	To improved network asset management, there is a need of faster and more reliable pipe inspection techniques with better shape/breakage recognition.
Contextualization	Legislation, environmental protection, cost optimization (OPEX and CAPEX).

Need 3	Improve and speed up the acceptance phases of work and interventions.
Brief description	To improve network asset management, it will be necessary to improve and speed up the acceptance phases of work and interventions carried out on the network.
Contextualization	Legislation, environmental protection, costs optimization (OPEX and CAPEX).

Need 4	Prevent combined sewer overflows of incoming pollutants.
Brief description	Improve network monitoring to limit combined sewer overflows to 5% of incoming pollutant flows. For this, it will be



	necessary new solutions such as measurement and data acquisition system as well as IT infrastructure for data storage and processing that is affordable for Limoges Metropole.
Contextualization	Legislation, environmental protection.

Need 5	Improve resiliency of sewage system against combined sewer overflows.
Brief description	If the pollutant releases by CSO (combined sewer overflow) exceed 5% of the incoming pollutant load, it will be necessary to determine the work to be carried out. Need for affordable infrastructure for Limoges Metropole.
Contextualization	Legislation, environmental protection, costs optimization (OPEX and CAPEX).





## 6.2 Annex 2.2. Adour-Garonne Water Agency

### Potential needs for public procurement of innovation

Organization:

Adour-Garonne Water Agency.

Description:

Created by the 1964 Water Law, the Adour-Garonne Water Agency is a public institution of the State.

The Agency implements, in the Adour-Garonne basin, the objectives and provisions of the master plan for water development and management (SDAGE and its local versions, the SAGEs), by promoting balanced and economical management of water resources and aquatic environments.

The objective of the Agency is to contribute to the achievement of good status for all waters in the Adour-Garonne basin and to seek a balance between available resources and water needs.

Its main lines of action are as follows:

- improve water quality (priority to drinking water supply),
- reduce the impact of human activities on aquatic environments,
- ensure the natural functionalities of aquatic environments,
- place water at the centre of spatial planning,
- master the quantitative management of rivers, especially in summer,
- sustainable groundwater management.

The Agency levies fees for water pollution and water abstractions according to the "polluter-pays" and "withdrawer-pays" principles.

Thanks to this money, it provides financial assistance to project owners and water stakeholders (local authorities, companies, farmers, associations, individuals) to help them equip themselves with facilities for depollution, the creation of water resources or to encourage them to save water.



Identified needs:

Need 1	Phosphorus valorisation.
Brief description	New solutions to treat and valorise phosphorus from wastewater, including in small wastewater treatment plants.
Contextualization	Compliance with legislation, protection of the environment and water resources, recovery of a limited resource (phosphorus).

Need 2	Circular economics of wastewater nutrients.
Brief description	Recycling and valorisation of nutrients during the wastewater treatment and sludge management phases.
Contextualization	Protection of the environment and water resources, recovery of a limited resources.

Need 3	Diagnosis of the sewerage network.
Brief description	New solutions for a permanent diagnosis of the sewerage network => need of solution for real time monitoring, data collection and data treatment.
Contextualization	Compliance with legislation, protection of the environment and resources, recovery of a limited resource (phosphorus) cost optimization (OPEX and CAPEX).

Need 4	Water reuse.
Brief description	New and adapted solutions to reuse of treated wastewater in rural areas.
Contextualization	Protection of the environment and water resources.

Need 5	Decentralized systems.
Brief description	New models to change the system from a centralized to a decentralized system. The idea is to no longer seek to convey all wastewater from a

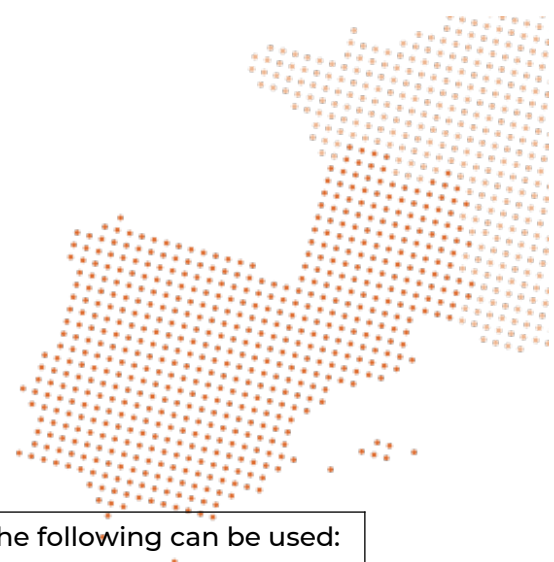
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	territory to a single treatment point. The following can be used: <ul style="list-style-type: none"><li>• Separate toilets</li><li>• Local treatment of combined sewers overflows</li><li>• Local re-infiltration of rainwater</li></ul>
Contextualization	Protection of the environment and water resources.



