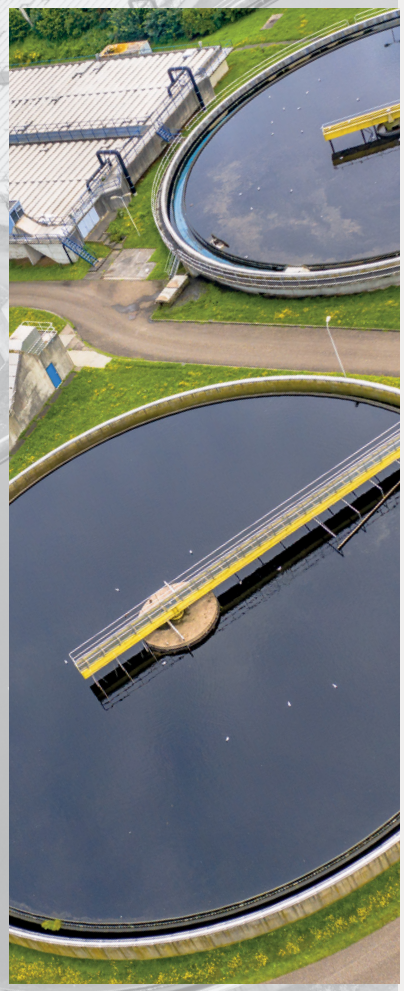
National Plan for Wastewater Treatment, Sanitation, Efficiency, Savings and Reuse

DSEAR PLAN



GOBIERNO DE ESPAÑA
MINISTERIO PARA LA TRANSICIÓN ECOLÓGICA Y EL RETO DEMOGRÁFICO
SECRETARÍA DE ESTADO DE MEDIO AMBIENTE
DIRECCIÓN GENERAL DEL AGUA

National Plan for Wastewater Treatment, Sanitation, Efficiency, Savings and Reuse

DSEAR PLAN

Authors:
General Water Directorate. Secretary of State for the Environment. Spanish Ministry for Ecological Transition and the Demographic Challenge.

MINISTERIO PARA LA TRANSICIÓN ECOLÓGICA
Y EL RETO DEMOGRÁFICO

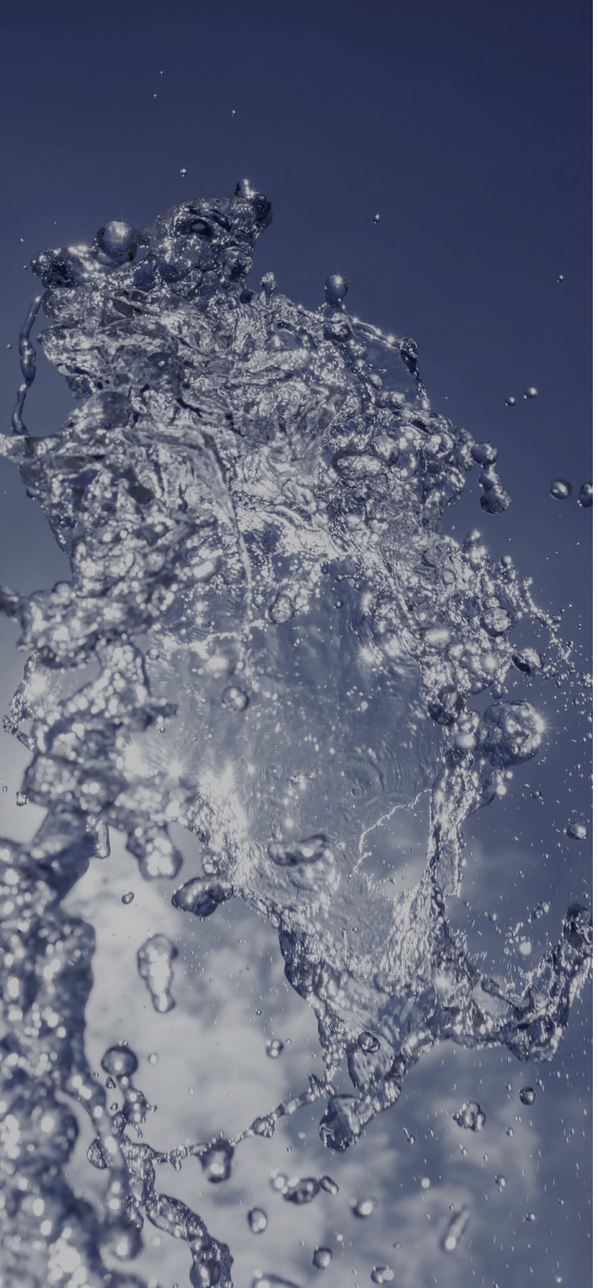
Edited by:

Technical General Secretariat.
Publications Center.
Central Government Publications Catalogue:
http://publicacionesoficiales.boe.es/

Plaza de San Juan de la Cruz, s/n
28071 Madrid
www.miteco.gob.es

NIPO: 665-21-053-0

Prologue



Water is indispensable for the maintenance of natural ecosystems and our quality of life. Climate change is causing a decrease in natural water supplies and an increase in droughts and floods, threatening to alter the quantity and quality of water available to us.

This forces us to rethink our water management and to move towards a more sustainable and efficient model. Aware of the importance and seriousness of these challenges, the Ministry for the Ecological Transition and the Demographic Challenge, through its General Water Directorate, has drawn up the National Plan for Wastewater Treatment, Sanitation, Efficiency, Savings and Reuse (DSEAR Plan).

The DSEAR Plan is a governance tool for the third cycle river basin management plans (2022-2027) to incorporate improved procedures and working methodologies that are well aligned with the principles of the ecological transition and the demographic challenge.

Its implementation will mean a reinforcement of the river basin management plans in order to advance towards their fundamental objective: to achieve the good environmental status of water bodies, making the protection of our rivers, aquifers, and ecosystems compatible with the availability of quality water for the sustainable development of the different human activities.

This objective, established in European standards and incorporated into Spanish legislation, is also a reflection of a social demand: the right to enjoy a healthy environment. It is therefore essential to carry out a complete and correct wastewater treatment, applying the necessary processes to obtain water of excellent quality both to be reincorporated into the natural environment and for subsequent water reuse. In addition, other by-products are obtained from reclaimed water that can be reintegrated into subsequent uses, contributing to a zero-waste, low-carbon circular economy.

The DSEAR Plan reviews in depth the strategies for public intervention in water management and puts forward proposals to advance in the resolution of strategic problems detected after two planning cycles in the areas of wastewater treatment, sanitation, and water reuse:

- It establishes a procedure for prioritising water treatment, sanitation, and reuse measures to be carried out by the Central Government.
- It proposes improvements in coordination and cooperation between the different administrations that design the measures.
- It improves the definition of the actions that should be considered of General Interest of the State.
- It analyses the improvements that need to be made to increase the energy and overall efficiency of water treatment plants.
- It proposes the improvement of the economic and financial regime of water to adapt it to the new challenges.
- Identifies the obstacles that need to be overcome to promote water reuse.
- It establishes mechanisms that promote technology transfer and innovation in public water management.

The DSEAR Plan is the result of more than three years of work in which the participation of multiple people representing all areas of the administration, sectors, society, as well as experts, scientists and legal experts related to water, has been fundamental to its design, allowing the best available knowledge to be incorporated and addressing discussions on issues that seem complex. Workshops, conferences, and participatory forums were some of the activities organised by the General Water Directorate to bring together all the voices and to design and discuss the contents that now comprise the DSEAR Plan.

This plan will make it possible to increase the effectiveness of public action and better fulfilment of our EU obligations, which are also commitments acquired with the citizens; shaping a new context for action that should lead to a significant change in the agents involved.

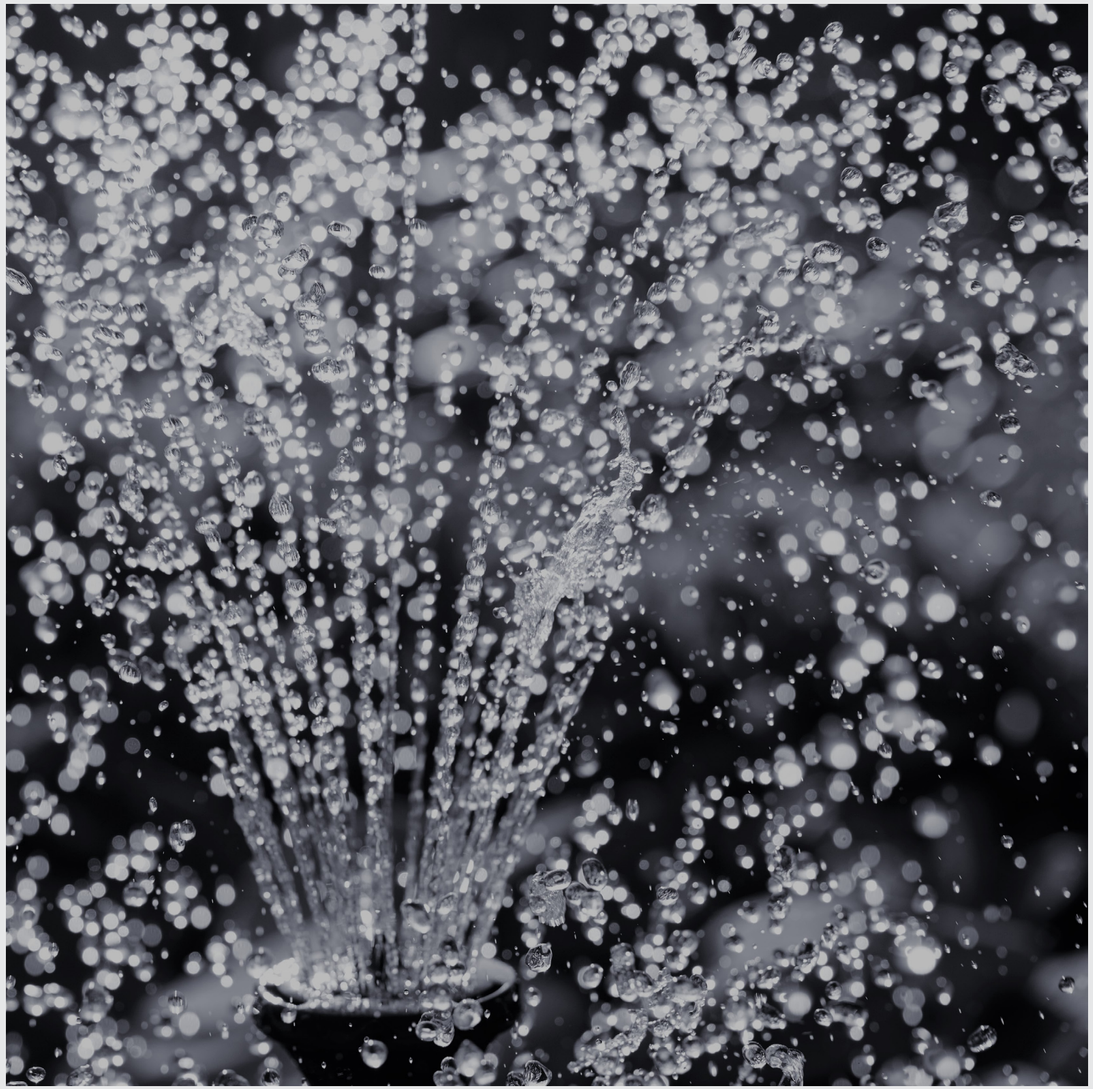
I would like to thank my predecessor, Manuel Menéndez Prieto, for initiating the implementation of this Plan, as well as for the work carried out for its approval by the Water Planning Unit with the collaboration of all the Department of the General Water Directorate.

The DSEAR Plan, a work by all and for all.

Teodoro Estrela Monreal
General Water Director

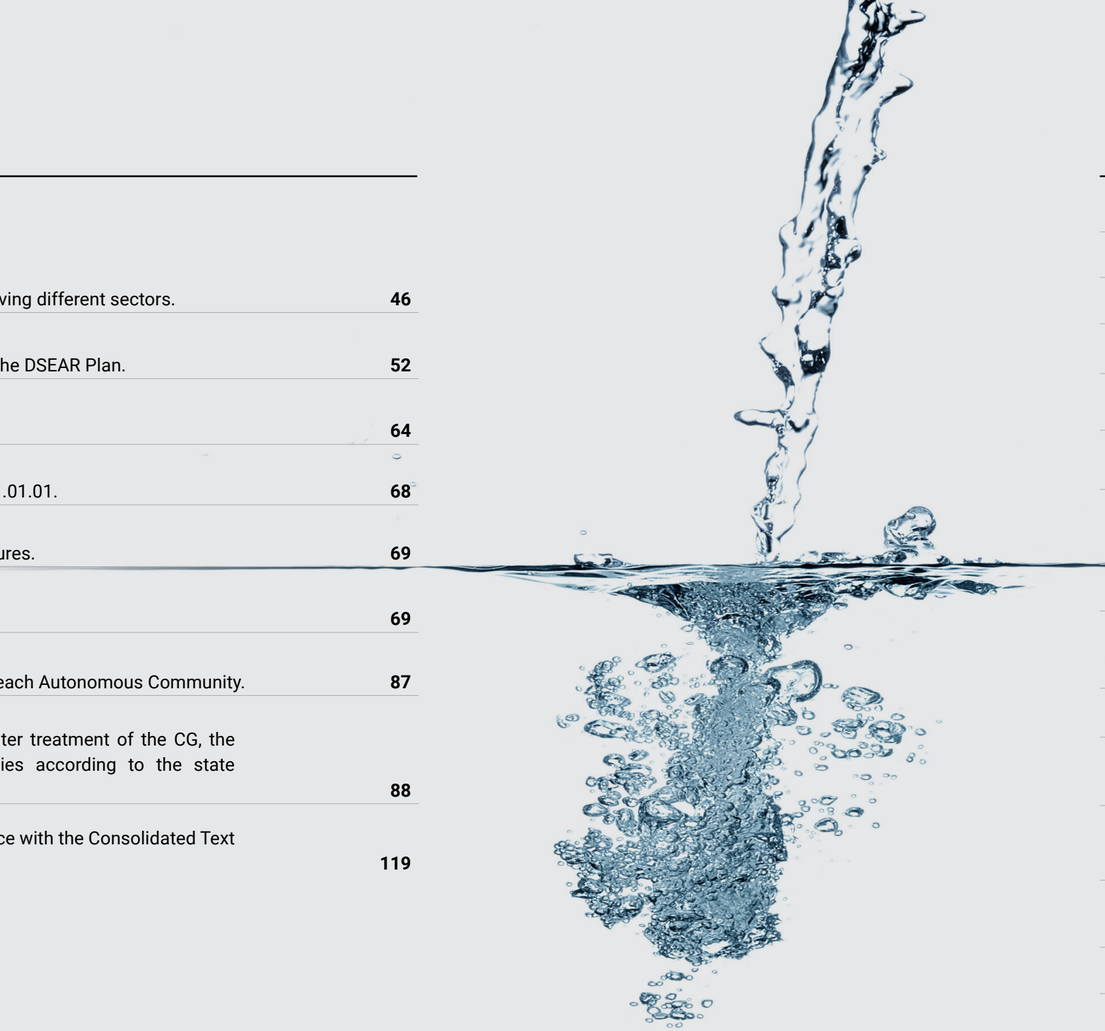
National Plan for Wastewater Treatment, Sanitation, Efficiency, Savings and Reuse

DSEAR PLAN



Contents

Index of tables



Index of figures

Lista de abreviaturas

ACUAES Sociedad Mercantil Estatal Aguas de las Cuencas de España S.A. (state-owned water company)

ACUAMED Sociedad Mercantil Estatal Aguas de las Cuencas Mediterráneas S.A (state-owned water company)

AEAS Spanish Association of Water Supply and Sanitation

BOD Biological Oxygen Demand

BOE Spanish Official State Gazette

CAC Committee of Competent Authorities

CCAA Autonomous Communities

CCHH Hydrographic Confederations

CDTI Centre for Industrial Technological Development

CEDEX Centre for the Study and Experimentation of Public Works

CG Central Government

CJEU Court of Justice of the European Union

CNA Spanish National Water Council

COD Chemical Oxygen Demand

CR Canon of Regulation

DAE Strategic Environmental Declaration

DG General Directorate

DGA General Water Directorate of MITECO

DIA Environmental Impact Declaration

DPH Public Water Domain

DPSIR Logical chain of the WFD connecting Driver, Pressure, State, Impact and Response

DSEAR PLAN Spanish National Wastewater Treatment, Sanitation, Efficiency, Savings and Reuse Plan

EC European Commission

EIA Environmental Impact Assessment

EPSAR Public Entity for Wastewater Sanitation of the Valencian Community

ESAMUR Sanitation and Wastewater Entity of the Region of Murcia.

GHG Greenhouse Gases

GO Governance Objective

IDAE Institute for Diversification and Energy Savings

INE Spanish National Institute of Statistics

IPH Hydrological planning Instruction

JRC European Commission Joint Research Centre.

KTOE Kilotonnes of Oil Equivalent

LCSP Spanish Law on Public Sector Contracts (Law 9/2017, of 8 November, on Public Sector Contracts, by which the Directives of the European Parliament and of the Council 2014/23/EU and 2014/24, of 26 February 2014, are transposed into the Spanish-EU legal system)

LRBRL Regulatory Law on the Basis of Local Regimes (Law 7/1985, of 2 April, Regulating the Basis of Local Regimes)

MAGRAMA Spanish Ministry of Agriculture, Food, and the Environment

MAPA Spanish Ministry of Agriculture, Fisheries and Food

MAPAMA Spanish Ministry of Agriculture, Fisheries, Food, and the Environment

MARM Spanish Ministry of the Environment, Rural and Marine Affairs

MITECO Spanish Ministry for Ecological Transition and the Demographic Challenge

NILSA Navarra de Infraestructuras Locales, S.A. (state-owned infrastructure company)

NUTS Nomenclature of Territorial Units for Statistics

OIG Hydraulic Works of General Interest of the State

OPI Public Investigation Agency

p.e. population equivalent, representing the burden of urban discharges.

PdM Programme of Measures

PGRAR Reclaimed water Risk Management Plan

PHN Spanish National RBMP

PH-Web Spanish national information system for RBMPs and programmes of measures

PNIEC Spanish National Integrated Energy and Climate Plan 2021-2030

PRTR Spanish National Recovery, Transformation and Resilience Plan

RBMP River Basin Management Plan

RD Royal Decree

RPH Hydrological Planning Regulation (approved by Royal Decree 907/2007, of 6 July)

RRF European Union Recovery and Resilience Facility

SEA Strategic Environmental Assessment

SEDIGAS Spanish Gas Association

SEPE Public Employment Service

SES Strategic Environmental Study

SSEE Spanish State Companies

STS Spanish Supreme Court Judgement

TFEU Treaty on the Functioning of the European Union

TRL Technological Readiness Level

TRLA Consolidated Water Law (revised by Royal Legislative Decree 1/2001, of 20 July)

TUA Water Use Fee

TWRP Treated Water Regeneration Plant

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

WWTP Wastewater Treatment Plant

Executive summary

EXECUTIVE SUMMARY

The Spanish National Plan for Wastewater Treatment, Sanitation, Efficiency, Savings and Reuse (the "DSEAR Plan") was launched in the summer of 2018, with the aim of reviewing intervention strategies for the implementation of water policy measures on issues such as wastewater treatment, sanitation, and water reuse. Previous operating models had led Spain into an undesirable situation of non-compliance with European Community rules relating to the protection of water, as repeatedly underlined by the Court of Justice of the EU (the "CJEU").

In order to tackle such issues, the DSEAR Plan has been developed to analyse the causes and propose solutions to solve them, thus configuring itself as a governance instrument, and not as an investment catalogue. It should be remembered that the River Basin Management Plans (RBMP), currently under review, already incorporate detailed lists of measures, and that, in the matter of wastewater treatment and sanitation, there are also Biennial Programmes (Q Reports) required to ensure compliance with Directive 91/271/EEC, of 21 May 1991, on the treatment of urban wastewater.

On the other hand, the 3rd Cycle River Basin Management (RBM) Plan (2022-2027) represents a crucial challenge, based on the realization that, according to the 2nd Cycle Plans, in 2015, more than 2,600 water bodies, accounting for approximately 50% of the total number of catalogued water bodies in Spain, still did not reach a good or potentially good status. This is, therefore, a sizeable challenge to tackle before the end of the 3rd planning cycle and highlights the deficiencies of the first two cycles. The aim is for the ongoing revision of the RBMPs to incorporate improved procedures and well-aligned work methodologies to achieve the fulfilment of the hydrological planning objectives.

In this way, the proposals of the DSEAR Plan seek to form part of a comprehensive response from the new water policy, which must promote progress in solving the identified issues.

In addition, as a result of this work, it is expected that the 3rd Cycle RBMPs apply criteria for prioritizing actions and assume other approaches derived from the DSEAR Plan, in order to prepare better adjusted and more effective programmes of measures than the current ones, which are clearer, better documented and more transparent and accessible to the interested public, and with those responsible for the execution of each action well identified. All this so that the plans can be truly capable of achieving the environmental and socioeconomic objectives that they pursue by the identified deadline, and, when this cannot be done, so that it can be understood under what responsibilities and circumstances it was impossible to implement the planned measures.

The timeliness of the DSEAR Plan is reinforced by the need to align the actions proposed in Spain with European Community policy **(European Green Deal)** and national policies on "Ecological Transition and the Demographic Challenge". Adding to the above is the extraordinary budgetary contribution that, for a period similar to that of the 3rd planning cycle, is provided for by the EU Recovery and Resilience Facility (RRF), which is transferred to Spain through the plan entitled **"Recovery, Transformation and Resilience Plan – Spain Can".** Representing an economic support of great importance, its optimal use through various lever policies framed in the European Green Deal constitutes one of the main challenges for Spain.

Specifically in the areas of wastewater treatment and sanitation, the latest data reported by Spain to the European Commission **(Biennial Report Q-2019, of D.91/271/EEC)** indicate that more than 500 Spanish urban agglomerations have not yet reached compliance with Directive 91/271/EEC. This number implies 10.7 million in population equivalent (p.e.), and the non-compliance of more than 25% of urban agglomerations greater than 2,000 inhabitants p.e. in Spain, for which various infringement procedures, sentences and economic sanctions have been imposed by the CJEU.

The DSEAR Plan is not intended as an implementation plan, in the sense that it is not designed to include a determination of what, when how and who conducts certain actions, nor does it have an associated list of investments. Rather, it is a governance instrument that establishes a critical analysis of the wastewater treatment, sanitation, and water reuse sectors in Spain, aiming to identify the problems in seven areas, or Governance Objectives (GO), and develop a set of action proposals for improvement. The Governance Objectives are as follows:

1- Definition of criteria for the prioritization of the measures of the River Basin Management Plans.

2- Strengthening of administrative cooperation for the review and promotion of the Programmes of Measures of the River Basin Management Plans.

3- Improvement of the definition of actions that must be considered of General Interest of the State.

4- Improvement of the integral and energy efficiency of wastewater treatment and regeneration plants and water reuse.

5- Improvement of the financing of measures included in the River Basin Management Plans.

6- Promotion of wastewater reuse.

7- Innovation and technology transfer in the water sector.

The proposals addressed by the Plan are established with different scopes and content, because although they all respond to strategic problems, their various levels and dimensions make it necessary for them to be ambitious yet also realistic and pragmatic. This is why some of the proposals are developed in depth, while others merely present some guiding principles that will serve to inspire the development of future regulatory changes currently under maturation or are limited to establishing a roadmap for subsequent development after the process of public consultation.

Tools are thus proposed to increase the effectiveness of public action and the better fulfilment of EU obligations, which are also commitments made to citizens, in a new context of action for driving significant change in the agents involved. These tools, prepared on the basis of selfless work by over 100 experts from the public administration, private companies, water users, and various scientific, social and environmental organizations, are presented in relation to the seven Governance Objectives adopted by the Plan. Public discussion of these initiatives and the degree of agreement that can finally be reached on the adoption of the solutions proposed here will inform and give support to decision-makers, who, where opportune, will make their adoption possible.

The DSEAR Plan has been developed within a framework of collaboration with the competent authorities in the field of water resources, and, especially, with players in the wastewater treatment, sanitation, and water reuse sectors. It is aligned with the principles of ecological transition and the demographic challenge, and it supports transparency and public participation. The work of the DSEAR Plan is, therefore, part of the general strategy of the Spanish Ministry for Ecological Transition and the Demographic Challenge (MITECO), and contributes, in coordination with other initiatives, such as the **Green Paper on Water Governance (MITECO, 2020c)** and proposals for ongoing legislative reforms, to the definition of a new model of action to overcome the urgent problems in matters of wastewater treatment and sanitation, and thus to the configuration of the 3rd Cycle RBMPs and their programmes of measures, aimed at more effective, efficient and innovative public sector water management.

In brief, for each of the indicated Governance Objectives, the following conclusions have been reached:

GO1. Definition of criteria for the prioritization of the measures of the River Basin Management Plans:

It is urgent to drive the limited economic and human resources available to the fulfilment of the environmental objectives assumed by Spain and the legal obligations derived from European regulations. For this and given the enormous dimension of the 2nd Cycle programmes of measures, due to both the number of actions proposed and the technical and investment capacity that their implementation requires, it must be clearly identified which wastewater treatment, sanitation and water reuse measures, among those contained in the RBMPs, should be prioritised in terms of the achievement of their objectives.

To carry out the prioritization of the measures, and to advance in the resolution of infringement procedures and economic sanctions imposed on Spain in the field of wastewater treatment and sanitation, technical and socio-economic criteria are applied to ensure the efficiency of public expenditure and incorporate the principles of water strategy for ecological transition and demographic challenge. In effect, the definition of criteria for the prioritization of the measures is guided, first, by environmental drivers - clearly establishing what impacts must be mitigated to correct the non-compliance situations and what the necessary measures are - and, second, by other conditions of a technical nature (e.g. cost-effectiveness of the measure, use of European funds, state of preparation of the action) or a socio-economic nature, with respect to the area of action (income, unemployment, population, ageing), in order to allow decisions to be taken from a perspective of their costs and benefits.

Some of the indicators proposed for prioritizing the actions have been established within the framework of the work already carried out, while others, due to the changing nature of the information required, should be evaluated in coordination with the basin organizations when designing the programmes of measures, and during the public consultation of the RBMPs, throughout the second half of 2021. Indicators will finally be organized in an evaluation tool that manages the data and facilitates the presentation and extraction of the results for different types of measures and territorial areas.

The following have been classified as high priority measures: 1) Wastewater treatment and sanitation measures that respond to the most serious cases of non-compliance with Directive 91/271/ EEC, as underlined by the Court of Justice of the European Union; 2) those that respond to other infringement procedures opened by the European Commission; 3) other measures relating to the National Programme communicated to the European Commission in the framework of the Q-2019 Report for Directive 91/271/ EEC for the resolution of the recognized non-conformities; and, 4) other wastewater treatment, sanitation and water reuse actions included in the Plans that serve to ensure that wastewater discharges do not prevent the achievement of the environmental objectives by the end of 2027.

GO2. Strengthening of administrative cooperation for the review and promotion of the Programmes of Measures of the River Basin Management Plans

&

GO3. Improvement of the definition of actions that must be considered of General Interest of the State:

Improvements in competence and procedural matters established by the Plan can be realised through various synergistic means. On the one hand, criteria that allow hydraulic works to be declared of general interest must be reconsidered and clarified, in order to overcome the tendency to excessive use of this classification. On the other hand, general recommendations must be established to improve inter-administrative cooperation.

Regarding the declarations of general interest, it has been found that a very high number of works have been declared of general interest that do not always refer to measures that should be endorsed with such consideration, and that, furthermore, exceed the capacity for implementation of the Central Government (CG), adding obligations not originally within its competence. For this reason, this Plan reviews the criteria that must be applied to adopt such declarations, and, in addition, proposes reconsideration of several of the current declarations. The Central Government must ensure that wastewater treatment and sanitation measures are unquestionably worthy of the declaration of general interest of the State.

In the context of hydrological planning, it is essential to strengthen coordination and cooperation between the public administrations involved, or competent authorities in the language of the WFD, all of whom have defined and legally established responsibilities. To the extent that this is achievable, it will result in the improvement of the Plans and in the better definition and execution of their programmes of measures.

