



E.3.3.1. Report of the pilot cases of innovation procurement

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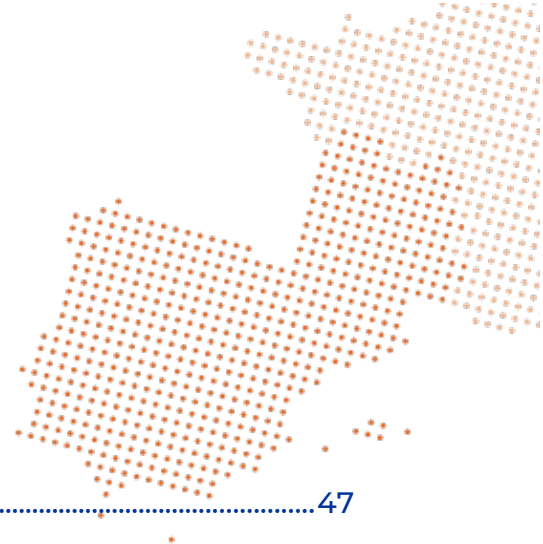
OiEau: Office International de l'Eau

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LIST OF ACRONYMS

EDM : Early Demand Map

EU : European Union

GDP : Gross Domestic Product

IP : Innovation Procurement

IPR : Intellectual Property Rights

KPI: Key Performance Indicator

LaViSO : Laboratoire Vivant du Sud-Ouest pour l'Eau (in English, South West Living Laboratory for Water)

Living – Lab : Living Laboratories

MITECO : Ministerio para la Transición Ecológica y el Reto Demográfico (in English, South West Living Laboratory for Water)

OECD : Organisation for Economic Co-operation and Development

OWL-2 : Open Water Living Lab

p.e. : population equivalent

PCP : Pre-Commercial Procurement

PMC : Preliminary Market Consultation

PPI : Public Procurement of Innovative solutions

PRB's : Public Procurement of Innovative solution

R&D : Research and development

R&D&I : Research, Development and Innovation

SME : Small and Medium-sized Enterprise

TRL : Technology Readiness Level

TWIST : Transnational Innovation Strategy in the Water Sector

UI3 : Urban Lisbon Living Lab

WFD : Water Framework Directive

WWT : Waste Water Treatment

1. CONTEXT

The European project [TWIST \(Transnational Water Innovation Strategy\)](#), financed by the INTERREG SUDOE programme, aims to develop an [open innovation model](#) for wastewater management, from a [circular economy](#) approach, to comply with the [Water Framework Directive](#) (WFD) and to promote [Innovation Procurement](#) (IP) that allows [comparable result](#) to be obtained that can in turn be [extrapolated](#) to other European regions.

In the framework of the [TWIST Project](#), 3 specialised and complementary [Living Labs](#) (OWL-2, LaViSO y uL3), located in three regions (Andalusia, Lisbon and Nouvelle Aquitaine):

1. [Open Water Living Lab \(OWL-2\)](#) in [Spain](#): aimed at the co-creation, exploration and evaluation of innovations in the treatment and regeneration of wastewater.
2. [Laboratoire Vivant du Sud-Ouest pour l'Eau \(LaViSO\)](#) in [France](#): aimed at the co-creation, exploration and evaluation of innovations in the field of wastewater treatment and associated infrastructure management.
3. [Urban Lisbon Living Lab \(uL3\)](#) in [Portugal](#): aimed at the co-creation, exploration and evaluation of innovations in the reuse of reclaimed water and recovery of resources.

The aim of the Living Labs is to [strengthen the innovative ecosystem](#) through research infrastructures that serve as a platform for the development of technologies, projects or ideas related to the challenges presented by the water sector, in order to promote a change in the innovation model in the sector that will shorten the distance between technological development and the market, accelerate the commercialisation process, promote a collaborative model and specialisation in the innovation process, promote the integration of innovation

processes in the public sector and improve the provision of public services for the management of the full water cycle (CENTA, 2021).

For this reason, the beneficiary countries of this project have given [the Living Labs the role of promoting a change in the innovation model in the water sector](#), which will make it possible (CENTA, 2021):

1. Shorten the distance between technological development and the market.
2. Accelerate the commercialisation process.
3. Promote the integration of innovation processes in the public sector.
4. Promote a collaborative model and specialisation in the innovation process in which all the agents involved (research centres, companies, administrations and society) are integrated and interact.

In this way, "[Livings Labs can play a key role in the development of Innovation Procurement actions in the water sector to the extent that they can implement IP](#) through knowledge transfer (Lobera et al, 2018), transforming in turn the innovation system of the water sector" (TWIST, online b 2021).

In recent years, and especially after the approval of the [Europe 2020 Strategy](#), and in the terms that the 2030 Agenda is currently advocating, innovation has become a fundamental axis of the activity of all the administrations of the EU member states. Moreover, the circular economy has become a major objective of the political agenda at international level, with increasingly ambitious objectives that connect with the claims of innovation to improve sustainability, especially in such an essentially circular resource as water

In this specific case of the [TWIST](#) project, the innovation acquires special relevance due to its direct link with the European Funds to the achievement of the objectives related to making knowledge and innovation the basis for sustainable economic and social growth.

Likewise, bearing in mind that the IP is the instrument to be used when a public entity, with the aim of satisfying a need (current or future), requires an innovative product or system to find a solution to a predefined need, it can be affirmed that "Living Labs can play a key role in the development of Innovation Procurement actions in the water sector to the extent that they can implement IP through knowledge transfer (Lobera et al, 2018), transforming in turn the innovation system of the water sector" (TWIST, online b 2021).

Therefore, the **objective of the TWIST project** is to achieve through the development of three "pilot" cases of IP some results to determine what type of technology should be developed and, in the future, to develop functional technical specifications for the **Innovation Procurement** projects that are decided to undertake.

In order to achieve this objective, the partners, after consensus, have defined as "pilot" the process ranging from the definition and explanation of the three common needs (technological challenges) for the TWIST regions, to the completion of the descriptive and evaluative report on the path followed and the conclusions reached, following a comparative methodology than can serve as a basis and learning tool for future IP procedures.

In order to be able to carry out this IP process effectively, the TWIST partners need to establish a strategy that defines which objectives, action lines, priorities, measures and resources are necessary to launch the procurement process. Therefore, the TWIST project comprises the following groups of activities (GTs):

GT 1: Analysis of actors and characterisation of innovation processes at regional level.

GT 2: Creation of three living laboratories for the management, treatment, reuse and recovery of wastewater products.

GT 3: Analysis of results and exploration of market opportunities.

GT 4: Enhancing capacity for regional development and job creation.

GT 5: Capitalisation and transfer of results to other Sudoe regions.

To this end, this document includes, as part or milestone of GT3, the entire process carried out the IP pilot process, from the detection of needs, the technical dialogue and its results and, finally, a propositional explanation and in the light of the shortcomings identified, of how to effectively and efficiently implement an IP process.

Initially, however, a theoretical description of Innovation Procurement (IP), its benefits and the regulations to be considered will be given.

2. INNOVATION PROCUREMENT (IP)

2.1. Concept and modalities of IP

In an approximation of the meaning of innovation, the Oslo Manual contains a "Guide to the Collection and Interpretation of Innovation Data", jointly produced by the Organisation for Economic Co-operation and Development (OECD) and the European Commission (Eurostat), which defines innovation as "the introduction of a new, or significantly improved, product (good or service), process, new marketing method or new organisational method, in internal business practices, workplace organisation or external relations" (OECD/Eurostat, 2005).

The concept of innovation in the OECD /Eurostat¹ Oslo Manual has permeated European public procurement law and is now embraced by the European Parliament Directive 2014/24/EU of 26 February 2014 (recital 47). Includes products and services that are based on knowledge and technologies that did not exist before, as well as products and services that may result from combinations of existing knowledge and technologies. This is the conceptual framework in which public procurement comes into play as a suitable means to meet the objectives proposed by the OECD and the European Union to ensure a continuous and sustainable development of the economic and social reality.

The European Union sees IP operations as an opportunity to boost R&D&I procurement as part of the European strategy to increase investment in this field, on the one hand, and as a potential way to improve the delivery of public services, on the other.

¹The Oslo Manual by OECD/Eurostat is a world reference in the measurement of innovation, therefore it is reviewed and updated from time to time. Although the latest update of the Oslo Manual is from 2018 (OCDE/Eurostat, 2018), the European Public Procurement Law (Directive of the European Parliament 2014/24 / EU and following) includes the concept of innovation from the 2005 Oslo Manual as this version is the most up-to-date when these standards were enacted in 2014.

The purpose of IP is therefore to support the innovative activity of the private sector to meet the previously identified needs of a public body, i.e. the demand from the public sector drives the innovative activity and not the other way around. This process essentially pursues the following objectives:

- Incorporation of innovative goods or services that do not exist or that improve current public services.
- Encourage innovation and commercialisation by supporting enterprises.
- Promoting cooperation between the different actors involved internationally.

Within the IP process, two types of action can be distinguished:

- **Public Procurement of Innovative solutions (PPI):** this modality is appropriate when the needs of the purchase can be met by innovative solutions that are close to market access, in prototype phase, or that are already on the market but require innovative adaptations for the contracting authority.

The purpose of this procurement is the acquisition of improved technology that has already undergone some prior R&D&I process. With this acquisition, the Public Administration positions itself as a launch customer for those goods and services that, although they have a prototype or model, have not yet reached the commercial phase.

In legal and procedural terms, PPI is included in the scope of application of Directive 2014/24/EU, being a public sector contract for all purposes (art. 2.2 of the Directive).

- **Pre-commercial Procurement (PCP):** this is to be used when there are still no solutions close to the market that meet the requirements required by the buyer, and new R&D is necessary to obtain new solutions, developed

and tested to address the need to which the purchase is addressed. In this way, through PCP, the pros and cons of alternative solutions can be compared and the risk of stage-by-stage innovations can be reduced through solution design, prototyping, and product development and testing.

In principle, these contracts are excluded from the scope of application of public procurement law, in application of the exclusion protected by Directive 2014/24/EU in its article 14, since one of the essential characteristics of PCP contracts is the joint management of risks and benefits by the public and private actors involved in the procurement.

Irrespective of the fact that PCPs may fall outside the public procurement rules, PCP procurements are required to comply with the general principles of public procurement (freedom of access, publicity and transparency, non-discrimination and equal treatment, integrity, free competition and selection of the most economically advantageous tender).

In this case, the local authority that initiated the PCP does not necessarily buy the solution(s) that emerged during the process.

2.2. IP at international and European level. Strategic framework and potential benefits

IP is a procurement modality that aims to increase investment in R&D&I as a factor in the competitiveness of the European economy and the improvement of public services from the demand side. Moreover, IP is a strategic commitment of the OECD and the European Union to achieve the macro objectives of the 2030 Agenda for Sustainable Development. Particularly in the water sector, the objectives of axis 6 (clean water and sanitation) are in many respects connected to those of axis 9 (innovation).

The OECD is also firmly committed to promoting sustained, cleaner and fairer growth, promoting innovation beyond science and technology, and extending its application to education, business growth and job creation. The OECD's aims were set out some time ago in "The OECD Innovation Strategy: Getting a Head Start on tomorrow" of 2010, which described the five main lines of action: (i) developing people's innovative capacity through education and training, (ii) unlocking innovative potential, (iii) implementing and adequately funding research, (iv) applying innovation as a solution to challenges, present and future, and (v) refining innovation policies. These lines of action include, among others, IP as an instrument with which public purchasers and private operators will be able to obtain R&D&I results by combining innovation and public procurement.

At EU level, the Framework Programme on research and innovation activities for the period 2014-2020, known as the "Europe 2020 Strategy" (COM (2010) 2020 final), subsequently replaced by the equivalent axis of the new framework of the 2030 Agenda for Sustainable Development in Europe, which is the reference planning for the innovation policies of the Member States.

These programmes, designed to boost the Innovation Union strategy (COM (2010) 546 final), are committed to a smart, sustainable and inclusive growth model for European society as a whole, based on three basic pillars relating to tackling major societal challenges, promoting industrial leadership in Europe and consolidating the excellence of its science base. The funds of this programme continue to run through 2021, where they will be replaced by the new 2021-2027 Budgetary Framework focused on the objectives of the 2030 Agenda, which reinforces Europe's commitment to innovation.

With a total budget of 77,028 million euros and an initial investment in R&D&I of 3% of the European Union's GDP, Horizon 2020 has brought together and promoted the activities financed by the 7th Framework Programme for Research

and Development, the innovation actions of the Competitiveness and Innovation Framework Programme and the actions of the European Institute of Innovation and Technology. The key to these European innovation programmes is that they integrate all phases of research and innovation, i.e. from knowledge generation to commercial work, with a specific focus on direct support for IP.

Through IP Europe aims to significantly reduce the gap and disconnect between research and innovation processes and technology and public purchasers. This requires the development of the coordination mechanisms of the public bodies responsible for public procurement and the formulas for collaboration with private actors, as well as the regime for public administration and business to jointly bear and share the risks and benefits derived from R&D and innovation. The most recent analyses of the evaluation of the application of these objectives undertaken by the European Commission show that IP is still a challenge that has been poorly met in the European procurement market, despite the EU's investment efforts in this field.

The intention to boost a definitive national commitment to the use of these funds in IP projects by Member States was reflected in the adoption of "Guidelines on public procurement in innovation" in May 2018 by the European Commission [OJEU C (2018) 3051 final], adopted in the context of the Commission's Communication on the "New European agenda for research and innovation: an opportunity for Europe to shape its future".

The strength of the commitment to IP in the international framework described above alone highlights some of the most important benefits generated by IP processes.

For public administrations and other public service providers, such innovation procurement processes can contribute to meeting the objectives of new

environmental and social policies, making it possible to respond to unmet needs through innovation, in whose benefits - including economic ones - they can participate directly. Moreover, investment in innovation indirectly contributes to the growth of a sector considered strategic in the framework of European competitiveness policy.

On the other hand, it also has great benefits for companies, and not only for large technology supplier companies, but also for small and medium-sized technology-based or innovative companies, which are given the opportunity in these processes, providing them with resources to develop their technologies, thus improving their competitiveness in the market.

Last but not least, Innovation Procurement greatly benefits society, as public services and infrastructures are improved, new and more competitive industries are developed on a global scale, with the consequences for employment and economic growth that this entails. Likewise, the inclusion of the IP in the 2030 Agenda is also aimed at improving the environment, protecting terrestrial and marine ecosystems, climate action and the circular economy, all of which are undoubtedly reflected in the integral water cycle and water sanitation and treatment policy.

2.3. The Legal Framework

The current legal framework on which Innovation Procurement is generally based at EU level include:

- Directive 2014/23/EU of the European Parliament and of the Council of 28 February 2014 on the award of concession contracts.
- Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement.

- Directive 2014/25/EU of the European Parliament and of the Council of 26 February 2014 on procurement by entities operating in the water, energy, transport and postal services sectors.

These are intended to encourage companies to develop 'their capacity for innovation, while maintaining the basic requirements of competition, transparency and equal treatment' and to facilitate 'approaches to procurement that have been found to be conducive to innovation' (European Commission, 2015).

In addition, the legislation and regulations of each region (France, Portugal and Spain) in which the IP process is to be developed, which may contain different procedural and substantive peculiarities, must be taken into account.

These rules are:

In France:

- National Pact for Growth, Competitiveness and Employment (2012), which establishes in the field of Innovation Procurement the expenditure target to be made by the IPs by 2020.
- Order n° 2015-899 of 23 July 2015 on public Procurement and Order no. 2016-360 of 25 March 2016 are the rules transposing the above-mentioned Parliament Directives. These two ordinances are included in the French legal code "Code de la commande publique" of 1st April 2019.
- Decree of December 26, 2018 relating to the declaration of innovative purchases provided for by article 2 of decree n° 2018-1225 of December 24, 2018 relating to various measures relating to public procurement contracts.
- Decree n° 2018-1225 of December 24, 2018 on various measures relating to public procurement contracts.

In Portugal:

- Decree Law n° 111-B/2017, which contains the Public Procurement Code, and transposes the above-mentioned European Parliament Directives.
- RCM n° 25/2018 (legal document approving the National Strategy for Technological and Business Innovation 2018-2013).

In Spain:

- Law 14/2011, of 1th June, on Science, Technology and Innovation, which introduces and regulates fundamental aspects of IP.
- Law 9/2017, of 8 November, on Public Sector Contracts (LCSP), transposing the above-mentioned Directives of the European Parliament and of the Council into Spanish law.

3. PROCESS FOLLOWED

IP is designed, on the one hand, to encourage contracting authorities to demand innovative solutions that improve existing ones by tendering for R&D&I contracts and, on the other hand, to stimulate the private sector to focus its activity on innovation as a factor of competitiveness. For this reason, IP procedures do not follow the ordinary patterns of public procurement. In these procedures, both the preparation and award of the contract and its execution must be adapted to a form of procurement based on unique premises that question the classic principles of procurement: certain object, determined price, immediacy and short term, risk and chance of the entrepreneur, etc., evolving towards models in which negotiation with the market and the sharing of risks prevail in the face of the uncertainty that inevitably entails the acquisition of innovation and the commitment to applied research.

The success of IP lies in a rebalancing of forces where companies see the Administration as a reliable partner to undertake innovative projects and vice versa. The public purchaser, modulating the idea of prerogative, will have to position itself as a partner willing to negotiate in each of the phases and aspects arising from the procurement of innovation. Potential suppliers must also be willing to share their *know-how* and technological knowledge with the bidding public entity in advance without the guarantee of the contract award, and to do so even in the face of potential competitors. It is also possible that the generation of the innovative product or service may require the participation of several successful bidders, who do not compete with each other, but cooperate in innovation (as in the case of innovation partnerships). On the other hand, IP entails a risk of not achieving the desired result, which explains why, when the innovation in this type of contract is really significant, risks and benefits sharing

mechanisms can be established between the purchaser and the successful bidder.