## 6.3 Annex 2.3. Consejería de Agricultura, Ganadería, Pesca y Desarrollo Sostenible

### Potential needs for public procurement of innovation

Organization:

Consejería de Agricultura, Ganadería, Pesca y Desarrollo Sostenible (CAGPDS).

Description:

The Estatuto de Autonomía para Andalucía (BOJA no. 240 of 14/12/2015) attributes in Article 50.1 the exclusive competence to the Autonomous Community in matters of waters that run entirely through Andalusia, including in its paragraph c) of said section, the participation of users.

The Consejería de Agricultura, Ganadería, Pesca y Desarrollo Sostenible (CAGPDS) of the Regional Government of Andalusia is the public body of the Andalusian government that is responsible for water issues in the region of Andalusia, and therefore, issues related to "water resources in Andalusia, both from the natural environment -surface water and aquifers- and those resulting from human intervention on the environment, through desalination, reuse of treated water or water transfers".

According to Decree 477/2015, of 17 November (BOJA no. 240 of 14/12/2015), "the Andalusian Water Administration consists of the following collegiate bodies, all of which are attached to the Regional Ministry responsible for water:

- The Andalusian Water Council.
- The Water Observatory.
- The Commission of Competent Authorities.
- The Monitoring Commission for the Prevention of Urban Floods.
- The Water Councils of the Hydrographical Districts.
- The Commissions for Drought Management.



- The Management Committees.
- The Permanent Cabinet.
- The Commission for the Exploitation of the Guadiaro-Guadalete water transfer".

The CAGPDS also has the following functional structure:

- The Hydrological Planning Office: coordination attached to the Directorate General for Planning and Management of the Public Water Domain under the General Secretariat for the Environment and Climate Change. Its competences in water matters include the drafting and control of the hydrological plans of the Andalusian Internal Basins.
- The Area of Information, Evaluation, Environmental Analysis and European Funds: department attached to the General Secretariat for the Environment, Water and Climate Change. Among its competences is the coordination of the activity of the Technical Office of Innovation Procurement (IP) of the CAGPDS in environmental matters, which will aim to detect the technological demands of the different departments of the Regional Ministry and consolidate the IP in the Regional Ministry.

Relationship with other competent bodies in water management in the region: The Commission of Competent Authorities encompasses all the authorities with competence in water uses. It includes the State, the Autonomous Community and the Local Authorities and especially controls the Programme of Measures of the Hydrological Plans and thus the investment effort of the different administrations.

Identified needs:

Need 1	Preventing water losses in distribution networks.
Brief description	New solutions for monitoring urban and agricultural distribution networks are needed to enable efficient leak detection.



Contextualization	Water losses in distribution networks represent a major challenge for efficient water use. In 2016, actual water losses in Andalusia represented 20% of the water supplied to the public supply network, according to data from the National Institute of Statistics.
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Need 2	Optimisation of water management.
Brief description	New tools are needed to support decision-making in water management that allow for sustainable use within the water cycle, for example the joint use of conventional and non-conventional resources (reuse, desalination, satellite observation techniques, etc.).
Contextualization	The fact that Andalusia is one of the most water-stressed regions in Europe, together with its significant agricultural activity, makes it necessary to optimise the use of water in the territory.

Need 3	New solutions for water treatment in small towns.
Brief description	New solutions are needed for water treatment in small towns to reduce costs compared to conventional systems.
Contextualization	Small towns where the treatment of treated water is carried out inefficiently with the risk that this entails in the timely maintenance of the state of the water bodies and the quality of the soil (septic tanks, drainage farms).