The objective of the clarification of competences in wastewater treatment and sanitation is to promote the correct understanding of the competence mapping and the responsibilities of all agents, in such a way to facilitate the assumption of competences of all the administrations involved.

There are also other ways, different from the declaration of general interest, that the Central Government can use for the execution and financing of the wastewater treatment, sanitation, and water reuse measures, even if they are not directly within its competence. Among these other options are the possibility of developing the measures by state-owned companies within the framework of collaboration agreements and subsidies. With these instruments, the Central Government can financially support other public administrations, particularly when socio-economic, equity and territorial balance reasons are clearly stated and justified, making such actions recommendable.

GO4. Improvement of the integral and energy efficiency of wastewater treatment and regeneration plants and water reuse:

The large volume of resources mobilized for the processes of wastewater treatment, sanitation and water reuse in Spain, and the generation of sludge as a result of the treatment processes, suggest that measures can be promoted to improve the energy efficiency of plants and the recovery of by-products, thus contributing to the objectives pursued by the **"Spanish Circular Economy Strategy 2030. Circular Spain 2030"**.

These actions are related, in general terms, to regulatory changes and adaptations intended to promote the creation of sustainable and efficient plants and favouring both the use of wastewater itself and the surplus energy or biogas produced in the plants, as well as the concentration and exploitation of other by-products, such as phosphorus, in new production processes, so that they are not treated merely as disposable waste.

GO5. Improvement of the financing of measures included in the River Basin Management Plans:

The analyses developed in terms of financing and cost recovery of public water investments make it very clear that the economic and financial situation does not respond to current needs, since it does not favour a clear incorporation of the polluter pays principle, nor are the current cost recovery instruments sufficient to sustain water services, including those supplied to users for productive purposes. In addition, economic instruments should provide the necessary management incentives to contribute to the achievement of environmental objectives.

There are two approaches to this problem; on the one hand, proposals can be made to get measures acting more

efficiently under the current legal framework, and, on the other, opportune legal modifications can be introduced through the reserve of law to improve the current economic and financial regime. This second approach, which is not an alternative but rather complementary to the previous one, requires a longer time of maturation.

In relation to the first approach, the establishment of objective criteria for distributing the measures attributed to the Central Government in the RBMPs among the various agencies with executive capacity (General Water Directorate, Hydrographic Confederations, and state-owned companies) should aim to improve the efficiency of the public spending, respecting the roles assigned to each management unit, and optimizing the cost recovery and the use of European funds. The criteria proposed redefine responsibilities so that the Confederations, and, particularly, the state-owned companies would increase their participation at the expense of the General Water Directorate (DGA) of MITECO.

Regarding the second approach, the analysis of pressures leading to the poor condition of water bodies and the agents causing such pressures, which includes wastewater treatment and sanitation as a fundamental player, shows the need to strengthen the tax framework by expanding to taxable concepts not explicitly considered at present, and clarifying the role of the various tax elements. The aim is to achieve a more efficient cost recovery, through improved and more direct taxation by the State on those who pollute, use water, and benefit from waterworks. Thus, according to the analyses of the RBMPs, pollution from different sources and extractive overpressure are the main causes of numerous non-compliances with the environmental objectives. The impacts deriving from these pressures generate environmental costs, due to the lack of economic instruments that allow their recovery from the application of the polluter pays principle

In general, the State's economic-financial policy for water is aimed at recovering costs in a limited way on investments that have already been made under state competence and not at recovering those for which the state was not originally competent, for example wastewater treatment, or that are undertaken to respond to pressures that have not been themselves traditionally considered, such as water extraction, diffuse contamination, and so on.

The budgetary balance of income and expenses shows a high dependence of the Hydrographic Confederations on the investments made by the DGA, and on the funding that they need to receive from the Public Treasury to cover current gaps. Public investments generate their own income for basin organizations through fees and tariffs that, although generally are consequence of investments financed by the DGA, are collected by the Confederations, as shadow funding. In addition, the fact that a good portion of the collection rights are soon to expire, because the legally established amortization periods of the works are ending, threatens to increase the imbalance in the near future.

In accordance with these analyses, the DSEAR Plan proposes some orienting principles for the reform of the economic and financial policy that guide the establishment of effective tax figures, adequately adjusted so that the distribution of the burden is balanced and equitable, complies with the cost recovery principle of Article 9 of the WFD, and justifies its possible exceptions. Various modifications are also proposed regarding the rates and fees regulated in Article 112 et seq. of the **Spanish Consolidated Water Law** aimed to help the design of a new water financing framework in Spain that ensures greater efficiency and transparency in public spending, engages citizens, and addresses the challenges of ecological transition.

GO6. Promotion of wastewater reuse:

The reuse of water is one of the lines of action articulated by the "Spanish Circular Economy Strategy - Circular Spain 2030" (MITECO, 2020b), which considers it a "valuable tool for reducing the pressure on natural water resources". Other advantages include its potential to reduce the nutrients discharged into continental and marine waters, and to reduce the consumption of fertilizers.

However, without questioning the above, water reuse does not always lead to an improvement in the availability of resources, or the status of water bodies. The diversion of reclaimed water to new use can affect both the water ecosystem that previously received discharges and the uses dependent on it. Therefore, an individualized analysis must be conducted on how each reuse proposal impacts the achievement of the various hydrological planning objectives, including environmental aspects, the satisfaction of water demands, and the territorial balance.

Over the complexity explained above, it is superimposed the approval of the European Regulation on the minimum requirements for the reuse of water **(EU Regulation 2020/741),** a rule that requires the adaptation of the legal formulas that currently regulate the use of reclaimed water in Spain. For this purpose, the various combinations of involved actors are considered, from the licensee of first use (supply), that generates the obligation to treat the water, to the end user of the reclaimed water, passing through the operators of the different water treatment, regeneration, transport and storage facilities and infrastructures. The question also arises of how the various actors should contribute to financing the necessary investments and the subsequent exploitation of facilities and infrastructures, to overcome the institutional and financial barriers that have slowed the development of water reuse in recent years.

The DSEAR Plan provides an analysis of the determining factors and the variety of reuse cases, with a particular focus on clarifying how water reuse measures can serve to meet the environmental objectives of the water bodies and the necessary modifications in the legal and institutional framework. Again, it should be noted that the contribution of the Plan complements other initiatives of the Ministry in this area, among which it is worth highlighting the work to adapt to the European Regulation that is under development with the technical support of the CEDEX Centre for Hydrographic Studies, and, in particular, the preparation of a guiding document for the elaboration of risk management plans as a new regulatory element.

GO7. Innovation and technology transfer in the water sector:

It is complementary and fundamental to give momentum, to innovation and technology transfer in the water sector from the Central Government, including, among others, the potential support of sustainable drainage measures and nature-based solutions for rainwater management and treatment and, more generally, for promoting the application of innovative measures to replace or complement those developed by means of conventional techniques. Such measures should serve to minimize the high number of water bodies subject to exemption from meeting environmental objectives due to technical infeasibility or disproportionate costs — a justification that will no longer be viable as of 2027 — and to facilitate their achievement of good environmental status.

The DSEAR Plan offers a series of contributions in this area: 1) it establishes the basis for periodically updating the strategic document elaborated by the DGA in 2015 and entitled **"Innovation and Research in the Water Sector: Strategic Lines"**; 2) it proposes an annual conference on innovation and technology transfer in the water sector; 3) it proposes to incorporate content on innovation and technology transfer in the water sector on the MITECO website; and, finally, 4) it proposes the development of tools to facilitate public procurement procedures encouraging innovation and technology transfer, through competitive dialogue and innovation partnerships, and the strengthening of training of all those involved, through a specific training plan.

01

Introduction and objectives

1.1. INTRODUCTION & OBJECTIVES

The Ministry for Ecological Transition and the Demographic Challenge (MITECO), which is responsible for **proposing and implementing the water policy** through its General Water Directorate (DGA), has prepared the National Plan for Wastewater Treatment, Sanitation, Efficiency, Savings and Reuse (DSEAR Plan) in order to advance the development of legal and institutional modifications in response to the various issues caused by the **limited progress in the implementation of the programmes of measures** accompanying the RBMPs. The delay in the implementation of the measures is especially worrying in the areas of wastewater treatment and sanitation, which has given rise to several infringement procedures opened by the European Commission (EC) against Spain, and to judgements obliging the payment of significant financial penalties.

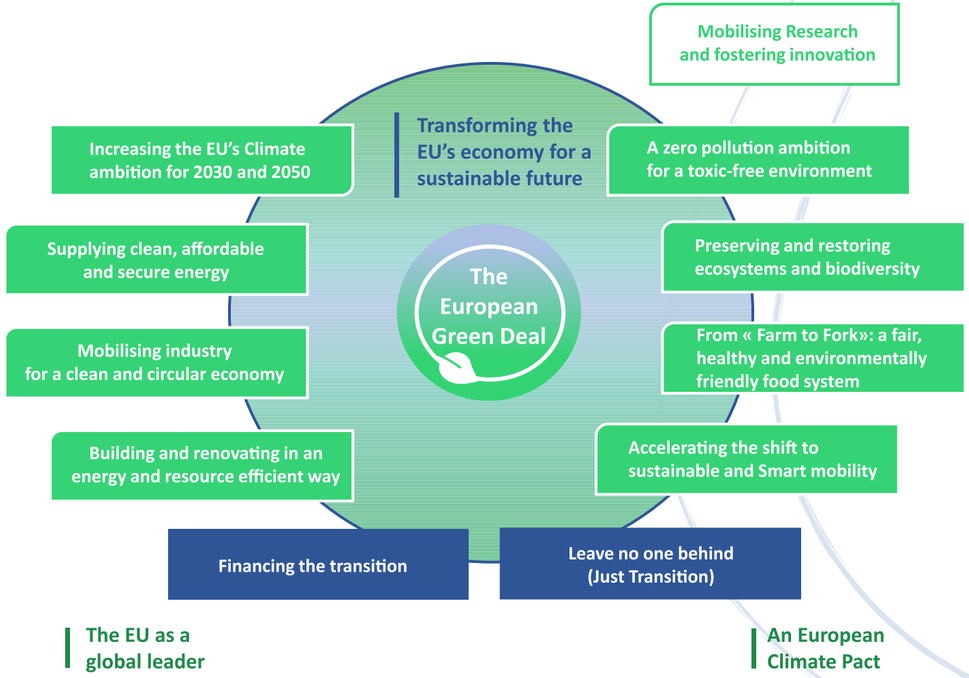


Figure 1. The European Green Deal (European Commission, 2019).

On the other hand, the ecological transition that gives the Ministry its name will only be successful if it is global in scope. Aware of this challenge, the European Union has launched the so-called European Green Deal (Figure 1), which defines a set of aligned and synergistic sectoral strategies, to be implemented in Spain through the **National Integrated Energy and Climate Plan 2021- 2030 (PNIEC)** and its **Long-Term Decarbonization Strategy 2050**, among other initiatives.

The actions targeted by the DSEAR Plan are the wastewater treatment, sanitation, and water reuse measures regarding the urban water cycle in large agglomerations, including interventions to improve efficiency and make savings in the use of energy and natural resources that may impact the relevant facilities and infrastructures. Even though MITECO is working on these through other instruments, some related but differentiated issues exceed the scope of the Plan, such as the wastewater treatment of scattered population and small villages, the separation of rainwater and prevention of infiltration, the connection of all the discharges into the sanitation networks, the risk of pollution at treatment plants built on flooded areas, and the treatment of emerging pollutants. Similarly, not directly targeted by the Plan are other types of measures or actions aimed at saving water, or to make a more efficient use when attending water demands for human supply and economic activities, as well as the application of low-cost and low-maintenance technologies based on nature or sustainable urban drainage systems.

In particular, it is worth mentioning the specific situation of small population centres (agglomerations of less than 5,000 inhabitants p.e.), which must be provided with a sufficient financing to implement the various infrastructures needed for the treatment of their effluents, but which are located in areas that are disadvantaged or where the ability to pay of users is limited. This DSEAR Plan anticipates, as explained in GO3 and GO5, the possibility of articulating subsidies to finance these still pending hydraulic works, by channelling the necessary financial support, but without assuming a competence that is not legally attributed to it.

The Plan is articulated around Governance Objectives, which were put forward — except for the seventh — in the document entitled **"Guidelines, Work Programme, Calendar and Participation Formulas of the DSEAR Plan"**, and thar are addressed through as many working areas that need improvement for the implementation of the water policy as an essential public good. These objectives are:

- **GO1**: Definition of criteria for the prioritization of the measures of the River Basin Management Plans.
- **GO2:** Strengthening of administrative cooperation for the review and promotion of the Programmes of Measures of the River Basin Management Plans.
- **GO3:** Improvement of the definition of actions that must be considered of General Interest of the State.
- **GO4:** Improvement of the integral and energy efficiency of wastewater treatment and regeneration plants and water reuse.
- **GO5:** Improvement of the financing of measures included in the River Basin Management Plans.
- **GO6:** Promotion of wastewater reuse.
- **GO7:** Innovation and technology transfer in the water sector.

1.2. CHALLENGES TO BE FACED

1.2.1 The current situation of wastewater treatment, sanitation, and water reuse in Spain

Council Directive 91/271/EEC, of 21 May 1991, on the "Treatment of Urban Wastewater, approved almost thirty years ago now, established a series of obligations for Member States of the European Union regarding the collection, treatment and discharge of urban wastewater and water from certain industrial sectors. The European Community regulation essentially refers to urban agglomerations whose collected discharges exceed a load greater than 2,000 inhabitants in population equivalent terms (p.e.). For these agglomerations, the Directive establishes specific measures for the collection and treatment of wastewater, within specific time limits, while, for discharges at loads below 2,000 inhabitants p.e., it limits itself to stating that there must be adequate treatment. The obligations of this Directive have time limits. The longest established compliance period expired on 31 December 2005, fifteen years ago, yet Spain is still far from properly treating all its wastewater, and, consequently, far from complying with the obligations set out in this EC regulation.

After entry into force of Directive 91/271/EEC, and its transposition into Spanish Law, the various successive governments considered investment in wastewater treatment and sanitation actions both necessary and strategic. To this end, two specific national plans were promoted: the **National Plan for Sanitation and Treatment (1995–2005)** and the **National Plan for Water Quality - Sanitation and Treatment(2007–2015)**.

These plans catalogued the actions to be undertaken, distributed them among the corresponding responsible parties and formed the main impulse thus far in the matter. On the other hand, they introduced the Sanitation Levy, a tax that the Autonomous Communities of Spain could implement in order to obtain the necessary financing to establish and sustain an adequate wastewater collection and treatment system.

It should be noted that a substantial portion of the infrastructures built under the framework of the first National Plan are ending their useful life. Therefore, in the coming years, a significant investment effort must be faced for the construction of a new generation of Wastewater Treatment Plants (WWTP) with advanced technologies, and subject to increasing demands for quality and efficiency. There are already plants, such as the WWTP in Vigo (Figure 2), which incorporate several available technological improvements, and which are a benchmark in the area.

Regarding the above, the **Royal Decree 817/2015 of 11 September, which established criteria for monitoring and evaluating the status of surface waters and environmental quality standards**, requires concentrations of nitrates and ammonium in water that are clearly more demanding than that which can be achieved with the currently operative treatment plants in various parts of the country. Consequently, in the short and medium term, it will be necessary not only to construct new facilities, but also to renovate certain plants that have already been built yet which, in addition to complying with the new regulation, must incorporate the latest technologies capable of reducing the impact due of odours generally released by water treatment facilities. For example, the **"Basic Odour Management Guide" of the International Environmental Society of Odour Managers** rmakes reference to various existing methodologies. It is also necessary to consider the environmental vectors of noise and visual impact.

Figure 2. Aerial view of the WWTP of Lagares, Vigo (Source: ACUAES).

An example of the construction of a new generation of WWTPs are the works carried out by the General Water Directorate to adapt a large part of the **treatment facilities of Madrid, including the plants of La China, Butarque and Sur**.

These three treatment plants serve a population of approximately 2.5 million inhabitants p.e. The La China treatment plant in Madrid was the first treatment plant in Spain, and as a result of the advancement of time and legislation, the need to update these treatment works became clear.

For the purposes of the RBMPs, the proposed measures, required by Directive 91/271 / EEC, are considered "Basic" according to the terminology of the Water Framework Directive, and should have already been implemented. The current 2nd Cycle RBMPs, adopted mostly in 2016[1] , include more than 3,500 sanitation, treatment, and water reuse measures, to be implemented by the three public administrations (i.e., local, regional and state). This set of measures requires an investment of the order of Euro 12,600 million. 11% of the aforementioned measures were assigned in the 2nd Cycle RBMPs to the Central Government (CG), thus assuming a total investment of more than Euro 3,600 million. It should also be noted that this attribution to the GSE that appears in the current RBMPs is in many cases incorrect, since the actions have not been declared of general interest, and, therefore, within its competence.

The total load of urban wastewater discharged in Spain is in the order of 75 million inhabitants p.e. Furthermore, according to the last Biennial Notification Report (Q-2019), submitted by MITECO to the European Commission, the wastewater load in urban agglomerations with more than 2,000 inhabitants p.e. sums to 64.5 million inhabitants p.e. This load comes from 2,059 urban agglomerations, of which 516 do not comply with all the conditions on collection and treatment required by Directive 91/271/EEC. In percentage terms, it can be stated that 16.6% of the total load generated in Spain from urban agglomerations with more than 2,000 inhabitants p.e., are in a situation of non-compliance, affecting 21.5% of the urban agglomerations of the Communities Autonomous.

However, this problem does not affect all territories equally. Andalusia, the Canary Islands, Castilla-La Mancha, Castilla y León and Extremadura concentrate the majority of non-compliances, while Navarra, La Rioja and the Region of Murcia are not affected by significant deficiencies.

Consequently, there are currently five infringement procedures open against Spain for incorrect implementation of Directive 91/271/EEC, two of which have already received a final judgement, and one of which implies an important financial penalty. Furthermore, a sixth case is expected in relation to the Q-2017 Notification Report.

Each of the five open procedures regarding wastewater collection and treatment are detailed below:

[1] *The RBMPs of the Inter-community river basin districts were approved by Royal Decree 1/2016, of 8 January, which approved the revision of the RBMPs of river basin districts of West Cantabria, Guadalquivir, Ceuta, Melilla, Segura and Júcar river basin districts, and the Spanish part of the eastern Cantabrian, Miño-Sil, Duero, Tajo, Guadiana and Ebro River basin*

• C-38/15. Sensitive Areas (2002/2123)

Descriptión: Collection and treatment of wastewater from urban agglomerations of more than 10,000 inhabitants p.e. that discharge in sensitive areas.

Current situation: Formal Notice following the judgement of the CJEU - Article 260 of the Treaty on the Functioning of the European Union (TFEU) - due to the current non-compliance of an urban agglomeration under the responsibility of the Autonomous Community of Galicia (Pontevedra-Marín-Poio).

Figure 3. Aerial view of the WWTP of Pontevedra.

Responsibility: Autonomous Community of Galicia.

Most significant milestones:

- 2002. Opening of the infringement procedure.
- March 2016. Judgement C-38/15 of the CJEU (Article 258 TFEU).
- September 2016. Start of the Judgement Enforcement Procedure (Article 260 TFEU).

• C-205/17. Normal Areas (2004/2031; C-343/10)

Description: Collection and treatment of wastewater from urban agglomerations of more than 15,000 inhabitants p.e. that discharge in normal areas.

Current situation: In phase of judgement by the CJEU (Article 260 TFEU), due to the current non-compliance of 8 urban agglomerations, with the imposition of economic sanctions: 6 in Andalusia (Alhaurín el Grande, Barbate, Coín, Isla Cristina, Matalascañas and Nerja), 1 in Asturias (Gijón Este), and 1 in the Canary Islands (Valle de Güímar).

Responsibility: Of the 8 agglomerations, 4 fall under the responsibility of the Central Government (CG) (Barbate, Matalascañas, Nerja and Gijón Este), and another 4 under the corresponding Autonomous Communities (Alhaurín el Grande, Coín, and Isla Cristina, in Andalusia, and Valle de Güímar, in the Canary Islands).

Most significant milestones:

- 2004. Opening of the infringement procedure.
- April 2011. Judgement C-343/10, notifying the non-compliances and obligations that Spain must meet in this regard.
- July 2018. Judgement C-205/17 of the CJEU, condemning the Kingdom of Spain to pay the EC a coercive fine of Euro 10.95 million for each six-month delay in the application of the necessary measures to comply with Judgement C-343/10, from the date this new judgement is issued (July 2018) until the full execution of Judgement C-343/10. Moreover, it condemned Spain to pay the Commission a lump sum penalty of Euro 12 million.
- 2019. As a consequence of the compliance of one of the agglomerations, Tarifa, the EC considered that the progress achieved during the first six-month period from the date of the judgement would be reflected in the effective amount to be paid by the Kingdom of Spain, thus, the semi-annual payment was reduced by Euro 594,480.33 to Euro 10,355,519.67.
- To date, the Euro 12,000,000 of lump sum has been paid, together with the first three semi-annual payments of the periodic penalty amounting to Euro 10,355,519.67 each. The total amounts to Euro 43,066,559.01, taken from water budgets of the General Water Directorate of MITECO.

• 2012/2100. Small Agglomerations

Description: the wastewater treatment and collection from urban agglomerations of more than 2,000 and less than 15,000 inhabitants p.e. that discharge in normal areas, and less than 10,000 inhabitants p.e. that discharge in sensitive areas.

Current situation: In the Reasoned Opinion phase, due to the non-compliance of 606 urban agglomerations.

Responsibility: Shared. In 97 cases, the responsibility lies with the CG, of which the need to act is recognized in 64. The remaining 509 agglomerations fall under the responsibility of Autonomous Communities or Local Administrations.

Most significant milestones:

- November 2011. EU Pilot opening.
- June 2012. Opening of the infringement procedure. Letter of Formal Notice.
- February 2015. Reasoned Opinion.

• 2016/2134. Normal Areas and Sensitive Areas "Q-2013"

Description: : the wastewater treatment and collection in certain urban agglomerations that discharge in both normal and sensitive areas.

Current situation: In the Reasoned Opinion phase, due to the non-compliance of 133 urban agglomerations.

Responsibility: Shared. In 62 cases, the responsibility lies with the CG, of which the need to act is recognized in 28. The remaining 71 agglomerations fall under the responsibility of Autonomous Communities or Local Administrations.

Most significant milestones:

- July 2014. EU Pilot opening.
- December 2016. Opening of the infringement procedure. Letter of Formal Notice.
- May 2017. Reply to the Letter of Formal Notice.
- February 2020: Reasoned Opinion.
- July 2020. Reply to the Reasoned Opinion.

• 2017/2100. Normal Areas and Sensitive Areas "Q 2015"

Description: the wastewater treatment and collection in certain urban agglomerations that discharge in normal and sensitive areas, revealed in the self-assessment conducted by the Autonomous Communities and communicated to the EC via the Biennial Reports.

Current situation: In the Reasoned Opinion phase, due to the non-compliance of 145 urban agglomerations.

Responsibility: Shared. In 22 cases, the responsibility lies with the CG, and in 17 of which it is necessary to act or continue acting. In the remaining 123, the responsibility lies with the Autonomous Communities or Local Administrations.

Most significant milestones:

- October 2017. Opening of the infringement procedure. Letter of Formal Notice.
- November 2019. Reasoned Opinion.
- January 2020. Reply to the Reasoned Opinion

Taking into account the five procedures described above, and the one foreseen as a consequence of the Q-2017 Report, it can be stated that as many as 970 urban agglomerations of the total of 2,059 active ones reported by Spain in Q-2019 are involved or are expected to be involved in an infringement procedure (46.7% of the national total). If this same information is expressed in terms of pollutant load, around 21 million inhabitants p.e. (32.5% of the national total in urban agglomerations greater than 2,000 inhabitants

p.e.) are included or soon expected to be included in an infringement procedure.

It should be noted that the infringement procedures for breaches of European legislation on wastewater treatment and collection are addressed to the Kingdom of Spain, although **procedures may later be endorsed to the various Autonomous Communities** and, where appropriate, the competent Local Administrations. In any case, the portion of the penalty corresponding to urban agglomerations whose works have been declared of the general interest of the State is paid jointly by all citizens from public budgets.

Spain generates around 5,000 hm³/year of treated wastewater. According to the information provided by the Spanish National Institute of Statistics (INE), the volume of treated wastewater has increased in recent years, from 2,830 hm³/year in 2000 to 4,726 hm³/year in 2016. The magnitude of the wastewater generation is similar to the aggregate census of wastewater discharges in 2017 that points to a total annual volume of urban discharges to the public hydraulic domain of 3,081 hm³ and to the public maritime-terrestrial domain of 1,711 hm³, altogether approximately 4,800 hm³/year.

Figure 4, shows the evolution of treated and reused water, evidencing a certain stagnation in reuse, confirmed by data from the **"Monitoring Report on the RBMPs and Water Resources in Spain" (MITECO, 2019)**. This report assess the volume of water reused in 2017-2018 at 382 hm3, a value clearly lower than the INE estimates.

In any case, the current level of water reuse covers less than 10% of the volume of total discharges, far from the forecasts of the **National Water Reuse Plan (MARM, 2010)** , that estimated at 998 hm³/year for 2015 and 1,403 hm³/year for 2021. Territorial differences in the degree of reuse are very noticeable, from practical irrelevance in the Cantabrian and Galician basins to a very notable reuse in the most arid basins of the east and south-east of the peninsula, as well as in the islands, where the scarcity of water is a structural problem.

To overcome the stated problems, it is necessary to analyse the causes and identify the opportunities for improvement that can be considered by the DSEAR Plan.

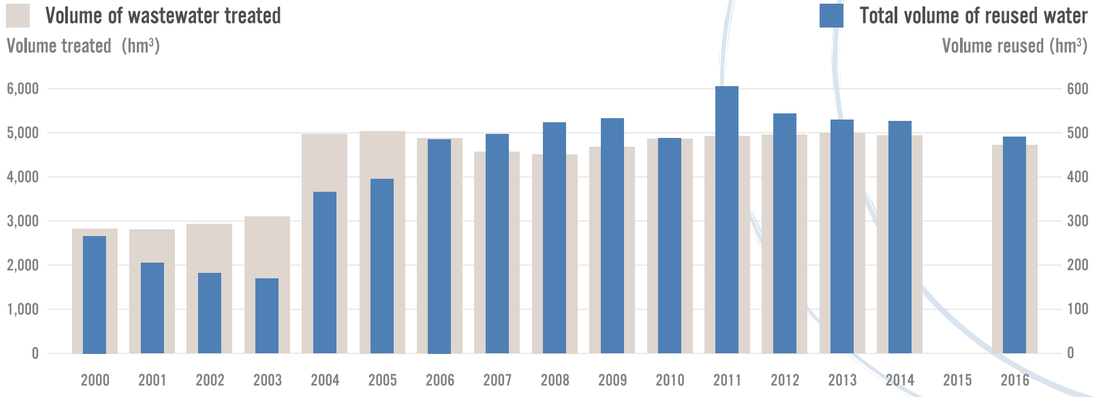


Figure 4. *Evolution of the volume of wastewater collection and treatment in Spain.*

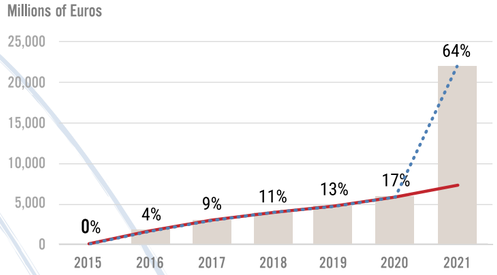


Figure 5.1 *Progress of executed investment and projection to 2021 (base year 2015).*

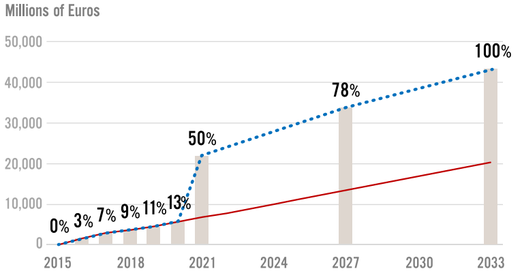


Figure 5.2 *Progress of executed investment and projection to 2021, 2027 and 2033.*

1.2.2. The main deficiencies in water governance for an adequate promotion of wastewater treatment, sanitation, and water reuse in Spain

Article 1 of the Consolidated Water Law (TRLA) establishes that any action on the hydraulic public domain is subject to the provisions of hydrological planning. Therefore, proper functioning of such planning is essential for the deployment of the water policy. For this, the RBMPs are accompanied by programmes of measures aiming to achieve the objectives set by the planning itself. However, these programmes of measures are being implemented at a much lower rate than initially envisaged.