All these factors require a change of mentality on the part of public managers and suppliers of goods and services interested in participating in an IP procedure. This is no small challenge, as no change of mentality in public procurement is free of inertia and misgivings, both on the part of public managers and the market itself, which is not used to collaborating with the bidder unless after the contract has been awarded. However, IP procedures require the anticipation of needs planning and the exploration of potential solutions in the market by designing a long and complex phase of collaboration between demand and supply that is unusual in ordinary public procurement procedures.

Therefore, the Project partners have developed the three pilot IP cases following the guidelines set out in document [E 4.1.1 Training materials for Innovation Procurement in the water sector](#) which includes in its subchapter 6.4 a guide with the stages of the IP processes:



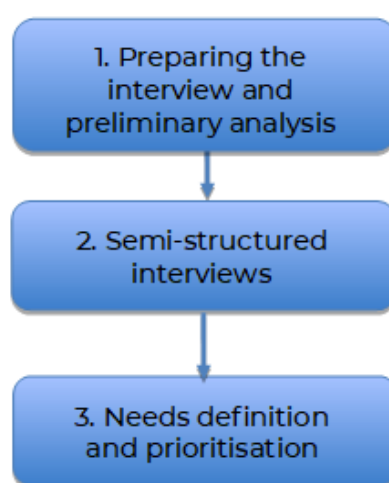
3.1. Stage 1: Detection of needs

The first step to take in an Innovation Procurement is to detect the needs to be solved. To carry out this task, the partners followed the methodology presented in document [E 3.3.2 Guideline for the early identification of the needs of the public sector in the scope of water management](#) (TWIST, online 2021). This methodology was based on a series of semi-structured interviews with decision-



makers in public bodies involved in water management, who could be potential buyers of innovation in the field of wastewater and water reuse.

The methodology comprises the following three stages:



•**Stage 1. Preliminary analysis and interview preparation:** At this stage, the interview is prepared and information on the issues to be addressed in the following stages is identified and analysed.

Therefore, the first step was to identify public entities that could act as potential buyers of innovation in the field of wastewater and water reuse (three from each country) in order to ensure reliable information. These were:

| | |
|-----------------|---|
| FRANCE | <ul style="list-style-type: none"> • Limoges Metropole • Adour – Garonne Water Agency • Service D’Assainissement, Bordeaux Metropole |
| SPAIN | <ul style="list-style-type: none"> • Consejería de Agricultura, Ganadería, Pesca y Desarrollo Sostenible • Empresa Metropolitana de Abastecimiento y Saneamiento de Aguas de Sevilla, S.A. • Empresa Municipal de Agua y Saneamiento de Murcia, S.A. |
| PORTUGAL | <ul style="list-style-type: none"> • Instituto Superior Técnico • Águas do Tejo Atlântico |

•**Stage 2. Semi-structured interviews:** during this stage, interviews were carried out with each of the entities identified in the previous stage. This stage constitutes the main part of the methodology, and is designed to explore, through various questions, potential technological needs of public entities in the water sector. Two tools were used to carry out this stage: interview questionnaire and interview questionnaire guide.

•**Stage 3. Definition and prioritisation of needs:** this stage aimed to define and contextualise the needs identified and prioritise them according to the interviewee on the basis of the information and results obtained in the previous stage.

From these interviews, a total of thirty-three public sector technology needs in the field of wastewater and reuse were obtained, which from the process of classification, grouping and selection of common technological needs were reduced to three needs common to the six TWIST regions in the technological fields addressed by the three Living Labs in order to be able to carry out three pilot cases of Innovation Procurement in the water sector.

The process followed was as follows:

•**Phase 1: Ranking of technology needs identified in TWIST regions**

Initially, in order to make the process of finding the three needs easier, the TWIST partners proceeded to catalogue them by colour. They have been categorised by similarities in certain areas of water use with the following colours:

Red: Water reuse



Blue: Sustainable solutions for wastewater treatment

Green: Sewerage network works (pipelines)

Orange: Circular economy

Purple: Stormwater management

Pink: Water management

Black: Other

Therefore, based on this classification, we have the following in the different regions:

| FRANCE | Technology need |
|--|--|
| Limoges Metropole | Pipe breakage prediction models Reliable pipe inspection Improve and speed up the acceptance phases of work and interventions Prevent combined sewer overflows of incoming pollutants Improve resiliency of sewage system against combined sewer overflows |
| Adour-Garonne Water Agency | Phosphorus valorisation Circular economy of wastewater nutrients Diagnosis of the sewerage network Water reuse Decentralized systems |
| Service D'Assainissement, Bordeaux Metropole | Control of rainwater and fight against flooding Collecting, transporting and treating wastewater Operational and strategic asset management |
| SPAIN | Technology need |
| Andalusia (CAGPDS) | Reduce water leaks Optimization of water management |



| | |
|------------------------|--|
| | <p>New solutions for wastewater treatment in small communities</p> <p>New solutions to facilitate the use of reclaimed water in agriculture</p> <p>Water quality control</p> |
| Andalusia (EMASESA) | <p>New integrated model for sewage sludge and other waste</p> <p>New solutions to remove emerging pollutants in water purification processes</p> <p>New solutions to remove emerging pollutants in wastewater treatment processes</p> <p>New solutions to detect and measure emerging pollutants</p> <p>New solutions for floating waste</p> |
| Murcia (EMUASA) | <p>New solutions for reclaimed water</p> <p>New solutions to manage sewer sludge</p> |

| PORTUGAL | Technology need |
|---------------------------------|---|
| Instituto Superior Técnico | <p>Water leaks detection</p> <p>Water reuse</p> <p>Rainwater use</p> |
| Águas do Tejo Atlântico | <p>Water reuse</p> <p>Stormwater management</p> <p>Energy efficiency in WWT</p> <p>Cost-effective solutions for wastewater treatment in small communities</p> |
| Instituto Superior de Agronomia | <p>Nutrient recovery from wastewater – phosphorus and nitrogen implying</p> <p>Circular economy of wastewater nutrients</p> <p>Removal of xenobiotics in wastewater</p> |

Innovative solutions for wastewater
recycling/treatment/upcycling to self-sufficient houses
Water reuse (irrigation and other less noble uses e.g.
washing of facilities, and toilet flushing)
Green technologies (constructed wetlands)

All these needs have arisen because in the last decades all over Europe water policy has evolved from “a clear priority on satisfying demand, towards a planning and management of water resources that is more attentive to environmental considerations in a context of integral efficiency, improvement of the useful life of assets and their maintenance, optimisation and reduction of energy and water losses” (MITECO, 2020). Likewise, the new national and EU regulations lead to an increase in the quality required in the processes of purification, sanitation and reuse, which come on top of the pressure derived from the current non-compliance with the Water Framework Directive. (TWIST, online b).

•Phase 2: Scope (clustering) of identified technology needs

Once all of the needs had been classified by colour, the partners proceeded to group them according to whether they were common or not in the three countries in order to speed up the process, obtaining the following classification:

1. Common needs to the three countries:

- Water reuse
- Sustainable solutions for wastewater treatment in small populations, decentralised
- Reduce water leaks, pipe breakage, pipe inspection
- Resources recovery - Sludge treatment-nutrients circular economy



2. Other needs that are common to two countries:

- Stormwater management – overflows (Portugal, France)
- Water management (France, Spain)

3. Other needs detected just in one country:

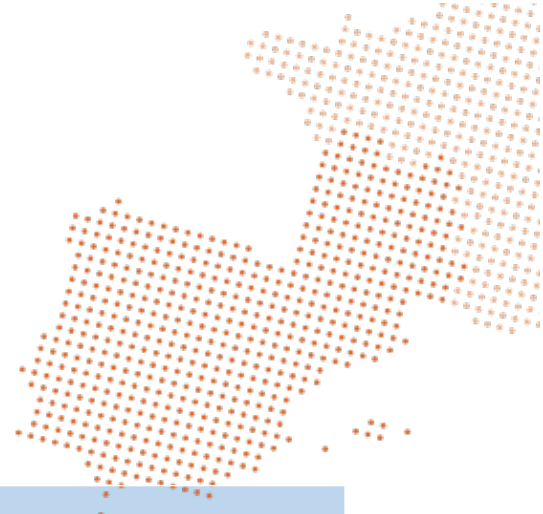
- Rainwater use (Portugal)
- Energy efficiency (Portugal)
- Removal of emerging pollutants (Spain)
- Measurement techniques for emerging pollutants (Spain)

•Phase 3: Selection of the three common needs

Following the process applied, it was very easy to select the three needs common to the six TWIST regions. As can be seen in the previous phase, four needs were detected in the three countries, but after a consensus among the TWIST partners, three technological needs were selected.

In order to discard one of them we took as a criterion the urgency that the countries have due to the new and future regulations established in the European Union and in the respective regions, on the treatment of wastewater and its reuse, which are the follows:

| FRANCE | PORTUGAL | SPAIN |
|---|--|--|
| 1) Sustainable solutions for wastewater treatment in small populations, decentralised | 1) Water reuse | 1) Sustainable solutions for wastewater treatment in rural areas/small populations/decentralized |
| 2) Water reuse | 2) Sustainable solutions for WWT in small communities and self-sufficient houses | 2) Water reuse |



| | | |
|---|---|---|
| 3) Circular economy of wastewater nutrients | 3) Resources recovery - Sludge treatment - Nutrients circular economy | 3) Resource recovery: sewage sludge management/valorisation |
|---|---|---|

As a result of this process, the Living Labs have managed to select three common technology needs out of the thirty-three functionally defined ones that will serve as the basis for the Early Demand Map (EDM). The Early Demand Maps allow, with their publication, to reduce risks and improve IP planning in a very considerable way. As well as to allow *stakeholders* to be aware of the identified technology needs.

The three needs than make up the EDM, as defined by the Living Labs, are:

1st Technological need:

At the present there is an inescapable need to carry out an adequate purification of wastewater since there is a special interest in having quality water since it is essential for human health, economic development and environmental protection.

Complying with the regulations and achieving this objective is not easy due to the large number of small rural village scattered all over Europe whose water is not treated, above all, in the countries participating in this project (France, Portugal and Spain).

In small municipalities where water treatment systems, especially conventional technology systems, exist, there are multiple problems due to technical and economic limitations, compromising the efficiency of urban wastewater treatment systems and preventing the maintenance of the status of water bodies and the quality of de soil.

Thus arises the technological challenge 1 with the idea of providing a solution to small populations in terms of wastewater treatment, ensuring compliance with the Directive in specified time and parameters, with a view to protecting the environment from the negative effects caused by discharges of untreated or inadequately treated wastewater. A technology adapted both economically, technically and environmentally to the area of action is sought. In short this is it:

Sustainable solutions for Waste Water Treatment (WWT) in small communities (depending on the requirements (regulations) of the different countries).

- 1. Primary treatments.**
- 2. Comply with limits of discharge in populations under 10000 p.e. or below with special requirements.**
- 3. Comply with limits of discharge in sensitive areas or populations between 200 and 2000 p.e., for example in France.**

2nd Technological need:

The growing consumption of water for different purposes, such as public supply, agricultural and livestock production, industry and recreational uses, among others, has been putting increasing pressure on water resources. To meet the growing demand for water, reuse has been erected as an alternative source, which contributes to the sustainable use of water resources, as it allows the maintenances of water in the environment and its preservation for nobler and future uses, safeguarding the present use, in line with the principles of the circular economy and of sustainable development.

Globally and in Europe, water reuse has expanded from agricultural irrigation to green spaces and urban uses, restricting it to potable uses. The treatment plant currently in service are not designed to remove emerging contaminants and, although treated wastewater is seen as a new, additional and/or alternative

source of water for multiple purposes, there is little user confidence in the quality of this resource.

This is where the need for the search for a technology arises, as the use of this water can provide important environmental, social and economic benefits, and can contribute to improving the environment by addressing water deficit. The problems associated with the perception of its quality hinder its implementation in the agricultural sector, in addition to its high cost (higher than drinking water consumption).

It should also be noted that the entry into force (June 26, 2023) of the new European Regulation on the reuse of water, the aim is to harmonise “the regulation on water reuse throughout the European Union and the consequent establishment of common minimum requirements that guarantee the quality of reclaimed water and its control, which will guarantee a level playing field in all countries and increase confidence in the practice of water reuse, thus promoting its use”. This new regulation will require a water quality that, at present, is not achieved in most of the facilities.

Water reuse (these can be classified on the basis of the new European regulation on the subject, depending on the use and the different levels of treatment required for each use).

1. Irrigation of crops.
2. Irrigation of gardens
3. Aquifer recharge
4. Reuse of greywater in buildings

3rd Technological need:

Another issue to be addressed is the recovery and reuse of wastewater resources. This is one of the main objectives of current circular economy policy

across Europe, as this could help improve water management and climate change mitigation efforts. At present, there are no efficient and low – cost technologies to do this.

Many of the pollutants in wastewater (nitrogen, organic load, metals, paper cellulose, oils, among others) are only possible resources for obtaining other high-value products. For example, sludge could be used as fertiliser, produce biogas or use them to produce energy or, in the case of sands, use them as raw material in the works.

That is why it is necessary to develop new technologies that allow for the valorisation of this floating waste. On the other hand, we are also looking for technologies that allow a new model of sewage sludge management that allows its adequate treatment and the fulfilment of future requirements for its use in agriculture, suitable for the long term and sustainable in its three dimensions (social, economic and environmental). Furthermore, a model for the agricultural valorisation of sludge with direct application, composting and co-composting with plant biomass is foreseen. Technological challenge 3 is defined as follows:

Resources recovery:

- 1. Recovery of nutrients: phosphorus, nitrogen,..**
- 2. Recovery of biomass for energy production.**
- 3. Treatment of sludge for reuse as fertilizers.**

Therefore, the EDM is made up of the following technological requirements:

- 1) Sustainable solutions for waste water treatment in small communities**
(depending on the requirements (regulations) of the different countries).
 1. Primary treatments.
 2. Comply with limits of discharge in populations under 10.000 p.e. or below with special requirements.

3. Comply with limits of discharge in sensitive areas or populations between 200 and 2.000 p.e., for example in France.

2) Water reuse (these can be classified on the basis of the new European regulation on the subject, depending on the use and the different levels of treatment required for each use).

1. Irrigation of crops.
2. Irrigation of gardens.
3. Aquifer recharge.
4. Reuse of greywater in buildings.

3) Resources recovery.

1. Recovery of nutrients: phosphorus, nitrogen,..
2. Recovery of biomass for energy production.
3. Treatment of sludge for reuse as fertilizers.

Once the EDM was established, the viability of these projects was checked in order to be articulated through Innovation Procurement projects. These were validated on the basis of a series of criteria such as: being innovative, having a social impact and promoting a circular economy model.

Initially, however, it was not possible to establish the degree of innovation needed to achieve the objectives set out in the project, so the TWIST project partners set up a process of technical dialogue between demand and supply to find solution.

3.2. Stage 2: Searching for solutions

Once the needs have been detected and defined (EDM), the next step in the IP process is the search for solutions, and for this purpose the TWIST partners carried out a [Preliminary Market Consultation](#) in the form of a technical dialogue that was held within three [National Conferences](#) organised by each of the Living Labs.

In this phase of the process, with the [\(Preliminary Market Consultation\)](#), dialogue is achieved by starting from the challenge posed and obtain the necessary information to be able to propose the solution in an effective way, achieving a balance between the interests of the intervening parties. Therefore, [this dialogue corresponds to the entire approach stage with suppliers and interested administrations](#) and covers from the moment in which the needs are opened to the market to the activity in which the different options are presented in an orderly manner, promoting expanding the information, doubts to be resolved and possible variations to the defined needs to be evaluated. This is done in order to have better information for the evaluation of the ideas received by virtue of the demand, before building the conditions document to start with the next stage.

This process is considered to be the most appropriate at this stage since the Living Labs do not have sufficient specific knowledge to be able to develop functional specifications or specific expertise in IP. Therefore, in the context of the IP process, a [technical dialogue](#) between public purchasers, universities and technology centres and potential suppliers is necessary. Technical dialogue should not be confused with competitive dialogue since, unlike the latter, it is not an award procedure, but a tool for acquiring the necessary information on the technology as a preliminary step to the procurement process.

In order to achieve an efficient and effective technical dialogue, the Living Labs used as a guide the document [Common Guidelines for the development of the technical dialogue](#) (ANNEX 2), which explained the steps to be taken during their corresponding National Conferences (Spain, France and Portugal) and how to carry out the technical dialogue correctly. On the other hand, reference was also made to the document [E 1.1.1 Identification of actors and innovation projects on the water sector](#) (TWIST, online 2019) which identifies the stakeholders that must participate in the dialogue that initiates any IP. In addition, the Living Labs were

consulted prior to the National Conferences by means of forms specifically designed to enable them to describe their technological needs in a comparable way.

In essence, the technical dialogue between supply and demand that was to take place within the National Conferences was intended to respond to the *meet the market event* methodology, which was explained in detail in the aforementioned [Common Guidelines](#). Previously to the National Conferences and in order to have a solid basis on which to conduct the technical dialogue, the Living Labs filled out the [Common Forms defining their needs](#) (ANNEX 1), whose answers show that the level of pre-existing knowledge on the IP in the water sector is very limited, and that the methodology of the previous dialogue with the market is unknown. This explains the degree of development and the pedagogical orientation that the above-mentioned [Common Guidelines for the development of technical dialogue during the National Conferences](#) were intended to have.

Therefore, one of the main aims of these Conferences is to actively involve participant in defining how the challenges presented can be met and, to this end a form was made available for them to fill in depending on the type of entity involved: contracting authorities or potential suppliers. In addition, the aim was to put the participants in context in order to take advantage of the innovation opportunities found in the TWIST project development framework and thus to achieve cooperation and enhance innovation capacities through IP.