Need 4	New solutions to facilitate the use of reclaimed water in agriculture.
Brief description	New solutions are needed to reduce the cost of reclaimed water and increase the guarantee of its use (level of user confidence in the quality of this resource) for agricultural and recreational uses (gardens, golf courses).
Contextualization	Reclaimed water is presented as a solution of great interest to tackle the water deficit in Andalusia, however, its cost and image-related aspects make its implementation in the agricultural sector difficult.





Need 5	Water quality monitoring in general.
Brief description	The continuous appearance of new pollutants makes it necessary to implement and develop techniques to detect them, and it is necessary to increase the continuous monitoring of all pollutants.
Contextualization	Improve the control of water bodies and comply with the European Water Directive.



## 6.4 Annex 2.4. Empresa Metropolitana de Abastecimiento y Saneamiento de Aguas de Sevilla, S.A

### Potential needs for public procurement of innovation

#### Organization:

Empresa Metropolitana de Abastecimiento y Saneamiento de Aguas de Sevilla, S.A. (EMASESA).

#### Description:

EMASESA is a publicly owned trading company whose corporate purpose is "to carry out all activities relating to planning, programming, projects and research, development cooperation, training, consultancy, construction, operation, maintenance and management of water resources and services in all phases of the integral water cycle, from production, acquisition and adjudication, treatment and distribution of flows, to evacuation, discharge, sanitation, purification, elimination and recycling of liquid waste and sludge, as well as the commercialisation of all these products and services [. ...] the provision of public drinking water supply, sewerage and wastewater treatment services for all the local councils that are members, as well as participation in the coordination and/or provision of drinking water supply, sewerage and wastewater treatment services in the supra-municipal area when such actions are the responsibility of the member councils by agreement, delegation or authorisation of the local, regional or state body that is responsible for them in accordance with the provisions of the applicable regulations". (art. 2.1. Articles of Association).

EMASESA is responsible for managing the integral water cycle in Seville and its metropolitan area under a sustainable approach.

EMASESA manages the direct supply of drinking water to the city of Seville and the towns of Camas, Dos Hermanas, Alcalá de Guadaíra, Mairena de Alcor, San



Juan de Aznalfarache, Coria del Río, La Puebla del Río, Alcalá del Río, La Rinconada, El Garrobo and El Ronquillo. It also supplies raw (untreated) water to the 29 towns located in the Aljarafe area of Seville and to Guillena - Las Pajanosas. It is also responsible for the public sewerage and water treatment services in Seville, Alcalá de Guadaíra, Camas, La Rinconada, San Juan de Aznalfarache, Coria del Río, La Puebla del Río, Alcalá del Río, Mairena del Alcor, Dos Hermanas and El Ronquillo.

Identified needs:

Need 1	New integrated model for sewage sludge and other organic waste management
Brief description	A new model for the management of sewage sludge is needed to enable its proper sanitisation.
Contextualization	<p>The aim is to have a model based on the agricultural valorisation of sludge (direct application, composting and co-composting with vegetable biomass) which has operational limitations and generates minimal environmental impact on the surrounding population.</p> <p>Furthermore, the new legal regulation in the Autonomous Community of Andalusia establishes important restrictions on the agricultural recovery of sewage sludge to which EMASESA must adapt.</p>

Need 2	New solutions for emerging contaminants in drinking water purification
Brief description	In the future, new solutions will be necessary for the elimination of emerging contaminants in drinking water treatment processes.
Contextualization	The concern of public administrations about the presence of emerging contaminants (or micropollutants in water) has led them to develop increasingly restrictive EQS - Environmental Quality Standards in this area and to extend the lists of substances (latest extension: Commission Implementing Decision (EU) 2018/840 of 5 June 2018).



	There are draft European Directives that will further tighten existing regulations on emerging pollutants, with a view to changing the wastewater model in the next 20-30 years.
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Need 3	New solutions for emerging contaminants in wastewater treatment
Brief description	In the future, new solutions for the elimination of emerging pollutants in wastewater treatment processes will be necessary.
Contextualization	<p>The concern of public administrations about the presence of emerging pollutants (or micropollutants in water) has led them to develop increasingly restrictive EQS - Environmental Quality Standards in this area and to extend the lists of substances (latest extension: Commission Implementing Decision (EU) 2018/840 of 5 June 2018).</p> <p>There are draft European Directives that will further tighten existing regulations on emerging pollutants, with a view to changing the wastewater model in the next 20-30 years.</p>