Figure 5 shows the progress of investment made so far in the six-year period 2015-2021, the horizon date of the current RBMPs. The trend suggests that in 2021 not even half of the expected action would have been materialized.

If instead of assessing the overall progress of the programme of measures, we only considered those measures intended to reduce point source pollution (type 1 according to the EU classification), which are essentially wastewater treatment and sanitation actions, it can be stated that, by the end of 2018, half way through the six-year planning cycle, only 17% of the measures has been completed, accounting for 17% of the financial investment planned to the 2021 horizon.

These figures are taken from the yearly monitoring reports drafted by the basin authorities and synthesized by the Ministry. The problem affects all administrations (the Central Government, the Autonomous Communities, Local bodies and other institutions), and all types of measures. The aforementioned reports, which can be consulted via the MITECO web portal, provide detailed analyses of this information by administration, territorial scope and type of measure. This general problem takes on a particular importance when such a delay leads to legal infringements considered by the Court of Justice of the European Union (CJEU) and sizeable financial penalties, as in the case of non-compliance with wastewater treatment obligations.

This problem emerges from some weaknesses of water governance in Spain, many of which have already been explored in the process of preparing the **Green Paper on Water Governance in Spain (MITECO, 2020c).**

The main opportunities for improvement in this area include the following:

• Lack of an objective prioritization to address the actions:

The programmes of measures of the 2nd Cycle RBMPs incorporate over 3,500 wastewater treatment, sanitation, and water reuse measures to be implemented by public administrations that have limited financial and technical capacities and are unable to undertake all the proposed actions. Consequently, it is necessary to prioritize the implementation of the measures, and to do so in a reasonable, objective, and transparent way. The current lists of programmed measures do not generally provide information on which pending measures are a priority with respect to others. Among so many opportunities for action, not all investment agents can clearly and transparently analyse the diversity of factors to be considered.

Therefore, the first Governance Objective of the DSEAR Plan (GO1) is the design of a prioritization mechanism for the measures included in the RBMPs that are focused on wastewater treatment, sanitation, and water reuse.

The aforementioned RBMPs are currently undergoing review, and, therefore, represent an opportunity to adjust and clarify the programming so that all the priority measures can be completed according to the demanding schedule of the WFD by the end of the year 2027.

• The complex framework of competences and difficulties in cooperation between administrations:

Competences in wastewater collection and treatment originally correspond to the local administrations, that is, municipalities and their associations, and provincial councils, in accordance with the provisions of Law 7/1985, of 2 April, “Regulating the Basis of Local Government”. However, several Autonomous Communities and the CG have assumed certain competences in this area, conforming a complex framework of responsibilities for the whole of Spain that has led to operative difficulties.

It should be remembered that the legal obligations to be assumed are aimed to benefit the environment and the society but not so directly favour the generators of wastewater discharges. Indeed, in accordance with the cost recovery and the polluter pays principles, the latter should be part of the solution just as much as they are part of the problem. However, the reality is that it is not always easy for responsible entities to understand and assume their obligations and is not rare that certain measures do not find a promoter, with discussions arising around which administration is competent, and, ultimately, priority measures fail to be considered as such over other measures that generate more evident social and political returns for the promoting administration.

The intervention of the CG in these matters, which are not within its own competence, has been established in three ways: by means of a collaboration agreement with the competent authorities for participation in the financing and execution of the works, with the collaboration of state-owned companies, and through the declaration of general interest of the State. In the latter case, the competence shifts from its original holder to the State Administration.

In relation to the first approach, inter-administrative cooperation started after approval of the National Plan for Water Quality,: Sanitation and Treatment (2007-2015), through the signing of seven Cooperation Protocols, in the period from 2008 to 2010, between the State Administration and the Autonomous Communities of Castilla y León, Galicia, Balearic Islands, Ceuta, Melilla, Cantabria and the Madrid City Council, and two Agreements, one with the Principality of Asturias, and the other with Aragon. A decade later, it has become clear that these instruments have not always been effective. For the most part, they have not been completed for several reasons, such as: the lack of a precise granting of budgetary allocations (which is also applicable to the other two instruments); the lack, in some cases, of a specific definition of the agent to carry out each measure; implementation periods not sufficiently defined for the set of actions and eventually terminated due to non-adaptation to Law 40/2015, of 1 October, on the Legal Regime of the Public Sector. All these aspects must be taken into account before considering the undertaking of new collaboration instruments for the immediate future.

This inter-administrative cooperation also takes place through state-owned companies for those measures that are commissioned by the competent Ministry (MITECO, in this case), via the corresponding legal instrument, namely Management Agreements. The state companies incorporate into these agreements measures that are declared of general interest of the State or other non-declared measures that have been agreed between the Central Government and other administrations. To take on such measures, the companies must also sign specific agreements with the future beneficiaries of the action. The time required for all these steps is long, since, on the one hand, the Management Agreement needs to be adapted to entrust the state company with the execution of a certain action, and, on the other hand, the specific agreements to be negotiated and signed with the beneficiaries of the investment set, among other issues, the financial regime and the formula for cost recovery.

With a declaration of general interest of the State, the competence shifts from its original holder to the CG, which is the reason such a declaration needs to be implemented by a regulation with the rank of law. This solution has led the CG taking over many waterworks of this type, more than 2,000 in the last twenty-five years. At present, this means that, simply considering the 970 urban agglomerations associated with an EC infringement procedure, in at least 190 cases, the agent responsible is the CG. The detailed situation is as follows:

- In 60 cases, the measures have already been implemented or are being implemented. Thus, the measures still to be undertaken by the CG concern the remaining 130 urban agglomerations, with an investment estimated at around Euro 2,500 million.

- In 78 of the 130 agglomerations, the wastewater load is less than 10,000 inhabitants p.e. This subset requires an investment estimated at Euro 375 million.

The high number of wastewater collection and treatment measures declared of general interest of the State implies an assumption of competence by the CG that, today, is no longer justified. Indeed, it is considered a financial overburden that it is not possible to address, and, associated with this, there is an insufficient overall recovery of the costs of investments due to the lack of appropriate tax instruments. This situation is neither in line with the provisions of the Water Framework Directive nor with national legislation.

The increasing complexity of contracting processes, together with the thinning out of the public sector, makes it very difficult to sign the contract for implementing the works in less than two years from conception, and tender processes are increasingly scarce. Thus, in the last five years, between the General Water Directorate, the nine Hydrographic Confederations and the two state companies (ACUAES and ACUAMED), only about thirty works have been tendered, that is, an average of six treatment plants per year, among all the state water entities with the capacity to contract. If this rate is maintained, it would take 22 years to tender out the 130 pending wastewater treatment measures that have been declared of general interest of the State. In addition, other difficulties can contribute to prolong the process of contracting and executing the works, such as environmental procedures and their social aspects.

The immediate conclusion from all the above is that the improvements that can be proposed in the field of administrative cooperation on the matters of wastewater treatment, sanitation and water reuse are still multiple and complex. The DSEAR Plan sets, as its objectives, the strengthening of administrative cooperation (GO2) and the improvement of the definition of the actions that must b e considered of general interest of the State (GO3).

- **The need to make progress towards energy and process efficiency in treatment plants -renewable energies, greenhouse gas emissions and by-product- to improve processes with an impact on energy and climate objectives and the circular economy:**

Current wastewater treatment practices may be missing opportunities for energy efficiency and the circular economy. This is not properly a problem that has contributed to the delay in the implementation of the measures described above, but rather an opportunity for improvement, whose correct consideration can help promote the development and sustainability of our wastewater treatment, regeneration and water reuse facilities.

Law 7/2021 on Climate Change and the Energy Transition in particular, introduced certain provisions to promote the use of renewable gases, such as biogas, biomethane and other alternative fuels, which may be employed in wastewater treatment facilities. Similarly, the Law establishes emission reduction targets that affect all economic sectors.

Considering all the above, within the framework of strategies derived from the European Green Deal, the **revision of Directive 91/271/CEE** is ongoing, and this revision is pointing towards even greater demands. Among various expectations is an update for minimum nutrient requirements, that will be more in line with the evaluation criteria of the WFD, thus conditioning the declarations of sensitive areas. Other contents that have aroused particular concern are requirements against micro-pollutants, and, among these, micro-plastics, in light of the technologies already available for their elimination.

The integral efficiency component that is linked to circularity can be achieved by valuing certain by-products of the wastewater treatment process, such as sewage sludge and its nutrients, including phosphorus, which can be extracted from the treated water by a treatment process that is ever more efficient and minimizes residue discharges.

The DSEAR Plan sets the Governance Objective (GO4) of improving the energetic and integral efficiency of urban wastewater treatment, regeneration, and water reuse plants.

- **Inadequate financial and cost recovery framework:**

National and European Community regulations establish the principle of cost recovery for water-related services, including environmental and resource costs, in accordance with the polluter pays principle. In turn, in addition to applying the principle of cost recovery, the WFD aims to transfer the necessary incentives to end users in order to ensure efficient use of resources. This idea is based on the fact that, if water use causes its deterioration and pollution, users become more aware if they know the true cost of services and can participate in supporting them.

There are mechanisms to limit the cost to be recovered, but this must be justified and motivated in the corresponding RBMP, in accordance with clearly stated geographical, climatic, or socio-economic reasons. It does not seem logical to avoid recovery from users (urban agglomerations in this case) with a high payment capacity, at the expense of common taxes for all citizens.

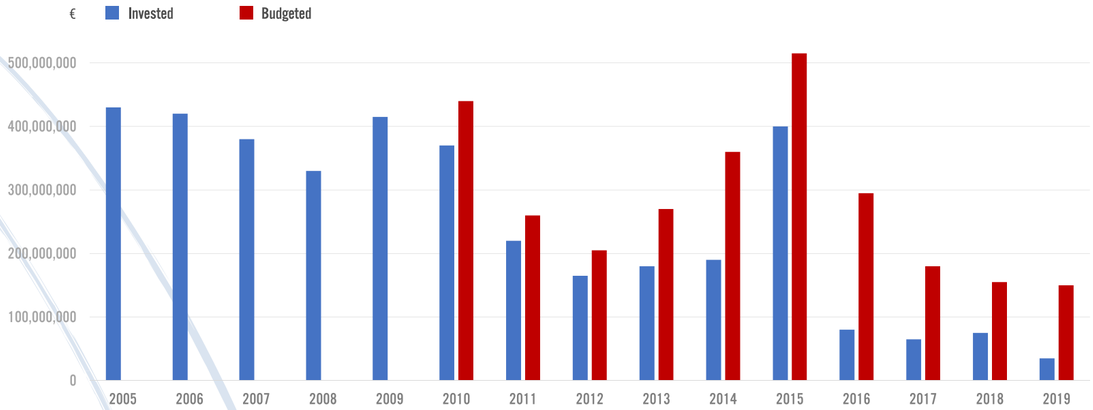


Figure 6. Investments of the General Water Directorate (MITECO) in wastewater treatment and sanitation, from 2005 to the present.

The economic instruments available for this purpose range from the water treatment levy, through taxation by the Autonomous Communities, to specific cost recovery formulas that can be established through agreements, on a case-by-case basis. The CG, as it is not a matter of its own competence, does not have at its disposal a specific tax in this regard. In other words, depending on which body or administration conducts a certain wastewater treatment or sanitation measure, the direct contribution of the citizens that benefit may be very different, or even non-existent, without responding to clearly rational criteria.

The need for financing is also a problem that makes it difficult to promote certain wastewater treatment, sanitation, and water reuse measures.

Figure 6 shows the amounts invested (blue) and budgeted (red) in wastewater sanitation and treatment by the DGA of MITECO from 2005 to the present. Starting in 2010, the downturn of the economic crisis can be noticed. Then, there is a clear upturn in 2015, and, later, a very significant drop. Certainly, since 2015, there have been a series of special circumstances that have made it necessary to reduce spending, such as long periods of governments in office with limited capacities, general state budgets extended without being updated, a new law on public sector contracts, and so on, all circumstances that add to the need to meet the deficit path committed by Spain to the EU.

Among the various financing support mechanisms, European funds have been a very important one, which has helped the undertaking of various already completed works, and, at the same time, are a relevant incentive for future works to be carried out. This funding makes it possible to reduce the part that needs to be recovered from the final users or beneficiaries, thereby facilitating financing agreements. Therefore, it is interesting to explore how these, or other means of economic support can be integrated into the financing of pending measures, in the most efficient way possible.

Consequently, the DSEAR Plan sets the Governance Objective (GO5) aimed at the proposal of actions to improve procedures for financing and for recovering the cost of the measures.

• Insufficient incentives for the reuse of reclaimed water:

The use of reclaimed wastewater as a non-conventional resource is very important in some areas of Spain, especially in certain territories where there is a high exploitation of water resources and no other supply alternatives, while wastewater are discharged into coastal waters.

The reuse of reclaimed water, in general for irrigation, is a clear opportunity to help solve water unbalance in those areas, and, also, to promote the recycling of by-products coming from the treatment process, which is an issue that has already been addressed above when discussing the energy and integral efficiency of wastewater facilities (GO4).

The approval of **Royal Decree 1620/2007, establishing the "Legal Regime for the Reuse of Treated Water"**, placed Spain in a pioneering position. It was one of the first regulations on the matter approved in the EU, conceptualized and drafted long before any European Community regulation was established.

However, more than a decade after this Royal Decree entry into force, and considering the recent approval of **Regulation 2020/741 of the European Parliament and of the Council, of 25 May 2020, on the minimum requirements for the reuse of water**, it is now necessary to review the current situation of reuse in Spain, from technical, economic and regulatory points of view. This review must de intended to promote the reuse of water as part of the circular economy, and synergistically as a measure contributing to the achievement of WFD environmental objectives.

Thus, the DSEAR Plan includes among its objectives the promotion of the reuse of wastewater (GO6), in those cases where it is opportune.

• Insufficient incentives for innovation and technology transfer:

As stated regarding the opportunities on energy and waste management, and, even recognizing that is not a major driver for explaining the delays in the implementation of the measures, the lack of incentives for innovation and technology transfer in the field of water is a problem that has been pointed out by various actors.

The Public Sector Contract Law (LCSP) offers various instruments to tackle this issue, although they are rarely taken advantage of. For this reason, the DSEAR Plan also assumes as a Governance Objective (GO7) the promotion of innovation and technology transfer in the areas of wastewater treatment, sanitation, efficiency, savings and water reuse, areas where Spanish companies are present throughout the world.

In addition, during the preparatory discussions of the DSEAR Plan, other difficulties have been brought to the table that can partially explain the reasons for the delays in the implementation of the investments, common to all administrations.

The DSEAR Plan analyses all these problems and proposes some short-term solutions to be incorporated into the new RBMPs.

1.3. THE OBJECTIVES & SCOPE OF THE DSEAR PLAN

The DSEAR Plan is articulated around the seven areas of potential improvement that have been listed above. For each of the Governance Objectives, a set of action proposals has been prepared, which will be presented further below. The work that is reflected in the Plan has been extremely ambitious, albeit looking for pragmatism and effective results, limiting the scope of proposals to areas where there is significant potential for effective and relevant action.

In brief, the objectives and scope of each area of work are the following:

• GO1. Definition of criteria for the prioritization of the measures of the River Basin Management Plans:

By pursuing the establishment and, insofar as possible application of criteria for prioritizing the measures of wastewater treatment, sanitation and water reuse, included in programmes of the 3rd Cycle RBMPs, criteria that must be clear, objective, and transparent, committing public administrations to the implementation of the plans as established, avoiding deviations such as those observed up to now, and, similarly, avoiding the materialization of poorly justified measures not included in the plans .

• GO2. Strengthening of administrative cooperation for the review and promotion of the Programmes of Measures of the River Basin Management Plans:

By exploring the misfunctioning of the current system of inter-administrative coordination in order to propose measures for achieving more efficient and coordinated action, through fostering the voluntary cooperation, and the identification of responsibilities for the planning and execution of the measures included in the RBMPs, especially regarding wastewater treatment, sanitation and water reuse.

• GO3. Improvement of the definition of actions that must be considered of General Interest of the State:

By focusing the general interest of the State on the measures corresponding to the actual sphere of State competence while limiting its use in other cases to exceptional circumstances, as a result of analyses that are specific, participated and transparent to society. For such purposes, the DSEAR Plan explores the area of hydraulic works and the procedures for the declaration of general interest of the State in relation to wastewater treatment, sanitation, and water reuse, trying to objectify, as far as possible, the cases to proceed with the declaration, as well as analysing whether it is opportune to withdraw those current declarations that do not meet the new requirements.

• GO4. Improvement of the integral and energy efficiency of wastewater treatment and regeneration plants and water reuse:

By exploring opportunities offered by integrated solutions, in terms of energy efficiency and the reuse of nutrients, such as phosphorus and sewage sludge, and the potential generation of economically valuable by-products.

- **G05. Improvement of the financing of measures included in the River Basin Management Plans:**

By considering the environmental costs raised by measures of wastewater treatment, sanitation and water reuse measures, aimed at compensating the significant pressures on the environment. Those responsible for such pressures must participate in the cost of their remediation, particularly when the pressure on the environment is the result of an activity that provides private financial benefit because of the exploitation and use of resources, such as water, which belong to the public domain. Exceptions to the cost recovery principle, which are possible under law, must be clearly justified, and should not be applicable to those activities with higher payment capabilities.

- **G06. Promotion of wastewater reuse:**

By recognizing the technical and economic opportunities for improvement, pursuing the priority objective of favouring the use of such unconventional resources to substitute those applied to existing uses, mainly irrigation, whose extraction puts pressure on the environment. In this regard, progress must be made in promoting water reuse if it ensures compliance with environmental objectives in parallel to meeting water demands.

- **G07. Innovation and technology transfer in the water sector:**

By encouraging the water administration to incorporate and promote the development of technologically innovative and efficient products and services in the use of energy and resources.

Once the DSEAR Plan becomes consolidated, it is expected to be effectively used in the process of preparing the 3rd Cycle RBMPs. The instruments provided by the DSEAR Plan must help the new programmes of measures for the 2022-2027 investment period, to be more efficient and streamlined than previous ones, elucidating the responsibilities for the implementation of those actions that are truly essential to meeting key obligations and achieving objectives. Such measures must also be prioritized.

The programmes of measures are the formal commitment of Spain to complying with the Water Framework Directive. As explained above, there are deficiencies in their preparation concerning aspects such as administrative cooperation, disconnection between the measures and the significant pressures that are impacting water bodies, and the planning itself in terms of numbers, times and financing capability. Such deficiencies have led to a low rate of implementation of the measures, as well as in the progress towards meeting environmental objectives. The coincidence of the 2022-2027 planning cycle with the current European Community financial framework, and, particularly, with the extraordinary Recovery and Resilience Facility (RRF) conform a unique opportunity, for the budgetary programming over the next few years to take a significant leap forward to the achievement of the objectives of hydrological planning.

The DSEAR Plan is not intended to replace the RBMPs in the design of the programmes of measures, nor to replace other planning instruments such as the 2007-2015 Treatment and Sanitation Plan, or the Biennial Reports to the European Union, which assesses the current situation of wastewater treatment and sanitation in Spain and sets the commitments for the future.

1.4. THE GUIDING CRITERIA OF THE DSEAR PLAN

The main criteria of the DSEAR Plan come from different sources but can be grouped into the following three categories *(Figure 7)*:

GENERAL CRITERIA

The DSEAR Plan responds to the general approach of ecological transition, under the following general guiding criteria:

- Commitment to facing climate change, with concrete long-term objectives of emission reduction and decarbonisation.
- Rational and responsible use of resources.
- Commitment to making the energy transition fair, by supporting affected territories and workers, shifting from a centralized model based on supply to a decentralized one based on the management of demand.
- Commitment to renewable energy and energy efficiency.
- Importance of cities, and the city-energy binomial.
- Commitment to job creation.
- Application of transversal measures that reflect the consensus of the research community.
- Promotion of environmental taxation and green criteria in public procurement.
- Wide participation and engagement of society, placing the citizen at the centre of the model.
- Need to make progress in compliance with the Water Framework Directive, and other related European policies

Figure 7. Guiding criteria of the DSEAR Plan.

REGULATORY CRITERIA

Hydrological planning is substantially regulated at both national and European Community levels. In Spain, such regulation is mainly established through the Consolidated Water Law (TRLA) and derived regulatory instruments. Thus, the DSEAR Plan must ensure matching the general criteria to regulatory ones and establishing opportune synergies. Among such regulatory criteria, the following should be remembered:

- Any action on the public hydraulic domain must be submitted to hydrological planning (Art. 1.4 of the TRLA). The objectives of hydrological planning are stated in Article 40.1 of the TRLA: "*hydrological planning will have as its general objectives to achieve the good status and adequate protection of the public hydraulic domain and the waters that are the object of this law, to satisfy water demands, to balance and harmonize regional and sectoral development, to increase the availability of water, to protect its quality, and to economise and optimize its uses in harmony with the environment and other natural resources*". Law 7/2021, of 20 May, on "Climate change and energy transition" complements the above, by including, in its article 19.1, the objectives of hydrological planning and management, aimed at adapting to climate change.
- The exercise of the functions of the State in water issues are subject to the following principles (Art.1.4 of the TRLA).
  - ✓ *Integrity of management, comprehensive treatment, water economy, deconcentration, decentralization, coordination, efficiency, and participation of users.*
  - ✓ *Respect for the hydrographic basin unit, hydraulic systems, and the hydrological cycle.*
  - ✓ *Compatibility of public water management with spatial planning, the conservation and protection of the environment, and the restoration of the natural environment.*
- Application of the principles of "the polluter pays" and "recovery of the cost of water services" enshrined in the WFD and in Art. 111bis of the TRLA.

SOCIAL CRITERIA

The **Spanish Constitution** orders public powers *"facilitate the participation of all citizens in political, economic, cultural and social life"*. This constitutional guideline is translated into the recognition of the right to intervene in the adoption of administrative decisions that affect the citizens and the social entities in which they are organized. Consequently, transparency and participation have duly led the process of developing and adopting the DSEAR Plan.

Social criteria have also been integrated into the general ones for the ecological transition. Furthermore, the demographic challenge, which gives its name to MITECO, has been integrated, as will be made clear below, into the guidelines of the DSEAR Plan.

1.5. THE PLAN PREPARATION PROCESS AND ITS ENVIRONMENTAL ASSESSMENT

The process of preparing the DSEAR Plan is made up of the following phases: I) Start, II) Development, and III) Implementation ***(Figure 8)***. In addition, it is necessary to differentiate the process of elaboration of the Plan itself from the parallel strategic environmental assessment it has been subjected to.

1.5.1. The process for preparing the DSEAR Plan

PHASE I. START

It is in this phase that the first document of the DSEAR Plan was drafted, which was entitled "Guidelines, Work Programme, Calendar and Participation Formulas of the DSEAR Plan". This document established the general approach of the Plan, the work programme, the implementation schedule, and the formulas for participation and public consultation.

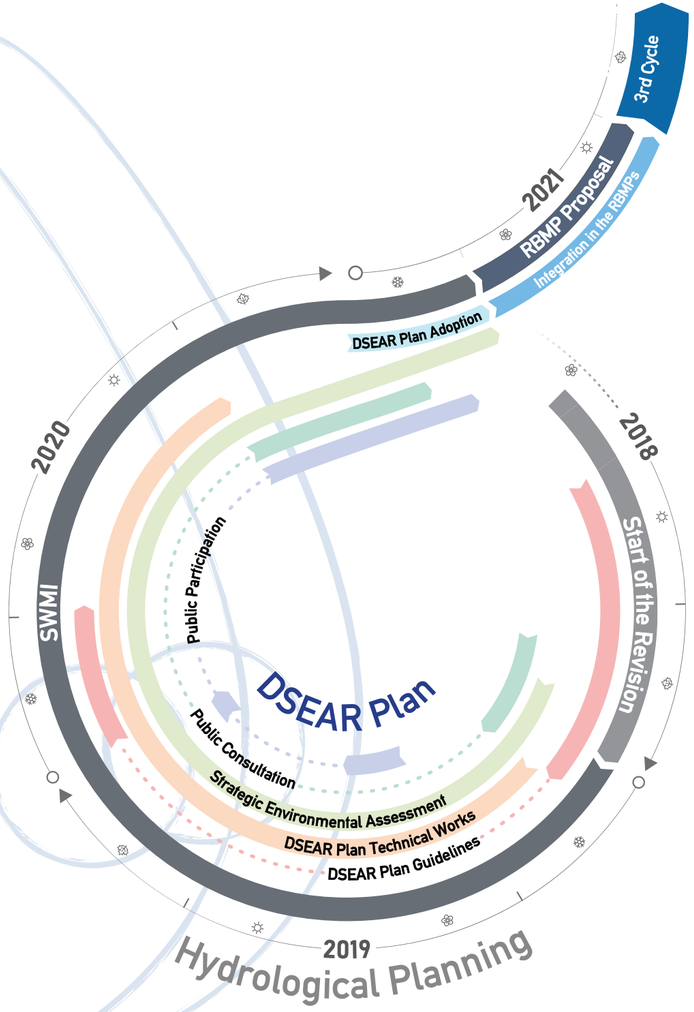


Figure 8. Process of the technical preparation of the DSEAR Plan and its integration with the 3rd Cycle RBMPs.

The first draft of the Guidelines document was presented at the 33rd Plenary Session of the National Water Council, held in October 2018. In the same session of the Council, it was reported the status of the preparation of the revision of the 2nd Cycle RBMPs in all river basin districts and their fitting with the DSEAR Plan.

By resolution of the General Water Directorate (DGA), of 15 October 2018 (BOE of October 19), was announced the start of the three-month public consultation of the draft Guidelines document of the DSEAR Plan. To facilitate access to the public, both the document and its annexes, with the lists of measures on the topics of the Plan, as included in the 2nd Cycle RBMPs, were made available via the MITECO website.

As a result of the consultation, 99 written statements were received. A corresponding **assessment report** of the proposals, observations and suggestions received was drafted, and also made available on the website. This new document explained the analysis carried out, the response given to the written statements received, and the way in which these contributions had been integrated into the Plan. Many of the written statements came from local administrations and were directly related to the planning of very specific measures. For this reason, they were referred to the corresponding river basin authorities according to the territorial scope.

The **consolidated Guidelines document** and the accompanying assessment report were prepared and published between January and March 2020.

PHASE II. DEVELOPMENT

This second phase of the work has been the development of the DSEAR Plan itself, based on the Guidelines consolidated document resulting from the Phase I. In addition, a series of workshops (see Table) were held to explore the challenges faced by the Plan. Approximately a hundred experts participated in these workshops, in representation of the various sectors involved in the planning process.

As a result of all this work, the second formal document of the DSEAR Plan was drafted, entitled "Challenges and Proposals Addressed in the DSEAR Plan". The document summarizes the challenges that the Plan faces and outlines the solutions to overcome them. This document served as the basis for the orientation of all following work.

The draft of the DSEAR Plan, its Strategic Environmental Study, the annexes to the latter, the non-technical summary of the Strategic Environmental Study, together with a set of thematic reports complementary to the DSEAR Plan, have all been subjected to public participation process and consultation prior to their final consolidation. On 22 October 2020, the General Water Directorate announced in the BOE the start, as of the following day, of the period of public participation process of the DSEAR Plan and its Strategic Environmental Study (BOE No. 279, of 22 October 2020). The consultation period lasted 45 business days, up until 31 December 2020. Within that period, as many contributions, observations and suggestions as deemed opportune by the public could be made.

The promoting body (the DGA) implemented the public consultation process in parallel to the disclosure, in compliance with the provisions of Article 22.1 of Law 21/2013, of 9 December, on Environmental Assessment. This was made by consulting, via telematic means, the affected public administrations and stakeholders that had previously been determined by the environmental body of the strategic environmental assessment procedure.