To these forms, an introductory part of the reference needs and regulations in each region was added. This information would be obtained thanks to the [common forms to be filled in by the Living Labs describing their technological needs](#). The forms are as follows:

- 1) [Request form technology providers](#) (ANNEX 3): aimed at universities, technology centres, technology companies, etc. in order to be able to provide

comparable solutions to the technological need, indicating, among other things, the TRL (Technology Readiness Level) of their technological solution .

2) [Request form administration and public enterprises providers of services](#) (ANNEX 4): the objective is to enable them to provide comparable information on their interest in technologies based on the needs detected by the Living Labs, from which TRL they would be interested in participating in IP processes, etc.

The three National Conferences were held under the slogan: "Living Labs and the Innovation Procurement in the water sector" in each of the countries where Living Labs are located (ANNEX 5).

All the Conferences were held in live online format, due to the current pandemic situation in which we find ourselves, taking into account the principles of transparency and non-discrimination, so that all those natural or legal entities with the capacity to contribute innovative ideas aimed at responding to the challenges or needs presented above through the use of technologies that exceeded the benefits of those already existing could participate it's in the market.

The [Portuguese Conference](#) took place on the morning of 24th June 2021 and was attended by different entities from the public and private sector, as well as university students interested in the sector. The [French Conference](#) took place on 2th July 2021 and was attended mainly by entities belonging to the French public water sector. The third of these, the [Spanish Conference](#), was the one with the greatest impact in terms of attendees: just over 100 participants from different entities in the water sector from Spain, Portugal and even Latin America. It took place during the morning of 7th July 2021.

After the Conferences and with the help of the forms filled in by the technology providers and the administrations and public service providers, the partners should be able to draw up a [final Conclusions document](#) stating:

1. The existing technological difficulties in each challenge.
2. The degree of innovation required, defining the type of process to be carried out depending on whether an R&D process is required or whether a prototype already exists on the market.
3. Estimate an appropriate and realistic budget, as well as the appropriate timeframe that guarantees the fulfilment of the object and scope of the contract.
4. Define the functional requirements that will constitute the object of the contract.
5. To estimate the minimum solvency levels to guarantee the object of the contract by the bidders, which will be determined according to the solvency presented by those economic operators that have participated in the consultation and taken part in the technical dialogue.
6. Determine the key variables that will guarantee the optimum choice (award criteria).

However, despite this preparation, the results obtained were not the desired ones, mainly due to the low proactive participation of those attending the different National Conferences, highlighting the fact that no completed forms were obtained from the attendees.

All this has been favoured due to various factors such as:

- The annual period in which the conferences were held (beginning of the summer holidays).
- The online format, forced by the pandemic situation.
- The scarce or practically non-existent experience in the sector in this type of process

- The perceived lack of knowledge in the market about IP processes in general and, in particular, about the capacity for innovation in the water sector.

In addition to these factors, the lack of material time (this stage of the IP process takes between three and eight months and the TWIST project has only three months from the National Conferences to its finalisation) prevents the continuation of the technical supply - demand dialogue and to find out if there are available technologies close to the market that can cover the existing water demands.

However, at least one Public Research Bodies (PRB's) showed interest in the technological demands presented during the Spanish National Conference and in being part of the Living Lab for the future.

3.3. Stage 3 y 4: Drafting and processing of procurement documents, contract monitoring and evaluation

Under these conditions, it has been impossible to define functional requirements to meet the needs detected that could be included in future IP specifications, therefore, it has been impossible to continue with **Stage 3 (Drafting and processing of the procurement specifications)** and **Stage 4 (Monitoring and evaluation of the contract)** and, therefore, to complete the three IP processes associated with each of the three common needs in the technological fields addressed by the three Living Labs of the TWIST project.

The activities that have been successfully implemented in the three IP pilot cases (in green) and those that could not be implemented (in red) are shown below:



The partial implementation on the defined route has been mainly due to the lack of meaningful responses in the technical dialogue, to the extent that the state-of-the-art for the different technological needs identified has not been available.

Consequently, it will be necessary to deepen the supply-demand technical dialogue in the future in order to be able to define common technical specifications for the technological challenges identified and to be able to proceed with the next steps of the process.

4. INNOVATION PROCUREMENT PROCESS – STEP BY STEP

As it has been seen in the previous sections, it has not been possible to obtain the necessary knowledge to carry out the IP pilot cases, so the partners have established that it is desirable to create a [guide on how to carry out the Innovation Procurement process](#). This guide is addressed to all public purchaser, service providers and Living Labs that are carrying IP processes or want to implement them in the future.

This heading therefore explains step by step, the process to be carried out to develop IP, although it should be pointed out that there is no univocal pattern or methodology that can be transferred to all cases, as each IP process will depend on: the type of procurement modality chosen in view of the degree of innovation required in each case (PPI or PCP); the type of public sector entity that formulates the demand and the tender (contracting authority or not); the needs identified in each case, which will determine the criteria for selecting the contractor and the achievement of the object of the contract; and the sector in which we find ourselves.

IP procedures do not follow the ordinary patterns of public procurement. In these cases, both the preparation and award of the contract and its execution must be adapted to a form of procurement based on unique premises that to a large extent question the classic principles of procurement: certain object, determined price, immediacy and short term, risk and chance of the entrepreneur; evolving towards models in which negotiation with the market and the sharing of risks in the face of the uncertainty that the acquisition of innovation inevitably entails.

In any case, it should be made clear preliminarily that an IP process requires much more time and resources than an ordinary purchase, as well as greater participation and commitment on the part of all the parties involved.

In IP procedures, the development of a **preliminary phase** preceding the legally foreseen phase of contract preparation is essential. Planning is a mandate from the legislator to contracting authorities. While this planning work is necessary and mandatory in ordinary tenders, in complex tenders, such as IP, it is essential to determine the need that the contract addresses and whether there is a solution available on the market to satisfy it, as well as its degree of technological maturity. In fact, this preliminary analysis of the market will determine whether the IP contract will be a PCP or a PPI.

The core questions to be clarified during the preparation of the contract (whether there is a solution available according to the state-of-the-art and its degree of suitability or development) are outside the administration's internal sphere and require research and investigation actions to guide the decision-making process. To this end, the administration should enter into contact with the market by means of prior and direct contact with potential bidders. An early participation of potential bidders that, until the appearance of the fourth generation Directives in 2014, the legislator viewed with suspicion as it could imply a violation of the principle of equality among bidders, but which can and should become a standard practice in tenders, especially in IP tenders.

These phases of defining the demand and contacts with the market, which are not common in ordinary purchasing procedures, are what make IP procedures special and make them particularly long and complex. On the other hand, the planning and definition of the buyer's needs, adjusted and contrasted with the market, are those that allow the objectives set to be achieved with a higher level of success, efficiency and adaptation, which in the end can lead to significant

savings in the quality-price ratio and, above all, a significant improvement in the performance of the good or service obtained as a result of the IP process.

In general, the steps to be followed in an IP procedure are as follows:

1. Needs assessment

- Analyse and describe needs in a functional way
- Think about which users need to be involved in the process.
- Analyse the market to get an idea of the level of development of possible solutions

2. Plan in advance

- Establish the strategy to be followed
- Estimate the time needed to carry out an efficient process.
- Schedule the whole project

3. Developing the Preliminary Market Consultation (PMC)

- Announce and disseminate information prior to the development of the PMC.
- Conduct conferences, interviews, meetings
- Maintain direct and constant contact with suppliers

4. Preparation of the specifications

- Develop specifications
- Select the appropriate procedure depending on the technology
- Define the evaluation criteria
- Follow the principles of transparency and non-discrimination

5. Evaluation and award

6. Follow-up

4.1. Detects needs

This stage is the first of all and corresponds to the search for and prioritisation of the needs that can be solved through the Innovation Procurement process.

The first step is to form a representative group of key actors with knowledge of the sector who cooperate with each other to identify common needs and describe them in functional and performance terms. To do this, buyers often do not have the necessary technical expertise, so they may hire external experts to provide technical assistance from the outset. These needs will be the basis for the whole process and the EDM will be made from them.

Bilateral meetings between the different actors can be held for the EDM, as the end-users might provide important information on what they really need, so it might be a good idea to involve them in the process.

In addition, a market analysis should be carried out, as it is essential to know whether an Public Procurement of Innovative solutions or a Pre-Commercial Procurement should be carried out.

4.2. Organisation and planning of the process

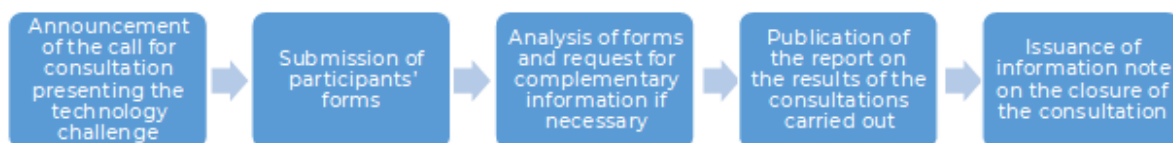
In order to carry out the process in such a way that all the established objectives are met it is necessary to plan it as if it were a project, with an established work programme, deadlines, tasks, responsibilities and assigned resources. All this taking into account that an IP process takes more time and resources than a regular procurement process.

This is necessary because during the process, inconveniences and situations may arise that delay or even force changes to tasks or the process itself, it is therefore

necessary to take these deviations into account in the scheduling of the work and to be able to meet the deadlines of the established work plan.

4.3. Development of the Preliminary Market Consultation

Preliminary Market Consultations (PMC) are a process through which the buyer dialogues with the market to find out the degree of maturity of the offer based on the technological challenge (detected needs), with the intention of obtaining the necessary information to be able to carry out a tender in an efficient way, and to define functional prescriptions that cover the defined needs. The phases that make up the **general procedure of a PMC** are shown below:



As can be seen in the graph above, the first thing to be done is to publish openly and under the principle of publicity the [Preliminary Market Consultation Notice](#) where the object of the consultation, the starting date and the entities that are going to participate in the consultation will be specified as a minimum. On the other hand, the forms for participants should be published or sent out, giving a deadline for the entities to respond to them.

These forms will contain the proposed solutions to the needs detected, and these must be focused on resolving the need, clearly answering all the questions asked, with a deadline for completion given in the [Preliminary Market Consultation Notice](#) itself or in this case in the conferences produced. For the PMC process to be a success, it is necessary that interested companies participate actively and intensively.

Once the given deadline has been met, the responses should be studied and, if necessary, interviews or consultations should be held with the participants in order to clarify any doubts they may have about the proposed solution.

After all this process, a [report](#) can be drawn up containing the results and conclusions obtained from the whole process to guide future contracting. This report will also serve to update the [Early Demand Map](#) that must be published and accessible to all potential purchasers, whether or not they have participated in its creation, through any electronic platform where announcements are published at EU, national and/or local level (document [E 4.1.1 Training materials for Innovation Procurement in the water sector](#)).

The activities to be carried out at this stage are:

- Identify the relevant stakeholders to be involved in the purchase (public and private companies, universities, technological institutes, etc.).
- Define how to proceed with the communication between stakeholders.
- Carry out a market analysis.
- Selecting how to proceed with the formulation of the consultation (website, profile of the contracting party, etc.).
- Preparation of forms to carry out the consultation and a technical dialogue between applicants and bidders.
- Determining the objectives to be achieved.
- Publication of all the information on the consultation so that all those involved can consult it.
- Compilation of all information.

4.4. Drawing up the specifications

With the help of the report of the previous stage, the [Early Demand Map](#) has already been updated so that it is possible to proceed to design and process the procurement documents for the Innovation Procurement, since the necessary

information should already be available to prepare the functional technical specifications of the possible technological solutions needed.

The specifications to be contained in the tender documents are normally based on mandatory requirements and recommended requirements, but in order to favour innovation, the specification should be focused on the achievement of a solution to a problem, not on a specific solution approach to be followed.

At the same time, together with the definition of the object of the contract and the specifications of the good or service to be developed, the preparation of the specifications is the moment to determine the type of Innovation Procurement to be followed (PPI or PCP), the tendering procedure to be followed, the solvency requirements to be met, the award criteria, the method for monitoring the execution of the contract and the evaluation of the results.

In order to choose the most appropriate IP procedure, it is important to know the Maturity Level of the technology presented as a solution (TRLs - these are explained in the document [E 4.1.1. Training materials for Innovation Procurement in the water sector](#)) and the TRLs to be reached at the end of the contract execution, i.e. to set the objectives to be achieved. Once all the aforementioned data are available, the following **sub-steps will be carried out in order to draw up an efficient tender** (MITECO 2020):

4.4.1. Type of contract

The type of contract to be tendered for must be known. These are classified according to the following classification:

- Works (Constructions)
- Services
- Supplies

- Mixed

These can be seen in more detail in document [E 4.1.1 Training materials for Innovation Procurement in the water sector](#), section 6.4.3.1 Types of contract.

4.4.2. Choice of the most appropriate award procedure

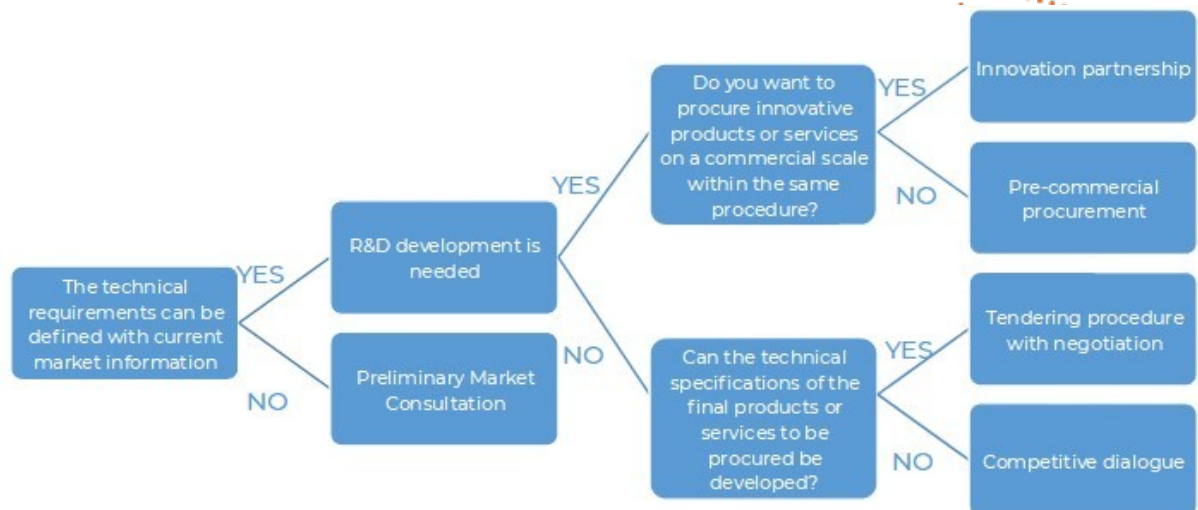
The type of procedure to be followed must be selected according to the information gathered in document [E 4.1.1. Training materials for Innovation Procurement in the water sector](#). There are four types for IP:

1. Procurement procedures that do not require R&D:
 - Competitive dialogue
 - Tendering procedure with negotiation
2. Procurement procedures requiring R&D:
 - Pre-Commercial Procurement
 - Innovation Partnership

In section 6.4.3.2. Main award procedures in IP, of document [E 4.1.1. Training materials for Innovation Procurement in the water sector](#), you can see in detail what each procedure consists of.

There are a number of indicators that can help to make the choice of procedure simpler:

- TRLs on the market.
- You have the knowledge to determine the technical requirements.
- R&D work must be developed.
- A final product or prototype is needed.
- There are future buyers and suppliers.
- Time and resources available for procurement.



This graphic description can be used to help select the type of IP that will follow the need.

4.4.3. Peculiarities of IP specifications

Once the two previous sub-steps have been completed, the next step is the drafting of the tender documents, the format of which will depend on what was selected in the previous stages.

Before starting with the drafting of the specifications, it is necessary to consider and learn how to manage risks, since a good management of these projects must always be accompanied by a risks identification and analysis exercise in order to avoid repeating what has happened with the current process (lack of time and previous knowledge). Likewise, in order to successfully complete all tasks, all stakeholders must be directly involved.

Tender specifications should generally include measures to promote innovation based on the **establishment of technical specifications of a functional nature**. These measures will promote the development of economic, social and

environmental sustainability. In relation to these requirements, the most unique feature of technical specifications is that they will normally be based on the formulation of functional or performance requirements, which must, however, be sufficiently precise to enable tenderers to determine the subject matter of the contract and the contracting authority to award the contract.

In IP contracts the delimitation of the **subject matter of the contract** raises the challenge of the degree of uncertainty arising from the intended innovation, which explains why the subject matter of the contract can be defined with regard to the specific needs or functionalities to be satisfied, without closing the subject matter of the contract to a single solution. In particular, they will be defined in this way in those contracts in which it is considered that technological, social or environmental innovations that improve the efficiency and sustainability of the goods, works or services to be contracted can be incorporated.

Another of the aspects that must be included in the tender documents are the **technical and economic solvency criteria**. In IP processes, care must be taken to maintain a balance between the demand for solvency requirements that allow the participation of experienced companies with innovative capacity that can truly provide solutions, but without these requirements being an obstacle to SMEs or micro-SMEs with a high innovative capacity (start-ups), but with little professional background and generally little experience as a company.

The **award criteria** should be linked to the subject matter of the contract. Since in IP procedures the subject of the contract is not fully defined, it is particularly difficult to establish the exact criteria. Therefore, the rule that allows the application of more than one award criterion is generally applicable in these tenders, where up to three of these cases correspond to the elements that can be perfectly matched in IP tenders:

- a) Those for which it has not been possible to establish projects or budgets in advance and which must be submitted by the candidates or tenderers.
- b) When the contracting authority considers that the definition of the service could be improved by other technical solutions or by reductions in the execution period.
- c) Those requiring the use of particularly advanced technology or whose execution is particularly complex.