Need 4	New solutions for the detection and measurement of emerging pollutants
Brief description	In the future, new solutions for the detection and measurement of emerging pollutants will be necessary for the adequate control of water quality.
Contextualization	<p>The concern of public administrations about the presence of emerging pollutants (or micropollutants in water) has led them to develop increasingly restrictive EQS - Environmental Quality Standards in this area and to extend the lists of substances (latest extension: Commission Implementing Decision (EU) 2018/840 of 5 June 2018).</p> <p>There are draft European Directives that will further tighten existing regulations on emerging pollutants, with a view to changing the wastewater model in the next 20-30 years.</p>



Need 5	New solutions for floating waste
Brief description	Alternative valorisation of floating waste generated in WWTPs (Waste Water Treatment Plants).
Contextualization	<p>Compliance with the principles of the Circular Economy and the legal requirements established in Decree 73/2012 on waste in Andalusia.</p> <p>By recovering this waste, together with other waste from the WWTPs, this type of facility will be converted into urban biorefineries, with a high degree of use of the resources that reach them through the sewage systems.</p>



## 6.5 Annex 2.5. Empresa Municipal de Agua y Saneamiento de Murcia, S.A.

### Potential needs for public procurement of innovation

Organization:

Empresa Municipal de Agua y Saneamiento de Murcia, S.A. (EMUASA).

Description:

Empresa Municipal de Agua y Saneamiento de Murcia, S.A., a mixed company created in 1989 with 51% owned by Murcia City Council and 49% by Hidrogea. EMUASA carries out the integral water cycle service in the municipality of Murcia, from catchment to the return of reused water to the natural environment.

Relationship with other bodies responsible for water management in the region:

- Entidad de saneamiento y depuración de la región de Murcia.
- Confederación Hidrográfica del Segura.
- Dirección General del Agua.

Identified needs:

Need 1	New solutions for water reclamation
Brief description	Incorporate advanced treatments in the facilities that intend to reuse water in a way that guarantees the elimination/reduction of the level of emerging and pathogenic compounds. The plants currently in service are not designed to eliminate the compounds that are expected to be incorporated in future regulations
Contextualization	It is expected that future European regulations on water reuse will establish qualities that cannot be obtained with the systems currently in place.





Need 2	New solutions for sewage sludge management
Brief description	<p>Sewage sludge is a waste generated continuously in water treatment facilities. Currently, most of the sludge is used in agriculture, either directly or in the form of compost. The draft directives include the definition of quality limits that would limit such agricultural use. It would be necessary to incorporate sanitisation treatments in WWTPs to allow agricultural use with quality guarantees.</p>
Contextualization	<p>Future European regulations on sewage sludge are expected to establish qualities that could not be obtained with the systems currently in place.</p>



## 6.6 Annex 2.6. Instituto Superior Técnico

### Potential needs for public procurement of innovation

Organization:

Instituto Superior Técnico.

Description:

Instituto Superior Técnico (IST) is a Higher Education Institution. Its position in the water cycle is mostly as an end user, having consumptions equivalent to domestic users, consumption associated with laboratories and also associated to the several restaurants and snack-bars inside the campus.

IST is strongly committed to reduce its water consumptions and wastewater generation and has achieved a water consumption reduction of 59% between 2010 and 2019.

Currently, most of the wastewater generated at IST is drained directly to the city's drainage system, which is mostly a combined sewer system.

At Alameda Campus the South Tower, which hosts the Chemical and Bioengineering Departments, has multiple laboratories and because of that has a small Wastewater Treatment Plant (WWTP) where the effluents are collected in a tank to adjust the pH and only after that the wastewaters are delivered to the municipal drainage system.

At the campus "Tecnológico e Nuclear", near Loures, there was a nuclear reactor installed for research purposes (recently deactivated) and the drainage system also delivered the wastewater in tanks to analyse and neutralize any existing radiation. These effluents were considered industrial effluents by the water utility that manages wastewater in Loures.

Identified needs:



Need 1	Water leaks detection.
Brief description	There is a need for new solutions to model and track the water balance in Campus, as well as in the field of monitoring, to detect the location of leaks and optimise water consumption.
Contextualization	The estimated water savings may reach around 10% of total consumption.