Table 1. Participatory DSEAR Plan workshops involving different sectors.

	NÚMERO	TEMÁTICA TRATADA	FECHA	LUGAR DE CELEBRACIÓN
Phase 1	1st Participatory Workshop	Water reuse	08/05/2019	Hydrographic Confederation of Júcar (Valencia)
	2nd Participatory Workshop	Wastewater Treatment, Sanitation, Savings and Efficiency	16/05/2019	Ministry for Ecological Transition, MITECO (Madrid)
	3rd Participatory Workshop	Innovation and technology transfer in the water sector	26/06/2019	ZINNAE- Cluster for the Efficient Use of Water (Zaragoza).
	Forum	Innovation and technology transfer in the water sector	25/10/2019	University of Castilla - La Mancha (Toledo), as part of the 4th Conference on Water Engineering
Phase 2	4th Participatory Workshop	Innovation and technology transfer in the water sector	11/12/2019	Palacio de Congresos conference centre (Zaragoza), as part of the 4th EIP Water Conference 2019
Work presentation	Webinar - Web conference	Day Conference for the Presentation and Public Participation of the DSEAR Plan	20/11/2021	Webinar

A public participation report was drafted describing the information and public consultation process, additional participatory activities carried out by the DGA, the various contributions received, their analysis and assessment, and how they were incorporated into the post public consultation documents of the DSEAR Plan and the Strategic Environmental Study.

Furthermore, on 18 June 2021, the Resolution 10203 of 11 June 2021, of the General Directorate for Environmental Quality and Assessment, was published in the BOE, which formulates the Strategic Environmental Declaration (DAE) of the National Plan for Wastewater Treatment, Sanitation, Efficiency, Savings and Reuse. With this, the Strategic Environmental Assessment procedure to which the DSEAR Plan was subjected was finalized. This document established a series of environmental determinations that were integrated into the final version of the Plan, including the contributions and changes derived from the environmental assessment, as well as an editorial and stylistic review including some changes of dates needed to maintain the validity of its contents.

The DSEAR Plan was approved by Order TED/801/2021, of 14 July, concerning "Approval of the National Plan for Wastewater Treatment, Sanitation, Efficiency, Savings and Reuse of the Ministry for Ecological Transition and the Demographic Challenge", and can be consulted via the department's website, under the DSEAR Plan section. This work, for and on behalf of stakeholders, will be reflected in the next RBMPs and in the impulse to be given to the water policy in the coming months.

PHASE III. IMPLEMENTATION

The time window between the start of the public consultation of the DSEAR Plan and the approval of the 3rd Cycle RBMPs should be used to implement all those results of the DSEAR Plan that should be reflected in those plans.

The implementation should be especially evident in the configuration adopted by the programmes of measures in essential aspects such as the prioritization of measures, the clarification of competences and responsibilities of each one of the administration involved and the dimension of the programmes, especially in the areas of wastewater sanitation, treatment and water reuse.

Furthermore, after final approval of the DSEAR Plan, there will be an opportunity to adjust the results prior to the start of the procedures for the adoption of the RBMPs as binding planning instruments.

1.5.2. Strategic Environmental Assessment Process

The Strategic Environmental Assessment (SEA) of plans and programmes is regulated by Law 21/2013, of 9 December, on "Environmental Assessment". The assessment aims to promote sustainable development, achieve a high level of environmental protection, and contribute to the integration of environmental aspects in the development and adoption of plans and programmes.

According to this Law, the DSEAR Plan is not required to be subjected to SEA, unlike the RBMPs and their programmes of measures to which it is closely related, since these constitute the referential framework for the future authorization of projects (the measures). Many of these measures are subject to an Environmental Impact Assessment, and may additionally require assessment as they affect protected

areas of the Natura 2000 Network, under the provisions of Law 42/2007, on "Natural Heritage and Biodiversity".

However, the DGA has voluntarily submitted the DSEAR Plan to the SEA process. This has been a purposeful and strategic decision in the design of the Plan itself, which has been carried out with two objectives in mind: 1) to obtain significant added value through the environmental assessment of the contents of the Plan, and 2) to provide the DSEAR Plan with a procedural framework to facilitate its preparation and formal processing, and to increase the transparency, participation, and objectivity of the process.

For the development of this SEA procedure, the promoting body of the DSEAR Plan was identified as the General Water Directorate of the Ministry for Ecological Transition and the Demographic Challenge, while the environmental authority was identified as the General Directorate of Quality and Environmental Assessment of the same ministerial department. Throughout the process, the documents detailed below were produced.

- **Initial Strategy Document and Scope Document of the Strategic Environmental Assessment:**

  During the initial phase of development of the DSEAR Plan, once the Guideline Document was in public consultation, the Initial Strategic Document was prepared. This document was submitted to the environmental body, which carried out the mandatory consultations and drafted the Scope Document of the Strategic Environmental Study, which was available in April 2019.

- **Drafting of the Strategic Environmental Study:**

  The drafting of the Strategic Environmental Study (SES) has been conducted in parallel to the preparation of the DSEAR Plan. Similarly, many issues dealt with in the Plan have been transferred and studied from an environmental point of view within the SES. The preparation of the SES was carried out between January 2019 and October 2020. The final result is embodied in a report and a volume of four annexes referring to: 1) the study of protected areas; 2) the study of the Water Exploitation Index Plus (WEI+); 3) the SWOT analysis of the DSEAR Plan; and 4) various tables supporting the report on compliance with the Plan's objectives and its environmental effects.

- **Strategic Environmental Declaration:**

  Once the joint information and public consultation of the Plan and the Strategic Environmental Study was complete, the environmental body prepared and adopted the Strategic Environmental Declaration (DAE), which was published in the Official State Gazette on June 18, 2021. This declaration establishes the environmental considerations to be integrated in the final version of the DSEAR Plan to improve their integration in its contents.

1.6. PUBLIC INFORMATION AND PARTICIPATION PROCESSES

Public participation processes linked to hydrological planning are intended to make both stakeholders and the general public aware of the process and its details, so that they can effectively influence the final outcome.

Public participation is essential in the design of modern public policies, especially in those that are complex and have led to misunderstandings. Law 19/2013, of 9 December, on "Transparency, Access to Public Information and Good Governance", highlights in its preamble, that: *"Transparency, access to public information and the rules of good governance must be the basic pillars of every political action. Only when the action of public authorities is subjected to scrutiny, when citizens can know how decisions affecting them are made, how public funds are managed, and under what criteria our institutions act, will we be able to speak of the outset of a process in which the public authorities begin to respond to a society that is critical, exacting and demands that public authorities enable participation"*.

Participation and public information process require, in addition to the political will to carry it out, the availability of means, time and appropriate techniques.

The regulatory framework for public participation is expressly included in the Water Law (Royal Legislative Decree 1/2001, of 20 July) and in the Hydrological Planning Regulation (RPH). These regulations provide for public participation throughout the planning process, including the development, approval, and review phases of the RBMPs. The results of the participation must be incorporated as an annex to the Plan, as established in Art. 74.3 of the of the aforementioned RPH, in reference to the RBMPs, and which can be extended to this case. Likewise, Law 27/2006, which regulates the rights of access to information, public participation, and access to justice in environmental matters, and Law 21/2013, on "Environmental assessment", which regulates the participation required by the SEA process to which the DSEAR Plan is subject, are applicable.

Since it has been considered essential to achieve a broad agreement on water protection and management, such as that sought in hydrological planning, , and this cannot be achieved without stakeholders being involved in the process, public participation has taken place in all phases of the DSEAR Plan. Furthermore, the DSEAR Plan has the aim of identifying and benefiting from the best solutions to the problems identified, thus remaining open to public and expert contributions.

Three types of participation activities have been developed in the plan: public information, public consultation, and active participation ***(Figure 9)***.

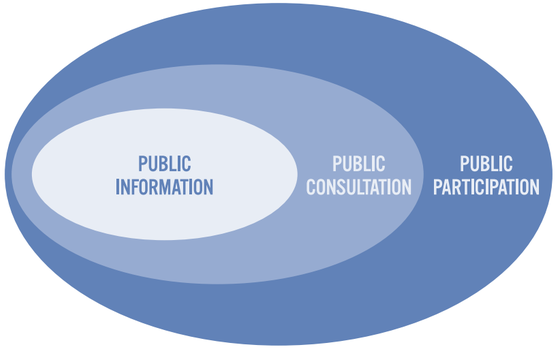


Figure 9.
Levels of public involvement in hydrological planning.

Public information process

This activity aims to ensure that stakeholders are informed of the process by having access to the information generated, both with respect to the documents that are being prepared and the data used to prepare such documents, with the only limitations established by Article 14 of Law 19/2013, on "Transparency, Access to Public Information and Good Governance". A broad scope is intended, accessible to anyone who wishes to have the information.

The disclosure process is ongoing. It began with the availability of the initial version of the Guidelines Document and has been completed with the public information of the draft of the DSEAR Plan, together with its Strategic Environmental Study. Additionally, the database of RBMPs and programs of measures PH-web, is available for public access, as well as a specific section of the MITECO website dedicated to the DSEAR Plan, where all the documents of the Plan can be found.

Public consultation

Unlike public participation process, where no response is expected, under this participation formula the promoting administration presents documents in the hope of obtaining a response from interested parties, allowing allegations on the content of the documents submitted to this process. This feedback will take place through the submission of documents with proposals, observations, or suggestions regarding the documents submitted for consultation during the limited period.

The scope is general, meaning that no-one is a priori excluded from the process.

Throughout the entire process, two phases of public consultation have taken place. The first referred to the initial documents and the second to the complete Plan itself. Each of the consultations began with the publication of the corresponding announcement in the Official State Gazette (BOE).

As part of the SEA process, two documents have been submitted for consultation. The first, submitted by the environmental body, was the Initial Strategic Document, and the second, submitted by the promoting body, was the Strategic Environmental Study carried out at the same time as the public consultation of the draft of the Plan.

The results of the consultations, as well as the explanation of how the contributions received have been dealt with, are included in specific reports, all which are made available to the public as complementary elements of the DSEAR Plan.

Active Participation (workshops)

Participation enables consensus to be reached throughout the planning process, and gives agents involved an active role in decision-making and in the preparation of documents. Active participation was implemented through workshops, such as those detailed in ***Table 1***.

The most prominent experts who felt particularly concerned by the matters to be analysed were invited to participate in these workshops, which sought to take advantage of the best knowledge and experience to enrich the work and obtain the best results. The discretionary process of selecting experts tried to balance the presence and weight of the different sectors of interest, trying to directly involve four main groups of stakeholders:

a) Public administrations (competent in water, agriculture, and energy).

b) Users and managers of the urban water cycle, the energy sector and irrigation.

c) Environmental Non-Governmental Organizations.

d) Institutions, universities, and research centres related to water.

The first workshop focused on the topic of water reuse. This workshop was held in May 2019 at the headquarters of the Hydrographic Confederation of Júcar, in Valencia ***(Figure 10)***. 53 experts from all sectors attended. The second workshop, focused on wastewater treatment and sanitation, with reference to savings and efficiency, was held in Madrid at the MITECO headquarters, on May 16 2019. 72 people attended, also representing all sectors.

Figure 10. *Image of one of the working groups of experts participating in the Water Reuse Workshop* ***(Valencia, 2019).***

As a result of the outcome of the two workshops held in Valencia and Madrid, it was considered necessary to add one more objective to the existing and initially proposed objectives of the DSEAR Plan, in reference to innovation and technology transfer. This led to the holding of new workshops focusing on this topic. Thus, on June 26 2019, a first workshop on innovation and technology transfer in the water sector was held in Zaragoza, at the headquarters of the ZINNAE Cluster for the Efficient Use of Water. 57 people participated in this workshop. A second workshop on the same topic was held in Toledo on October 25 2019, coinciding with the 4th Water Engineering Conference (IV Jornadas de Ingeniería del Agua), and a third and final meeting on this topic took place, again in Zaragoza, in December 2019, coinciding with the celebration of the 4th EIP Water Conference of the European Union ***(Figure 11)***.

The workshops began with a general meeting of all invited experts, in which technicians from MITECO's General Water Directorate made a general presentation of the DSEAR Plan, its objectives and the dynamics expected to unfold during the workshops. After this initial phase, the activity was organized by dividing the participants into small groups, of about 15 people each, to encourage discussion and the effective exchange of opinions.

In the first part of the group work, usually in the morning session, the difficulties or problems that were highlighted on the issue under analysis were explored, thus seeking to identify the challenges that the DSEAR Plan should face. In the second part, in the afternoon session, solutions were sought, proposals for action that the DSEAR Plan could develop to overcome the challenges previously identified on the topic under analysis.

Finally, the workshops closed with a new joint meeting of all participants to present and review the results.

More information on these workshops can be found in the descriptive files published in the "Water" section of the MITECO website.

In summary, for each of the seven Governance Objectives (GO), the above-described process sought to define the specific purposes and results expected to be achieved with the Plan, the specific challenges to be faced, and proposals and solutions to overcome the identified challenges. The table included at the end of this chapter as ***Table 2*** summarizes the results of this process.

.

Figure 11. *Presentation on the DSEAR Plan in the Innovation and Technology Transfer Workshop (Zaragoza, 2019).*

Table 2. Summary of challenges and proposals of the DSEAR Plan.

GO1. DEFINITION OF CRITERIA FOR THE PRIORITIZATION OF THE MEASURES OF THE RIVER BASIN MANAGEMENT PLANS

OBJECTIVES TO BE ACHIEVED	CHALLENGE	PROPOSAL
• The programmes of measures of the RBMP must clearly identify measures oriented to the achievement of the planning objectives. • The Central Government must identify the priority actions in the proposed areas. • Technical and socio-economic criteria must be progressively incorporated to translate the objectives of ecological transition and the demographic challenge into the prioritization of measures. • The bases to avoid new infringement procedures for non-compliance with European Community law must be established.	**C1.** To review, update, validate and prioritize wastewater sanitation, treatment, and reuse measures for the preparation of the 3rd Cycle RBMPs.	**P1.1.** To define the criteria and methodology for prioritizing measures, especially those concerning wastewater treatment, sanitation and water reuse. **P1.2.** To prioritize the measures and transferral of the result to the programmes of measures of the 3rd Cycle RBMP (2022-2027).

GO2. STRENGTHENING OF ADMINISTRATIVE COOPERATION FOR THE REVIEW AND PROMOTION OF THE PROGRAMMES OF MEASURES OF THE RIVER BASIN MANAGEMENT PLANS

OBJECTIVES TO BE ACHIEVED	CHALLENGE	PROPOSAL
• All the measures in the database must identify three types of authorities: Reporting Administration / Financing Administration / Competent Administration.	**C2.1.** To align the action of the competent authorities with the objectives of hydrological planning.	**P2.1.1.** To strengthen administrative cooperation mechanisms in relation to the planning process, in particular with regard to wastewater treatment, sanitation and water reuse actions.
• To advance knowledge of the urban agglomerations associated with works declared of general interest of the State. • To acquire exhaustive knowledge of the identified works of interest of the Autonomous Communities. To complete information on the Autonomous Communities that have not published this information.	**C.2.2** To clarify the responsibility of the various competent authorities in wastewater sanitation and treatment.	**P2.2.1.** To clarify the current framework of competence in wastewater sanitation. And treatment.

GO3. IMPROVEMENT OF THE DEFINITION OF ACTIONS THAT MUST BE CONSIDERED OF GENERAL INTEREST OF THE STATE

OBJECTIVES TO BE ACHIEVED	CHALLENGE	PROPOSAL
• Systematic rationalization of the number and type of actions declared works of general interest of the State (application of the new criteria defined in the draft regulation). • Significant reduction in the number of works declared of general interest of the State.	**C3.** To clarify and improve the legal regime of hydraulic works of general interest of the State in the areas of wastewater treatment, sanitation, and reuse.	**P3.1** To establish the legal concept of hydraulic works of general interest of the State with objective and rational criteria.
• All the works of general interest must be contemplated in the RBMPs.		**P3.2** To promote the use of Central Government intervention mechanisms other than declaration of general interest of the State.
• All the works of general interest must have undergone an assessment of their general interest prior to their declaration, and a report must be published evaluating their viability prior to their tender.		**P3.3.** To improve the procedures for evaluating and declaring works of general interest of the State, in particular for wastewater treatment, sanitation, and water reuse measures.

GO4. IMPROVEMENT OF THE INTEGRAL AND ENERGY EFFICIENCY OF WASTEWATER TREATMENT AND REGENERATION PLANTS AND WATER REUSE

OBJECTIVES TO BE ACHIEVED	CHALLENGE	PROPOSAL
• The Public Administration has financial mechanisms that favour the increase of actions aimed at improving the energy efficiency of treatment, sanitation, and water reuse plants. • A regulatory framework is in place to regulate the efficiency of wastewater treatment, sanitation, and water reuse plants. • Increase in electrical or thermal energy generation associated with renewable technologies. • The Public Administration has specific R&D funding via ad hoc Centre for the Development of Industrial Technology lines.	**C4.1.** To promote comprehensive energy efficiency of water treatment, sanitation, and water reuse facilities.	**P4.1.1** To promote energy savings in the different industrial processes that make up the wastewater treatment. **P4.1.2** To support renewable generation on land and in infrastructures associated with wastewater treatment, sanitation, and water reuse processes, or produced in the treatment of sludge from wastewater treatment plants. **P4.1.3** To modify the regulatory framework to recognize as valuable by- products some of those generated in the wastewater treatment, sanitation, and water reuse process.
• Regulatory review that recognizes by-products so that they can be commercialized and applied to different uses (e.g., struvite for agricultural use). • Increase in actions conducive to the development of the Spanish Circular Economy Strategy.	**C4.2.** To promote the recovery of by-products from wastewater treatment and regeneration plants.	**P4.2.1** To promote the reduction of greenhouse gas (GHG) emissions by improving the processes of the facilities.

GO5. IMPROVEMENT OF THE FINANCING OF MEASURES INCLUDED IN THE RIVER BASIN MANAGEMENT PLANS

OBJECTIVES TO BE ACHIEVED	CHALLENGE	PROPOSAL
• Establishment of a framework for allocating measures to the various entities of the CG (DGA, CCHH, SSEE) based on objective criteria: availability of financial cost recovery instruments, European funding, inter or intra-community scope of action, powers of competence and applicability of exemptions. • Methodology for the attribution of measures aimed at achieving environmental objectives or additional protection (types 1-10) to the causative agents and analysis of the results. • Analysis of the financial needs of the Hydrographic Confederations and their current self-financing capacity.	**C5.1.** To enable adequate financing channels for wastewater treatment, sanitation, and water reuse measures.	**P5.1.1.** To improve budgetary efficiency and analysis of the allocation of measures to different bodies of the Central Government with competences in water matters.
• Proposal of mechanisms to guarantee the general and systematic application of the cost recovery principle in the integral water cycle, mainly through the future reform of the economic-financial regime as regulated in the Consolidated Water Law.	**C5.2.** To improve the application of the cost recovery principle in wastewater treatment, sanitation, and water reuse actions.	**P5.2.1.** To establish mechanisms to guarantee the general and systematic application of the cost recovery principle in the integral water cycle.

GO6. PROMOTION OF WASTEWATER REUSE

OBJECTIVES TO BE ACHIEVED	CHALLENGE	PROPOSAL
• To clarify the current picture of water reuse and analyse its true potential in each planning area, in order to better target priorities, incentivize water reuse, and, thus, free up resources in water bodies under significant pressure.	**C6.1.** To incentivize the use of reused water in order to free up resources in water bodies under significant pressure.	**P6.1.1.** To analyse the potential for water reuse in Spanish basins, and its impact on the allocation and reservation of resources.
• Prioritization according to clear criteria and objectives aligned with the WFD of actions relating to the promotion of water reuse programmed in the 3rd Cycle RBMP.		**P6.1.2** To prioritize reuse actions aimed at achieving the good status of water bodies.
• Modification of the legal framework to promote water reuse based on its consideration as a resource (Circular Economy), and not as waste (Linear Economy). • Concession system with adaptive capacity to facilitate a better adjustment between available resources and consumption, avoiding both over-allocation and under-utilization of the concession, and recovering volumes granted and not used effectively. • To overcome the difficulty relating to differential costs compared to other sources of resources. • Further integration of reuse in water planning to support the achievement of environmental objectives. • Systematic measurement of allocations and consumption in all authorizations and concessions.	**C6.2.** To eliminate institutional and financial barriers limiting the reuse of water.	**P6.2.1.** To improve the regulatory and financial framework for water reuse (Revision and adaptation of RD 1620/2007 to Regulation 2020/741).
• Alignment of Royal Decree 1620/2007 for its mandatory adaptation to the new EU Regulation 2020/741 • To establish clear guidelines for developing new risk management plans and defining and addressing other milestones necessary to implement the Regulation.		
• Promotion of water reuse through the exchange of good practices and success stories, their dissemination, and communication of the technological developments of the sector. • Promotion of the sanitary safety of reused water to society, water users and end-consumers.	**C6.3.** To improve perception and social acceptance of water reuse.	**P6.3.1.** To ddevelop a section dedicated to water reuse on the MITECO website. **P6.3.2.** To cconduct a communication campaign on the use of reused water.

GO7. INNOVATION AND TECHNOLOGY TRANSFER IN THE WATER SECTOR

OBJECTIVES TO BE ACHIEVED	CHALLENGE	PROPOSAL
• Strengthening of the Public Water Administration's capacities in R&D and innovation (R&D&I), and their incorporation into its priorities. • Cooperation of the Public Water Administration with the competent administration in R&D&I at the CG level to transfer its interests. • Increase in the number of R&D&I actions in the programmes of measures.	**C7.1.** To strengthen coordination and collaboration within the Public Water Administration in order to establish needs and strategic lines of action.	**P7.1.1.** To enable administrative coordination and cooperation mechanisms to promote innovation and technology transfer in the field of water.
• Updating of the information in the Strategic Lines Document, and prioritization of actions based on hydrological planning objectives.		**P7.1.2** To periodically update the document "Innovation and research in the water sector: Strategic Lines (DGA, 2015).
• The Public Water Administration meets at least once a year with the scientific-technical field at a strategic conference with an agenda and objectives clearly defined by the General Water Directorate. • Updating of the innovation framework for the public water sector based on the strategic lines established by the General Water Directorate in 2015 and their updates.	**C7.2.** To strengthen collaboration between the administration and the technical and private scientific spheres.	**P7.2.1.** To organize a conference on innovation and technology transfer in the water sector.
• Increase in the functionality of the MITECO website (water section) with relevant information on R&D&I that serves to unite and coordinate efforts between different sectors of interest.		**P7.2.2** To create a section on R&D&I in the "Water" section of the MITECO web portal.
• To prepare a support guide for the activation of innovation contracting procedures. • To elaborate a list of pro-innovation criteria and evaluation/weighting methodology to apply in contracting specifications. • Increase in the number of R&D&I contracts by the Public Water Administration and streamlining of its administrative process. • Increase in the number of public procurement files of the General Water Directorate favourable to innovation.	**C7.3.** To promote the adoption of innovative technology that responds to the effective needs of the DGA.	**P7.3.1.** To develop tools to support the public procurement of innovation by the Public Water Administration.
• To offer specific training to those involved in public procurement procedures relating to R&D&I.		**P7.3.2.** To establish a training plan on innovative procurement tools.

1.7. CONTENT STRUCTURE

The result of the work of the DSEAR Plan is represented by a complex set of documents. This report, which constitutes the Plan itself, is accompanied by various other documents, including the Strategic Environmental Study and one or more complementary analysis documents for each of the seven Governance Objectives (GO) addressed. Regarding the latter, there is a technical report for each Governance Objective, which analyses their situation and context, identifies the challenges to be addressed, and describes the main intervention opportunities articulated in the form of action proposals. When any of these action proposals requires it, due to its importance or scope, a specific document has been created for it, which is included in the corresponding annex.

The DSEAR Plan is configured as the explanatory summary of all the work, synthesizing the various contents elaborated, and the most relevant conclusions obtained, which are presented in the following chapters, preceded by an executive summary:

1. Introduction and objectives: This chapter explains the issues addressed, the nature of the DSEAR Plan as a governance instrument, and its objectives and guiding criteria. The elaboration process of the Plan, the participation formulas developed, and its content structure are also described.

2. Development of action proposals: This chapter constitutes the essential body of the Plan, summarizing its essential elements. For each of the seven Governance Objectives considered and explained in the previous chapter, this extensive chapter presents, one by one, the elements that allow the contextualization of each of the problems, explaining the challenges that they pose, and, finally, developing the proposals described in the previous chapter.

3.Conclusions: This chapter summarizes, in the form of final considerations, the most notable results of this Plan.

4. References: This chapter lists the references cited in the text. Where possible, hyperlinks have been included to facilitate consultation of the referenced document.

Annex I: Strategic Environmental Declaration of the DSEAR Plan

All the above cited chapters are preceded by an Executive Summary (chapter 0), which summarises the nature and objectives of the Plan, and, for each Governance Objective addressed, the specific challenges it raises, the work carried out, and the results obtained.

This Plan is accompanied by various complementary documents:

Strategic Environmental Study:

- **Report** of the Strategic Environmental Study.
- **Annexes** to the Strategic Environmental Study.

Supplementary reports:

- Supplementary report of GO-1. **Definition of criteria for the prioritization of the measures of the River Basin Management Plans.**
- Supplementary report of GO-2. **Strengthening of administrative cooperation for the review and promotion of the Programmes of Measures of the River Basin Management Plans.**
- Supplementary report of GO-3. **Improvement of the definition of actions that must be considered of General Interest of the State.**
- Supplementary report of GO-4. **Improvement of the integral and energy efficiency of wastewater treatment and regeneration plants and water reuse.**
- Supplementary report of GO--5. **Improvement of the financing of measures included in the River Basin Management Plans.**
- Supplementary report of GO-6. **Promotion of wastewater reuser.**
- Supplementary report of GO-7. **Innovation and technology transfer in the water sector.**
  - ✓ Supplementary document to the Supplementary Report of GO-7: **Public Procurement Guide for Innovation and the Contracting Procedure in the Public Water Administration.**
  - ✓ Supplementary document to the Supplementary Report of GO-7: **Draft model of the Standard Specification (descriptive document) subject to the Competitive Dialogue Procedure.**
  - ✓ Supplementary document to the Supplementary Report of GO-7: **Draft model of the Standard Specification (with specific administrative clauses) subject to the Innovation Association Procedure.**

02

Development of the action proposals

GO.1

Definition of criteria for the prioritization of the measures of the RBMPs

SLOW PROGRESS IN THE IMPLEMENTATION OF MEASURES IN THE RIVER BASIN MANAGEMENT PLANS

EXISTENCE OF INFRINGEMENT PROCEEDINGS AGAINST SPAIN IN RELATION TO EU WATER LEGISLATION

LIMITED INCLUSION OF THE PRINCIPLES OF ECOLOGICAL TRANSITION AND THE DEMOGRAPHIC CHALLENGE INTO WATER PLANNING

LACK OF OBJECTIVE AND RATIONAL PRIORITISATION CRITERIA FOR THE PRIORITISATION OF WATER TREATMENT AND SANITATION MEASURES

As explained in the introductory chapter, the European Commission is pursuing nine infringement proceedings against Spain for potential non-compliance in the application of European water legislation. Five of them refer to issues with wastewater treatment and sanitation.

The CJEU has imposed a significant financial penalty on Spain for failing to provide adequate wastewater treatment in various urban agglomerations with discharge loads from a population greater than 15,000. Progress with the rest of the infringement proceedings could lead to the same result if the necessary measures are not implemented in time to resolve these issues.

The low rate of implementation of the Basic measures required by the legislation, and consequent delay in the achievement of environmental objectives, particularly in the areas of wastewater treatment, sanitation, and water reuse, demands a review and updating of the actions proposed in the 2nd Cycle RBMPs. For this, it is necessary to establish general criteria (economic, social and environmental) and administrative coordination criteria to be applied in order to ensure that the actions included in the programmes of measures of the RBMPs are not only feasible and can be carried out without unexpected difficulties and within the required deadlines, but are also adequately prioritized to meet our legal obligations, and achieve the objectives of environmental and socio-economic planning and the ecological transition that our economy and our society demands.