Normally, it is understood that the limitation affects the award criteria to be taken into account to select the tender with the best value for money, which in no case may be eliminated or replaced by others or vary their weighting throughout the negotiation process, but it is legally permitted to negotiate on the award criteria. It is one thing to negotiate on the contract price and another thing to negotiate whether the contract price is eliminated as an award criterion or whether its weighting or the score assigned in the evaluation of the bids is altered. The former is permitted, while the latter is what seems reasonable to prohibit, since if this were the case it would mean an alteration of the rules of the game and a deviation from the mandatory binding of the administration to the provisions of the tender specifications. Otherwise, the capacity and margin for negotiation would be practically nullified, eliminating the core element of this procedure, which is negotiation.

Another very relevant peculiarity of IP is the possibility of establishing the **estimated value of the contract through the use of provisional prices**, the setting of which should be accompanied by obligations on the successful tenderer regarding the cost and price audit regime, consisting of a critical and systematic examination of the cost statements of the contract, as well as a profit calculation methodology, which contractors should submit to the auditor to determine the final price of contracts awarded with provisional prices in negotiated procedures, competitive dialogue and innovation partnerships, contributing to

achieving rationality and transparency in procurement and public expenditure management.

Finally, the tender documents should set out the **strategy on Intellectual and Industrial Property Rights (IPR)**, since IP involves investing resources in making new ideas a reality, both on the part of the contracting authority and on the part of the company providing the product or service, and in the future issues such as the capacity of the contracting entity to change supplier, or the extent to which it could be licensed to another potential user of the service, must be taken into account. Defining the IPR strategy or specifications in the tender documents and in the contract is important since, in the case of granting the rights to the company, compensation for the exploitation of these rights can be demanded later on.

4.5. Evaluation and awarding

In the phase of analysis of the bids received, these have to be evaluated with a clear and concise justification in the most comprehensible and concrete way possible, identifying the results that would be obtained in each case. When defining the criteria, Directive 2014/24/EU must be taken into account, since article 67.2 defines that innovative characteristics are an important aspect when defining the award criteria. For example, some award criteria to be included in the tender documents could be the execution time, future energy savings, environmental improvements, reduction of maintenance costs, etc. In addition, the evaluation should consider value for money, recommending that one of the award criteria should be the most economically advantageous offer. Therefore, the duality of economic and qualitative criteria must be taken into account as a whole.

The innovation process aims to help sustainable development in the provision of public services to citizens, so everything developed should be geared towards

this, driving the market and orienting it to meet the proposed needs, so the evaluation should be focused on creativity and innovation.

In the following, the tasks to be followed in order to complete **phases 4 and 5** of the TWIST project will be summarised:

- Select the bidding process based on the requirements of the proposed solution.
- Developing the strategy and intellectual property clauses according to the benefit to be obtained.
- Drafting of tender documents taking into account requirements, clauses, innovative elements, evaluation criteria, deadlines, budget, ...
- Creation of complementary documentation for the publication of the IP tender.
- Compilation of the information received (bids).
- Tender award report of the IP procedure.

4.6. Monitoring

At this stage of contract execution, it is necessary to establish good collaborative management and a system of monitoring and control of the execution by the contractor.

This monitoring and control will make it possible to evaluate the results and efficiency of the contract, measuring performance between the services obtained and the resources provided. Furthermore, it is important that once the solution has been established or developed, the results obtained and the viability of the solution are measured, as well as its expected impact and sustainability.

Therefore, the tasks to be carried out at this stage are:

- Impact assessment of results.
- Monitoring of the implementation process.



- Compilation of all implementation phases.
- Establishing control points (KPIs- Key Performance Indicator).

5. CONCLUSIONS

After the process is carried out and despite the fact that the needs of the demand have been adequately defined, thanks to which the three common challenges for the parties involved have been identified and common methodology to be followed in order to obtain comparable results on which to formulate functional requirements for the IP specifications, the truth is that the process has been affected by the low level of development and progress of the technical dialogue with the *stakeholders* and the market.

The main conclusion to be drawn from the above is that the water sector is not yet mature enough to engage in a mature to undertake an IP process in its phases of drawing up common technical specifications and approving specific IP procedure specifications.

Furthermore, and after clearly defining three technological challenges on which there is a broad consensus, it would be possible to deepen the necessary technical supply-demand dialogue aimed at finding out whether there are available technologies close to the market that can meet existing water demands and, on that basis, be able to define common technical specifications for the technological challenges already defined.

To this end, more time and resources should be invested in the preparation and dissemination of such a technical dialogue, adding specific and individualised appeals to each of the *stakeholders* of reference in each technological challenge. To this end, the preparatory materials developed for the National Conferences remain fully valid.

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7. ANNEXES



ANNEX 1. Forms for Living Labs

Bellow we collect the responses of the three Living Labs of the TWIST Project to the forms expressly designed so that they can describe their technological needs in a comparable way.



Annex 1.1. France: Laboratoire Vivant du Sud-Ouest pour l'Eau (LaViSO)

Organization of the national conference

| |
|--|
| What day of June would you like the event to take place and why? |
| During the week of June 28 to July 2; 2021 |
| What type of conference would you prefer? Please select one of the options: |
| Distance mode |
| Please indicate your reasons: |
| Covid-19 |
| How do you prefer the conference to be held in one day, in the morning and/or afternoon? |
| Key-note and a single round table. |
| Please, indicate which technical entities will be invited to the event. It is important that you specify the flowing: |
| <ul style="list-style-type: none"> - Type of organisation (University, company, R&D center, public administration, ...) - Institution role in the conference (technology provider, administration and public company providing services ...) |
| University, company, R&D center, public administration, technology provider, administration and public company providing services, water utilities |
| Note important considerations: |
| - |



Definition of technological needs

Technological Challenge 1

Sustainable solutions for waste water treatment in small communities (depending on the requirements (regulations) of the different countries).

1. Primary treatments.
2. Comply with limits of discharge in populations under 10.000 p.e. or below with special requirements.
3. Comply with limits of discharge in sensitive areas or populations between 200 and 2.000 p.e., for example in France.

| |
|---|
| <p>Briefly describe the specific need in your country. Please, remember to link to government policies, national goals and/or own municipality level goals.</p> |
| <p>Comply with limits of discharge in populations under 10.000 p.e. or below with special requirements. Comply with limits of discharge in sensitive areas or populations between 200 and 2.000 p.e. Wastewater treatment for small communities.</p> |
| <p>Why should this technological challenge be solved through innovative public purchasing?</p> |
| <p>For cost reasons and to improve the efficiency of the systems</p> |
| <p>When do you need a new solution? How urgent is it?</p> |
| <p>The sooner the better</p> |
| <p>Overall objective Please, describe the objectives to be achieved to solve the need or the problem in the form of functional requirements that solve the need. In addition, describe, where appropriate, the technology that is intended to be developed with the determination of the functional specificities and the technological state, with express mention, if known, of technological maturity levels (TRL) from which it is based and those that are hopes to achieve with the execution of the project.</p> |
| <p>See the different pilots developed in the framework of TWIST</p> |
| <p>Specific requirements. What would you like to ask the market? Please describe, based on the capabilities and technologies already available in your Living Lab, what specific requirements you want to obtain from the market in order to provide a complete solution to the proposed need.</p> |
| <p>I don't understand the question... the market is not a person => you can't ask it anything</p> |
| <p>Indicate the relevant legislation/regulation.</p> |
| <p>Waste water treatment directive Law and order relating to waste water treatment</p> |
| <p>Impact indicators or discharge parameters to consider. For example: efficiency parameters required by regulations or recommendations for primary treatment, limit of discharge parameters in towns below 10.000 inhabitants, limit of discharge parameters in areas with special requirements...</p> |
| <p>See Waste water treatment directive</p> |



| |
|--|
| And in France the quality targets that depend on the vulnerability of the receiving environment |
| What stage of development do you consider these technologies to be at? |
| <p>It depend</p> <ul style="list-style-type: none"> - Somewhat developed (nature base solutions; solutions for water reuse and solutions for resource recovery) - Sufficiently developed (extensive solutions : constructed wetland...) - Remarkably developed or Highly developed => activated sludge and other classic systems |
| Expected results. |
| What results and outcomes would you hope to get from the market dialogue process? (e.g. identify potential new solutions, test the feasibility of your needs against what is available in the market, allow suppliers time to plan and prepare) |
| <p>Again I don't understand the question... the market is not a person => you can't have a dialogue with it</p> <p>Of course I want to identify potential new solutions, test the feasibility of the needs against what is available in the market, allow suppliers time to plan and prepare</p> |
| Is there currently investment in the country destined to cover this need? |
| Describe if you know of the existence of projects or technologies in development that are trying to cover this need. |
| I don't know |
| Do you know any other public administration or entities in search of the same (or similar) problem solving solutions as you are? If so, indicate them. |
| <p>Yes</p> <p>CEREMA - Centre d'études et d'expertise sur les risques, l'environnement, la mobilité et l'aménagement https://www.cerema.fr/fr</p> <p>IIFTS our partner</p> <p>Different universities or School</p> |
| Comments. |
| Please include any important considerations in this regard. |
| - |



Technological challenge 2

Water reuse (these can be classified on the basis of the new European regulation on the subject, depending on the use and the different levels of treatment required for each use).

1. Irrigation of crops.
2. Irrigation of gardens.
3. Aquifer recharge.
4. Reuse of greywater in buildings.

Briefly describe the specific need in your country.

Please, remember to link to government policies, national goals and/or own municipality level goals.

Water reuse is mainly used for irrigation (70%), but also mainly for uses that do not require drinking water (industrial uses for about 20% and domestic uses for about 10%). Water recycling is first practiced for internal industrial wastewater: some industries recycle their water, which thus functions in a closed circuit. Companies can thus aim to reduce their consumption by 40% to 90%.

But the process is also used for secondary municipal wastewater: the water recovered after treatment in a wastewater treatment plant receives additional treatment in order to be used, essentially for uses that do not require drinking water: irrigation, groundwater recharge, industrial uses, etc.

Why should this technological challenge be solved through innovative public purchasing?

For Recycling therefore fulfils a double objective of resource saving: it allows both to save resources upstream by reusing them, but also to reduce the volume of polluted waste.

The interest is however limited when there is no quantitative tension on the water resource in the sector concerned.

When do you need a new solution?

How urgent is it?

No dangerous quantitative tension on the water resource (except in a few limited areas).

It is not necessarily very urgent but the sooner the better.

Overall objective

Please, describe the objectives to be achieved to solve the need or the problem in the form of functional requirements that solve the need. In addition, describe, where appropriate, the technology that is intended to be developed with the determination of the functional specificities and the technological state, with express mention, if known, of technological maturity levels (TRL) from which it is based and those that are hopes to achieve with the execution of the project.

The main need is to find a reliable and low cost wastewater treatment technology that produces treated water that meets the quality standards for water intended for reuse

Specific requirements.

What would you like to ask the market?

Please describe, based on the capabilities and technologies already available in your Living Lab, what specific requirements you want to obtain from the market in order to provide a complete solution to the proposed need.



Here again, I don't understand the question... the market is not a person => you can't ask it anything

Indicate the relevant legislation/regulation.

In France, the use of treated wastewater for irrigation is mentioned by :

- l'article R211-23 du code de l'environnement : « Wastewater may, after treatment, be used for agronomic or agricultural purposes, by watering or irrigation, provided that its characteristics and methods of use are compatible with the requirements of public health and environmental protection » ;
- l'arrêté du 22 juin 2007 (article 10) : « If the discharge of treated effluent into surface water is not possible, the treated effluent can be either eliminated by infiltration into the soil, if the soil is suitable for this method of elimination, or reused for watering green spaces or irrigating crops, in accordance with the provisions defined by order of the minister responsible for health and the minister responsible for the environment ».
- the order of August 2, 2010 on the use of water from urban wastewater treatment for the irrigation of crops or green spaces.

And the following notices :

- recommendations of the Conseil supérieur d'hygiène publique de France (CSHPF) issued in 1991 for use after treatment for irrigation of crops and green spaces;
- afssa opinion 2008: reuse of treated wastewater for watering or irrigation, Agence française de sécurité sanitaire des aliments, November 2008 (opinion relating to a draft decree setting the technical requirements, implementation and monitoring procedures applicable to the use of water from the treatment of wastewater from local authorities for the watering or irrigation of crops or green spaces).
- afssa opinion 2010 (risks of effluents from animal by-product processing plants. The Anses published in 2012 a report assessing the risks related to respiratory exposure to treated wastewater and giving recommendations.

Impact indicators or discharge parameters to consider.

For example: limit of the parameters required by regulations or recommendations for authorized waters for reuse, differentiating whether there is a limitation depending on the use (as in Spain, the RD 1620/2007 legislation establishes water qualities depending on whether the irrigation of crops enters in contact or not with the fruit)

See "article R211-23 du code de l'environnement" : « Wastewater may, after treatment, be used for agronomic or agricultural purposes, by watering or irrigation, provided that its characteristics and methods of use are compatible with the requirements of public health and environmental protection » ;

What stage of development do you consider these technologies to be at?

Underdeveloped or undeveloped

Expected results.

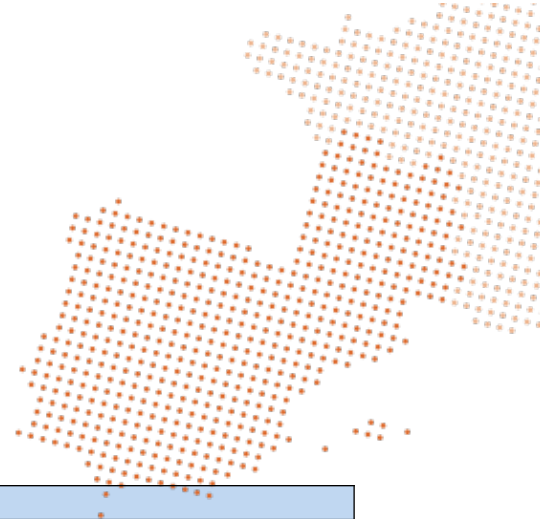
What results and outcomes would you hope to get from the market dialogue process? (e.g. identify potential new solutions, test the feasibility of your needs against what is available in the market, allow suppliers time to plan and prepare)

Again I don't understand the question... the market is not a person => you can't have a dialogue with it

Of course I want to identify potential new solutions, test the feasibility of the needs against what is available in the market, allow suppliers time to plan and prepare

Is there currently investment in the country destined to cover this need?

Describe if you know of the existence of projects or technologies in development that



are trying to cover this need.

Not known

Do you know any other public administration or entities in search of the same (or similar) problem solving solutions as you are? If so, indicate them.

Yes

CEREMA - Centre d'études et d'expertise sur les risques, l'environnement, la mobilité et l'aménagement <https://www.cerema.fr/fr>

IIFTS our partner

Different universities or School

Comments.

Please include any important considerations in this regard.

-



Technological challenge 3

Resources recovery.

1. Recovery of nutrients: phosphorus, nitrogen,..
2. Recovery of biomass for energy production.
3. Treatment of sludge for reuse as fertilizers.

Briefly describe the specific need in your country.

Please, remember to link to government policies, national goals and/or own municipality level goals.

The resource recovery is one of the mains objective of French policy relating to the circular economy

See [https://www.ecologie.gouv.fr/leconomie-circulaire#:~:text=L'économie,](https://www.ecologie.gouv.fr/leconomie-circulaire#:~:text=L'économie, circular) circular consists of a more circular economic model

Why should this technological challenge be solved through innovative public purchasing?

Some of the solutions for resource recovery are not Mature (TRL)

When do you need a new solution?

How urgent is it?

The circular economy is high national priority

Phosphorous quantity is running critically low

Overall objective

Please, describe the objectives to be achieved to solve the need or the problem in the form of functional requirements that solve the need. In addition, describe, where appropriate, the technology that is intended to be developed with the determination of the functional specificities and the technological state, with express mention, if known, of technological maturity levels (TRL) from which it is based and those that are hopes to achieve with the execution of the project.

The main need is to find a reliable and low cost wastewater treatment technology that allow resource recovery

Specific requirements.

What would you like to ask the market?

Please describe, based on the capabilities and technologies already available in your Living Lab, what specific requirements you want to obtain from the market in order to provide a complete solution to the proposed need.

Here again, I don't understand the question... the market is not a person => you can't ask it anything

Indicate the relevant legislation/regulation.

Law n° 2020-105 of February 10, 2020 on the fight against waste and the circular economy (Law n° 2020-105 du 10 février 2020 relative à la lutte contre le gaspillage et à l'économie circulaire): <https://www.ecologie.gouv.fr/loi-anti-gaspillage-economie-circulaire-1>

Regulations applicable to sewage sludge (Réglementation applicable aux boues d'épuration): <https://www.actu-environnement.com/ae/dossiers/traitement-des-boues/reglementation-traitement-des-boues.php4>

Impact indicators or discharge parameters to consider.

For example: requirements or limitations demanded in regulations or recommendations for the different resources to be recovered, characteristics of the resources to be obtained, analytical requirements for the treatment of sludge so that it



can be considered as fertilizer...

Hygienization of sludge is a "treatment that reduces the pathogens present in the sludge to a non-detectable level". It sets the reference thresholds for the content of pathogenic micro-organisms in sanitized sludge. Indeed, if the spreading of sludge from wastewater treatment plants is subject to compliance with good practice rules, the hygienization of sludge before spreading is mandatory in specific agronomic use contexts.

What stage of development do you consider these technologies to be at?

- Underdeveloped or undeveloped for phosphorus recovery
- Somewhat developed for Energy and fertilizer

Expected results.