Need 2	Water reuse.
Brief description	There is a need for new solutions to regenerate water to use in activities that do not require potable water (drip irrigation, floor washes, etc).
Contextualization	<p>IST is strongly committed to reduce its water consumptions and wastewater generation and has achieved a water consumption reduction of 59% between 2010 and 2019.</p> <p>New legislation in the field of water of water reuse (Law Decree 119/2019 of August 21st) establishes the legal regime for the production of water for reuse, obtained from wastewater treatment, as well as from its use.</p> <p>The National Program for Efficient Water Use– implementation 2012-2020 has as one of its objectives to minimize the use of drinking water in activities that may perform as well with waters of alternative quality and from sources other than the public drinking water network by promoting the use of rainwater and the eventual reuse of treated wastewater.</p>

Need 3	Rainwater use.
Brief description	There is a need of innovative solutions to enable the use of rainwater for irrigation.
Contextualization	<p>IST is strongly committed to reduce its water consumptions and wastewater generation and has achieved a water consumption reduction of 59% between 2010 and 2019.</p> <p>The National Program for Efficient Water Use – implementation 2012-2020 has as one of its objectives to minimize the use of drinking water in activities that may perform as well with waters of alternative quality and from sources other than the public drinking water network by promoting the use of</p>

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	rainwater and the eventual reuse of treated wastewater.
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## 6.7 Annex 2.7. Águas do Tejo Atlântico

### Potential needs for public procurement of innovation

Organization:

Águas do Tejo Atlântico.

Description:

Águas do Tejo Atlântico, public company, is a leading company operating in the environmental sector in Portugal and its mission is to contribute to the pursuit of national objectives in the wastewater collection and treatment within a framework of economic, financial, technical, social and environmental sustainability.

Águas do Tejo Atlântico has the responsibility to manage and operate the wastewater multi-municipality system of the Great Lisbon and West, guaranteeing the quality, continuity and efficiency of the water public services, in order to protect the public health, populations' welfare, the accessibility to the public services, the environmental protection and economic and financial sustainability of the sector, in a framework of equity and tariff stability, contributing also to the regional development and planning.

Águas do Tejo Atlântico exploits now a system that includes 103 Water Resource Recovery Facilities (WRRF), 268 pumping stations and 1093 km of main sewage system, and treats around 194 Mm<sup>3</sup>/yr, serving a population of 2,3 million inhabitants (served 23 municipalities: Alcobaça, Alenquer, Amadora, Arruda dos Vinhos, Azambuja, Bombarral, Cadaval, Caldas da Rainha, Cascais, Lisboa, Loures, Lourinhã, Mafra, Nazaré, Óbidos, Odivelas, Oeiras, Peniche, Rio Maior, Sintra, Sobral de Monte Agraço, Torres Vedras e Vila Franca de Xira) and a covered area of 4.145 km<sup>2</sup>.

Águas do Tejo Atlântico develops R&D activities in partnership with other institutions, companies and universities in a wide range of subjects, including



novel treatment processes and implementation of management and simulation tools for optimizing wastewater treatment and collection.

Identified needs:

Need 1	Water reuse
Brief description	There is a need for new solutions to regenerate water from wastewater plants for different uses in a cost-effective way
Contextualization	<p>New legislation in the field of water of water reuse (Law Decree 119/2019 of August 21st) establishes the legal regime for the production of water for reuse, obtained from wastewater treatment, as well as from its use.</p> <p>The National Program for Efficient Water Use – implementation 2012-2020 has as one of its objectives to minimize the use of drinking water in activities that may perform as well with waters of alternative quality and from sources other than the public drinking water network by promoting the use of rainwater and the eventual reuse of treated wastewater.</p>

Need 2	Stormwater management
Brief description	There is a need for new solutions for stormwater management in a cost-effective way.
Contextualization	Stormwater systems are under the responsibility of municipalities but few are managed properly since they do not generate income.

Need 3	Energy efficiency in wastewater
Brief description	There is a need for innovative solutions to improve the energy efficiency in wastewater treatment plants in order to reach energy neutrality.
Contextualization	Energy efficiency will contribute to reach objectives of the Strategic Plan for Water Supply and Wastewater Sanitation 2020 in the field of efficient resource management and optimization and economic, financial and social sustainability.