The particular importance of the 3rd Cycle RBMPs derives from the fact that the extensions of the deadline for achieving the environmental objectives for water bodies cannot exceed 2027, unless expected non-compliances can be justified as natural conditions of the water bodies that prevent the achievement of objectives. It is not possible, as was the case in previous cycles, to justify temporary exemptions due to technical difficulties or disproportionate costs.

It is therefore imperative that the programmes of measures of the 3rd Cycle incorporate all the actions necessary for the water bodies and protected areas to meet their environmental objectives. This will comply with the WFD and the rest of the acquis communautaire on water which it incorporates (Annex VI, Part A of the Framework Directive), such as, for example, the measures necessary to comply with Directive 91/271/EEC which are considered "Basic", and, therefore, mandatory. It is also imperative that the measures are implemented on time, over the six-years of the cycle, which will require a major investment effort, coordination of the competent authorities, and management of human and technical resources at all levels.

In this context, environmental criteria take on a clear role, and it is essential to determine which measures are those specifically designed to solve situations of non-compliance, and to prioritize them accordingly. The technical-economic and social criteria must contribute to the prioritization in a complementary manner, to ensure the efficiency of public action and social and territorial equity.

Considering all the above, the proposals have been developed as follows:

- Definition of the criteria and methodology for prioritizing measures, especially those concerning wastewater treatment, sanitation, and water reuse.
- Prioritization of the measures and their transfer to the programmes of measures of the 3rd Cycle RBMPs.

1.1. DEFINITION OF THE CRITERIA AND METHODOLOGY FOR PRIORITIZING MEASURES, ESPECIALLY THOSE CONCERNING WASTEWATER TREATMENT, SANITATION AND WATER REUSE

The objective of this proposal is to establish criteria for prioritizing wastewater treatment, sanitation and water reuse measures, under the competence of the Public Water Administration (the DGA, Hydrographic Confederations, state companies), and their methodology of application to the programmes of measures of the 3rd Cycle RBMPs.

Such application aims to maximise the efficiency of public spending and to incorporate the principles of ecological transition and the demographic challenge when selecting the actions to be developed, so that decisions can be taken from an increasingly holistic perspective of the benefits and costs of the actions.

The proposed prioritization criteria are objective, transparent, and the result of a widely developed participation process. In this regard, the results can be understood and made public, indirectly binding the different administrations, which must try to avoid unjustified deviations from what has been established, as well as the execution of unplanned actions. These criteria make it possible to classify the various types of actions according to the relevance of the action and its urgency for the achievement of the planning objectives.

1.1.1. Definition of the prioritization criteria and their indicators

The proposed criteria are of an environmental, technical, and socio-economic nature.

The environmental criteria are based on the obligations established in the water regulations, that is, to clearly determine what pressures must be mitigated and what necessary measures must be adopted to correct situations of non-compliance with the good status of water bodies.

The technical and economic criteria relate to the assessment of the feasibility and cost-effectiveness of the measures, the use of European funding, and the state of preparation of the action.

The social criteria incorporate socio-economic information on the area of action (according to parameters such as income, unemployment, population, and ageing), in line with the priority of incorporating information into decision-making on the social and demographic reality of the areas of action.

Table 3 shows the proposed criteria, and the numerical indicators necessary for their implementation.

Given that it is not possible a priori to prioritise between measures that serve different objectives, actions should be classified and grouped from a functional point of view into blocks that can be prioritised. The allocation of economic resources to a given functional group would then be at the discretion of policy decisions. In the case of the measures included in the DSEAR Plan, this grouping is relatively straightforward:

a) Wastewater sanitation and treatment actions with the common objective of reducing point source pollution.

b) Water reuse measures.

c) Mixed actions, combining wastewater sanitation and treatment with water reuse.

Table 3. Criteria and indicators for prioritization.

CRITERIA	INDICATORS
ENVIRONMENTAL CRITERIA	
A1. Ensure compliance with Directive 91/271/EEC	Response to infringement processes
A.2. Promote compliance with environmental objectives and the WFD	Correction of situations of non-compliance
A.3. Promote the fulfilment of other objectives of RBM or sectoral planning	Risk of non-compliance with environmental objectives
TECHNICAL-ECONOMIC CRITERIA	
B1. Promote cost-effective measures	Planning indicators (specific by type)
B2. Promote actions that can be carried out in the short term	Advancement status of the measure
B3. Promote actions that have community funding	Participation of European Funding
SOCIAL CRITERIA	
C1. Contribute to the development of the most disadvantaged municipalities	Average Income
	Unemployment
C2. Contribute to territorial balance and demographic stability	Population density
	Population over 65 years old

To accelerate compliance with environmental objectives and optimize the efficiency of the CG's intervention, these measures should be prioritized according to whether they are:

- Actions aimed at achieving the objectives and compliance with the obligations deriving from Directive 91/271/EEC on urban wastewater treatment, with the highest priority being given to measures aimed at resolving cases in which judgements have been issued by the CJEU. These will be followed by actions in cases currently involved in an infringement procedure, prioritized by their urgency according to the progress of such procedures.
- Actions aimed at achieving the environmental objectives of hydrological planning, and, in general, European Community and national legislation on water protection.
- Actions that respond to criteria of economic rationality, such as the availability and possibility of using European funding, and to the consideration of their positive effects on other environmental and social issues, particularly in reference to measures that support areas that are at a disadvantage and at risk of depopulation.

In short, it is a matter of prioritizing Basic actions insofar as they are mandatory and ensuring that the minimum requirements of water legislation are met. Complementary measures which, according to analyses conducted by basin organizations, are programmed to achieve the environmental objectives in protected areas and water bodies, are also urgently needed.

For the rest of the Complementary measures programmed, the prioritization will be based on the results of a cost-effectiveness analysis, in application of Article 43.6 of the Hydrological Planning Regulation (RPH). This analysis will consider the economic, social and environmental aspects of the measures through an extended efficacy study (multi-criteria), aiming to take into account the effects of the different measures on other environmental and social problems, even if they do not directly affect aquatic ecosystems; all in accordance with the Strategic Environmental Assessment process of the DSEAR Plan, and the multi-purpose approach of the WFD.

It should be noted that certain criteria that emerged in workshops and in the internal discussion processes conducted prior to the drafting of this document have not been incorporated due to implementation difficulties. Such is the case of the innovative component of the measure, which, alternatively, is dealt with in the framework of GO-7 of this Plan (innovation and technology transfer), in order to reinforce its consideration in future public procurement processes. On the other hand, some of the indicators proposed for the prioritization of actions have been established in the work carried out, while others, particularly regarding the classification of Complementary measures and the evaluation of cost-effectiveness, require information that is being prepared but is not yet available, and should be evaluated in coordination with the basin organizations as the review of the RBMPs progresses.

Although effective prioritization will only be carried out on the wastewater treatment, sanitation and water reuse actions in which the CG (DGA, Hydrographic Confederations and state companies) participate, the methodology that is described could be applied, with the necessary adaptations, to other types of measures included in the RBMPs. Likewise, similar criteria could be voluntarily assumed by other competent authorities in the programming of investments linked to hydrological planning.

In this sense, the prioritisation can only be conducted within each competent administration, in accordance with its management autonomy and budgetary independence. A different matter is that the prioritization criteria, insofar as they transfer the prevalence of the objectives of hydrological planning and ecological transition, should be considered by all stakeholders in the process of the design of their respective action programmes. Having said this, it is clear that this exercise, although theoretically it can be carried out globally, in practice it must be carried out for each of the investment administrations.

The prioritisation criteria and associated indicators are briefly described below, as well as the proposed implementation methodology.

A- ENVIRONMENTAL CRITERIA

Criterion A1-Ensure compliance with Directive 91/271/EEC:

An assessment is made on the basis of the identification of urban agglomerations subject to infringement proceedings initiated by the European Commission against Spain, as well as agglomerations likely to be added to this list in the future. This information comes from the DGA itself, which has conducted specific work to characterise the situations of non-compliance, coordinate the response actions to the infringement procedures, and is responsible for the Biennial Report of Compliance with Directive 91/271/EEC.

The actions proposed to correct these situations are basic measures of particular interest. However, given the complexity of the issue, three levels of priority have been established according to the urgency with which the necessary interventions must be implemented:

- **Priority 1.** Open proceedings that have culminated in judgements (C-38/15 and C-205/17).
- **Priority 2.** Procedures at the reasoned opinion phase (2012/2100, 2016/2134 and 2017/2100).
- **Priority 3.** Foreseeable non-compliance procedures according to reports Q2017 and Q2019, or cases of flagrant non-compliance that may lead to the opening of new infringement procedures. Other Basic measures, in addition to those responding to infringement procedures, that are included in the notified National Programme are also considered under this priority (see Article 17 of the Q2019 Report).

Criterion A2-Promote compliance with environmental objectives and the WFD:

The actions incorporated into the programmes of measures may aim to improve and protect water bodies and dependent ecosystems, or to meet other planning objectives, such as: meeting demands, prevention and protection against extreme phenomena, or other sectoral development objectives. Within the first group, related to the achievement of environmental objectives, a distinction is made between Basic and Complementary Measures (Art. 11 of the WFD).

- In the case of wastewater sanitation and treatment, "Basic measures" are identified as 1) those associated with non-compliances recognized in the infringement procedures of Directive 91/271/EEC, which will have therefore been prioritised through the application of criterion A1; and 2) those other measures necessary to avoid future non-compliances.

  These measures can be identified in the "National Programme - Q Report" for the application of Directive 91/271/EEC, which is prepared every two years in response to Article 17 of the aforementioned regulation. The Q-2019 Report includes the measures associated with the infringement procedures that are still unresolved but already prioritised, along with other actions unrelated to the pending prioritisation procedures.

  The remaining wastewater sanitation and treatment actions not included in the "National Programme" are considered "Complementary measures." Therefore, it is also interesting to prioritise those other measures that, although not contemplated in the "National Programme" relative to Article 17 (e.g. actions in smaller agglomerations, or the establishment of stricter conditions than those initially required by Directive 91/271/EEC), have been indicated in the RBMPs as necessary for the achievement of the established environmental objectives set for surface and groundwater bodies and protected areas, or to comply with European Community regulations on water protection.

- The water reuse measures are not Basic, since they do not respond to the fulfilment of an explicit legal obligation, but they may be necessary or contribute significantly to the achievement of environmental objectives and will therefore be Complementary and Priority measures. This would be the case for:

  ✓ Those that, for water bodies or protected areas that do not meet their environmental objectives and suffer significant pressure due to extraction, involve a substitution of the origin of the resource used, and thus ensure an effective and permanent reduction of said pressure, provided that: the cost-effectiveness ratio of water reuse is more favourable than that of other measures of a different nature that can be alternatively used to counteract the same pressure; that the measure includes the closure and dismantling of the extraction facilities being replaced; the reduction in extraction is net and measurable and takes place both de jure and de facto, with a reduction in concession volumes or water rights; and the context allows the basin organization effective control to avoid the implantation of new uses on the same water body or the expansion of existing ones.

  ✓ Those which, for water bodies or protected areas that do not meet their environmental objectives because they are subject to significant pollution pressure, without suffering pressure due to extraction or regulation, lead to a significant reduction or the elimination of pollution, thus resulting in an adequately treated discharge, provided that: the alternative of increasing the level of treatment is not feasible; the cost-effectiveness ratio of water reuse is more favourable than that of other measures of a different nature that could alternatively be used to counteract the same pressure; the reduction of pollution is net and measurable and takes place both de facto and de jure, with a reduction in the polluting load of the discharge authorization; and the context allows the basin organization effective control to prevent the introduction of new discharges into the same water body or the expansion of existing ones.

Considering all the above, two types of cases are established. The first type is associated with Priority 3 set for criterion A1 (ensuring compliance with community legislation).

- **Priority 3.** Identification of other Basic measures, in addition to those that respond to infringement procedures included in the notified National Programme (see Article 17 of Q2019).

- **Priority 3.** Identification of Complementary measures that directly affect the achievement of environmental objectives (water bodies and protected areas) or are necessary to comply with community regulations on water protection.

- **Priority 4.** Any remaining measures that contribute to water protection.

Criterion A3- Encourage the fulfilment of other objectives of RBM or sectoral planning:

In the case of water reuse, the measures can also serve other objectives:

- Measures aimed at replacing the urban supply for another of higher quality, so as to ensure compliance with D.98/83/EC, of the Council of 3 November 1998, on the "Quality of Water Intended for Human Consumption", in exchange for using reclaimed water to meet the use that cedes its original high quality resources to the more demanding use for supply.

- Measures aimed at meeting water demands, to reinforce service guarantees and make the current supply more flexible.

- Other investments defined within the framework of sectoral policies affecting water use.

This type of actions must be assessed according to their impact on the achievement of environmental objectives and are classified into two types of cases.

Priority 5. The rest of the measures that respond to other planning objectives, neutral for the achievement of environmental objectives.

- This would be the case of measures that involve the reuse of water directly discharged into the sea via underwater outlet or another system lacking an environmentally preferable alternative (e.g., creation or restoration of coastal wetlands, or recharge of overexploited coastal aquifers).

Non-priority. Other measures that put the achievement of environmental objectives at risk. In this group, the following cases should be included

  ✓ When the treated discharge contributes or can contribute to reducing pressure by abstractions or by regulating the water body or protected area that originally receives it, or other hydrologically connected ones, including cases of water bodies at the mouth of main rivers or in correspondence with coastal wetlands in river basin districts where the water exploitation index (WEI+) indicates water stress, river basin districts in which a strong reduction in the availability of the resource is expected in the medium term due to the effect of climate change, and treated discharges that are or may be an important source of water supply for water-dependent protected areas or wetlands whose natural regime is strongly altered by the pressure of abstractions to which the water bodies that originally fed them are subjected.

  ✓ When the alternative of maintaining the treated wastewater in the water body or protected area that originally receives it, improving the quality of wastewater treatment (tertiary treatment, selective removal of pollutants), can represent a significant advance in achieving environmental objectives of the water body or protected area, or of other hydrologically connected ones.

- ✓ When water reuse increases the risk of deterioration of the status or can prevent the achievement of the environmental objectives of water bodies or protected areas (e.g., water reuse for the purposes of increasing or intensifying irrigation on areas vulnerable to agricultural nitrate pollution or on agricultural land causing significant diffuse pollution pressure on water bodies or protected areas).

- ✓ When water reuse only increases the supply of resources to meet new demands, increasing abstraction pressure and vulnerability to climate change.

B- TECHNICAL-ECONOMIC CRITERIA

Criterion B1-Promote cost-effective measures:

The cost-effectiveness analysis is used in hydrological planning (Article 61 of the RPH) as a tool for selecting the most appropriate combination of measures and for assessing options in the analysis of disproportionate costs when an exemption is applicable. It should also be recalled that the Basic measures (required to implement water protection legislation) must be a mandatory part of the programme of measures, so that their integration into the programme of measures does not merely result from the cost-effectiveness analysis. The above can be summarized in two conclusions:

- The Basic measures, classified by applying criterion A1 and those criteria included in the National Programme for the application of Directive 91/271/EEC, do not require cost-effectiveness analysis because they are already mandatory. However, cost-effectiveness does play a role in selecting alternative technologies.
- Complementary measures included in the programmes of measures should form the best (cost-effective) mix of measures to meet the objectives.

The cost-effectiveness analysis proposed here as a prioritization criterion is based on these premises. To do so, the impact of the measures on the achievement of the objectives is evaluated as an additional ranking tool useful for sequencing implementation and advancing the most cost-effective measures. In any case, all the Basic and Complementary measures necessary to achieve the environmental objectives must be implemented by the various competent agents on an operational level by the end of 2027.

- Wastewater sanitation and treatment measures in all cases measures with a positive impact on the achievement of environmental objectives, as they remove polluting elements that would otherwise be discharged into continental or marine waters. Furthermore, they do not imply an increase in other types of pressures on waters. Therefore, the measure of their effectiveness is directly related to the pollutant load removed.

Table 4. Efficacy indicators for measure subtype 01.01.01.

SUBTYPE	INDICATOR	
01.01.01	01.01.01.4	BOD that the measure reduces (t/year)
01.01.01	01.01.01.5	COD that the measure reduces (t/year)
01.01.01	01.01.01.6	Suspended Solids that the measure reduces (t/year)
01.01.01	01.01.01.7	Nitrogen load that the measure reduces (t/year)
01.01.01	01.01.01.8	Phosphorus load that the measure reduces (t/year)
01.01.01	01.01.01.9	Priority substance load that the measure reduces (t/year)
01.01.01	1.01.01.10	Specific pollutant load that the measure reduces (t/year)

Note: These indicators and the corresponding coding are those proposed in the PH-Web system for the subtype of measure 01.01.01 (Construction of new urban wastewater treatment facilities).

Table 5. Environmental effect of water reuse measures.

OBJECTIVE OF THE MEASURE		A) THE TREATED WATER WAS PREVIOUSLY DISCHARGED INTO THE SEA	B) THE TREATED WATER RETURNED TO THE CONTINENTAL WATER ENVIRONMENT
Substitution of other sources of supply	1. To reduce extraction in water bodies at quantitative risk.	The extractive pressure on continental waters is reduced. The discharge of nutrients and other pollutants into transitional and/or coastal water bodies is reduced.	The global extractive pressure is maintained but can be readjusted to benefit environmental objectives (options 1 and 2) or offer additional protection for other water bodies (3) or contribute to non-environmental objectives (4). The discharge of nutrients and pollutants to continental water bodies is reduced.
	2. To avoid discharges to water bodies at risk due to nutrients.		
	3. To achieve environmental improvements in other water bodies.		
	4. To improve supply quality.		
5. Improvement in the guarantee of pre-existing uses without substitution.		There is no increase in extractive pressure. The discharge of nutrients and other pollutants to transitional and coastal water bodies is reduced (although the input from new use must be taken into account, where appropriate).	The global extractive pressure is maintained, except in dry periods. In such periods, nutrient and pollutant discharge is reduced.
6. Supply to new uses or increase the allocation of pre-existing uses.			Extractive pressure increases with probable impact on other uses and/or the water environment. Nutrient balance dependent on various factors.

- Of the effectiveness indicators proposed and gathered in the PH-Web database, those that respond more directly to the objectives of this type of measures are to be considered, which in the case of wastewater sanitation and treatment actions, can be identified with the compliance parameters of Directive 91/271/EEC. In the event that the measure is motivated by the need to remove a specific substance, the effectiveness should also be measured in terms of the reduction of that substance, and the following indicators may be considered:

- From the point of view of determining effectiveness, the consideration of water reuse measures is notably more complex. Starting from the consideration that all the programmed measures must ensure that no more cost-effective alternatives are available and justify that the benefits for the environment and society outweigh the costs incurred, it should be remembered that these actions may respond to diverse objectives and situations in relation to their quantitative and qualitative impacts on the water environment and dependent uses.

Consequently, the following indicators are considered regarding their quantitative impact ***(Table 6)***:

Table 6. Indicators for water reuse measures.

SUBTYPE	INDICATOR	
12.02.0n	12.02.0n.1	Volume of reclaimed water obtained with the measure in relation to the indicated use (hm^3/year).
12.02.0n	12.02.0n.1	Volume of reclaimed water that replaces water body resources with a status worse than good due to extractive pressure (hm^3/year).

Furthermore, the indicators for wastewater sanitation and treatment measures are also applicable, insofar as water reuse entails a reduction in discharge, which may be especially relevant in the case of nutrients and specific pollutants. Given that such indicators have already been described, no further consideration will be given to them, except to recall that, in addition to the reduction in pollutants, the loss or reduction of discharge flow must also be taken into account.

To establish the prioritization, the effectiveness indicator is calculated, and all the measures are ranked according to their cost-effectiveness by establishing thresholds at the 33rd and 67th percentiles. In this way, the following result is achieved:

- **Priority 1.** The cost-effectiveness indicator is greater than the 67th percentile.
- **Priority 2.** The cost-effectiveness indicator is between the 33rd and 67th percentiles.
- **Priority 3.** The cost-effectiveness indicator is less than the 33rd percentile.

In establishing the weighting, the degree of confidence in the indicator's assessment has been taken into account. Although the criterion of prioritizing cost-effective measures is key in the context of WFD implementation, and, in general, in any investment decision-making process, it is complex to determine, especially in the case of measures that respond to environmental objectives. This is why its importance has been recognized by assigning maximum weight between the technical-economic and social criteria.

Criterion B2-Promote actions that can be carried out in the short term:

This criterion aims to report on the state of advancement of each of the measures as a complementary decision-making element. The logic is to favour the promotion of measures with a more advanced state of definition and processing, with regard to both the technical development of the measure (preliminary studies, preliminary draft or definitive project) and the environmental assessment procedures. Based on the available information, three priority classes have been established:

- **Priority 1.** The work can be put out to tender or has a project that either does not need to undergo an environmental impact assessment or has a favourable environmental impact declaration.
- **Priority 2.** The work has been established in a project or preliminary project, but the environmental procedure has not been completed.
- **Priority 3.** Other stages of development of the process.

Criterion B3-Promote actions that have community funding:

Given the budgetary limitations of the Spanish administrations, it is understood that, if a measure has European funding, it transfers efficiency to public spending. This temporary economic support for certain measures facilitates the acceptance of economic commitments for their financing by reducing the total amounts to be financed and, as a result, makes it easier for the measure in question to be implemented in the short term so that the investment can be made before the availability of such funds expires.

In line with this criterion, a fund participation threshold is established to differentiate two priority classes from another non-priority class for the many measures that lack European funding:

- **Priority 1.** European funding covers at least 60% of the investment.
- **Priority 2.** European funding covers less than 60% of the investment.
- **Priority 3.** The measure is not supported by European funding.

C- SOCIAL CRITERIA

In the Council of Ministers held on 29 March 2019, an Agreement on the General Guidelines of the National Strategy for the Demographic Challenge was approved. Its transversal objectives include, among others, ensuring the adequate provision of basic services to the entire population, in conditions of equity and adapted to the characteristics of each territory, and the incorporation of the demographic impact and perspective in the drafting of laws, plans and investment programmes, favouring territorial redistribution in pursuit of greater social cohesion.

Now the task is to incorporate the criteria of social and territorial equity into the prioritization of measures, transferring the objective of addressing the demographic challenge to hydrological planning. To this end, various socio-economic descriptors have been considered to identify which municipalities can be classified as disadvantaged or depopulated in a given territorial context, which should correspond to the scope of analysis of the competent authority responsible for the measure. These criteria also have the potential to be exploited for an objective determination of eventual exemptions to cost recovery, or to incorporate socio-economic conditions in the framework of assessing the general interest of the actions.

It should be noted that the proposed criteria are, to a large extent, similar to those established in **Law 45/2007, of 13 December, for the "Sustainable development of rural areas"**, which defines rural areas to be revitalized as, "those with low population densities, high levels of agricultural activity, low income levels, and significant geographic isolation or difficulties in territorial structuring". Other criteria have been adopted considering the fact that the actions to be prioritized also affect non-rural areas, and, in general, actions located in municipalities, rather than supra-municipal areas. Regarding geographical and climate conditions, also cited in the Consolidated Water Law (TRLA), in the framework of the application of the cost recovery principle, given the difficulty of their explicit consideration, it is estimated that they come into play insofar as they are the cause of socio-economic difficulties, evaluated by the set of criteria proposed, or because they generate additional costs that should be characterized and identified in the design phase of the measures.

It should also be clarified that for actions affecting more than one municipality (e.g., wastewater treatment in supra-municipal or protected areas), the average ratios in the affected territory have been calculated.

Although it would have been desirable for the proposed criteria to address the effect of the measures on the development of disadvantaged groups, seeking to increase the distributive impact of the measures, the official information necessary to characterize them for such purposes is lacking. However, this proposal for prioritization criteria is a first definition that will have to be improved in subsequent work, once its practical application in the 3rd Cycle RBMPs has been evaluated, and as the sources of official information available on issues related to both the ecological transition and the demographic challenge are expanded.

Criterion C1-Contribute to the development of the most disadvantaged municipalities:

Public investment can be a supporting element to articulate a harmonious development and boost the economy of areas in difficulty, contributing to promote equality and compensate the territories most vulnerable to social exclusion and depopulation. To report on this criterion, two indicators are used: average income of the municipality, and unemployment.

- **C1a--Average income:**

  Average income per person and municipality has been selected as an indicator of the wealth of a territory, information that is provided by the experimental survey, "Atlas of household income distribution" of the National Institute of Statistics (INE). This project proposes the elaboration of statistical indicators of income distribution at the municipal and infra-municipal level. This is done by

linking census information with tax data, mainly from the Tax Agency, but also from Provincial Treasuries. The latest data available corresponds to the year 2017.

Three priority classes have been established using two thresholds, specifically, the 33rd and 67th percentiles, which allow the universe of municipalities to be subdivided into three similar groups:

- **Priority 1.** The average income of the municipality (in the case of several municipalities, the weighted average income of the municipalities) benefiting from the measure is below the 33rd percentile.
- **Priority 2.** The average income of the municipality (in the case of several municipalities, the weighted average income of the municipalities) benefiting from the measure is between the 33rd and 67th percentiles.
- **Priority 3.** The average income of the municipality (in the case of several municipalities, the weighted average income of the municipalities) benefiting from the measure is above the 67th percentile.

- **C1b-Unemployment rate**

The unemployment rate is a critical parameter when determining the vulnerability of a territory to social exclusion. In the absence of municipal data on the active population, an alternative indicator based on the unemployment data provided by the Public Employment Service (SEPE) of the Ministry of Labour, Migration and Social Security on its website has been applied. Depending on the sector and geographic location of the municipality, the unemployment rate may be highly influenced by seasonal variability. In order to obtain a rate that mitigates this effect, it is considered appropriate to use an average value of the twelve months (from January to December) of the last full year for which data is available (2019). Given that the data on the active population for each municipality is unknown, the ratio of the number of unemployed to the total population registered in January of the same year has been used.

Similar to the criterion adopted for average income, three priority classes have been established based on the 33rd and 67th percentiles, so that the priorities are defined as follows:

- **Priority 1.** The average income of the municipality (in the case of several municipalities, the weighted average income of the municipalities) benefiting from the measure is below the 33rd percentile.
- **Priority 2.** The average income of the municipality (in the case of several municipalities, the weighted average income of the municipalities) benefiting from the measure is between the 33rd and 67th percentiles.
- **Priority 3.** The average income of the municipality (in the case of several municipalities, the weighted average income of the municipalities) benefiting from the measure is above the 67th percentile.

Criterio C2-Contribute to territorial balance and demographic stability:

Among the lines of action to tackle depopulation are those of improving competitiveness and facilitating the development of new economic activities, as well as promoting the settlement and rooting of the population in rural areas. Consequently, it is considered appropriate to include the depopulation of rural areas as a social criterion to be considered in the prioritization of investments in the programmes of measures, given that the implementation of investments in a territory contributes in some way to territorial balance and demographic stability. Therefore, the indicators used to apply this criterion are population density in the municipality and the percentage of the population over 65 years of age.

- **C2a-Population density:**

Population density is an immediate indicator of human desertification and indicates a certain risk of depopulation of the territory. The latest data published by the National Institute of Statistics for its estimation corresponds to the municipal census of inhabitants as of 1 January 2019.

The density criterion can be associated with an absolute significant threshold. In particular, the figure of 8 inhabitants/km2 is considered relevant, as it is a value used to classify NUTS2 regions as "areas with very low population density" in the European Commission Communication "Guidelines on Regional State Aid for 2014-2020" (2013/C-209/01). Considering that work is carried out at municipal level, an additional, top category can be introduced for areas below 4 inhabitants/km2 (slightly more than 20% of Spanish municipalities). Thus, the following categories appear:

- **Priority 1.** Population density in the municipality or municipalities benefiting from the measure equal to or less than 4 inhabitants per square kilometre.
- **Priority 2.** Population density in the municipality or municipalities benefiting from the measure between 4 and 8 inhabitants per square kilometre.
- **Priority 3**. Population density in the municipality or municipalities benefiting from the measure higher than 8 inhabitants per square kilometre.

- **C2b-Percentage of the population over 65 years of age:**

The proportion of older population is another key indicator to gauge the risk of depopulation, since it points directly to an insufficient replacement rate. INE's Income Distribution Atlas provides this data by municipality. Similar to the criterion adopted for average income and unemployment, three priority classes have been established based on the 33rd and 67th percentiles.