What results and outcomes would you hope to get from the market dialogue process? (e.g. identify potential new solutions, test the feasibility of your needs against what is available in the market, allow suppliers time to plan and prepare)

Again I don't understand the question... the market is not a person => you can't have a dialogue with it

Of course I want to identify potential new solutions, test the feasibility of the needs against what is available in the market, allow suppliers time to plan and prepare

Is there currently investment in the country destined to cover this need?

Describe if you know of the existence of projects or technologies in development that are trying to cover this need.

Not known

Do you know any other public administration or entities in search of the same (or similar) problem solving solutions as you are? If so, indicate them.

Different universities or School

Comments.

Please include any important considerations in this regard.

-



Annex 1.2. Portugal: Urban Lisbon Living Lab (uL3)

Organization of the national conference

| |
|--|
| What day of June would you like the event to take place and why? |
| ISA - 24th morning |
| What type of conference would you prefer? Please select one of the options: |
| Remote / zoom |
| Please indicate your reasons: |
| ISA - The pandemic situation is also easier to manage if the conference is virtual. |
| How do you prefer the conference to be held in one day, in the morning and/or afternoon? |
| One morning (short project presentation, followed by a roundtable) |
| Please, indicate which technical entities will be invited to the event. It is important that you specify the following: |
| <ul style="list-style-type: none"> - Type of organisation (University, company, R&D center, public administration, ...) - Institution role in the conference (technology provider, administration and public company providing services ...) |
| Universities, public administration: University of Lisbon, ANI |
| Note important considerations: |
| - |



Definition of technological needs

Technological Challenge 1

Sustainable solutions for waste water treatment in small communities (depending on the requirements (regulations) of the different countries).

1. Primary treatments.
2. Comply with limits of discharge in populations under 10.000 p.e. or below with special requirements.
3. Comply with limits of discharge in sensitive areas or populations between 200 and 2.000 p.e., for example in France.

Briefly describe the specific need in your country.

Please, remember to link to government policies, national goals and/or own municipality level goals.

In Portugal the sanitation level is at 84%, with centralized systems covering large cities and more densely populated areas. To increase the level of service regarding wastewater treatment the challenge remains in the more isolated agglomerations, with low population. This usually corresponds to higher costs per capita, since there is no economy of scale. The government has identified the need to improve the quality of service in wastewater treatment, and as such small urban areas must also be addressed. Therefore, there is the need for sustainable solutions for small agglomerations.

Why should this technological challenge be solved through innovative public purchasing?

Innovative options for public procurement and purchases are an important step towards a greater efficiency of both financial and technical resources that will foster the efficiency and national coverage of sanitation.

When do you need a new solution?

How urgent is it?

Solutions to better performance and coverage are always urgent

Overall objective

Please, describe the objectives to be achieved to solve the need or the problem in the form of functional requirements that solve the need. In addition, describe, where appropriate, the technology that is intended to be developed with the determination of the functional specificities and the technological state, with express mention, if known, of technological maturity levels (TRL) from which it is based and those that are hopes to achieve with the execution of the project.

At this stage, the maximum TRL achievable is between 4 and 5, with the development of the ISA living lab.

Specific requirements.

What would you like to ask the market?

Please describe, based on the capabilities and technologies already available in your Living Lab, what specific requirements you want to obtain from the market in order to provide a complete solution to the proposed need.

Still no market entry at this stage

Indicate the relevant legislation/regulation.

Decreto-Lei 152/97



Impact indicators or discharge parameters to consider.

For example: efficiency parameters required by regulations or recommendations for primary treatment, limit of discharge parameters in towns below 10.000 inhabitants, limit of discharge parameters in areas with special requirements...

This needs to be discussed with the licencing authorities, since the discharge limits are flexible for populations below 200 inhabitants, but these authorities end up demanding the same discharge limits as large WWTP.

What stage of development do you consider these technologies to be at?

Depends on the technology and the situation described in the previous question

Expected results.

What results and outcomes would you hope to get from the market dialogue process? (e.g. identify potential new solutions, test the feasibility of your needs against what is available in the market, allow suppliers time to plan and prepare)

Identify potential new decentralised solutions

Is there currently investment in the country destined to cover this need?

Describe if you know of the existence of projects or technologies in development that are trying to cover this need.

N/A

Do you know any other public administration or entities in search of the same (or similar) problem solving solutions as you are? If so, indicate them.

No

Comments.

Please include any important considerations in this regard.

-



Technological challenge 2

Water reuse (these can be classified on the basis of the new European regulation on the subject, depending on the use and the different levels of treatment required for each use).

1. Irrigation of crops.
2. Irrigation of gardens.
3. Aquifer recharge.
4. Reuse of greywater in buildings.

Briefly describe the specific need in your country.

Please, remember to link to government policies, national goals and/or own municipality level goals.

The Portuguese Government has set the goal to achieve 20% reuse in 2030. This is a very ambitious goal since in 2018 the reuse level was only 1,2% in 2018, with most of the reuse being done at WWTP. Not only the level of reuse needs to be increased, but the development of other uses is necessary.

Why should this technological challenge be solved through innovative public purchasing?

Although there is a national law that regulates water quality for reuse (DL 119/2019), there are still many barriers for its applications, involving different stakeholders. IPP allow to meet the specific needs of the public sector, which has the potential to be a main driving force for water reuse examples.

When do you need a new solution?

How urgent is it?

Medium term, although short term examples would be positive to act as guidance.

Overall objective

Please, describe the objectives to be achieved to solve the need or the problem in the form of functional requirements that solve the need. In addition, describe, where appropriate, the technology that is intended to be developed with the determination of the functional specificities and the technological state, with express mention, if known, of technological maturity levels (TRL) from which it is based and those that are hopes to achieve with the execution of the project.

The different types of reuse require different solutions. The barriers to reuse should be identified for each type, as well as the respective TRL.

Specific requirements.

What would you like to ask the market?

Please describe, based on the capabilities and technologies already available in your Living Lab, what specific requirements you want to obtain from the market in order to provide a complete solution to the proposed need.

Since the different types of reuse require different solutions, the needs for the Living Lab depend on the reuse. For greywater reuse that is being addressed in UL3, technical solutions to improve the collection and storage of greywater in existing buildings are one of the requirements needed to provide a complete solution.

Indicate the relevant legislation/regulation.

DL 119/2019

Impact indicators or discharge parameters to consider.

For example: limit of the parameters required by regulations or recommendations for



authorized waters for reuse, differentiating whether there is a limitation depending on the use (as in Spain, the RD 1620/2007 legislation establishes water qualities depending on whether the irrigation of crops enters in contact or not with the fruit)

DL 119/2019 sets reuse parameters for several applications, but there are still gaps.

What stage of development do you consider these technologies to be at?

Somewhat developed

Expected results.

What results and outcomes would you hope to get from the market dialogue process? (e.g. identify potential new solutions, test the feasibility of your needs against what is available in the market, allow suppliers time to plan and prepare)

Identify potential new, and efficiently applicable solutions

Is there currently investment in the country destined to cover this need?

Describe if you know of the existence of projects or technologies in development that are trying to cover this need.

Not yet

Do you know any other public administration or entities in search of the same (or similar) problem solving solutions as you are? If so, indicate them.

-

Comments.

Please include any important considerations in this regard.

-



Technological challenge 3

Resources recovery.

1. Recovery of nutrients: phosphorus, nitrogen,..
2. Recovery of biomass for energy production.
3. Treatment of sludge for reuse as fertilizers.

Briefly describe the specific need in your country.

Please, remember to link to government policies, national goals and/or own municipality level goals.

In Portugal, the most pressing need is for water recovery, e.g. for agriculture, in a water scarcity scenario. Besides, nutrient recovery and recycling, potential soil and water streams contaminants needs to be addressed.

Treated WW will only be valuable for reuse if complying to quality parameters.

Why should this technological challenge be solved through innovative public purchasing?

Nutrient recovery and contaminants cleaning are necessary for environmental reasons, that may be facilitated through public innovative purchases.

When do you need a new solution?

How urgent is it?

Medium term solutions with immediate action towards problem solving

Overall objective

Please, describe the objectives to be achieved to solve the need or the problem in the form of functional requirements that solve the need. In addition, describe, where appropriate, the technology that is intended to be developed with the determination of the functional specificities and the technological state, with express mention, if known, of technological maturity levels (TRL) from which it is based and those that are hopes to achieve with the execution of the project.

N/A at this stage

Specific requirements.

What would you like to ask the market?

Please describe, based on the capabilities and technologies already available in your Living Lab, what specific requirements you want to obtain from the market in order to provide a complete solution to the proposed need.

N/A at this stage

Indicate the relevant legislation/regulation.

-

Impact indicators or discharge parameters to consider.

For example: requirements or limitations demanded in regulations or recommendations for the different resources to be recovered, characteristics of the resources to be obtained, analytical requirements for the treatment of sludge so that it can be considered as fertilizer...

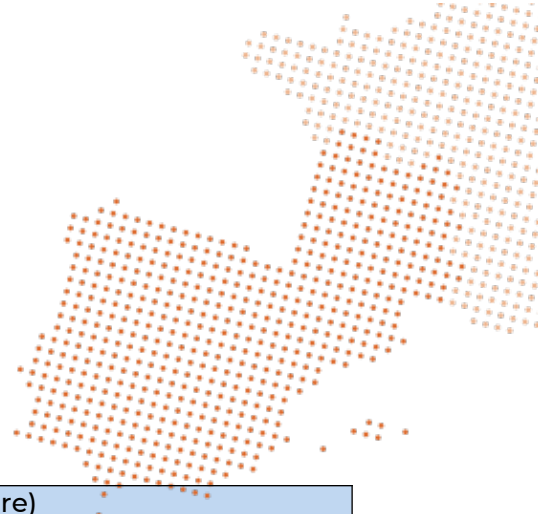
-

What stage of development do you consider these technologies to be at?

Underdeveloped or undeveloped

Expected results.

What results and outcomes would you hope to get from the market dialogue process? (e.g. identify potential new solutions, test the feasibility of your needs against what is



| |
|--|
| available in the market, allow suppliers time to plan and prepare) |
| N/A at this stage |
| Is there currently investment in the country destined to cover this need? Describe if you know of the existence of projects or technologies in development that are trying to cover this need. |
| No |
| Do you know any other public administration or entities in search of the same (or similar) problem solving solutions as you are? If so, indicate them. |
| No |
| Comments. Please include any important considerations in this regard. |
| - |



Annex 1.3. Spain: Open Water Living Lab (OWL-2)

Organization of the national conference

| |
|---|
| What day of June would you like the event to take place and why? |
| Last week of June, as the work still to be done before the conference does not allow the event to be brought forward. |
| What type of conference would you prefer? Please select one of the options: |
| On-line |
| Please indicate your reasons: |
| Whether it will be held in person: <ul style="list-style-type: none"> the current health situation, although it has improved, does not guarantee that we will not suffer a setback; we would have to guarantee security measures; it would be difficult to guarantee the attendance of participants. |
| How do you prefer the conference to be held in one day, in the morning and/or afternoon? |
| Independently and sequentially with three round tables throughout the day (morning and afternoon). |
| Please, indicate which technical entities will be invited to the event. It is important that you specify the following: <ul style="list-style-type: none"> - Type of organisation (University, company, R&D center, public administration, ...) - Institution role in the conference (technology provider, administration and public company providing services ...) |
| In the absence of specifying the entities (since, given the time pressure, we cannot rule out any in the event that they are not available) these will be: <ul style="list-style-type: none"> Operators of the integral water cycle (Integral management of the water cycle). Public administration (Integral management of the water cycle) Suppliers of goods or services (Wastewater treatment) Public administration (Wastewater treatment) Research centres (Integrated management of the water cycle) Universities (Research and development in wastewater treatment) |
| Note important considerations: |
| - |



Definition of technological needs

Technological Challenge 1

Sustainable solutions for waste water treatment in small communities (depending on the requirements (regulations) of the different countries).

1. Primary treatments.
2. Comply with limits of discharge in populations under 10.000 p.e. or below with special requirements.
3. Comply with limits of discharge in sensitive areas or populations between 200 and 2.000 p.e., for example in France.

Briefly describe the specific need in your country.

Please, remember to link to government policies, national goals and/or own municipality level goals.

There is a need to find new solutions to reduce the cost of wastewater treatment in small towns, as in many of them it is a general trend that the treatment of the wastewater generated is inefficient, which prevents the maintenance of the status of water bodies and soil quality.

Why should this technological challenge be solved through innovative public purchasing?

Innovation in the water sector has been established as one of the priorities within the European Union's Framework Programme for Research and Innovation, Horizon 2020. At regional level, the National and Regional Strategies for Smart Specialisation (RIS3) are a fundamental tool for regions to move towards a new production model based on innovation

In this line, to address public sector challenges that cannot be solved by products or services available on the market, PPI allows addressing unmet needs.

When do you need a new solution?

How urgent is it?

-

Overall objective

Please, describe the objectives to be achieved to solve the need or the problem in the form of functional requirements that solve the need. In addition, describe, where appropriate, the technology that is intended to be developed with the determination of the functional specificities and the technological state, with express mention, if known, of technological maturity levels (TRL) from which it is based and those that are hopes to achieve with the execution of the project.

The aim is to provide small populations with a solution for the treatment of the waste water they generate, ensuring compliance with the Directive within the specified time and parameters, with a view to protecting the environment from the negative effects caused by discharges of untreated or inadequately treated waste water.

This requires the use of technologies adapted (economically, technically and environmentally) to the area of action.

Specific requirements.

What would you like to ask the market?

Please describe, based on the capabilities and technologies already available in your Living Lab, what specific requirements you want to obtain from the market in order to provide a complete solution to the proposed need.



| |
|---|
| - |
| Indicate the relevant legislation/regulation. |
| <p>EUROPEAN LEGISLATION:</p> <ul style="list-style-type: none"> • Council Directive of 21 May 1991 concerning urban waste water treatment • 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 • 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 (DOUE n° 348 de 24/12/2008) • 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 Text with EEA relevance (DOUE n. ° L 226 de 24/08/2013) <p>SPANISH LEGISLATION:</p> <ul style="list-style-type: none"> • Royal Legislative Decree 1/2001 of 20 July 2001, approving the revised text of the Water Law (BOE n.º 176 de 24/07/2001) • Royal Decree 60/2011 of 21 January 2011 on environmental quality standards in the field of water policy (BOE n.º 19, de 22/01/2011) • White Book of Water (MMA 2000 aims to provide the basis for the description of the current situation, the estimation of foreseeable developments and the establishment of options and priorities in water use. (http://hispagua.cedex.es/node/66958)) • Royal Decree 817/2015, of 11 September, establishing the criteria for monitoring and evaluation of the status of surface waters and environmental quality standards (BOE n.º 219, de 12/09/2015) • National Plan for Purification, Sanitation, Efficiency, Saving and Reuse (DSEAR Plan) • Hydrological basin plans in force: Royal Decree 1/2016 of 8 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". • Green Paper on Water Governance in Spain: in preparation (http://www.librogobernanzagua.es/) <p>Impact indicators or discharge parameters to consider. For example: efficiency parameters required by regulations or recommendations for primary treatment, limit of discharge parameters in towns below 10.000 inhabitants, limit of discharge parameters in areas with special requirements...</p> |

| Vertido bruto | | | Salida depurada (mínimo) | | |
|------------------|------------------------------|---|--------------------------|--------------------------|-------------|
| Parámetro | Concentración | | Parámetro | Límite de vertido* | % Reducción |
| DQO | 400-600 mg O ₂ /l | ➔ | DQO | 125 mg O ₂ /l | 75 |
| DBO ₅ | 250-300 mg O ₂ /l | | DBO ₅ | 25 mg O ₂ /l | 90 |
| SS | 300-450 mg/l | | SS | 60 mg/l | 70 |
| NT | 40-60 mg/l | | NT | 10-15 mg/l | 70-80 |
| PT | 10-15 mg/l | | PT | 1-2 mg/l | 80 |

*Requisitos exigibles a las aguas residuales urbanas de acuerdo con el Anexo I del Real Decreto 509/1996, de 15 de marzo, de desarrollo del Real Decreto-ley 11/1995, de 28 de diciembre, por el que se establecen las normas aplicables al tratamiento de las aguas residuales. La eliminación de N y P se exige para vertidos en zonas sensibles.

What stage of development do you consider these technologies to be at?

-

Expected results.
What results and outcomes would you hope to get from the market dialogue process? (e.g. identify potential new solutions, test the feasibility of your needs against what is available in the market, allow suppliers time to plan and prepare)

-

Is there currently investment in the country destined to cover this need?
Describe if you know of the existence of projects or technologies in development that are trying to cover this need.

-

Do you know any other public administration or entities in search of the same (or similar) problem solving solutions as you are? If so, indicate them.

-

Comments.
Please include any important considerations in this regard.

-



Technological challenge 2

Water reuse (these can be classified on the basis of the new European regulation on the subject, depending on the use and the different levels of treatment required for each use).

1. Irrigation of crops.
2. Irrigation of gardens.
3. Aquifer recharge.
4. Reuse of greywater in buildings.

Briefly describe the specific need in your country.

Please, remember to link to government policies, national goals and/or own municipality level goals.

- New solutions to facilitate the use of reclaimed water. These solutions must make it possible 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).
- Reclaimed water is also a very interesting solution to address the water deficit, but its cost, as well as problems related to the perception of its quality, make it difficult to implement in the agricultural sector.
- New advanced solutions to ensure the removal of emerging contaminants from reclaimed water. Treatment plants currently in service are not designed to remove emerging contaminants. Future European regulations on water reuse are expected to set quality standards that cannot be achieved by currently implemented systems.

Why should this technological challenge be solved through innovative public purchasing?