Need 4	Cost-effective solutions for wastewater treatment in small communities
Brief description	There is a need for new solutions for wastewater treatment in small communities in a cost-effective way.
Contextualization	For conventional treatment the costs are recovered for medium-large systems, but it is difficult to recover costs for small system. The implementation of advanced treatment makes more difficult the cost recovery and urges the need for new business models and regulation.

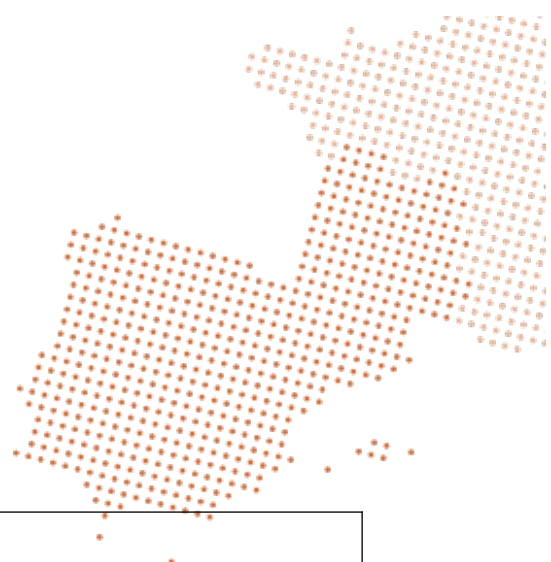


## 7 ANNEX 3. QUESTIONNAIRES ON DIFFICULTIES AND LESSONS LEARNED

### 7.1 Annex 3.1. Agencia Andaluza del Conocimiento

#### Questionnaire -Lessons learned

1. What is the level of knowledge of the interviewed about public procurement of innovation?		
High	X	
Medium		
Low		
Additional comments		
The 2 institutions interviewed have knowledge of Innovation Procurement		
2. Are they interested in public procurement of innovation?		
Yes	X	
No		
Additional comments		
The 2 institutions interviewed are involved in Innovation Procurement processes.		
3. How did you do the interviews?		
Telephone		
Email		
Face to face meeting	X	
Mix		
Additional comments		
-		
4. From your point of view, are the organizations interviewed aware about their future challenges regarding water management?		
Yes	X	



No		
Additional comments		
EMASESA has been involved in Innovative Public Procurement processes in order to comply with current and/or future regulations. Not applicable for Regional Ministry.		
5. Do they have specific plans to address their future challenges on water management?		
Yes	X	
No		
Additional comments		
EMASESA has specific plans. Not applicable for Regional Ministry.		
6. What were the main difficulties to do the interviews?		
Scheduling and reviewing drafts of the interviews for clearance, as well as the summary of needs.		
7. What information asked in the interview questionnaire were more difficult to obtain?		
The two interviews are not comparable because in the second one (EMASESA) we had the experience of having questions 1, 2, 3, 4, 5 and 7a) filled in, which made the interview much easier.  The profiles of the interviewees and the role of their institutions also played a role. The Regional Ministry has a policy-making role while EMASESA has both the role of administrator and the role of service provider.		



## 7.2 Annex 3.2. Fundación Universidad Empresa de la Región de Murcia

### Questionnaire -Lessons learned

1. What is the level of knowledge of the interviewed about public procurement of innovation?		
High	X	
Medium		
Low		
Additional comments		
-		
2. Are they interested in public procurement of innovation?		
Yes	X	
No		
Additional comments		
The institution interviewed is involved in Innovation Procurement processes.		
3. How did you do the interviews?		
Telephone		
Email	X	
Face to face meeting		
Mix		
Additional comments		
-		
4. From your point of view, are the organizations interviewed aware about their future challenges regarding water management?		
Yes	X	
No		
Additional comments		



EMUASA has been involved in Innovative Public Procurement processes in order to comply with current and/or future regulations.

5. Do they have specific plans to address their future challenges on water management?

Yes	X	
No		

Additional comments

EMUASA has specific plans.

6. What were the main difficulties to do the interviews?

To be able to arrange meetings with the agents involved, as although we have requested meetings with different agents and institutions, not all of them have responded or not all of them have responded. Several meetings with organisations are planned for the near future. In the case of EMUASA, their collaboration has been very rapid and satisfactory.