- **Priority 1.** The percentage of the population over 65 years of age in the municipality or municipalities benefiting from the measure is above the 67th percentile.
- **Priority 2.** The percentage of the population over 65 years of age in the municipality or municipalities benefiting from the measure is between the 33rd and 67th percentiles.
- **Priority 3.** The percentage of the population over 65 years of age in the municipality or municipalities benefiting from the measure is below the 33rd percentile.

1.1.2. Methodology for establishing priorities: application of the criteria

Once the prioritization criteria and calculation procedures and indicators that inform them have been defined, it is necessary to specify the global evaluation mechanism for the prioritization of the wastewater treatment, sanitation and water reuse measures to be included in the 3rd Cycle RBMPs, under the competence of the CG's Public Water Administration. For this, the sequencing of the application of the criteria and, where appropriate, the way in which their weighting is to be established must be defined.

The methodology must clearly establish a preference for environmental criteria in order to ensure compliance with Spain's legal obligations before the EU, with regard to not only Directive 91/271/EEC, but also the WFD, and rest of the European Community legislation in general. Technical-economic and social criteria may then intervene later, once the main priority groups have been established. The objective of the application of the methodology is to improve the classification and efficiency of the programmes of measures, helping to organize the actions and adjust the rate of execution to the budgetary availabilities, with the maximum favourable impact on the objectives, in the shortest time possible.

In accordance with the above, the criteria are applied sequentially as follows: firstly, environmental criteria, and then, technical-economic and social criteria.

- Application of criterion A1: Ensure compliance with Directive 91/271/EEC
- Application of criterion A2: Promote compliance with environmental objectives and the WFD
- Application of criterion A3: Promote the fulfilment of other objectives of RBM or sectoral planning
- Application of the other criteria of a technical-economic and social nature: for the rest of the criteria, two thresholds are applied to establish three types of priority with values of 3, 2 and 1, from highest to lowest priority. For each of the seven criteria (3 technical-economic and 2 social criteria aggregated into 4), a weighting factor has been applied. In this way, an aggregate priority value can be obtained by multiplying the value corresponding to the type of criterion by its weighting. The aggregate value may reach a maximum of 3 and a minimum of 1, so that two thresholds can be established to generate three types of aggregate priority:

✓ **Priority 1.** Aggregate Value ≥ 2,3

✓ **Priority 2.** 1,6 < Aggregate Value ≤ 2,3

✓ **Priority 3.** Aggregate Value ≤ 1,6

In the absence of data for any of these criteria, as is the case of the income data for municipalities with very low population, this criterion is excluded from the calculation.

Finally, the data necessary to apply the described process (priorities, thresholds, and weights) are summarized in ***Figure 12.***

Stage 1- Prioritization according to environmental criteria

A.- Environmental criteria

A1. Ensure compliance with D.91/271/CEE	Priority 1	Basic - Procedures with judgements	Maximum urgency measures: technical-economic and social criteria are not applied
	Priority 2	Basic - Procedures in the Reasoned Opinion phase	
A.2. Promote compliance with environmental objectives and the WFD	Priority 3	Basic - Foreseeable procedure (non-compliance)	Measures susceptible to the application of technical-economic and social criteria
	Priority 4	Complementary - Achievement of environmental objectives	
A.3. Promote the fulfilment of other objectives of hydrological or sectoral planning	Priority 5	Complementary - Additional water protection	
	Priority 6	Other objectives, without additional risks	
	No priority	Other objectives, risks for environmental objectives	

Stage 2- Prioritization according to technical-economic and social criteria

Values adopted for each criterion

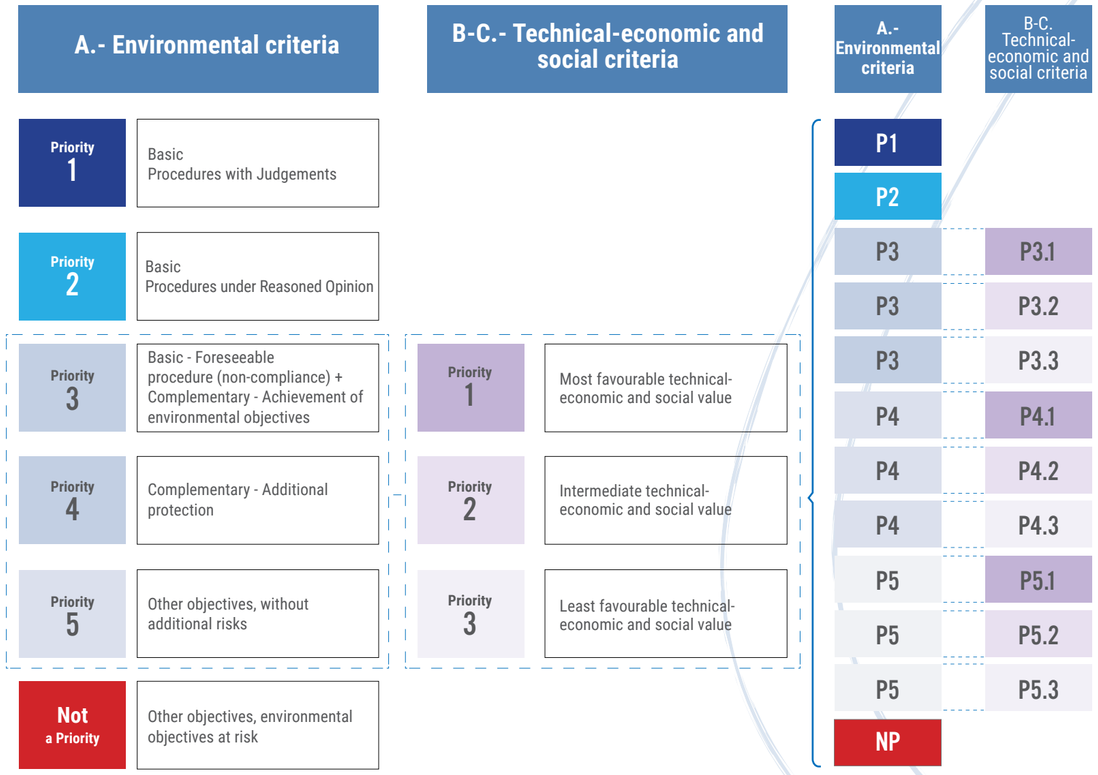
			Least favourable range	Intermediate range	Most favourable range	Weighting [Wt]
B.- Technical-economic criteria	B1. Promote cost-effective measures	Planning indicators	1	2	3	0,2
	B2. Promote actions implementable in the short term	State of advancement	1	2	3	0,1
	B3. Promote actions with community funding	European funding coverage	1	2	3	0,1
C.- Social criteria	C1. Contribute to the development of the most disadvantaged municipalities	C1a.- Average income	1	2	3	0,1
		C1b.- Unemployment	1	2	3	0,1
	C2. Contribute to territorial balance and demographic stability	C2a.- Population density	1	2	3	0,1
		C2b.- Population over 65 years old	1	2	3	0,1

Aggregate Value [VA]= $\sum$ Vc x Pc

Aggregate [VA]	
3,0 ≤ VA	Priority 1
1,6 ≤ VA	Priority 2
1,0 ≤ VA	Priority 3

Figure 12. Outline of the prioritization procedure for wastewater treatment, sanitation, and water reuse measures.

Stage 3- Final priority structure: combination of environmental, technical-economic, and social criteria



- The classification system has a total of 11 priority classes and one non-priority class
- The measures that fall under environmental priorities P1 and P2, due to their undeniable urgency, and those characterised as non-priority (NP - not recommended since they put the achievement of environmental objectives at risk) are not prioritized by technical-economic and social criteria..
- For measures classified under priorities 3 to 11, in addition to environmental criteria, technical-economic and social criteria are also applied in a complementary manner within each level of environmental priority.

The final result will be a list of actions to be carried out by the CG in order of priority. The procedure designed to establish priorities thus determines the categories of most urgent measures (Priorities 1 and 2), that is, those aimed at resolving non-compliances affected by infringement procedures (Figure 13). The rest of the categories are aimed at promoting the completion of the measures required by the WFD, with three priority levels: Priority 3 (other Basic and Complementary measures), Priority 4 (measures offering additional protection), Priority 5 (measures indifferent to the achievement of environmental objectives). These last three categories include a large number of measures, which is why it is useful to have additional criteria for their internal classification. Hence, the technical-economic and social criteria are used.

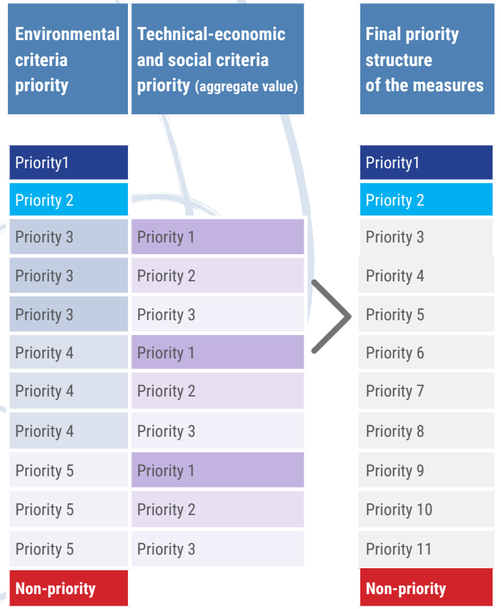


Figure 13. Final priority structure.

Finally, remaining as a non-priority, which does not mean that they are completely discarded, are measures that imply an unfavourable environmental effect. In general, these are measures requiring further research to justify their exemption from achieving the objectives of Article 4.7 of the WFD, transposed in Article 39 of the Hydrological Planning Regulation.

1.2. PRIORITIZATION OF MEASURES AND TRANSFERRAL OF THE RESULT TO THE PROGRAMMES OF MEASURES OF THE 3RD CYCLE RBMPS

Once the prioritization criteria and their application methodology have been defined, they have been presented to all interested parties for discussion via the processes of information disclosure and public consultation for the DSEAR Plan. Especially important in this process is the assessment of basin organizations, that is, the Hydrographic Confederations for intercommunity river basin districts, and the competent Hydraulic Administrations, in the case of intracommunity districts. These bodies are responsible for preparing the RBMPs and composing the programmes of measures based on the information provided by the various competent authorities. In this context, the DGA will have the task of coordinating and promoting meetings and discussion forums to reach a collective understanding for the adjustment, formal definition, and application of the prioritization criteria.

For the application of the prioritization criteria, an IT tool is being developed in Excel format. The tool will allow, on the one hand, the organization of data and filtering by thematic and territorial fields, and on the other, the direct use of the above prioritization criteria by the basin authorities promoting the plans, as well as facilitating the final presentation of the results of the prioritization process.

The prioritization of measures will be carried out during the preparation of the programmes of measures of the 3rd Cycle

RBMPs, and, essentially, during at least the six months that the participation process of the draft plans will be extended until the final consolidation of the programmes of measures and the revised RBMPs.

During the implementation phase, the feasibility of implementing all measures, of Priorities 1, 2 and 3, all of which are necessary to achieve the objectives of water policy, in particular Directives 91/271/EEC and 2000/60/EC, will be assessed. If the foreseeable budgetary scenario for the CG agencies bound by the Plan is not sufficient, criteria should be established to select the priority 3 measures to be addressed most urgently. Such criteria could prioritize the following measures:

- Measures necessary to counteract significant pressures on water bodies which also support protected areas for supply or for the protection of habitats and species, since in these cases the need for action comes from various European Community regulations and would therefore entail various issues of non-compliance.
- Measures contained in the Priority Action Frameworks for financing the Natura 2000 Network in Spain.
- Measures aimed at reducing nutrients (tertiary treatment) at facilities whose discharges affect coastal waters that do not achieve good environmental status for criterion D-5 Eutrophication, indicated in Part IV of the Strategies for Marine Demarcations.
- It is also considered that, should it be necessary, in case the financial availability of the CG does not make it possible to address all the measures necessary to meet the objectives, these strictly environmental considerations should be applied with preference over the technical-economic and social criteria.

As mentioned above, the application of the prioritization criteria is a responsibility that must be addressed fundamentally within each area of hydrological planning, so that the basin organizations, together with the administrations responsible for the actions included in the RBMPs, are ultimately responsible for their application. The DGA will provide guidance and support to the inter-community basin organizations, as well as to the competent administrations that decide to apply them within the framework of collaboration and technical cooperation that has supported the preparation of the RBMPs of the twenty-five Spanish river basin districts up to now.

In the case of inter-community river basin districts, the lists of measures prioritized according to the defined criteria must obtain approval from the Committees of Competent Authorities. Similarly, in the event that the prioritization criteria are applied by the intra-community basin organizations, it will be necessary to obtain approval from the bodies designed for this purpose by the Autonomous Communities in these river basin districts.

Finally, the basin organizations will proceed to incorporate the lists of measures, with their prioritization indicator, in the PH-Web database, following the same procedure that has been used up to now for the configuration, monitoring and updating of the programmes of measures in previous RBMPs.

Once the process has been completed, the programmes of measures associated with the 3rd Cycle RBMPs, of which they are part, will be made public and binding. Any citizen will then be able to consult the details of the planned actions, as well as their prioritization, through the information made available by the corresponding basin authority, and, in any case, through the PH-Web database.

GO.2

Strengthening of administrative cooperation for the review and promotion of the Programmes of Measures of the River Basin Management Plans

INSUFFICIENT COORDINATION AND COOPERATION BETWEEN THE COMPETENT ADMINISTRATIONS FOR THE PREPARATION OF THE PROGRAMME OF MEASURES OF THE RIVER BASIN MANAGEMENT PLANS

LACK OF CLARIFICATION OF COMPETENCES AND ASSUMPTION OF RESPONSIBILITIES BY THE ADMINISTRATIONS IN THE FIELD OF WASTEWATER TREATMENT AND SANTITATION

THE NEED TO STRENGTHEN ADMINISTRATIVE COORDINATION AND COOPERATION IN THE FIELD OF WASTEWATER TREATMENT AND SANITATION

PROBLEMS REGARDING THE QUALITY AND SUFFICIENCY OF THE INFORMATION ON THE MEASURES TO BE INCLUDED IN THE RIVER BASIN MANAGEMENT PLANS

The adequate development of obligations in terms of wastewater treatment, sanitation and water reuse necessarily requires a precise identification and prioritization of the actions within the programmes of measures of the RBMPs. In this regard, one of the complexities of hydrological planning is the large number of competent authorities that intervene and the difficulties that have been evidenced in achieving an efficient dialogue, interrelation and cooperation between all of them. According to the competent authorities' annexes to the initial documents of the 3rd Cycle RBMPs, a total of 300 administrative units are involved in hydrological planning, of which 195 participate in some way in the preparation or implementation of the programmes of measures.

Although the basin organisation is responsible for consolidating the programme of measures for each river basin district, or the authority designated by the Autonomous Communities in the case of the basins under their jurisdiction, the programme will contain measures that can be applied in any sectorial area, that is, not only those actions for which the basin authority may be competent. Therefore, in the planning process, the promoter of the plan must necessarily work together and in coordination with other administrations to decide what combination of measures is incorporated in the RBMP to achieve the planning objectives, and what type of mechanisms will be needed for their implementation and control. The selection of the Basic measures still pending, as well as the configuration of the most appropriate combinations of measures among the various possible alternatives, will be supported where appropriate by a cost-effectiveness analysis, also taking into account the results of the Strategic Environmental Assessment procedure to which the hydrological planning is subject.

The active involvement of all public administrations is essential in supporting the basin organization, or the water administration of the corresponding Autonomous Community, which has the technical responsibility for preparing the documents that comprise the RBMP. After two planning cycles, it is clear that this active involvement of the competent authorities has not reached the desirable level of operability.

Among the existing deficiencies in the elaboration and implementation of the programmes of measures of the RBMPs, and in particular, with regard to wastewater treatment and sanitation measures, at least the following deficiencies have been identified as a consequence of improvable administrative cooperation:

- **Coordination problems involving the inventory of pressures and the identification of significant pressures:** approximately 130 administrative units of the various competent administrations participate in the preparation of such inventories of pressures. It has been detected that the existing cooperation between the basin organizations and those other authorities with competence to manage the inventories of pressures is insufficient, with significant differences between territories, river basin districts and authorities. This necessary interrelation and cooperation between administrations is key to the basin organizations to be able to compile the relevant information on the pressures affecting water bodies, and, in this way, identify those that may be proving significant, for which it will be necessary to take corrective measures.

- **A lack of consistency between significant pressures and the measures identified for their correction:** it has been detected that there is a lack of connection between the significant pressures to be corrected (as collected in the "General Study of the River Basin District", as part of the initial documents of the planning process) and the measures incorporated to remedy the effect of such significant pressures. The measures must therefore be adequately proposed and assumed by each competent authority within the framework of their powers and obligations.

  Currently, as explained in the introduction, there are more than 500 agglomerations greater than 2,000 inhabitants p.e. that do not comply with Directive 91/271/EEC and for which action is needed. In addition, 67 urban agglomerations that do not comply with the Water Directive and are lacking corrective measures for wastewater treatment and sanitation in the RBMPs. In contrast, more than 80% of the total measures are set for non-compliant agglomerations.

- **Problems in the assignment of measures to the competent administrations:** In the 2nd Cycle RBMPs, 11% of measures recognized as necessary for the correction of significant pressures in matters of wastewater treatment, sanitation and water reuse do not have a formally assigned competent administration, which means that, except for errors, the competent administration to implement it avoids expressing its direct responsibility, possibly because it is overwhelmed by the associated economic commitment.

  There is also another significant percentage of measures (25% added to the 11% above) for which the identification of the responsible administration is generic, that is, avoiding a clear and unequivocal indication of the administrative unit involved and supposedly responsible, thus blurring its responsibility to the public.

- **Issues regarding the quality of the information on the measures:** The information provided by competent authorities is, in general, insufficient to discriminate the objectives pursued by each measure on the water body or bodies affected and supposedly benefiting from the action. In addition, the information is often insufficient to assess the impact of each measure on water status, so its implementation and effectiveness cannot be easily linked to its effect on the objectives of the plans, a deficiency that makes it difficult to use this important criterion for prioritizing measures. In this regard, it is necessary for each competent authority to provide a "gap indicator" for each measure (e.g., pollutant reduced, water abstraction replaced by reclaimed water, etc.) so that the promoter of the plan can calculate the foreseeable evolution of the status of the affected water body in response to the implementation of the measure or set of measures.

- **Issues in the implementation of the measures included in the plan:** There is a lack of application and implementation of the measures included in the RBMPs, deriving from, among other factors, a lack of involvement and co-responsibility of the competent administrations in certain measures. In other words, the RBMPs have not yet become the reference document as the master plan for the actions of the different public administrations involved.

- **Difficulties in establishing additional objectives in protected areas:** Regarding the different areas included in the Register of Protected Areas of each river basin districts, the competent authorities for each area, or type of area, as this is how competences are distributed, have to provide the basin organization with their particular environmental objectives, clarifying whether the general objectives of good status and prevention of deterioration are sufficient or whether other additional objectives need to be considered. In many cases, such dialogue on the objectives of protected areas is not delivering the expected results.

In view of the above, the following proposals have been developed to try to overcome the difficulties mentioned:

- Strengthening of administrative cooperation mechanisms in relation to the planning process, in particular with regard to wastewater treatment, sanitation, and water reuse actions.
- Clarifying the current framework of competence in wastewater sanitation and treatment.

2.1. STRENGTHENING ADMINISTRATIVE COOPERATION MECHANISMS IN RELATION TO THE PLANNING PROCESS, IN PARTICULAR WITH REGARD TO WASTEWATER TREATMENT, SANITATION AND WATER REUSE ACTIONS

The aim of this proposal is to explore deficiencies and opportunities for improvement that may exist in terms of administrative cooperation for the preparation and implementation of the programmes of measures of the RBMPs, particularly in the areas of wastewater treatment, sanitation and reuse. Once the initial diagnosis of the problem has been presented, proposals for improvement are included which are intended to serve as a guide for the basin organizations of inter-community river basin districts to standardize and systematize the work with the other competent administrations, with whom they have to configure the proposed measures to include in the RBMPs.

The analysis carried out consists of the following contents:

a) Analysis of weaknesses in current legislation, focusing on the dispersion and lack of definition of roles and methodologies.

b) Analysis of the current situation and the way in which the problems detected are reflected in the measures included in the RBMPs in force.

c) Recommendations for the improvement of administrative cooperation for the preparation and implementation of programmes of measures in relation to wastewater treatment, sanitation, and water reuse actions.

As a result of the above, possible changes can be explored in relation to the bodies of cooperation in water matters: The Committee of Competent Authorities (CAC) and the Sector Conference, in synergy with the work and analysis previously performed in the Green Paper on Water Governance.

Regarding the **Committee of Competent Authorities**, the following is proposed:

- Revision of the format and scheduling of the intervention of the Committee of Competent Authorities (CAC) in the process of preparing the RBMPs, both to increase the number of times the Committee participates in the preparation of the RBMPs and to schedule its intervention in advance, prior to the key moments in the development process: It should be evaluated whether the presentation, explanation and submission of draft programmes of measures to the CACs can be performed by the time the consultation of the draft plans begins, that is, more than six months in advance of the moment of its final discussion, facilitating the existence of a sufficient margin of time to study the documentation and receive contributions.

- Creation of working groups with a technical profile to assist the CAC in the performance of its functions: Although the creation of such working groups was already foreseen in the regulatory provision organizing the Committees (Article 6.1 of Royal Decree 126/2007, of 2 February), their uneven and irregular performance can now be seen. It is thus proposed that the basin organization channels the request for information through these working groups, involving them in the process of preparing the RBMPs from as early a stage as the identification of pressures and impacts.

- Establishment of a direct working mechanism (working group of the basin authority with the competent administrations): Given the plurality of sectoral interests that can converge on different administrative units, where it is not always the same people who have all the powers of a certain public administration, it seems advisable to establish different working group formations to study the various topics such as wastewater sanitation, treatment and water reuse. The functions of these groups will be, among others:

  ✓ Exchange of information and work proposals to be developed by each competent administration.

  ✓ Discussion and analysis of regulatory projects, when deemed appropriate.

  ✓ Adoption of joint plans, projects, and programmes.

  ✓ Joint adoption of agreements.

  ✓ Inclusion in the hydrological planning of those necessary measures for which there is no commitment or possibility of financing.

In addition, these meetings may serve to prepare and give continuity to the work carried out within the framework of the Committee of Competent Authorities. In this regard, some of the topics that could be dealt with would be, among others, the preparation of the meetings of the CAC, the follow-up of the agreements adopted by the Committee, and the follow-up and evaluation of the constituted working groups.

- Improving the representation of the competent authorities: The possibility of improving the representation of poorly represented local administrations with relevant powers in the urban water cycle will be explored. For this, the possible inclusion of provincial councils and similar entities that participate in the territory of the river basin district will be studied.

- Assessment of the establishment of the necessary synergies through the National Water Council (CNA) and other administrative bodies that address issues of wastewater treatment, sanitation and water reuse (e.g., the Sectoral Conference on the Environment, or the autonomous working groups that exist on the subject), to promote the active involvement of the various competent authorities in wastewater treatment, sanitation and water reuse matters in the CAC from a high level.

Additionally, and as a reinforcement of the previous proposals, it is suggested to study the establishment of other administrative cooperation mechanisms at other levels, such as the activation of the **Sectorial Conference on Water,** whose constitution was authorized by the Council of Ministers in March 2007, or the creation of a working group of the appropriate administrative rank (e.g. at the level of Director General, or similar), within or under the supervision of the Sectorial Conference on the Environment. It must be taken into consideration that the relationship between Autonomous Communities and basin organizations is established territorially from two perspectives. That is to say, on the one hand, for the scope of each inter-community river basin district in which several Autonomous Communities participate, and, on the other hand, for the different districts in which each Autonomous Community participates. This is an aspect common to all inter-community river basin districts, where each Autonomous Community is related to several basin organisms.

For this reason, a transversal meeting is missing, such as a meeting at the level of General Directorates, or a sectoral and thematic meeting, perhaps at a lower level and subordinate to the previous one, to adjust aspects which, when dealt with individually, between each basin agencies and the Autonomous Community, may lose coherence or effectiveness.

The aim of proposing additional cooperation mechanisms to those already in place seeks to strengthen coherence, coordination, and collaboration between the Ministry, the General Water Directorate, basin agencies and the competent administrations linked to the hydrological planning process; in particular, but not exclusively, in relation to wastewater treatment, sanitation and water reuse. These proposals remain in the DSEAR Plan though no specific details are included. The result of public consultation and the participation of the stakeholders in the DSEAR Plan will be considered in order to assess and establish their subsequent development.

2.2. CLARIFYING THE CURRENT FRAMEWORK OF COMPETENCE IN WASTEWATER SANITATION AND TREATMENT

Compliance with Community and national obligations in the field of wastewater treatment and sanitation, for which there is still a clear margin for improvement in our country, requires proper cooperation, coordination, and assumption of the competences of all the administrations involved. For this, a correct understanding of the competence map and the responsibilities of all the agents involved in wastewater treatment and sanitation is essential.

The legislative and administrative framework for wastewater management, treatment and purification is particularly complex. The three administrative levels (Central Government, Autonomous Communities and Local Entities) intervene in it according to the competences attributed to them by legislation, specifically the Spanish Constitution (EC), the Statutes of Autonomy, Law 7/1985, of April 2, Regulating the Bases of the Local Regime (LRBRL) and the regulations on water, both state and regional. This set of legislative powers establishes the following competences for each of the public administrations in the field of waterworks:

:

- **State Level:** public works of general interest or those that affect more than one Autonomous Community (art. 149.1. 24ª CE).
- **Autonomous Level:** public works of interest to the Autonomous Community within its own territory (art. 148.1. 4th CE) and the projects, construction, and operation of waterworks, canals, and irrigation of interest to the Autonomous Community (art. 148.1. 10ª CE).
- **Local or municipal level:** the municipalities will in any case exercise as their own competences, under the terms of the legislation of the State and the Autonomous Communities, the supply of drinking water to homes and the disposal and treatment of wastewater (art. 26 and 86 LRBRL).

In relation to sanitation and urban wastewater treatment services, as indicated, local entities enjoy a reserve of activity (art. 86.2 LRBRL). However, the allocation is determined according to the population of the municipality. Thus, although all municipalities must provide sewerage and treatment services, in those with a population of less than 20,000 inhabitants, it is the Provincial Council or equivalent entity that must coordinate, with the agreement of the affected municipalities, the supply of drinking water to homes and the disposal and treatment of wastewater. This coordination may result in the direct provision of the service by the Provincial Council or in the implementation of shared management formulas through consortia, associations, or other solutions, unless the municipality justifies that it can provide the aforementioned services at a lower effective cost.

The provision of these services can be conducted by direct or indirect management. The former covers management by the competent administration itself, by an autonomous body of that administration, by a public business entity or by a commercial company whose share capital is publicly owned. Indirect management refers to the new service concession contract, included in article 15 and in additional provision 34 of Law 9/2017, of November 8, on public sector contracts.

In summary, generally speaking the LRBRL assigns the competences in wastewater treatment and sanitation to local authorities. However, it is common for regional regulations to qualify this distribution. This is mainly done in two ways:

1. By assigning the ownership of the competence in wastewater treatment to the Autonomous Community, either by declaring what is related to this service as of 'autonomous interest' in their water laws (cases of Castilla-La Mancha, Madrid, and Valencian Community) or by establishing in the same laws that these services are the function and competence of the Autonomous Community (case of the Region of Murcia).
2. Maintaining the municipalities as holders of the competence but with the Autonomous Community being responsible for the operation and management of all the wastewater treatment plants of the territory (for example, in the case of La Rioja, where all the municipalities are members of a consortium).

A less clear case would be that of Galicia, for which the Agreement of the Council of Ministers of March 10, 2020, which resolves the procedure for determining and passing on responsibilities for breach of European Union Law, interprets the Autonomous Community as the competent administration of the hydraulic works included in the Galician Sanitation Plan.