Innovation in the water sector has been established as one of the priorities within the European Union's Framework Programme for Research and Innovation, Horizon 2020. At regional level, the National and Regional Strategies for Smart Specialisation (RIS3) are a fundamental tool for regions to move towards a new production model based on innovation.

In this line, to address public sector challenges that cannot be solved by products or services available on the market, PPI allows addressing unmet needs.

When do you need a new solution?

How urgent is it?

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

It is therefore 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 users, especially in deficit systems.

Overall objective

Please, describe the objectives to be achieved to solve the need or the problem in the form of functional requirements that solve the need. In addition, describe, where appropriate, the technology that is intended to be developed with the determination of the functional specificities and the technological state, with express mention, if



known, of technological maturity levels (TRL) from which it is based and those that are hopes to achieve with the execution of the project.

The reuse of reclaimed water is an alternative to the use of natural water but will not be implemented until the cost of reclaimed water is significantly lower than the consumption of drinking water.

It is necessary to obtain reclaimed water at lower costs than at present. To achieve this, action must be taken in two areas:

- Reduce the costs of water supply services: the cost of obtaining reclaimed water should be equal to or less than the cost of obtaining natural water.
- Minimise the costs of applicable technologies: water reuse technologies exist, but they are expensive, so the cost of these technologies would need to be reduced.

The main objective is to be able to enforce the new Reused Water Directive, which will come into force in a few years' time.

Specific requirements.

What would you like to ask the market?

Please describe, based on the capabilities and technologies already available in your Living Lab, what specific requirements you want to obtain from the market in order to provide a complete solution to the proposed need.

-

Indicate the relevant legislation/regulation.

EUROPEAN LEGISLATION:

- Council Directive of 21 May 1991 concerning urban waste water treatment
- 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
- 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 (DOUE n° 348 de 24/12/2008)
- Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - A plan to safeguard Europe's water resources (COM (2012) 673 final)
- 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 (DOUE n. ° L 226 de 24/08/2013)
- Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - Plan for Closing the Loop: An EU Action Plan for the circular economy (COM (2015) 614final)
- 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 (DOUE n.° L 141 de 07/06/2018)
- Regulation (EU) 2020/741 of the European Parliament and of the Council of 25 May 2020 on minimum requirements for water reuse.

SPANISH LEGISLATION:

- Royal Legislative Decree 1/2001 of 20 July 2001, approving the revised text of the



Water Law (BOE n.º 176 de 24/07/2001)

- Royal Decree 1620/2007 of 7 December 2007 establishing the legal regime for the reuse of treated water (BOE n.º 294 de 08/12/2007 <https://www.boe.es/buscar/doc.php?id=BOE-A-2007-21092>)
- Royal Decree 60/2011 of 21 January 2011 on environmental quality standards in the field of water policy (BOE n.º 19, de 22/01/2011)
- White Book of Water (MMA 2000) aims to provide the basis for the description of the current situation, the estimation of foreseeable developments and the establishment of options and priorities in water use (<http://hispagua.cedex.es/node/66958>)
- Royal Decree 817/2015, of 11 September, establishing the criteria for monitoring and evaluation of the status of surface waters and environmental quality standards (BOE n.º 219, de 12/09/2015)
- National Plan for Purification, Sanitation, Efficiency, Saving and Reuse (DSEAR Plan)
- Spanish Circular Economy Strategy, "Spain Circular 2030" (Draft): 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).
- Hydrological basin plans in force: Royal Decree 1/2016 of 8 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".
- Green Paper on Water Governance in Spain: in preparation (<http://www.librogobernanzagua.es/>)

ANDALUSIAN LEGISLATION:

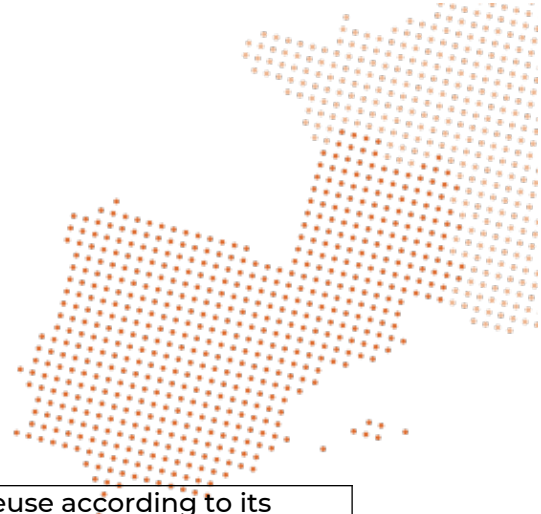
- Law 9/2010, of 30 July, on Andalusian Water: its purpose "is to guarantee the basic water use needs of the population and to make the economic and social development of Andalusia compatible with the good state of aquatic and terrestrial ecosystems" (BOJA n.º 155 de 09/08/2010)
- Decree 357/2009 of 20 October 2009, establishing the territorial scope of the hydrographic demarcations of the intra-community basins located in Andalusia: "aims to establish the territorial scope of the hydrographic demarcations corresponding to the intra-community basins located in Andalusia, whose functions and services have been transferred" (BOJA n.º 208 de 23/10/2009)
- Special Drought Plan (PES)
- Hydrological Planning 2015-2021:
 - ✓ Guadalete-Bárbate Hydrological Plan 2009-2015
 - ✓ Tinto, Odiel and Piedras Hydrological Plan 2015-2021
 - ✓ Hydrological Plan of the Andalusian Mediterranean Basins 2009-2015
- Hydrological Planning 2021-2027: under development

Impact indicators or discharge parameters to consider.

For example: limit of the parameters required by regulations or recommendations for authorized waters for reuse, differentiating whether there is a limitation depending on the use (as in Spain, the RD 1620/2007 legislation establishes water qualities depending on whether the irrigation of crops enters in contact or not with the fruit)

Quality criteria set out in:

-Regulation (EU) 2020/741, Annex I: Minimum uses and requirements.



| |
|---|
| -Royal Decree 1620/2007, Annex I.A: Quality criteria for water reuse according to its uses. |
| What stage of development do you consider these technologies to be at? |
| - |
| Expected results. What results and outcomes would you hope to get from the market dialogue process? (e.g. identify potential new solutions, test the feasibility of your needs against what is available in the market, allow suppliers time to plan and prepare) |
| - |
| Is there currently investment in the country destined to cover this need? Describe if you know of the existence of projects or technologies in development that are trying to cover this need. |
| - |
| Do you know any other public administration or entities in search of the same (or similar) problem solving solutions as you are? If so, indicate them. |
| - |
| Comments. Please include any important considerations in this regard. |
| The draft of the future reused water regulations will demand qualities that, at present, cannot be achieved in many facilities, so future investments in this line must be promoted. |



Technological challenge 3

Resources recovery.

1. Recovery of nutrients: phosphorus, nitrogen,..
2. Recovery of biomass for energy production.
3. Treatment of sludge for reuse as fertilizers.

Briefly describe the specific need in your country.

Please, remember to link to government policies, national goals and/or own municipality level goals.

- New integrated model for sewage sludge: there is a need for a new model for sewage sludge management that allows for proper treatment of sludge and compliance with future requirements for the use of sewage sludge in agriculture.
- A model based on the agricultural valorisation of sludge (direct application, composting and co-composting with plant biomass) is foreseen.
- New alternatives to valorise floating waste from wastewater treatment plants.
- Compliance with the principles of the Circular Economy and the legal requirements established in Decree 73/2012 on waste in Andalusia.

Why should this technological challenge be solved through innovative public purchasing?

Innovation in the water sector has been established as one of the priorities within the European Union's Framework Programme for Research and Innovation, Horizon 2020. At regional level, the National and Regional Strategies for Smart Specialisation (RIS3) are a fundamental tool for regions to move towards a new productive model based on innovation.

In this line, in order to address public sector challenges that cannot be solved by means of products or services available on the market, PPI allows to address unmet needs.

When do you need a new solution?

How urgent is it?

At the Andalusian level, 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 and 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".

At present, technically, it cannot comply with the new legal requirements, so a new or significantly improved sewage sludge management system has to be implemented that is 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".

Overall objective

Please, describe the objectives to be achieved to solve the need or the problem in the form of functional requirements that solve the need. In addition, describe, where appropriate, the technology that is intended to be developed with the determination of the functional specificities and the technological state, with express mention, if known, of technological maturity levels (TRL) from which it is based and those that are



hopes to achieve with the execution of the project.

The main objective is to enforce compliance with the new directives on the agricultural application of sludge.

It seeks, by applying the essence of the circular economy, to give a second use to the waste generated in water treatment, transforming it into raw material:

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

Specific requirements.

What would you like to ask the market?

Please describe, based on the capabilities and technologies already available in your Living Lab, what specific requirements you want to obtain from the market in order to provide a complete solution to the proposed need.

-

Indicate the relevant legislation/regulation.

EUROPEAN LEGISLATION:

- Council Directive 86/278/ECC of 12 June 1986 on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture (DOUE n.º L 181 de 04/07/1986)
- Council Directive 91/271/EEC of 21 May 1991 concerning urban waste water treatment (DOUE n.º L 135 de 30/05/1991)
- 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
- Decision No 2455/2001/CE of the European Parliament and of the Council of 20 November 2001 establishing the list of priority substances in the field of water policy and amending Directive 2000/60/CE (DOUE n.º L 331 de 15/12/2001)
- 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 (DOUE n.º L 348 de 24/12/2008)
- 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 (DOUE n.º L 226 de 24/08/2013)
- Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - Plan for Closing the Loop: An EU Action Plan for the circular economy (COM (2015) 614final)
- 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 (DOUE n.º L 141 de 07/06/2018)

SPANISH LEGISLATION:

- Royal Decree 1310/1990 of 29 October 1990 regulating the use of sewage sludge in agriculture (BOE n.º 62, de 01/11/1990)
- White Book of Water (MMA 2000): aims to provide the basis for the description of the current situation, the estimation of foreseeable developments and the establishment of options and priorities in water use (<http://hispagua.cedex.es/node/66958>)



- Royal Legislative Decree 1/2001 of 20 July 2001, approving the revised text of the Water Law (BOE n.º 176 de 24/07/2001)
- Royal Decree 60/2011 of 21 January 2011 on environmental quality standards in the field of water policy (BOE n.º 19, de 22/01/2011)
- Royal Decree 817/2015, of 11 September, establishing the criteria for monitoring and evaluation of the status of surface waters and environmental quality standards (BOE n.º 219, de 12/09/2015)
- National Plan for Purification, Sanitation, Efficiency, Saving and Reuse (DSEAR Plan)
- Spanish Circular Economy Strategy, "Spain Circular 2030" (Draft): 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).
- Hydrological basin plans in force: Royal Decree 1/2016 of 8 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".
- Special drought plan in force: the TEC Order 1399/2018 of 28 November, "approves the revision of the Special Drought Plans corresponding to the hydrographic demarcations 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".
- Green Paper on Water Governance in Spain: in preparation (<http://www.librogobernanzagua.es/>)

ANDALUSIAN LEGISLATION:

- Law 9/2010, of 30 July, on Andalusian Water (BOJA n.º 155 de 09/08/2010)
- Hydrological Planning 2015-2021
- Guadalete-Bárbate Hydrological Plan 2009-2015
- Tinto, Odiel and Piedras Hydrological Plan 2015-2021
- Hydrological Plan of the Andalusian Mediterranean Basins 2009-2015
- Hydrological Planning 2021-2027: under development
- Order 6 August, 2018, which regulates the use of treated sludge in treatment plants in the agricultural sector

LOCAL REGULATIONS:

- Municipal Ordinance on Domestic or Non-Domestic Dumping (commercial, industrial, services) managed by EMASESA.
- Regulation regulating the provision of sanitation services (discharge and treatment). (BOP n.º 81 de 09/04/2016)

Impact indicators or discharge parameters to consider.

For example: requirements or limitations demanded in regulations or recommendations for the different resources to be recovered, characteristics of the resources to be obtained, analytical requirements for the treatment of sludge so that it can be considered as fertilizer...

-

What stage of development do you consider these technologies to be at?

-

Expected results.



What results and outcomes would you hope to get from the market dialogue process? (e.g. identify potential new solutions, test the feasibility of your needs against what is available in the market, allow suppliers time to plan and prepare)

Today, the destination of sewage sludge is for agricultural purposes, however, future European regulations are expected to set high quality standards for the use of sludge that current treatment systems cannot achieve.

The system currently employed has operational limitations and produces some minor environmental effects on the surrounding population. In addition, the new legal regulation of the Andalusian government establishes new restrictions on the agricultural valorisation of sewage sludge to be complied with in the region.

Is there currently investment in the country destined to cover this need?

Describe if you know of the existence of projects or technologies in development that are trying to cover this need.

-

Do you know any other public administration or entities in search of the same (or similar) problem solving solutions as you are? If so, indicate them.

-

Comments.

Please include any important considerations in this regard.

Future sludge regulations will require qualities that are currently not achievable in many plants, so investment in this area should be encouraged.



ANNEX 2. Guidelines for the development of technical dialogue

1. INTRODUCTION

One of the preparatory documents of the National Conferences to be organized by the TWIST Project´s partners according the respective technological field of their Living Lab, involves the preparation of the “guidelines for the Living Labs, in conjunction with the National Conferences, it can be carried out an efficient and effective technical dialogue, that includes an explanation to give to the participants what is the dialogue technical, such as collecting information for to be comparable from which relevant data can be extracted”.

1.1. Applicable regulatory framework

In the regulatory framework of this technical dialogue with the market (meet the market event) is defined at the European level in the Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014, under the generic of “Preliminary market consultation”. In the Directive’s Article 40 define such consultations as a pre-procurement phase, especially timely in the Public Procurement Innovation (IP), to implement the future contract by gathering information of the existing technological solutions in the market and to inform the economic operators about the meet the needs of contracting authorities, their plans and procurement requirements.

The European Union contemplates IP operations as an opportunity to promote the R&D&I contracting in the strategy of European framework at increased investment in that field, in one hand, and on the other hand it is somewhat like a formula potential to improve the establishment of public services.

The purpose of IP is, therefore, to support the innovation activity of private sector to meet the requirements previously identified in the public entity, in other words, this is about the demand from the public sector address the innovative activity and not all the way around.

1.2. Guideline and principles to be guaranteed in the technical dialogue

At the present time there is an European heritage about the way to perform the technical dialogue focus on the Preliminary Market Consultations (PMC) and, essentially, it should be preserved and considered the following patterns:

1º) Players and dialogue scope

The technical dialogue must be designed and organised in such way that it is addressed to a wide range of businesses and technology agent that know as closely as possible the state of science and technology on the supply side on each of the three challenges set by the project partners. The purpose of this approach is perceived and described effectively the effective capacity's market to attend to the demand from contracting authorities.

For this purpose, the contracting authorities and the organizers of Conference have been able, first of all, to describe in as much details as possible their needs and the objectives seeks with each purchase operation in each of the three challenges identified.

Additionally, the operators which are involved the technical dialogue, they should be sufficiently representative for technical knowledge on the tender, and hence include potential firms or potential suppliers or tenderers, the Universities and research centres institutions, as well sector operators from treatment and regeneration water. Inside of wide spectrum of enterprises, pay special attention to invite large corporations which have R&D&I departments and the technological SME and start-ups operating in the sector.

2º) Publicity

For the purpose indicated, it is important to give the widest publicity possible to the celebration of the National Conference and before it holds its meeting to

elaborate a technical document for each of the needs or challenges defined in the needs form already prepared by the TWIST Project partners, that its development is to be carried out by Living Labs. The mentioned technical document should describe:

- It describes with sufficient clarity and precision the three challenges defined.
- The pretensions and objectives of the technical dialogue in each of the challenges described.
- The list of attendees and guests.
- Information on the program of the National Congress: the registration and accreditation and participation regime of the attendees, the mode of celebration (place and date) and the presentations, sessions and contents of the Congress.

3º) Technical dialogue's technology neutrality

The exchange of information among participants of technical dialogue it is essential that principles of maximum attendance, equality and non-discrimination, transparency and trade secrets and the intellectual property rights or industrial property right of the participants, always be guaranteed.

On one hand, the Conference's organizers must guarantee that all the available information on the demand side, reaches each participant equally. On the other hand, they are entitled to the preservation of trade secret and the intellectual property and industrial property right of the proposed solutions, which will have to be hidden from the other participant to the extent that they request it.

To be clear, the public purchaser has to avoid the previous actions with the market agents which will be translated into distortion and unfair practices.

4º) Transparency and the result

It is essential to record the result of the consultations and the meeting in a final report of the actions carried out within the framework of the Conference, organize the data and information and this documentation distributed and analysed by the attendees. The report will list the studies carried out and their authors, the entities consulted, the questions that have been asked and the answers to them. This report will be motivated, and may be part of the memory of future procurement procedures that may originate from the results obtained in the TWIST project.

5º) Restrictions and limitations on the engagement of supplier companies

As a main rule, participation in the technical dialogue of technology supplier companies does not prevent their later intervention in the contracting procedure if it is processed.

The European regulation and the national legislation of reference it only analyses two restrictions on the participation of companies in the Preliminary Market Consultations (PMC). A direct restriction consisting in that the intervention of the entity in the preliminary delimitation of the object of the contract cannot be valued as a positive or preferential aspect according with the rest of the tenderers. And an indirect restriction regarding the possibility that the active participation of the company in the consultation has set for the specification of characteristics and technical requirements that can only be developed by the same, meaning that the participant has "appropriated" the object of the contract in such a manner that you have designed it according to their own competences.

6º) Effects of the results in the future IP records

It is important to note that the consultations made and the information generated in the Conference cannot result in such a specific and delimited contractual object that it only fits the technical characteristics of the technologies, companies or institutions that have participated in the meeting.

The result of the studies and consultations must, where appropriate, be specified in the introduction of generic characteristics, general requirements or abstract formulas or generic functional technical requirements targeted to satisfying the defined technical challenges, without in any case, the well-defined technical requirements defined may entail advantages with respect to the adjudication of the contract for the participating companies.