7. What information asked in the interview questionnaire were more difficult to obtain?

With AAC's indications, it was a very good indication to fill in questions 1, 2, 3, 4, 5 and 7a), and it made the interview much easier.

It also influenced the fact that EMUASA had already had a previous presentation and approach from FUERM, so they already knew about the project and their response was very quick.



## 7.3 Annex 3.3. Instituto Superior Técnico

### Questionnaire -Lessons learned

1. What is the level of knowledge of the interviewed about public procurement of innovation?		
High		
Medium		
Low	X	
Additional comments		
-		
2. Are they interested in public procurement of innovation?		
Yes		
No	X	
Additional comments		
-		
3. How did you do the interviews?		
Telephone	X	
Email		
Face to face meeting	X	
Mix		
Additional comments		
-		
4. From your point of view, are the organizations interviewed aware about their future challenges regarding water management?		
Yes	X	
No		
Additional comments		
Up to a certain extent		





5. Do they have specific plans to address their future challenges on water management?

Yes	X	
No		

Additional comments

-

6. What were the main difficulties to do the interviews?

To explain the concept of public procurement. It is sometimes confused with the administrative procedures associated with it.

7. What information asked in the interview questionnaire were more difficult to obtain?

At IST, information about the remaining campus (“Tagus Park” and “Tecnológico e Nuclear”)



## 7.4 Annex 3.4. Office International de L'Eau

### Questionnaire -Lessons learned

<b>1. What is the level of knowledge of the interviewed about public procurement of innovation?</b>		
High	X	
Medium		
Low		
Additional comments		
Both interviewees are fully aware of the public procurement of innovation.		
<b>2. Are they interested in public procurement of innovation?</b>		
Yes	X	
No		
Additional comments		
Yes but "not so much". I believe that they don't see the need for it yet.		
<b>3. How did you do the interviews?</b>		
Telephone	X	For Agence de l'Eau Adour Garonne
Email		
Face to face meeting	X	For Limoges Métropole
Mix		
Additional comments		
-		
<b>4. From your point of view, are the organizations interviewed aware about their future challenges regarding water management?</b>		
Yes	X	
No		
Additional comments		
Yes, they have a very strong awareness of future challenges		



5. Do they have specific plans to address their future challenges on water management?		
Yes	X	
No		
Additional comments		
Yes, but for Limoges Métropole it seems that they don't need, in the first instance, to use PCP or PPI		
6. What were the main difficulties to do the interviews?		
It was just difficult for people to find a time slot of an hour and a half to exchange		
7. What information asked in the interview questionnaire were more difficult to obtain?		
Nothing special noticed		



## 7.5 Annex 3.5. Université de Limoges

### Questionnaire -Lessons learned

<b>1. What is the level of knowledge of the interviewed about public procurement of innovation?</b>		
High	X	
Medium		
Low		
Additional comments		
-		
<b>2. Are they interested in public procurement of innovation?</b>		
Yes	X	
No		
Additional comments		
<b>3. How did you do the interviews?</b>		
Telephone		
Email		
Face to face meeting		
Mix	X	
Additional comments		
It was via telephone calls to one person and this person coordinated via email with colleagues internally.		
<b>4. From your point of view, are the organizations interviewed aware about their future challenges regarding water management?</b>		
Yes	X	
No		
Additional comments		



-		
5. Do they have specific plans to address their future challenges on water management?		
Yes	X	
No		
Additional comments		
-		
6. What were the main difficulties to do the interviews?		
Because the work was not the responsibility of one single person, the coordination between colleagues as not easy. Three people within Bordeaux metropole were involved in the management of the wastewater treatment.		
7. What information asked in the interview questionnaire were more difficult to obtain?		
The precise mechanisms for the innovation process. How the methods for developing new ideas fitted into the strict rules for public procurement.		