In many other cases the Autonomous Communities distribute the competences in wastewater treatment and sanitation between them and the municipalities, assigning themselves the role of planning or coordinating body while maintaining in the municipalities the direct responsibility for services and infrastructures. It should be borne in mind that article 3 of Royal Decree-Law 11/95, which establishes the rules applicable to the treatment of urban wastewater, attributes to the Autonomous Communities the responsibility for determining the urban agglomerations into which their territory is structured "establishing the representative public entity of the municipalities to which it corresponds, in each case, to comply with the obligations established in" the aforementioned Royal Decree-Law. Some jurists (B. Setuáin, 1998, 2000 and 2002, among others) interpret this function of the Autonomous Communities as a real displacement of competence from the local entities in favour of the Autonomous Communities.

Most of the regional legislation explicitly states that municipalities can delegate powers related to wastewater treatment and sanitation to the regional administration, a practice that is very common. All of the above means that, in practice, the distribution of responsibilities for the urban water cycle between the regional and local administration varies substantially between municipalities, even within the same Autonomous Community, configuring a very diverse and complex state framework of competences *(Table 7* and *Table 8)*.

Table 7. Competences in wastewater treatment in each Autonomous Community.

AUTONOMOUS COMMUNITY	EXCLUSIVE COMPETENCE	PLANNING AND COORDINATION *	OPERATION OF ALL WWTP
Andalusia	X	✓	X
Aragon	X	✓	X
Balearic Islands	X	✓	X
Catalonia	X	✓	X
Canary Islands	X	Shared with the Cabildos	X
Cantabria	X	✓	X
Castilla-La Mancha	✓	✓	✓
Castile and León	X	✓	X
Community of Madrid	✓	✓	✓
Autonomous Community of Navarre	X	✓	X
Community of Valencia	✓	✓	✓
Extremadura	X	✓	X
Galicia	On the works specified in the planning instruments	✓	X
Basque Country	X	✓	X
Principality of Asturias	X	✓	X
Region of Murcia	✓	✓	✓
La Rioja	X	✓	✓ **

[*] Explicitly included in the water regulations or in the functions attributed to the regional water management entity.

[**] The 174 municipalities of La Rioja are members of a consortium and, therefore, under regional management.

Table 8. Competences in sanitation and wastewater treatment of the CG, the Autonomous Communities, and the Local Entities according to the state regulations.

COMPETENCES IN SANITATION AND TREATMENT	
SPANISH CENTRAL GOVERNMENT	• Public works of general interest (art. 149.1. 24ª CE) • The commitments that are acquired in specific agreements with other administrations.
AUTONOMOUS COMMUNITIES	• Public works of interest to the Autonomous Community (art. 148.1. 4ª CE). • Projects, construction and operation of waterworks and canals of interest to the Autonomous Community (art. 148.1. 10ª CE). • The definition of the urban agglomerations into which its territory is structured and the establishment of the public entity that represents the municipalities they comprise (art. 3 RD-Law 11/1995). • Other management powers as established in their Statutes of Autonomy. • The commitments acquired in specific agreements with other administrations.
COUNCILS	• For municipalities with a population of less than 20,000 inhabitants, the coordination of the evacuation and treatment of wastewater (art. 26.2 LRBRL). • The commitments acquired in specific agreements with other administrations. • Guaranteeing the principles of solidarity and inter-municipal balance and, in particular: ensuring the comprehensive and adequate provision of services of municipal competence throughout the provincial territory (article 31.2 LRBRL).
CITY COUNCILS	• Sewerage service (art. 26 LRBRL) and wastewater treatment (art. 86 LRBRL). • The commitments that are acquired in specific agreements with other administrations.

The above competences are nuanced in each regional legislation and, furthermore, can be delegated through agreements between administrations as contemplated in both the legislation of the legal regime of the public sector and in that of water.

This basic framework is complemented by the figures of hydraulic works of general interest and of regional interest, legal instruments that enable an administration, either the State (in the case of the declaration of general interest) or an Autonomous Community (in the case of the declaration of regional interest), to be granted a competence which initially fell on another administration.

Responsibility for water treatment works and services lies with the municipalities (although they may be delegated as seen in the previous discussion), except in cases where they are declared to be of autonomous interest or of general interest, in which case the competent authorities will be, respectively, the regional administration or the Central Government (CG). In practice this situation is not always easy to discern, as there are hydraulic works that, for example, have a double declaration, that is, both of general interest and of regional interest, making it necessary in many cases to carry out an individual analysis of a treatment or sanitation plant to be able to identify the administration that holds the competence.

Different circumstances may lead to the fact that there is no perfect and universally applicable solution to the distribution of responsibilities. However, the cases that can be considered successful do provide information on the soundness of certain options. Previously it was said that the problems of non-compliance are not distributed equally throughout the territory, with some Autonomous Communities (Autonomous Community of Navarra, La Rioja, Region of Murcia) having no or very few deficiencies.

Reviewing the functioning of these three Autonomous Communities that seem to have the most efficient management in wastewater treatment and sanitation, some coincidences can be pointed out that, although they do not define the quality of management by themselves, if they can serve to understand the bases on which it rests.

La Rioja, Murcia and Navarre are among the Autonomous Communities that have opted to establish specific water management entities, being configured in public companies in the case of Navarre (NILSA) and Murcia (ESAMUR) or as a consortium (Water and Waste Consortium) in the case of La Rioja. These entities, with their own legal personality, are members of the public sector and maintain a certain degree of independence in their management with respect to the regional administration. In any case, they are long-established public bodies whose performance in terms of treatment and sanitation is a benchmark in Spain.

In addition, these three Autonomous Communities have regional legislation on water and specific cost recovery instruments for water treatment and sanitation. In all three cases this tax is called the 'sanitation fee' and is intended to finance the investment and operating costs of the treatment and sanitation of regional wastewater.

The above characteristics are also found in an analogous way in the Valencian Community and the Community of Madrid, which also have a high level of compliance with the Directive. In both cases, public management companies (EPSAR –C. Valenciana- and Canal de Isabel II -C. de Madrid-), have their own regional water legislation and a specific and finalist cost recovery instrument.

The main conclusions drawn from this analysis are the following:

- The competence of wastewater treatment and sanitation falls mainly on the City Councils. The Councils have a coordinating role defined in state legislation which, due to the usual practice in place, may not be assumed by several of these administrations.
- The units responsible for the planning and management of wastewater treatment are the urban agglomerations. The Autonomous Communities are responsible for their identification (Royal Decree-Law 11/1995, of December 28), as opposed to the municipal competence in wastewater treatment and sanitation. The duality of actors entails a notable difficulty in the coordination of these matters for the elaboration of the programs of measures of the RBMPs.
- With regard to wastewater treatment, except in those cases in which the regional legislation declares this matter as a whole to be of interest to the Autonomous Community, it is difficult to discern which works have been declared to be of interest to the Autonomous Community and which are the responsibility of the municipalities. This analysis has been conducted for water treatment and sanitation infrastructures for seven Autonomous Communities, since in the rest of the cases the necessary information is not published. After the analysis carried out, it can be seen that it is not possible to differentiate between the treatment works operated by the Autonomous Community because they are within its competence and those that are delegated to the Autonomous Community.
- In relation to sanitation, despite the fact that most of these works (sewerage and collectors) fall under municipal jurisdiction (unless a specific declaration of general or regional interest is made), in multiple cases there are management agreements that delegate the exercise of these powers to the Autonomous Communities. Once again, it is difficult to identify which sewerage works are managed by each Autonomous Community by delegation and which because they have been declared to be of regional interest.
- Regarding the distribution of competences attributed by Spanish legislation, competence for wastewater treatment works and services falls on the municipalities (although they may be delegated), except in cases where they are declared to be of regional or general interest, in which

case the competent authorities will be, respectively, the regional administration or the CG. For some wastewater treatment and sanitation infrastructures there are double declarations of both general and regional interest, so that the interpretation may have to be based on an individual legal analysis. Documents such as the Agreement of the Council of Ministers of 10 March 2020, which resolves the procedure for determining and passing on responsibilities for breach of European Union law, is an example of how in some cases it is not immediate to discern clearly which administration is competent. In fact, in the aforementioned Agreement for each urban agglomeration included in the procedure, an analysis of "delimitation of the non-compliant party" is carried out, in which these issues are analysed. That is why dialogue and administrative cooperation are necessary to clarify the situation of works with a double declaration of interest.

2

3

GO.3

Improvement of the definition of actions that must be considered of General Interest of the State

3

ABSENCE OF OBJECTIVE AND RATIONAL CRITERIA FOR THE DECLARATION OF WORKS OF GENERAL INTEREST OF THE STATE

INSUFFICIENT APPLICATION OF EXISTING CG INTERVENTION MECHANISMS OTHER THAN THE DECLARATION OF WORKS OF GENERAL INTEREST

LACK OF SYSTEMATISATION OF THE PROCEDURES FOR THE EVALUATION AND DECLARATION OF WORKS OF GENERAL INTEREST OF THE STATE

INSUFFICIENT APPLICATION OF THE POLLUTER PAYS PRINCIPLE AND THE PRINCIPLE OF COST RECOVERY IN WORKS FINANCED BY THE CG

In relation to hydraulic works of general interest of the State, and especially with regard to wastewater treatment, sanitation and water reuse, two problems are identified. On the one hand, there are difficulties with regard to the legal framework of hydraulic works of general interest in fundamental matters, such as the delimitation of what should be understood by hydraulic work, and on the other hand, the advisability of considering that these hydraulic works to be of general interest of the State.

The current legal regime of the waterworks of general interest, introduced by the 1999 amendment of the Water Law (now incorporated in the TRLA of 2001), must be combined with several factors among which the following stand out: i) the regulatory evolution experienced in the last two decades and ii) the particular economic situation of those years and the current one, in which there is a notable reduction in the investment capacity of the Central Government. In addition, the aforementioned legal regime for hydraulic works must be confronted with other areas currently regulated in water legislation; especially those derived from WFD. The incorporation of principles such as the recovery of costs of services or the polluter pays principle, the need to implement rational and efficient use of water, and the obligation to achieve environmental objectives for the different water bodies, must be taken into account in the definition of hydraulic works of general interest so that they reflect the evolution experienced in the legal sphere (incorporation of the principles of sustainable and integrated water management), economic (marked reduction of public resources) and environmental protection (obligation to achieve good status in all water bodies and other environmental objectives). At the same time, instruments such as State Societies have been created or policies have been implemented to promote desalination and water reuse, for example, which must also be taken into consideration.

In this scenario, the current legal regime of hydraulic works of general interest allows their declaration to be based on discretionary criteria, the ultimate aim of which is to enable the intervention of the Central Government (CG). The declaration of general interest of a hydraulic work, in addition to giving ownership of the work to the CG, has been linked, in practice, to the complete financing of the work by the State.

As a result of these circumstances, there are currently a large number of hydraulic works declared to be of general interest of the State (more than 2,000 throughout the country, 325 of which are hydraulic works related to water treatment and sanitation), which implies an assumption of powers for the CG that is not justified and a financial overload that is not possible to meet. On the other hand, there is room for improvement to review the procedures for the declaration of general interest, and more rational, objective, transparent and participatory mechanisms must be followed.

In summary, the following deficiencies have been detected with regard to the declaration of a hydraulic work as being of general interest of the State:

- **Definition:** the legal concept of hydraulic works of general interest of the State is not established on the basis of objective or systematic criteria, but according to a general definition for works of general interest established in Article 46 of the TRLA. This problem is compounded by the legal uncertainty surrounding the very concept of hydraulic works (art. 122 of the TRLA).

- **Declaration:** The current declaration procedures are not based on objective criteria, are not systematic and are fraught with the legitimate discretion associated with such decisions. The feasibility reports required by Article 46.5 of the TRLA must be improved to weigh more objectively the general interest of the project with respect to the added value of the declaration in social, economic, and environmental terms. Currently, declarations are mainly made through their inclusion in various regulations with the rank of Law, although other procedures may also be articulated.

- **Financing:** in practice, the declaration of a water treatment or sanitation work (or of any other type) as being of general interest of the State has been directly linked to the full financing of said action by the CG. However, water legislation does not reflect a direct correlation, as established in articles 46 and 124.4 of the TRLA, as has been corroborated by the State Attorney's Office in its reports. The aforementioned article 124.4 of the TRLA provides a mechanism for the CG to enter into agreements with which to participate in the execution and financing of hydraulic works that are the competence of other public administrations, without the need for a declaration of general interest for its involvement through this mechanism.

- **Cost recovery:** in works declared to be of general interest to the State and financed entirely by the DGA (MITECO) or the Hydrographic Confederations, and especially in the areas of sanitation and water treatment, investment costs are recovered to a very limited extent, despite the fact that the legislation contemplates the principle of cost recovery.

- **Irreversibility:** declarations of works of general interest of the State on actions that have already materialized are considered irreversible in legal terms. This means that the CG is the owner of water treatment and sanitation works whose declaration as works of general interest of the State at the time was based on criteria that may not be met today or that may not be relevant today in the decision today. By virtue of its ownership of hydraulic works of general interest, the CG is also obliged to assume a series of related expenses, both in terms of maintenance, replacement and safety of the infrastructures and certain associated taxes. An example of this is the water treatment works which, although initially constitute a local obligation, with the declaration of general interest become an obligation of the CG. The State Administration finds it exceedingly difficult to recover the public money invested and is also forced to pay local taxes such as real estate, which is collected by the are collected by the beneficiary municipality.

- **Other associated consequences:** the declaration of a work of general interest of the State entails other consequences, such as those derived from article 130.4 of the TRLA in relation to the compensation mechanisms (territorial restitution) for the effect of these works. This procedure has been somewhat blurred in recent decades and its application and consequences deserve to be reviewed.

In view of the above, the proposals for action set out below are the following:

- Establish the legal concept of water works of general interest of the state with objective and rational criteria.

- Promotion of the use of CG intervention mechanisms other than the declaration of general interest of the State.

- Improve the procedures for evaluating and declaring works of general interest of the State, particularly in the case of water treatment, sanitation, and water reuse measures.

3.1. ESTABLISH THE LEGAL CONCEPT OF HYDRAULIC WORKS OF GENERAL INTEREST OF THE STATE WITH OBJECTIVE AND RATIONAL CRITERIA

The development of this proposal is specified in the establishment of a set of objective and rational criteria for the definition of the concept of hydraulic work of general interest of the State, and in the proposal to reform Royal Legislative Decree 1/2001, of July 20, which approves the revised text of the Water Law, in its Title VIII on waterworks and in article 46, taking into account, in addition to the above mentioned, the following:

- The aim will be to make the legal regime for hydraulic works more consistent with hydrological planning, current water policy and current environmental legislation. The declaration of a hydraulic work of general interest of the State will have a distinctly exceptional nature. It will seek to minimize to the maximum this type of statements that would only have a place in two types of cases:

  ✓ In any case, works necessary for the regulation and conduction of water resources; control, defence and protection of the public water domain; hydrological-forestry correction; desalination and water reuse will be considered to be of general interest of the State provided that they are necessary for the correct management or water balance of the entire river basin.

  ✓ Individual and specific declarations may be made by Law for other hydraulic works following the assessment of certain essential requirements, which are configured as a list of objective and rational criteria and which seek to minimize discretion in this type of declarations. These requirements will include the essential obligation for the action to be included in the programs of measures of the RBMPs and to be coherent with the objectives of hydrological planning, and compliance with a list of essential environmental, social and safety criteria for people and property. Other criteria will also be considered and assessed, such as whether the action has a markedly innovative character that constitutes a pilot test that justifies the State's assumption of ownership and risk; or whether it addresses pressures that cannot be assigned to a specific competent authority. In any case, prior to the declaration it will be necessary to assess whether the action has a place within the framework of the multiannual budgetary scenarios.

- Hydraulic works that cover more than one Autonomous Community already fall within the competence of the CG as established in the Spanish Constitution, so they should not be declared works of general interest of the State.

- Legal modifications will be established to enable the necessary administrative procedures to be articulated in order to annul part of the declarations of works of general interest of the State (those which are susceptible to change ownership to another administration or which are not yet built or in operation) and which have been declared prior to the regulatory reform. In order to address these changes, always in coherence with the responsibility granted to the figure of general interest by the Constitution and the laws, three different procedures are proposed:

  ✓ Waterworks that have been declared to be of general interest and whose construction had not begun by the time this proposed regulation enters into force will cease to be considered as such if, within one year, it is not justified that the following conditions have been met:

    a) If the hydraulic work declared of general interest were to be built and operated by the CG, it must be confirmed by Ministerial Order that the requirements to maintain the declaration of general interest are met, following the preparation and assessment of the reports referred to in section 3.3 of this document; the general interest assessment report (where it is assessed that the work meets the essential criteria to qualify for such a declaration) and the feasibility report (where the economic, technical, social and environmental viability of the action is evaluated).

    b) If the work declared to be of general interest is not to be operated by the CG, the Agreement must be formalised with the Administration that is to operate it.

  ✓ The waterworks declared to be of general interest of the State which, at the time of entry into force of the new Law are being operated by an administration other than the CG, may lose the consideration of hydraulic works of general interest if so requested by the administration which operates them as the competent authority for the provision of the public service for which they have been built.

  ✓ For waterworks declared of general interest whose construction had already begun at the time of the entry into force of the new Law, but which are not in operation, a Ministerial Order will determine which administration is to take over their operation.

- The declarations of general interest of the State must in any case be concrete, without the effects of the declaration being extended to works of extension, rehabilitation or reconstruction of the infrastructure resulting from the original declaration.

- When a hydraulic work of general interest is not going to be operated by the CG, the tender for the hydraulic work declared of general interest may not begin until the CG, through the Ministry responsible for water matters, has previously signed an Agreement with the Operating Administration under the terms established in the legislation in force on the legal regime of the public sector. The maximum duration of these agreements will be ten years, extendable for a further ten years.

- Waterworks which have been declared to be of general interest would cease to have such consideration if the construction of the hydraulic work had not begun within 6 years of the declaration.

- The concept of IG waterworks would be relocated from art. 46 TRLA to Title VIII, where all the content of the Law related to hydraulic works would be placed.

3.2. PROMOTION OF THE USE OF CG INTERVENTION MECHANISMS OTHER THAN THE DECLARATION OF GENERAL INTEREST OF THE STATE

The solution of the declaration of general interest of the State has traditionally been interpreted in a double sense; on the one hand, as the only way to legitimise state intervention and, on the other, assuming that it presupposes the financing of the work from the CG budget. Both interpretations are exaggerated, that is, they are not strictly true, since there are other forms of intervention outside the declaration of general interest of the State and, likewise, nothing prevents agents outside the CG from participating in the financing of actions that have been declared to be of general interest or the CG from participating in the execution and financing of hydraulic works that do not fall within its competence.

In fact, article 124.4 of the TRLA expressly states that "*The Central Government, the River Basin Authorities, the Autonomous Communities and the Local Entities may enter into agreements for the joint execution and financing of hydraulic works under their jurisdiction*".

Consequently, the fact that, under the inaccurate premises set out above, through the declaration of general interest the State has assumed a competence that was not originally its own, has ended up configuring an enormous list of actions that exceed its capacity and remain pending, without citizens finding the expected response.

There is an obvious solution: to annul the declarations that are possible, especially those that do not meet the criteria that are now understood to be necessary for the competence (and the obligation) to return to the original responsible party. Another solution is to find implementation and financing agreements, such as those indicated in article 124.4, so that all the Administrations concerned can resolve the implementation and financing of these pending hydraulic works.

In addition to the option of the agreement indicated in 124.4 of the TRLA, there is also the possibility of subsidies regulated by **Law 38/2003, of 17 November, on general subsidies**.

A significant part of the public sector´s financial activity is channelled through subsidies in order to respond, through financial support measures, to the social and economic demands of individuals and public and private entities. The concept of subsidies entails the allocation of public funds provided on a non-repayable basis for the fulfilment of an objective, which can be the execution of a certain hydraulic work, as would be the case of water treatment, sanitation, or water reuse actions.

The procedure for allocating grants may be by direct award or, what seems more appropriate in this case, by means of a competitive procedure following a needs assessment phase, taking advantage, for example, of the aforementioned criteria for prioritising actions in the programmes of measures. Especially the social criteria: average income, unemployment, population density and aging, which in relation to the methodology to be applied for the prioritization of actions have been explained in section 1.1 of this chapter.

This instrument of subsidies, managed in this way, would allow the CG to participate in the financing of waterworks still pending in the most disadvantaged areas or in small municipalities, channelling the necessary economic support, but without becoming involved in the responsibility, which would remain unaltered in its holder, either the local or the regional administration.

There are some precedents in the implementation of the subsidy system. Such is the case, for example, of subsidies aimed at the Canary Islands through **Royal Decree 1012/2017**,of December, 1, which regulates their direct concession for reasons of public interest for the adaptation of hydraulic and coastal infrastructures that are of exceptional interest in the Autonomous Community of the Canary Islands, or the most recent call launched by MITECO for **subsidies awarded on a competitive basis** convening aid to projects of local authorities affected by a process of closure of coal-fired power plants.

Currently, the DGA has been launched through **RD 1158/2020, of, December 22**, a new case of subsidy amounting to 3 million euros, aimed at the municipalities of Los Alcázares, San Javier, Torre-Pacheco, Cartagena and San Pedro del Pinatar, in the Region of Murcia, for the development of pilot plans to promote the adaptation to flood risk of buildings, equipment and facilities or existing operations in its municipal areas.

Specifically in the field of wastewater treatment and sanitation, MITECO has made available, with funds from the Recovery, Transformation and Resilience Plan, a subsidy of 100 million euros on a competitive basis to the Autonomous Communities so that investments can be made in wastewater treatment and sanitation in agglomerations that do not meet the requirements established in Directive 91/271/EEC and that are not declared to be of general interest of the State, that is, that the competence over the infrastructures lies with the Autonomous Communities or municipalities. This subsidy is part of the **Sanitation and Treatment Plan for agglomerations under 5,000 inhabitants** and represents a first line of funds to promote investments in small urban agglomerations.

In conclusion, both the agreement under article 124.4 of the TRLA and the subsidy, preferably through the competitive tendering procedure, allow the intervention of the CG in the financing of water treatment and sanitation works. The first case seems to be applicable more generally, while the second would be especially appropriate in cases of small agglomerations in particularly disadvantaged areas where socio-economic support from the CG is justified.

3.3. IMPROVING THE PROCEDURES FOR EVALUATING AND DECLARING WORKS OF GENERAL INTEREST OF THE STATE, IN PARTICULAR FOR WASTEWATER TREATMENT, SANITATION, AND WATER REUSE MEASURES

In order to improve the evaluation procedures, the revision of the feasibility report for works of general interest of the State, established in article 46.5 of the TRLA, is proposed. Given that the objective of this report is the evaluation of the economic, technical, social and environmental viability, and that the evaluation of the conditions and the repercussions associated with the declaration of general interest of the State is not contemplated in it, it is proposed to review its structure and content to incorporate these other elements in the evaluation of the general interest through a previous report. It is also proposed that the procedure for adopting the evaluation be modified so that the body promoting the action and the body evaluating the general interest are not the same.

In the processing it is considered pertinent to incorporate the submission of proposals for declarations of works of general interest of the State to mandatory and binding reports from the Autonomous Community or Autonomous Communities in whose territory the work is to be carried out, an aspect which, although non-binding, is already contemplated in the final paragraph of article 36.5 of the PHN Law. Likewise, a public information procedure should be incorporated prior to the declaration.

It is proposed that the declaration be made through specific declaration laws for each work or set of works, avoiding formulas such as the use of laws unrelated to water, as has been the case of the General State Budget Law or the accompanying Laws, or the **Law of the National RBMP (PHN)** (except in the case of the works within the competence of the PHN, such as water transfers) or others.

As stated so far, three documents are proposed, the scope of which is described below:

a) Proposal for a prior report assessing the general interest of the State:

According to the above, two types of conditions would be considered under which a hydraulic work could be considered of general interest of the State:

1. On the one hand, hydraulic works that clearly have to be considered of general interest of the State (major regulatory works, works for the protection of the public water domain and defence against floods, etc.).

2. On the other hand, those that satisfy a set of criteria to be taken into consideration for the assessment of individual and specific declarations of hydraulic works, which must be established by Law.

The proposed evaluation report of general interest of the State is materialized in the form of a document to be completed and approved prior to any declaration of general interest of the State considered within the individual and specific declarations. This report includes general data on the action, relevant for its contextualization, followed by a checklist with the set of criteria established for its assessment and justification. It is, therefore a tool that seeks to guarantee a prior assessment of each action in terms of its adequacy to a possible subsequent declaration of general interest of the State.

It is necessary to emphasize the strategic nature of these reports, which are mainly intended to verify the advisability or not of carrying out a certain work. They will not be required, therefore, when works are proposed that are necessary to guarantee safety or, in general, the proper functioning of an action of general interest already existing or in execution.

b)) Proposal to update the feasibility report

This update should serve to assess the technical, financial, economic, social, and environmental viability of the action for adoption by the Secretary of State for the Environment and will be a step prior to the CG initiating the tender procedure.

The content of the document, to be completed by the promoting body the hydraulic work that aspires to be declared of general interest of the State, includes the following sections:

- **Basic data:** in which the basic aspects of the hydraulic work are completed in order to better contextualise it. This includes information such as the name, the type of action, the location of the action and the identification of the river basin RBMP in whose territorial scope it is located, also indicating the code of the planned measure to which the action corresponds.
- **Objectives of the action:** where the main objectives pursued by the action are filled in, describing whether they are environmental, socioeconomic, or mixed objectives.
- **Description of the action:** describing in some detail the elements that comprise the hydraulic work, its main characteristics and its relations with other significant elements as appropriate: affected water body, corrected pressures, role in the exploitation system, etc.
- **Adaptation of the objectives of the action to that established by the legislation and plans and programmes in force:** section in which the adaptation of the action to the regulations in force is assessed, including an evaluation of its impact on compliance with the environmental objectives of the water bodies and protected areas, or on the socio-economic objectives of hydrological planning, as well as its adequacy with respect to the objectives of the rest of the plans, programmes, strategies and related regulations.
- **Environmental sustainability:** although all hydraulic works of general interest must comply with environmental assessment regulations and undergo the corresponding procedure in accordance with Law 21/2013, in this section a brief assessment of the foreseeable unfavourable impact or environmental benefit of the action will be outlined.
- **Technical feasibility:** a concise breakdown of the technical alternatives considered to achieve the objectives of the action and the technical factors that have led to the choice of a specific typology for the action are concisely broken down, including information on its suitability with regard to the achievement of the objectives (for example, if it is a novelty), its safety (for example, in the event of extreme hydrological events) and its flexibility in the event of changes to the initial data (e.g. due to climate change).
- **Effectiveness of the proposal for the achievement of the objectives:** where the reasons that have led, from among all the possible alternatives, to select and propose the specific hydraulic work being evaluated are justified.
- **Financial and cost recovery analysis:** this analysis aims to determine the economic viability of the action, considering the flow of all the benefits generated by the project and the costs of the project (including the costs of the correction and compensation measures to be established) during the lifespan of the project. It also analyses the sources of financing foreseen for the development of the action and the extent to which costs are expected to be recovered through revenues from fees and charges; if these exist and are applicable.
- **Socioeconomic analysis:** this section establishes a series of criteria that must be evaluated to justify the benefits or disadvantages that the hydraulic works can bring to society, including indirect economic benefits, their possible relationship with the increase in employment or their interaction with historical or cultural heritage.
- **Conclusion:** where a final analysis is carried out, taking into account all the above, which concludes by justifying the financial, economic, social and environmental viability of the work in its appropriate dimension to be declared of general interest of the State.

(c) Technical guide for completing the general interest and feasibility assessment reports

The preparation of this technical guide will seek to ensure a certain homogeneity and coherence in the justifications and analyses included in both the general interest assessment report, referred to in paragraph (a), and in the feasibility report for the action or measure considered, referred to in paragraph (b), previously developed.

The guide should include precise technical indications of the information to be completed in the two previous reports and in what terms, the correct ways of presenting this information, possible sources of consultation to evaluate certain parameters and, in general, the details of what should be completed.