2. PHASE OF THE TECHNICAL DIALOGUE “MEET THE MARKET EVENT”

Thought technical dialogues with the market do not have a pre-established format, even if they usually comprise three phases or different contents.

2.1. Preliminary phase of explanation of demand and early demand maps

The initiation of the technical dialogue starts from the definition of procurement needs, identifying the objective and subjective scope of the technical dialogue; that is to say, the improvement objectives that are intended to be achieved in each of the challenges set, explaining, consequently, the potential innovations that can satisfy them.

The technical dialogue must start from the definition of the problem or technical problems posed by the challenge that is addressed in each case and the solutions to be achieved. In this phase, a preliminary evaluation process begins, which should result in initial information that is offered to the participants in the technical dialogue, identifying:

- (i) the problems detected,
- (ii) the objectives or challenges to be achieved,
- (iii) the economic, technical or legal conditions that must be taken into account and,
- (iv) the limitations of the available technology and the technological challenges envisaged.

The publication of this demand map early can reduce risk and improve planning IP significantly. The early demands maps allow, on the other part, in addition of the demand and the needs that are common to several potential purchasers, which would allow, where it is appropriate, to enhance the form of rationalization and centralization of procurements.

In the TWIST project, this early demand map is known and it is the one that has decided the joint definition of the three challenges by the participant in the project, coinciding in this case with milestone E3.3.2 “Guide for identification early needs of the public sector in the field of water cycle management”.

2.2. Phase of the Conference planning and development

Once the above information is available to all the Conference participants, the second phase will be carried out by the dialogue format in a National Conference, in which it is intended that the participants collaborate actively in defining how they can consider the achievement of the defined challenges.

The Conference organizers must adopt the appropriate means for undertaking dialogue with the participants, may choose, cumulatively or alternatively, for standardized surveys, market questionnaires, joint or separate interviews within the framework of each challenge, seminars, conferences, webinars, roundtables and dialogue by topics, etc. Among the multiple formats, the methodology of “meet the market event” seems the most appropriate for the TWIST project, which allows greater interaction between the contracting authority and the businesses. In point 2.4 of this Guideline there is a proposal on the phases and contents of the National Congresses.

Regarding the way to organize the Conference, it can be developed in a single plenary discussion in which the adjudicating entity presents its need as a conference and later, a colloquium is opened among the attendees. Or, with a

large number of participants, roundtable discussions may be organized after a short approach of the situation for each of the technological challenges defined.

2.3. Phase of conclusions, information sharing and monitoring. Management of unrequested tenders

The third and last phase of the dialogue would consist of obtaining a document of conclusions from the Conference and giving it sufficient promotion.

According to the conclusions, for the purposes of the IP, the technical dialogue makes it possible to verify the existence of innovative solutions in the market or / and the degree of adaptation and innovation that each of the challenges would require to meet the public needs that are the object of the public purchase of innovation. In this case, if the technology does not exist so far but its development is feasible through an R&D&I process, the dialogue will determine the choice of a Pre-commercial Procurement (PCP), while if the necessary technology does not It is available but there are models or prototypes with which it can be obtained in an estimated period of time, the previous action will lead to the Public Procurement of Innovative solutions (PPI). In the sections 6.4.1.2 and 6.4.1.3 of the deliverable E.4.1.1. explain the choice of the IP modality and the award procedure for each IP modality.

Once the conclusions have been disseminated, it is recommended to create a file and carry out a follow-up on the companies that have shown their interest in participating in a future tender during the consultation.

In terms of innovation, it is possible that the stimulus to solve the Administration's problems with new ideas comes from the same market through unrequested tender or proposal. With these proposals, companies expressly address the contracting authority, proposing innovative solutions to

needs, present or future, of a specific good or service that the proponent has the capacity to develop.

The management of these tenders is not easy since the public purchaser has to detect whether the tender's claim is to create a need, and thus obtain financing, or if not, the tender effectively responds to the solution of a problem.

For the contracting entities to deal with these tenders, which on some occasions can be classified as interesting and consequently be at the origin of a procurement procedure, it is advisable to create an innovation mailbox to which potential bidders can send ideas innovative applicable to the fields of action of the challenges identified.

2.4. Scheme/proposal of format and sequences of the National Congress

After the consultations made with the partners prior to the preparation of these Guidelines, the common format of the National Congress, conceived as a technical dialogue “meet the market event” would have the following approximate format:

1º) Call for the Congress, with dissemination of the program, the place and date of the event (in webinar format), with an indication of the registration method.

The invitation to companies and operating authorities in the water and purification sector, as well as to reference technological agents (Universities, Research Centres, Laboratories) must be direct. In any case, it is advisable to send the invitation at least fifteen days before the Conference.

2º) Schedule of day/days.

- a) Institutional presentation of the TWIST project, with a brief explanation of the starting and ending point of the project and its role in relation to the intended IP operations.
- b) Development of sector tables for each of the challenges posed. It is important that these sectoral tables do not overlap in time and are sequential, so that it is possible for guests to attend three. At each sector table, the technical dialogue begins with a presentation of each challenge and the objectives that are intended. Attendees must be able to intervene by proposing:
 - solutions available to the market, indicating the technology used, its cost and the degree of innovation that will need to be introduced in each case.
 - description of possible functional prescriptions that the Technical Specifications could contain to achieve the proposed solutions
- c) If the participants so request, they can demand the preservation of the commercial or industrial secret of the technological solutions exposed.

3º) All of the above must have a documentary reflection and/or be recorded in the recording of the sessions, of which the attendees must be previously informed, requiring their consent for this purpose.

4º) As a result of the development of each table, the organizers will prepare a final Conclusions document in which they express:

- The existing technological difficulties in each challenge and the degree of innovation required, defining whether a Pre-commercial Public Procurement (CPP) or Public Procurement of Innovative solutions (PPI) operation would be necessary.
- The approximate cost of executing the solution.

- The possible functional prescriptions that could be included in the technical specifications.

5º) After the closing of the Congress, a permanent communication channel will be kept open, as a suggestion box, until the completion of the TWIST project and the final presentation of the functional prescriptions that are proposed for inclusion in future administrative documents.

3. SPECIFIC ASPECTS TO TAKE INTO ACCOUNT IN THE TECHNICAL DIALOGUE BASED ON THE THREE CHALLENGES IDENTIFIED IN THE PROJECT

To address the technical dialogue should be clearly identified needs covered. These needs have arisen due to the fact that the water policy of the last decades throughout Europe has evolved from an obvious priority in the satisfaction of demands, towards a planning and management of water resources that is more attentive to environmental considerations in a context of comprehensive efficiency, improvement of the useful life of assets and their maintenance, optimization and reduction of energy and water losses. Likewise, the new national and community regulations lead to an increase in the quality required in the purification, sanitation and reuse processes, which add to the pressure derived from current breaches of the Water Framework Directive. And that is why these types of innovative challenges arise:

NEED 1 (Technological challenge 1)

Sustainable solutions for waste water treatment in small communities (depending on the requirements (regulations) of the different countries).

1. Primary treatments.
2. Comply with limits of discharge in populations under 10.000 p.e. or below with special requirements.

3. Comply with limits of discharge in sensitive areas or populations between 200 and 2.000 p.e., for example in France.

NEED 2 (Technological challenge 2)

Water reuse (these can be classified on the basis of the new European regulation on the subject, depending on the use and the different levels of treatment required for each use).

1. Irrigation of crops.
2. Irrigation of gardens.
3. Aquifer recharge.
4. Reuse of greywater in buildings.

NEED 3 (Technological challenge 3)

Water reuse.

1. Recovery of nutrients: phosphorus, nitrogen,..
2. Recovery of biomass for energy production.
3. Treatment of muds for reuse as fertilizers.

Since these should be described and presented to start the technical dialogue in the most detailed way possible at the beginning of the conferences, highlighting for each of them the following:

- Brief background summary.
- General description of the need or existing problem.
- Justification of public need. Where it is necessary to talk about the needs of the service by referring mainly to comply with the regulations.
- Establish a list of issues that respond to the needs to be covered.
- Establish a list of functional conditions that must meet at least the technological challenge.

Once the needs are well defined, it is necessary to differentiate the different candidates who can participate in the technical dialogue. The process must be treated in a transparent manner in order to guarantee equal treatment with all companies that may be involved. Therefore, all those physical or legal entities with the capacity to contribute innovative ideas destined to respond to the challenges or needs presented above must be able to participate through the use of technologies that exceed the benefits of those existing in the market and linked to the integral cycle of the water.

It is worth mentioning that the process is carried out for the activation or search of technological solutions, so, in this sense, the objectives pursued with the technical dialogue are the following:

- Define the functional requirements that will constitute the object of the contract.
- Estimate the minimum solvency levels to guarantee the object of the contract by the tenderers, which will be determined based on the solvency presented by those economic operators who have been interested in or invited to the consultation.
- Determine the key variables that will guarantee the optimal choice (award criteria)
- Estimate an appropriate and realistic budget, as well as the adequate term that guarantees the fulfilment of the object and scope of the contract.
- Establish management models for Industrial and Intellectual Property Rights (IPR) resulting from the tender, which will depend on the predisposition shown by economic operators in the consultation, to assign part of the rights that allow their exploitation, both pre-existing and those generated after the execution of the contract.

Finally, it is necessary to remember that the achievement of the objectives that have just been related does not end when the National Congress is formally

closed, being very convenient to maintain a “suggestion box” and file of proposals in the sense indicated in point 2.3. (Conclusions, dissemination and follow-up phase) above, which should be kept updated and accessible to all parties.



ANNEX 3. Request form technology providers



This application form in editable format is available to those invited to participate in CPI.

All sections of the application form must be completed in full in order to be considered. Please fill in the form as many times as there are needs in which you would like to participate.

1. Main data

| Basic Data | | | |
|--|--|-----------------------------|------|
| Name of the proposal: | | | |
| Challenge/s to which it applies | <input type="checkbox"/> Solution for wastewater treatment in small communities <input type="checkbox"/> Water Reuse <input type="checkbox"/> Resources recovery | | |
| Stakeholder data | | | |
| Individual person: | <input type="checkbox"/> | | |
| Legal entity: | <input type="checkbox"/> | | |
| Field or sector of activity (CNAE) | | | |
| Type of Entity (Self-employed, Private Business, Public Enterprise, Research Center, University, Technological Center, Other): | | | |
| Joint proposal of several physical or legal person: Check YES or NO | YES <input type="checkbox"/> | NO <input type="checkbox"/> | |
| Size of your entity at present (No. of people in staff) | | | |
| Total invoicing of the entity in the past 3 years (€): | 2020 | 2019 | 2018 |
| | | | |
| Representative / spokesperson data | | | |
| Name of spokesperson (or representative of the proposal in case of a joint proposal): | | | |
| Telephone: | | | |
| Email address: | | | |
| Address: | | | |
| Additional information | | | |
| Does your organization have invoicing in technologies similar to those of this proposal in the past 3 years? Answer YES or NO. | YES <input type="checkbox"/> | NO <input type="checkbox"/> | |



| | | |
|--|--|-----------------------------|
| If you have answered YES to the question above, state approximate invoicing in similar technologies to this proposal in the past 3 years (group figure of the 3 years) | | |
| Do you consider your organization has relevant certifications to undertake the challenges proposed? Answer YES or NO. | YES <input type="checkbox"/> | NO <input type="checkbox"/> |
| If you have answered YES to the question above, state which are those certifications (max. 300 characters): | | |
| Do you consider the staff of your entity has qualifications especially relevant to undertake the challenges proposed? Answer YES or NO. | YES <input type="checkbox"/> | NO <input type="checkbox"/> |
| If you answered YES to the question above, indicate what those qualifications are. | | |
| Have you carried out investments in R&D in the past 3 years? Answer YES or NO. | YES <input type="checkbox"/> | NO <input type="checkbox"/> |
| If you answered YES to the question above, state what the amount of the investment has been in the past 3 years (group figure for the 3 years): | | |
| Has your entity obtained public financing in competitive concurrence for R&D projects in any of the past 3 years? Answer YES or NO | YES <input type="checkbox"/> | NO <input type="checkbox"/> |
| If you answered YES to the question above, state the financing volume received during the past 3 years (total figure of the 3 years): | | |
| For the challenge posed, provide detailed information on research, development of solutions, publications, etc., carried out or being carried out with a similar objective to the one indicated. | <ol style="list-style-type: none"> 1. Research (detailed description) 2. Development of solutions (detailed description) 3. Publications(detailed description) 4. Others(detailed description) | |



2. Description of solution

| | |
|---|--|
| Indicate to which need the solution provided is applied: | |
| <input type="checkbox"/> Sustainable solutions for wastewater treatment in small communities depending on the discharge requirements in different countries. For example, in France different effluent quality is required depending on whether the population has less than 200 h.e. or between 200 and 2000. If treated wastewater discharges into sensitive areas, it is required to remove nutrients <ul style="list-style-type: none"> • Primary treatments. • Comply with limits of discharge in populations under 10.000 p.e. or below with special requirements. • Comply with limits of discharge in sensitive areas or populations between 200 and 2.000 p.e., for example in France. | |
| <input type="checkbox"/> Water reuse: this could be divided based on the new European regulation on water reuse, depending on the use and the different levels of treatment required for every use. <ul style="list-style-type: none"> • Irrigation of crops: different types of crops will demand different levels of treatment (removal of solids, pathogens, etc.) • Irrigation of gardens • Aquifer recharge • Reuse of greywater in buildings | |
| <input type="checkbox"/> Resources recovery: <ul style="list-style-type: none"> • Recovery of nutrients: phosphorus, nitrogen,... • Recovery of biomass for energy production • Treatment of sludge for reuse as fertilizers | |
| Brief summary of the solution proposed: functional specification. (maximum 1.250 characters) Description of the possible idea that can cover the need stated from a functional point of view. | |
| | |
| If the solution uses commercial software, please indicate the licenses | |
| Based on the proposed solution, indicate between the following options: | |
| <input type="checkbox"/> The proposed solution does not exist on the market. <input type="checkbox"/> The proposed solution exists in the market, but has never been used in the field of water treatment. <input type="checkbox"/> The proposed solution exists and is commercialized in the market. | |
| If you have selected that the solution does not exist in the market or that it has not been applied to any of the needs studied, indicate: | |
| Estimated duration for execution of the proposal (months) | |



| | |
|--|--|
| Estimated cost for development of your solution proposal (€) | |
| Is the proposed project in line with your business strategy? Explain in what way and how? | |
| Innovation elements (new technologies delivered and innovative solutions) or R&D expected results. | |
| Technological needs for application of your proposal | |
| Maturity level today of your solution proposed (in the event of knowing the technological maturity level (TRL) it is in, please state this) | |
| Results of R&D expected to be generated (max. 850 characters) | |
| Do you consider that there is any limitation or specific barrier for deployment of the product in the market? Which? | |
| What are the main advantages of the proposed solution compared to others? Indicate the differential values of the proposal for the need that you want to cover. | |
| | |
| Benefits provided by the proposed solution for the public service. | |
| | |
| Indicate the regulations and standards associated with the proposed solution. | |
| | |

Terms (according to the months given above)

Include a basic schedule for the development of the technology presented that determines the estimated duration of the execution and include items or activities that correspond to the different TRL jumps.

| |
|--|
| |
|--|

| Activity | Start date | End date | TRL milestone / jumps | Associated risks that can alter the deadlines set. |
|----------|------------|----------|-----------------------|--|
| | | | | |
| | | | | |

| Economic valuation of the proposed solution (according to the cost given above) Estimated economic value of R&D&I services, broken down by item (€); additionally, if possible, indicate the hours in the personnel item. | | |
|---|--------------|---------------------------|
| - | - | Economic valuation |
| Fixed asset investments | - | € |
| Personal | Hours | Economic valuation |
| University Graduates | h | € |
| No university graduates | h | € |
| Materials | h | € |
| Collaborations | h | € |
| Other expenses | h | € |
| Total | h | € |

In the event that the solution proposed in the previous section has elements, services, technological applications or technical solutions that are protected by special rights (industrial or intellectual property) or if you consider that their public communication to the participants and operators is subject to commercial secrecy on the part of the entity you represent, indicate this, indicating which elements, services, technological applications, technical solutions or methodologies of use are so protected, in order to preserve their confidentiality vis-à-vis third parties.

| | | |
|---|------------------------------|-----------------------------|
| Attach copyrighted documents Check YES or NO | YES <input type="checkbox"/> | NO <input type="checkbox"/> |
| List of attached documents provided In the event that there are such, stage documentation that goes with your proposal and which provides more information about the proposed idea. | | |
| Nave of the file | Brief description | Confidential* |
| | | <input type="checkbox"/> |
| | | <input type="checkbox"/> |
| | | <input type="checkbox"/> |

*Tick this box in cases that the documents are confidential.



This information, or part of it, will be published in the report of the pilot cases of innovation procurement. In general, however, this information will not be disclosed, except with express consent, and the information provided will only be used by the Administrations requesting the solutions or challenges.



TRL – HORIZON 2020

Each level characterizes the progress in the development of a technology, from the idea (level 1) to its complete deployment in the Market (level 9):

TRL 1 - Basic research: elementary principles are observed and referred

The lowest level of technological maturity. Scientific research begins to turn into applied research and development. Examples can include fundamental research and articles.

TRL 2 - Applied Research: the concept of the technology and / or its application are formulated

Once the basic principles are observed, the practical applications are formulated. The examples are limited to analytical studies and experimentation.

TRL 3 - Critical function, proof and establishment of the concept

Active research and development begins. Laboratory studies seek to validate the analytical predictions of the components separately from the technology. Examples include components that have not yet been integrated or are not representative.