## 8 BIBLIOGRAPHY

Department for Business Innovation & Skills - BIS (2011) Delivering best value through innovation. Forward Commitment Procurement. Practical Pathways to Buying Innovative Solutions. Available on internet: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/32446/11-1054-forward-commitment-procurement-buying-innovative-solutions.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/32446/11-1054-forward-commitment-procurement-buying-innovative-solutions.pdf)

European Assistance for Innovation Procurement initiative - EAFIP (online). EAFIP Toolkit. Available on internet: <https://eafip.eu/toolkit>

European Commission (2012). Guide to Research and Innovation Strategies for Smart Specialisation (RIS 3). Available on internet: [https://ec.europa.eu/regional\\_policy/sources/docgener/presenta/smart\\_specialisation/smart\\_ris3\\_2012.pdf](https://ec.europa.eu/regional_policy/sources/docgener/presenta/smart_specialisation/smart_ris3_2012.pdf)

European Commission (2018). Commission notice. Guidance on Innovation Procurement (C(2018) 3051 final, 15 may 2018). Available on internet: <https://ec.europa.eu/transparency/regdoc/rep/3/2018/EN/C-2018-3051-F1-EN-MAIN-PART-1.PDF>

European Commission (online). EU funded projects implementing Pre-Commercial Procurements (PCP) or Public Procurement of Innovative Solutions (PPIs). Available on internet: <https://ec.europa.eu/digital-single-market/eu-funded-projects>





European Commission (online). Innovation procurement - H2020 Online Manual. Available on internet: [https://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/innovation-procurement\\_en.htm](https://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/innovation-procurement_en.htm)

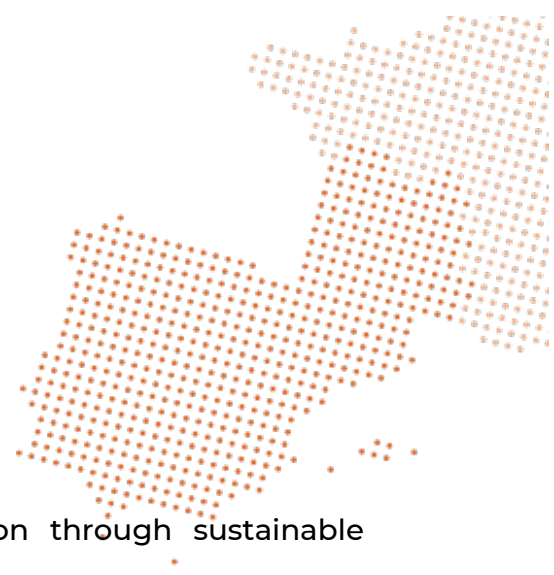
European Commission (online). Water innovation: boosting its value for Europe. Available on internet: <https://ec.europa.eu/programmes/horizon2020/en/h2020-section/water-innovation>

Empresa de Abastecimiento y Saneamiento de Aguas de Sevilla, S.A. - EMASESA (online). Proyecto MITLOP: “Modelo integrado de gestión de lodos de depuración y de otros residuos orgánicos”. Available on internet: <http://www.emasesa.com/compra-publica-innovadora>

Federal Ministry for Economic Affairs and Energy (2018). KOINNO Public Procurement of Innovation Guide. Available on internet: [http://procure2innovate.eu/fileadmin/user\\_upload/Documents/KOINNO\\_PublicProcurementofInnovation.pdf](http://procure2innovate.eu/fileadmin/user_upload/Documents/KOINNO_PublicProcurementofInnovation.pdf)

Junta de Andalucía (online). Compra Pública de Innovación. Demanda de Soluciones Innovadoras de la Consejería de Agricultura, Ganadería, Pesca y Desarrollo Sostenible (CAGPDS). Available on internet: <https://www.juntadeandalucia.es/organismos/agriculturaganaderiapescaydesarrollo/sostenible/consejeria/sobre-consejeria/compra-publica-innovacion.html>

PPI4Waste project (online). Promotion of Public Procurement of Innovation for Resource Efficiency and Waste Treatment (PPI4Waste). Available on internet: <https://www.ppi4waste.eu>



SMART SPP project (online). SMART SPP - innovation through sustainable procurement. Available on internet: <https://www.smart-spp.eu>

Smart.met project (online). Smart.met. Available on internet: <http://www.smart-met.eu>

Tenders Electronic Daily (2019). Norway-Bergen: Research and development services and related consultancy services (2019/S 129-317811). Available on internet: <https://ted.europa.eu/udl?uri=TED:NOTICE:317811-2019:HTML:EN:HTML>

TWIST project (2019). E 1.2.1 Analysis of opportunities in RIS3 and synergies between regions. Available on internet: <https://twistproject.eu/en/communication-3/deliverables/>