TRL 4 - Laboratory analysis of the prototype or process

The design, development and laboratory analysis of the technological components is carried out. Here, the basic technological components are integrated to work together. It is a "low fidelity" prototype compared to the final system.

TRL 5 - Integrated System Laboratory Analysis

The basic technological components are integrated together with real elements to be analysed in a simulated environment. This is a 'hi-fi' prototype compared to the final system.

TRL 6 - Verification of the prototype system

The good prototype, from level 5, is analysed in a relevant environment. The demonstration of the system or process takes place in an operational environment.

TRL 7 - Demonstration of the integrated pilot system

The prototype is close to the planned operational system level. The final design is virtually complete. The goal of this level is to eliminate engineering and manufacturing risks.

TRL 8 - System incorporates commercial design

The technology has been proven to work in the final part under the expected conditions. In most cases, this level represents the end of true systems development use.



TRL 9 - The system is ready for full scale use

Here, the technology takes its final form and is ready for commercial deployment.

Post 9 Level - Market Introduction

The product, process or service is commercially launched on the market and is accepted by a group of customers (including public authorities).



ANNEX 4. Request form administration and public enterprises providers of services



This application form in editable format is available to those invited to participate in IP.

All sections of the application form must be completed in full in order to be considered. Please fill in the form as many times as there are needs in which you would like to participate.

| Contact | |
|--|--|
| Administration or public company providing services | |
| Administration or entity name | |
| Main activity | |
| Type of contracting entity (If applicable: contracting authority) | |
| Other data | |
| Full address | |
| Name and surname of the contact person | |
| Contact email | |
| Telephone contact | |
| Position in the company or entity | |
| Role of the administration / company in the management of the water cycle | |
| | |



Technological challenge 1 “Solution for wastewater treatment in small communities”

Sustainable solutions for waste water treatment in small communities (depending on the requirements (regulations) of the different countries).

1. Primary treatments.
2. Comply with limits of discharge in populations under 10.000 p.e. or below with special requirements.
3. Comply with limits of discharge in sensitive areas or populations between 200 and 2.000 p.e., for example in France.

| |
|---|
| Specify within the challenge shown in which area you will be most interested |
| *Primary treatment *Comply with the discharge limits in towns below 10.000 inhabitants or with special requirements *Comply with limits of discharge in sensitive areas or populations between 200 and 2.000 p.e., for example in France. |
| Think what it is necessary to innovate in this type of need |
| |
| Investment Please briefly describe if your organization has investment plans in developing technologies to meet this need |
| |
| How likely is your organization to invest in this need? Please indicate 0-5 (highest probability) |
| *Short term *Medium term *Long term |
| From which TRL would be interested in participating in IP processes |
| |
| How long do you think would be appropriate for the development of an appropriate technology? |
| |
| What minimum requirements should the solution meet from your point of view? |
| |



As far as you know, are there solutions on the market to address this need? Check YES or NO

- ☐ YES
☐ NO

If you have answered YES, please fill in if you know the following:

| | |
|---|---|
| What organization / company is developing it | |
| At what stage of development do you consider that these technologies are? | <ul style="list-style-type: none"> *Little or nothing developed *Something developed *Sufficiently developed *Remarkably developed *Very developed |
| At what level of technological maturity is said solution? | |
| When you think implantation is possible | |



Technological challenge 2 “Water Reuse”

Water reuse (these can be classified on the basis of the new European regulation on the subject, depending on the use and the different levels of treatment required for each use).

1. Irrigation of crops.
2. Irrigation of gardens.
3. Aquifer recharge.
4. Reuse of greywater in buildings.

| |
|---|
| Specify within the challenge shown in which area you will be most interested |
| <ul style="list-style-type: none"> *Crop irrigation. *Irrigation of gardens. *Recharge from aquifers. *Reuse of greywater in buildings. |
| Think what it is necessary to innovate in this type of need |
| |
| Investment Please briefly describe if your organization has investment plans in developing technologies to meet this need |
| |
| How likely is your organization to invest in this need? Please indicate 0-5 (highest probability) |
| <ul style="list-style-type: none"> *Short term *Medium term *Long term |
| From which TRL would be interested in participating in IP processes |
| |
| How long do you think would be appropriate for the development of an appropriate technology? |
| |
| What minimum requirements should the solution meet from your point of view? |
| |



As far as you know, are there solutions on the market to address this need? Check YES or NO

- ☐ YES
☐ NO

If you have answered YES, please fill in if you know the following:

| | |
|---|---|
| What organization / company is developing it | |
| At what stage of development do you consider that these technologies are? | <ul style="list-style-type: none"> *Little or nothing developed *Something developed *Sufficiently developed *Remarkably developed *Very developed |
| At what level of technological maturity is said solution? | |
| When you think implantation is possible | |



Technological challenge 3 “Resource recovery”

Resources recovery.

1. Recovery of nutrients: phosphorus, nitrogen,..
2. Recovery of biomass for energy production
3. Treatment of sludge for reuse as fertilizers

| |
|---|
| Specify within the challenge shown in which area you will be most interested |
| *Recovery of nutrients: phosphorus, nitrogen,.. *Recovery of biomass for energy production. *Treatment of mud for use as fertilizers. |
| Think what it is necessary to innovate in this type of need |
| |
| Investment Please briefly describe if your organization has investment plans in developing technologies to meet this need |
| |
| How likely is your organization to invest in this need? Please indicate 0-5 (highest probability) |
| *Short term *Medium term *Long term |
| From which TRL would be interested in participating in IP processes |
| |
| How long do you think would be appropriate for the development of an appropriate technology? |
| |
| What minimum requirements should the solution meet from your point of view? |
| |
| As far as you know, are there solutions on the market to address this need? Check YES or NO |
| <input type="checkbox"/> YES <input type="checkbox"/> NO |



| If you have answered YES, please fill in if you know the following: | |
|---|---|
| What organization / company is developing it | |
| At what stage of development do you consider that these technologies are? | *Little or nothing developed *Something developed *Sufficiently developed *Remarkably developed *Very developed |
| At what level of technological maturity is said solution? | |
| When you think implantation is possible | |

| State how the principles of equal treatment and confidentiality of solution providers' proposals will be ensured throughout the National Congress and in the period of suggestions and consultations that will remain open after it. |
|--|
| |
| Indicate the processing of personal data that will apply to the participation of suppliers and the information provided by them. |
| |

The consultations carried out may not result in a contractual object that is so specific and delimited that it only conforms to the technical characteristics of one of those consulted. The result of the studies and consultations must, where appropriate, be specified in the introduction of generic characteristics, general requirements or abstract formulas that ensure a better satisfaction of public interests, and under no circumstances may the consultations carried out entail advantages with regard to the award of the contract for the companies participating in them.

TRL – HORIZON 2020

Each level characterizes the progress in the development of a technology, from the idea (level 1) to its complete deployment in the Market (level 9):

TRL 1 - Basic research: elementary principles are observed and referred

The lowest level of technological maturity. Scientific research begins to turn into applied research and development. Examples can include fundamental research and articles.

TRL 2 - Applied Research: the concept of the technology and / or its application are formulated

Once the basic principles are observed, the practical applications are formulated. The examples are limited to analytical studies and experimentation.

TRL 3 - Critical function, proof and establishment of the concept

Active research and development begins. Laboratory studies seek to validate the analytical predictions of the components separately from the technology. Examples include components that have not yet been integrated or are not representative.

TRL 4 - Laboratory analysis of the prototype or process

The design, development and laboratory analysis of the technological components is carried out. Here, the basic technological components are integrated to work together. It is a "low fidelity" prototype compared to the final system.

TRL 5 - Integrated System Laboratory Analysis

The basic technological components are integrated together with real elements to be analysed in a simulated environment. This is a 'hi-fi' prototype compared to the final system.

TRL 6 - Verification of the prototype system

The good prototype, from level 5, is analysed in a relevant environment. The demonstration of the system or process takes place in an operational environment.

TRL 7 - Demonstration of the integrated pilot system

The prototype is close to the planned operational system level. The final design is virtually complete. The goal of this level is to eliminate engineering and manufacturing risks.

TRL 8 - System incorporates commercial design

The technology has been proven to work in the final part under the expected conditions. In most cases, this level represents the end of true systems development use.



TRL 9 - The system is ready for full scale use

Here, the technology takes its final form and is ready for commercial deployment.

Post 9 Level - Market Introduction

The product, process or service is commercially launched on the market and is accepted by a group of customers (including public authorities).



ANNEX 5. Agenda of the three National Conferences on Capacities for Innovation in the water sector



Annex 5.1. French National Conference



“Living Labs et marchés publics de l'innovation dans le secteur de l'eau”

Conférence dans le cadre du projet TWIST - Stratégie transnationale pour l'innovation dans le domaine de l'eau

2 Juillet 2021, de 13h30 heures à 16 heures 45

| | |
|-------|---|
| 13h45 | <p>Ouverture de la session</p> <ul style="list-style-type: none"> • Stéphanie Laronde – Directrice Office International de l'Eau (OiEau) • Vincent EDERY – Institut de la Filtration et des Techniques Séparatives (IFTS) • Véronique Deluchat – Université de Limoges (UNILIM) <p>Suivi d'un tour de table avec les participants</p> <p style="text-align: right;">Modération : UNILIM</p> |
| | <p>Projet TWIST : Objectifs, activités et résultats atteints</p> <p>Véronique DELUCHAT; Jean-Marc BERLAND; Vincent EDERY – Collégial UNILIM/OiEau/IFTS</p> <p>La présentation sera suivie par une série de questions des participants concernant le projet TWIST.</p> <p style="text-align: right;">Modération : UNILIM</p> |
| 14h45 | <p>Laboratoire vivant du Sud Ouest : LaViSO</p> <ul style="list-style-type: none"> • Vincent EDERY – Institut de la Filtration et des Techniques Séparatives (IFTS) |
| 15h | <p>"Les marchés publics innovants dans le secteur de l'eau".</p> <p>Présentation des différentes procédures permettant l'Achat Public Innovant : PCP ; PPI ; Procédure négociée</p> <ul style="list-style-type: none"> • Intervenant extérieur <p>Retours d'expérience</p> <ul style="list-style-type: none"> • Retour sur un PCP : le projet Smart.Met – Jean-Marc BERLAND (OiEau) • retour sur une Procédure négociée – Ville Agen Marché négocié sans publicité dans le cadre du décret 24/12/2018 - Vincent Edery (IFTS) <p style="text-align: right;">Modération : IFTS</p> |
| 16h | <p>Débat avec les participants : "Les marchés publics innovants dans le secteur de l'eau".</p> <p style="text-align: right;">Modération : Oieau</p> |
| 16h45 | <p>Clôture</p> |



Annex 5.2. Portuguese National Conference

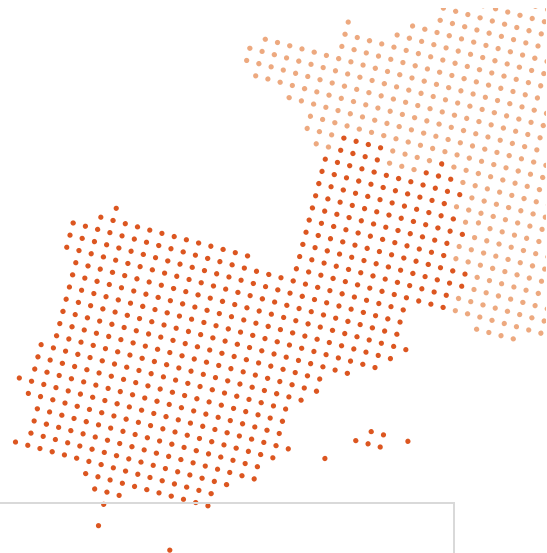


“Living Labs e Compras Públicas de Inovação no Setor da Água”

Conferência no quadro do
Projeto TWIST – Estratégia transnacional para a inovação no domínio da água

24 de junho de 2021, 5.^a feira | [Inscrição aqui](#)

| | |
|-------|---|
| 9:30 | <p>Abertura da sessão</p> <p>Ana Sofia Silveira - Presidente do Conselho de Administração da AdTA – Águas do Tejo Atlântico, S.A (*)</p> <p>José Saldanha Matos - Professor Catedrático no IST – Instituto Superior Técnico e Presidente da PPA - Parceria Portuguesa para a Água</p> <p>António Guerreiro de Brito - Presidente do Instituto Superior de Agronomia da Universidade de Lisboa</p> <p>Moderação: João Simão Pires Director Executivo da PPA – Parceria Portuguesa para a Água</p> |
| 10:00 | <p>Projeto TWIST: Objetivos, atividades e resultados alcançados</p> <p>Cláudia Marques dos Santos Cordovil – Professora do Instituto Superior de Agronomia da Universidade de Lisboa</p> <p>Painel concluído com ronda de perguntas dos participantes relativas às atividades do Projeto TWIST</p> |
| 10:30 | <p>Living Lab: Urban Lisboa</p> <p>Rita Alves – Responsável de Investigação, Desenvolvimento e Inovação na AdTA – Águas do Tejo Atlântico</p> <p>Ana Galvão - Professora Auxiliar no IST - Instituto Superior Técnico</p> <p>Painel concluído com ronda de perguntas e dos participantes relativas às atividades do Living Lab – Urban Lisboa</p> |



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|--------------|---|
| 11:00 | <i>Pausa para café</i> |
| 11:15 | <p><i>Mesa redonda virtual: “Compras Públicas de Inovação no Setor da Água”</i></p> <p>João Simão Pires – <i>Director Executivo na PPA – Parceria Portuguesa para a Água</i></p> <p>Ana Galvão - <i>Professora Auxiliar no IST - Instituto Superior Técnico</i></p> <p>Cláudia Marques dos Santos Cordovil – <i>Professora do Instituto Superior de Agronomia da Universidade de Lisboa</i></p> <p>Nuno Brôco – <i>Administrador - AdP Valor – Serviços Ambientais, S.A. (*)</i></p> <p>Moderação: Alexandra Correia – <i>Responsável na ADRAL – Agência de Desenvolvimento Regional do Alentejo</i></p> <p><i>Painel concluído com ronda de debate e perguntas dos participantes</i></p> |
| 12:30 | <i>Encerramento</i> |

(*) Orador a confirmar



Annex 5.3. Spanish National Conference



Los Living-Labs y la Compra Pública de Innovación en el sector del agua

Conferencia Nacional Española sobre Capacidades para la Innovación en el sector del agua

Proyecto TWIST - Transnational Water Innovation Strategy

7 de julio de 2021

| | |
|--------------|---|
| 09.30 | <p>Bienvenida</p> <p>Álvaro Real Jiménez Fundación Centro de las Nuevas Tecnologías del Agua (CENTA)</p> <p>Daniel Escacena Ortega Agencia Andaluza del Conocimiento (AAC)</p> <p>Jesús Gambín López Fundación Universidad-Empresa de la Región de Murcia (FUERM)</p> <p>Moderadora: Pilar Flores Sáenz Fundación Centro de las Nuevas Tecnologías del Agua (CENTA)</p> |
| 09.45 | <p>Proyecto TWIST: objetivos, actividades y resultados alcanzados</p> <p>Pilar Flores Sáenz Fundación Centro de las Nuevas Tecnologías del Agua (CENTA)</p> |
| 9.55 | <p>Open Water Living Lab (OWL-2): Los Living Labs y su papel en la Compra Pública de Innovación</p> <p>Pilar Flores Sáenz Fundación Centro de las Nuevas Tecnologías del Agua (CENTA)</p> |
| 10.05 | <p>Pausa para café</p> |
| 10.15 | <p>Workshop: el papel de la Compra Pública de Innovación en el sector del agua</p> <p>PPI4MED: el Living-Lab del CSIC en Compra Pública de Innovación Rosalía Feal Calvo Consejo Superior de Investigaciones Científicas (CSIC)</p> <p>DESAL+ LIVING LAB: una apuesta por la economía del conocimiento en desalación de aguas en Canarias Baltasar Peñate Suárez Instituto Tecnológico de Canarias (ITC)</p> |



La Compra Pública de Innovación en Andalucía

Rocío Muñoz Maestre
Agencia Andaluza del Conocimiento (AAC)

La Compra Pública de Innovación en la Región de Murcia

Guillermo Mas
Suez Spain

TWIST, los Living-Labs y la Compra Pública de Innovación

María José Romero García de Paredes
Agencia Andaluza del Conocimiento (AAC)

11.05

Mesa diálogo técnico: retos tecnológicos en el marco del agua

Proceso, retos planteados y formularios de participación

Juan Antonio Carrillo Donaire
Estudio 7 Soluciones Integrales, S.L. - Universidad de Sevilla

RETO TECNOLÓGICO 1: Nuevo modelo integrado para lodos de depuradora y otros residuos

Benigno López Villa
Empresa Metropolitana de Abastecimiento y Saneamiento de Aguas de Sevilla, S.A. (EMASESA)

RETO TECNOLÓGICO 2: Nuevas soluciones para el tratamiento de aguas residuales en pequeñas poblaciones

Jorge Delgado Sánchez
Consejería de Agricultura, Ganadería, Pesca y Desarrollo Sostenible (CAGPDS)

RETO TECNOLÓGICO 3: Nuevas soluciones para facilitar el uso del agua regenerada para usos agrícolas y recreativos

Eva Mena Gil
Empresa Municipal de Agua y Saneamiento de Murcia, S.A. (EMUASA)

Diálogo técnico oferta-demanda sobre posibles soluciones innovadoras que den respuesta a los retos tecnológicos detectados

Modera: Pilar Flores Sáenz
Fundación Centro de las Nuevas Tecnologías del Agua (CENTA)

12.30

Conclusiones

Juan Ramón Pidre Bocado
Fundación Centro de las Nuevas Tecnologías del Agua (CENTA)

12.45

Cierre

Pilar Flores Sáenz
Fundación Centro de las Nuevas Tecnologías del Agua (CENTA)