4

GO.4

Improvement of the integral and energy efficiency of wastewater treatment and regeneration plants and water reuse

4

INADEQUATE REGULATORY FRAMEWORK TO RECOGNISE RECOVERABLE BY-PRODUCTS GENERATED IN WASTEWATER TREATMENT

LACK OF SUPPORT FOR THE GENERATION OF RENEWABLES AND SLUDGE TREATMENT IN WASTEWATER TREATMENT AND SANITATION PROCESSES

THE NEED TO PROMOTE THE REDUCTION OF GREENHOUSE GAS EMISSIONS IN WATER TREATMENT

THE NEED TO INCREASE ENERGY SAVINGS IN INDUSTRIAL WATER TREATMENT PROCESSES

First of all, it is important to clarify that, despite the convenience of promoting energy and integral efficiency of wastewater treatment and water reuse plants, its application cannot be done only through the implementation of RBMPs but requires more specific instruments. Specifically, there are measures such as the determination of the carbon footprint in WWTRs, the minimization of emissions, CO2 offsets or the promotion of nature-based technologies that require implementation through other sectoral planning.

That said, the water sector in Spain requires a series of industrial processes that mobilize a large number of resources. It is estimated that the treatment of urban wastewater exceeds a volume of 4,000 hm^3/ year, and also leads to the consumption of a large amount of energy, about 4,000 GWh / year, which represents approximately 1.5% of the total national demand and 0.5% of the total greenhouse gas (GHG) emissions to the atmosphere in Spain[2] in its Energy chapter. In addition, emissions in the Waste management chapter account for 0.7% of total GHG emissions and include the following categories:

- Category 5D1. Urban R.W. treatment: 1,043 $KtCO_2eq$ (for uncaptured methane and nitrous oxide in effluents).
- Category 5D2. Industrial wastewater treatment: 1.211 $KtCO_2eq$ (due to methane generated and not captured).

[2] These data, provided by AEAS, do not include the energy consumption of desalination plants.

Although this energy consumption can be considered relevant in absolute values, it represents only 4% of the average household energy expenditure. In any case, the relatively small importance of the energy cost associated with the wastewater treatment and sanitation processes should not be a disincentive to pursue efficiency improvements.

Plans to save and improve energy efficiency in the urban cycle are common, covering the four main service areas: collection and treatment, distribution, sewerage, and wastewater treatment. With regard to wastewater treatment and sanitation, which is the subject of this Plan, the technological trend points to an increase in energy demand, as a result of growing demands on the quality of treated water[3]. The search for greater efficiency focuses on the energy savings that can be achieved through the implementation of systems applicable to all stages involved in water treatment. Likewise, monitoring, digitalization with the generalised use of sensors and automation for process control (measurement of flows, environmental conditions, biochemical or microbiological reactions) can contribute significantly to improving the efficiency of treatment and sanitation, with the consequent significant energy savings, which is why it is considered appropriate to establish standards and minimum levels of digitalization in both plants and pumping systems.

However, treatment and sanitation processes not only consume energy, but also produce it. The generation is of the order of 600 GWh/year (15% of consumption) and comes entirely from renewable sources, through the biogas obtained in the sludge treatment processes from wastewater treatment. This gas can be used in electricity cogeneration systems, which is not only used for self-consumption in the plants themselves (80%), but also generates a surplus that can be sold to other users (20%). If all the sectors that can generate biogas in Spain are taken into account, the potential figures of energy generation are very relevant. It is estimated that the energy recovery of waste could cover up to 10% of the current total demand and 64% of domestic-commercial consumption . It is important to highlight the potential for generation through multiple technologies in the integral water cycle, as well as the significant role of self-consumption in these types of treatment, and the potential immediate effect on the decarbonization of the economy.

[3] https://www.idae.es/uploads/documentos/documentos_Estudio_de_prospectiva_Consumo_Energetico_en_el_sector_del_agua_2010_020f8db6.pdf

However, it should be borne in mind that this potential for energy generation through biogas from sewage sludge is very small compared to that offered, for example, by the livestock sector in Spain, which is estimated to be about fourteen times greater (about 1,200 ktoe/year).

In any case, it should be noted that biogas is not only used in cogeneration installations but can also be enriched to biomethane and injected directly into the networks for consumption. This solution involves an overcharge that ranges between €15 and €30/MWh depending on the enrichment technology selected. This direct injection into the grid not only avoids methane emissions at source, but also allows the decarbonization of certain sectors not susceptible to easy electrification, such as domestic and industrial heat, ceramics, or metallurgy, which can lead to an even more efficient recovery than electricity generation. In this sense, the current cogeneration systems that are working properly must be maintained as long as they are efficient, considering the investments made in them by the owners and managers of the WWTPs.

An increasingly widespread use is the use of biomethane in vehicle fleets, allowing the substitution or mixing of this renewable gas with other fossil fuels. The Law on Climate Change and Energy Transition includes a series of specific objectives for the introduction of renewable energies in the transport sector which, in addition to promoting a greater deployment of electric mobility, includes the obligation to increase the use of advanced biofuels and biogas.

According to European legislation, the contribution of advanced biofuels and biogas produced, as a percentage of final energy consumption in the transport sector, will be at least 0.2% in 2022, 1% in 2025 and 3.5% in 2030. As highlighted by the **Integrated National Energy and Climate Plan. 2021-2030 (MITECO, 2020a)**, biogas is the only renewable gas with mature technology and available in sufficient quantity to address the 2022 and 2025 and even 2030 targets.

On the other hand, some new developments in wastewater treatment are oriented towards the recovery of products such as nutrients through energy-efficient technologies, production of raw materials for industrial processes, energy recovery of organic matter contained in wastewater and reuse of treatment effluents. The valorisation of by-products, mainly derived from the sludge treatments produced in the wastewater treatment plants, represents a remarkable improvement in the efficiency of the plants.

In recent years, new technologies are being developed to improve the treatment of sewage sludge, through improvements in biodigestion or new technologies for the energy recovery of sludge. Among the most promising is the production of struvite or guanite, a phosphate mineral of ammonium and hydrated magnesium that can be used as a fertilizer. However, the use of sludge as a fertilizer in agriculture is only allowed, in accordance with **Royal Decree 1310/1990, of October 29**, after prior stabilization treatment and, in any case, must be limited to sludge from urban wastewater treatment plants, domestic septic tanks or agro-industrial treatment plants, and the use of sludge from other types of industrial treatment plants is prohibited. The use in agriculture of properly treated sewage sludge saves between 5 and 15% of conventional chemical fertilizers and is a good example of the application of circular economy principles. The possibility of combining this recirculation source with reclaimed and especially 'manufactured' water for irrigation is an option to consider in advanced water reuse projects.

In this sense, together with the above, work is being done to recognize 'irrigation water' as a product that, with certain nutrient composition characteristics, could be prepared in wastewater treatment plants allowing the reuse, not only of water, but also of some nutrients, such as nitrogen and phosphorus, both necessary for the production of fertilizers commonly used in agriculture. This concept also called "Water à la carte", as well as the nutrients it contains are raw materials in demand, the latter (phosphorus) is also scarce and requires expensive imports. After their application in agriculture, part of the nitrogen and phosphorus are incorporated into the hydrological cycle, as they are dissolved and incorporated into the infiltrating waters, accumulating in aquifers and even appearing in surface waters, reflecting the impact of diffuse pollution. Consequently, the wastewater that reaches the treatment plants contains large amounts of nitrogen and phosphorus that must be removed by chemical and biological processes that incorporate them, in part, into the sewage sludge.

In the same way, the use of this reused water in urban use should also be considered in situations where agricultural supply is not efficient. This aspect is considered to be of great relevance, since it can considerably increase the volume reused and the consequent release of resources at source and the consequent support for the achievement of the objectives set in the planning.

In any case, the possible effects of emerging contaminants including medicines and personal hygiene products on soil and crops should be taken into account, both in the application of irrigation water and in other uses. In this sense, monitoring of the water-soil-plant chain is essential. The effects of emerging contaminants are poorly understood and include not only pharmaceuticals and their metabolites but also pathogenic microorganisms, some of them resistant to traditional disinfection processes.

In addition, at this point, innovation can play a fundamental role in the search for technologies that make it possible to obtain water of the right quality for irrigation, while maintaining the level of nutrients and recovering energy in the process. in this context, it is worth mentioning the project *"Innovation Deal on sustainable wastewater treatment combining anaerobic membrane technology and water reuse"* for whose development a consortium has been created formed by the European Commission and different European entities, including the Júcar River Basin Authority, the Regional Ministry of Agriculture, Environment, Climate Change and Rural Development of the Generalitat Valenciana and the Public Entity of Water Sanitation Residuals (EPSAR), in addition to several universities, including the University of Valencia and the Polytechnic University of Valencia, research centres and end users of reclaimed water.

On the other hand, the modernization of irrigation, both in terms of the introduction of sprinkler or drip irrigation and in terms of greater monitoring of irrigation water, allows for better dosage of nutrients and, ultimately, an economic, health and environmental optimization

Taking into account the above, four proposals have been generated which are developed in the following subsections:

- To promote energy savings in the different industrial processes that make up the treatment and wastewater treatment and to extend energy savings explicitly to the entire water reuse process, contemplating the entire water use cycle, from regeneration to reuse at the end point of use, for all measures/actions related to energy saving/efficiency.
- Support renewable generation on land and infrastructure associated with the processes of wastewater treatment, sanitation, and reuse, or produced in the treatment of sludge from treatment plants.
- Modify the regulatory framework to recognize as valuable by-products some of those generated in the process of treatment, sanitation, and water reuse.
- Promote the reduction of greenhouse gas (GHG) emissions by improving the processes of the facilities.

4.1. PROMOTION OF ENERGY SAVINGS IN THE DIFFERENT INDUSTRIAL PROCESSES THAT MAKE UP THE WASTEWATER TREATMENT

Energy savings in the different industrial processes that constitute wastewater treatment and purification have evolved strongly in recent years, but there is room for improvement with respect to the management and promotion of innovative solutions and technological improvements. In addition, energy saving and efficiency have a direct effect on the reduction of GHG emissions and therefore a positive environmental effect.

The improvement of energy efficiency should not be limited to large urban centres but, on the contrary, should pay special attention to small towns. It is precisely in these areas where there are more cases in which investments in wastewater treatment and sanitation have failed due to a lack of resources of local corporations for their operation and maintenance.

In any case, energy efficiency must cover the entire cycle of water use, from regeneration to reuse at the end point of use.

In order to advance in the above, the development of this proposal is specified in a series of measures that will be transferred to the Secretary of State for Energy (MITECO) and other competent administrations for their study and assessment:

- Support from public administrations for the development of protocols and regulations for carrying out audits of operating costs in wastewater treatment, sanitation and water reuse plants, and the development of specific metrics for calculating water and energy consumption.
- Development of regulations that require the generalization of carbon footprint calculation studies in this type of facilities.
- Tax incentives for those operators who develop energy efficiency programs.
- Specific financing of R&D&I through "ad hoc" lines of the CDTI, in aspects such as:
  - ✓ Anaerobic processes in the stabilization of sludge and its dehydration and drying.
  - ✓ Technological improvement of equipment (pumps, blowers and other high consumption machinery).
  - ✓ Adjustment of the power factor, smoothing of start-ups and adjustments to efficiency curves (frequency regulation, change of classic star-delta starters to electronic ramps, etc.).
  - ✓ Generalization of "LED" technology in lighting facilities.
  - ✓ Use of heat pumps in heating.

This proposal is aligned with the objectives and programme of the European Green Deal ***(Figure 1)*** which, recognising that the production and use in all economic sectors accounts for more than 75% of EU greenhouse gas emissions, makes energy efficiency a clear priority for action.

4.2 SUPPORT FOR RENEWABLE GENERATION ON LAND AND INFRASTRUCTURE ASSOCIATED WITH WASTEWATER TREATMENT, SANITATION AND WATER REUSE PROCESSES, OR PRODUCED IN THE TREATMENT OF SLUDGE FROM WASTEWATER TREATMENT PLANTS

It is proposed that the CG works to support the generation of renewable, energy, whether hydroelectric, solar or wind, on land and infrastructure associated with the processes of water treatment, sanitation, and water reuse, or produced from biogas, in the treatment of sludge from wastewater treatment plants. To this end, this proposal is specified in a deployment of measures that will be transferred to the Secretary of State for Energy (MITECO) and other competent administrations for their study and assessment:

- The promotion of electricity or thermal generation associated with classic renewable technologies (photovoltaic, wind, etc.) through the provision to operators of available public land (plots, roofs or covered surfaces, buildings, water bodies, etc.) or other types of facilities or locations, including the simplification of installation permits in the hydraulic and maritime-terrestrial public domains.
- Financing of hydroelectric power generation projects in urban wastewater networks, including marginal or small-scale projects (use of potential hydroelectric energy, replacement of pressure regulating valves with microturbines or pico-turbines and other solutions).
- The inclusion of this type of plant as a key element in the decarbonization of the economy, so as to remove administrative obstacles to, for example, the legalization of self-consumption facilities using two or more technologies within the plants.
- Taking into account these plants as an element of demand management due to their capacity to modulate generation and storage through biogas or other technologies or consumption.

It is important to mention that it is sometimes forgotten that the most energy efficient improvement in a wastewater treatment plant would be the lamination of its inflows, for example, through sustainable urban drainage measures. In this sense, Augas de Galicia conducts a series of local sanitation plans that include a very detailed analysis of the systems.

The increased use of renewable energy in treatment systems is a fact. For example, the Catalan Water Agency mentions its energy saving and efficiency program with the aim of decarbonizing wastewater treatment by means of energy self-consumption of its facilities with renewables and the increase of energy efficiency in its procedures. As a first objective, work is being done to increase the photovoltaic generation capacity, in different facilities, with the final objective of 20% of demand from renewable sources of its own origin.

On the other, hand, the recovery of energy from the biogas produced in the digestion of sludge allows both the recovery of sludge in wastewater treatment plants and the reduction of GHG emissions in coherence with the generation of renewable energy.

Plants with anaerobic digestion processes generate biogas that can be used directly for energy cogeneration or in other uses such as heating or domestic hot water production. The enriched and purified biogas is usually marketed through gas distribution networks and is known as biomethane. Due to its environmental benefits, the use of biogas and biomethane cannot have the same tax treatment as fossil fuels.

However, nowadays this energy recovery is especially profitable in those medium or large facilities (larger than 100,000 p.e., 128 facilities of the 2,300 existing in Spain) or in plants where, due to their dimensions (in general, when they have been sized for less than 100,000 h-e) anaerobic digestion processes are not available, it is possible to promote the delivery and centralized management of sludge from several treatment plants or in those that could be complemented with the biodigestion or biomethanisation of co-substrates of industrial, agricultural, livestock or food origin, compatible with the digestion of sludge or urban sludge, given the investment and maintenance costs that must be assumed. The same consideration of lack of profitability is applicable to thermal drying of sludge with power generation systems to be fed into the grid, a difficulty induced by the reform of the energy regulations which reduced or eliminated the premiums for this type of energy.

To extend this production to smaller plants and thus increase the use of the potential surplus, measures such as the following would be necessary:

- Definition of targets for penetration of biogas and biomethane in the short, medium, and long term, in accordance with state energy policies.
- Establishment of a stable regulatory framework that allows investments to be committed in order to achieve the objectives set for biogas production in wastewater treatment plants.
- Reduction of fiscal and bureaucratic obstacles and penalties that make the tax burden on biogas equivalent to that of fossil fuels and do not take into account its environmental advantages.
- Elimination of the special tax on hydrocarbons for biogas used in direct injection into the network or for use in vehicles. This work has already begun in a specific working group in order to approve a biogas roadmap.
- Development of economic and fiscal mechanisms and incentives. For example, the use of biogas and the use of biogas from wastewater treatment plants in thermal cogeneration with renewable sources should be explicitly included in the IDAE´s calls for aid for investment in electricity installations.
- Establishment of price mechanisms inspired by or similar to those already in place in other European countries, such as:
  - ✓ Reduction of fiscal and bureaucratic obstacles and penalties that make the tax burden on biogas equivalent to that of fossil fuels and do not take into account its environmental advantages.
  - ✓ Elimination of the special tax on hydrocarbons for biogas used for direct injection into the network or for use in vehicles.
  - ✓ Quota Systems: establishes the obligation to reach certain amounts of renewable gas in the energy mix. Italy, Belgium, Romania, and Sweden use this system.
  - ✓ Subsidies and tax credits: Finland, Iceland or Sweden employ a tax reduction system for biomethane. Austria and Belgium apply investment subsidies for biogas/biomethane facilities.
- Establishment of guarantee of origin certificates for 'renewable gas' along the lines of those that have existed for years in the electricity sector. The creation of such a system of guarantees and the issuing of green certificates by an independent agent is essential for the injection of biomethane into the network and would allow the potential commercialization of this renewable gas even at a cross-border European level, following the processes and protocols of the European Renewable Gas Registration Association (ERGaR), and therefore favouring the development of the market for this renewable gas in Spain.
- Modification of the gas conditions for direct injection into the network, aligning the "Detail Protocol PD-01" with the EN-16726 and EN-16723 standards.
- Greater dissemination and publicity to citizens of the advantages of biogas/biomethane, which is currently barely known as a renewable energy source and a pure element of a circular economy.

4

4.3. MODIFY THE REGULATORY FRAMEWORK TO RECOGNIZE AS VALUABLE BY-PRODUCTS SOME OF THOSE GENERATED IN THE WASTEWATER TREATMENT, SANITATION AND WATER REUSE PROCESS

The contribution of wastewater treatment, sanitation, and water reuse plants to the transformation from a linear to a circular economy involves a greater valorisation of the by-products generated, particularly in terms of the use of biosolids as fertilizers, through stabilized sludge, and the production of struvite and other fertilizers. The technical feasibility of struvite production has been demonstrated on an industrial scale, among others, by projects such as ENRICH and PHORWater funded by the EU Life Programme. In any case, it is necessary to advance in the knowledge of the environmental effect that these practices have, for example, on the levels of pollutants in air, water, and soil. In this sense, it is considered necessary to increase the monitoring of agricultural land before and after fertilization campaigns.

Sludge from wastewater treatment plants in itself, without undergoing industrial transformation and with an adequate treatment, is a source of nitrogen and phosphorus. Given the existence of soils devoid of organic matter and the possible risk of desertification, the agricultural application of sewage sludge is a technically and economically viable practice in accordance with the principles of a circular economy. Regarding its management, in Spain, approximately 1,057 million tons (in dry matter) of sludge or sludge from the WWTPs are currently produced. The total volume of these sludges reaches a value of approximately 5 million m3. The destination of this sludge is predominantly agriculture, gardening and forestry (49%), incineration or energy recovery (15%) and landfilling (7%). The treatments from which sludge is obtained are anaerobic digestion (65%), aerobic digestion (12%), composting (22%), thermal drying (22%), without treatment (14%) and other (18%). The recovery of sewage sludge must be considered in its widest range in the generation of by-products, both those that are currently available, and in the future as a result of R&D&I.

The use of sewage sludge, with quality and aptitude for application in agricultural or forest soils (commonly called biosolids in international technical literature, although it is not a term widely used in our country) must be considered for its technical and economic viability and an important environmental aspect, without leaving aside the need to advance technically and scientifically in order to guarantee that adverse impacts on the environment and human health are avoided. Today it is the main destination and use, given the conditions of organic poverty of a large part of our soils and their basic pH conditions. Along the same lines, it is important to advance knowledge about the effects that agricultural practices and the use of wastewater treatment by-products have on the environment, specifically on the levels of pollutants in air, water, and soil. To this end, it is considered necessary to increase the monitoring of agricultural land before and after fertilization campaigns.

In addition to the production of sludge or slurry of economic interest, it should be noted that the theoretical potential for phosphorus production from water treatment plants is 40,000 t/year (XV National Study. Drinking Water Supply and Sanitation in Spain. AEAS/AGA. 2018), that is, 13% of the Spanish needs for arable and woody crops, according to MAPAMA data from 2018. However, the potential of using wastewater treatment plant by-products as fertilizers is largely untapped due to the inadequacy of Spanish regulations to encourage their use. The Ministry of Agriculture, Fisheries and Food is preparing a **draft Royal Decree on the fertilization of agricultural soils** that considers sewage sludge and the conditions that must be taken into account in its application.

It is relevant that all these measures for the recovery of wastewater treatment products find a supportive legal and institutional framework, for example in the Spanish Circular Economy Strategy and in other transversal policies related to the Ecological Transition. Thus, Regulation (EU) 2019/1009 recognises struvite ***(Figure 14)*** as fertiliser and lays down provisions on the placing on the market of EU fertiliser products, amending Regulations (EC) No 1069/2009 and (EC) No 1107/209 and repealing Regulation (EC) No 2003/2003. The Spanish regulations will be adapted accordingly and will begin to apply in July 2022 although some provisions are already having to be applied from April 16, 2020. The potential use of struvite ***(Figure 14)*** as a fertilizer would decrease the dependence on other countries to meet the national demand for phosphorus. At the same time, it would offset certain operating costs of wastewater treatment plants and would have clear environmental benefits, including a reduction in the volume of waste produced that eventually reaches and pollutes the water.

In 2016, Canal de Isabel II launched the first industrial-scale struvite phosphorus recovery plant in Spain, at the South WWTP in Madrid. The plant is designed to treat up to 260 kg of phosphorus per day from two wastewater treatment plant return flows. Controlled struvite formation occurs in an upflow fluidized bed reactor. This initiative has meant an investment of 2.3 million euros for Canal de Isabel II, in line with its commitment to the circular economy and investment in R&D&I.

On the other hand, it is worth considering the role that nutrients contained in wastewater can play in the consideration of reclaimed water as a contribution to sustainable soil nutrition and the achievement of environmental objectives.

Figure 14. Struvite crystals obtained at a liquid manure processing plant in Hannover, Germany. Image width: 7.5 mm (Wikipedia).

In relation to quality objectives, the potential contribution of water reuse to the resolution of excess nutrients in surface and groundwater, which is the cause of deterioration of many water bodies, should be considered. Indeed, the most common problem preventing the achievement of good chemical status in bodies of groundwater is the impact of nitrate pollution, the concentration of which in many cases exceeds the limits set by the quality standards of Directive 91/676. Moreover, nitrate pollution is a determining factor in the designation of vulnerable zones under Directive 91/676/EEC and of sensitive areas whose waters are eutrophic or have a tendency to become eutrophic (Directive 91/271/EEC). The aim would be to reduce the contribution of nitrogen and phosphorus from urban sources by reintegrating them into the agricultural production cycle, leading to a net reduction of nutrients in the water environment. This approach combines several, often interrelated approaches:

- **If the WWTP must necessarily remove nutrients when the discharge point is located in a sensitive and/or vulnerable area, regardless of subsequent water reuse for irrigation, the current absurdity of "removing first to put in later" can be reached, which is inconsistent with the incentive to the circular economy.**

Taking into account the above, the development of this proposal is specified in a new set of measures that will be transferred to other competent administrations for their study and evaluation. The following are proposed:

- Modify Spanish regulations, to allow the commercialization and application of struvite as an agricultural fertilizer, as allowed by European regulations.
- Do not consider struvite as waste but as a by-product, proceeding accordingly to the revision of RD 506/2013, of June 28, on fertilizer products. Adjust national legislation to the update of Regulation (EU) 2019/1009, the next revision of which is scheduled at the beginning of 2022, to stop considering struvite as waste and consider it a by-product.
- In the development of the "Spanish Circular Economy Strategy", to promote the use of by-products and advance in the use of fertilizers, expressly mentioning struvite.

- To increase transparency on cost recovery, it is considered advisable to introduce a system to control production, consumption, and direct and indirect costs and, where appropriate, differentiate the operations associated with the generation of the by-products generated, as well as "self-consumption" and "delivery-sales invoices" to third parties, which will be integrated into an analytical and/or financial accounting system.
- The interest of these products and the effort for their water reuse should be linked to the interest of the market for their acquisition because there is a legal framework that supports it (promotion of transversal policies regarding the ecological transition).
- In relation to the consideration of the product 'irrigation water', reinforce the initiatives proposed by the Ministry of Agriculture, Fisheries and Food on sustainable nutrition of agricultural soils, exploring the possibility of reducing fertilizer inputs when these are already incorporated into the irrigation water produced in the WWTPs-ERA. This product could be supplied from the regeneration facilities significantly reducing the costs of extracting nutrients of interest to agriculture. It is a question of ensuring the sustainability of agriculture, rationalizing the use of the means of production and, in particular, of fertilizer products and other nutrient inputs to agricultural soils and crops[5].
- Within the framework of the legal consideration of reused water as a resource, to analyse the redefinition of discharge and wastewater, so that only that which reaches the public hydraulic domain would be considered as discharge. This reconsideration would facilitate on the one hand, the establishment of an economic incentive for the avoidance of the corresponding "Discharge Control Fee", to be included in the economic conditions in the agreement between the owner of the discharge and the end user; on the other hand, the reduction of treatment costs in sensitive areas without prejudice to these, due to the physicochemical characteristics of reclaimed water being more permissive than for its discharge into a water body.
- Also, to analyse the possibility of establishing a quality standard for irrigation water of any origin that would incorporate quality conditions similar to those required for the reuse of reclaimed water.
- In the context of the necessary improvement of agricultural soils and decarbonisation explore the potential of carbonisation techniques for biomass by-product (in this case, sewage sludge) and the establishment of a possible framework for their regulation and support.
- Consideration of optimal fertigation techniques (especially with reclaimed water) in combination with nutritional control in the plant and monitoring of nitrogen and nutrient movement in the soil.

4.4. PROMOTING THE REDUCTION OF GREENHOUSE GAS (GHG) EMISSIONS BY IMPROVING THE PROCESSES OF THE FACILITIES

It is also important to improve processes, not only from an energy perspective but also in terms of reducing process emissions. In this sense, as highlighted in the Plan and in other documents such as the EU Methane Strategy, the imminent revision of the Water Framework Directive and Sludge Directive, points to greater control of GHG emissions in WWTPs.

Furthermore, the Delegated Acts of Taxonomy Regulation (EU) 2020/852 lay down the conditions to be met by activities of construction, extension, renovation and operation of waste water collection and treatment systems in order to be considered as contributing substantially to climate change mitigation or adaptation, and to determine whether they do not cause significant harm to any of the other environmental objectives (sustainable use and protection of water and marine resources, circular economy, prevention and control of pollution, protection and restoration of biodiversity and ecosystems).

In view of the above, the development of this proposal involves a new set of measures that will be transferred to other competent administrations for study and evaluation. The following are proposed:

- Actions to reduce emissions of the aforementioned categories 5D1 and 5D2, thus considering actions aimed at reducing nitrogen in effluents.
- Improvement of sanitation and treatment in towns with less than 2,000 p.e. (or 10,000 in coastal areas). It is precisely in this type of population that a large part of methane emissions from wastewater are produced in Spain, as they have anaerobic treatment systems such as Imhoff tanks or septic tanks where the methane produced is not recovered and is emitted directly into the atmosphere, or they are small treatment plants in which the methane is partially used and / or burnt. The EU Methane Strategy promotes as a best option, whenever possible, their connection to other larger WWTPs, where the cost of capturing the methane generated is affordable, and otherwise other unconventional treatment systems with lower levels of GHG emission such as green filters.

[5] Spain is a member of the international initiative "4 per 1000", launched during COP 21.
The aim is to publicise or establish concrete actions on carbon storage in soils, and the type of practices to achieve it (agroecology, agroforestry, conservation agriculture, landscape management, etc). https://www.4p1000.org/es.

5

GO.5

Improvement of the financing of measures included in the River Basin Management Plans

5

ABSENCE OF OBJECTIVE AND RATIONAL CRITERIA FOR THE ALLOCATION OF MEASURES FROM THE RIVER BASIN MANAGEMENT PLANS TO SGA-WATER

LACK OF MECHANISMS TO ENSURE THE GENERAL AND SYSTEMATIC APPLICATION OF THE PRINCIPLE OF WATER COST RECOVERY

NEED TO IMPROVE THE BUDGETARY EFFICIENCY AND THE ALLOCATION OF MEASURES FROM THE PLANS TO THE SGA-WATER

NEED TO UPDATE THE ECONOMIC-FINANCIAL REGIME OF THE WATER LAW

The total investment attributed to the State Water Administration (DGA, Hydrographic Confederations and State Corporations) pending execution in accordance with the monitoring of the programmes of measures of the second cycle RBMPs, amounts to 17,131 million euros, of which 2,568 million correspond to basic and complementary measures for sanitation, water treatment, and water reuse. All this information is under review for the preparation of third cycle RBMPs and may undergo very significant variations. Notwithstanding the above, the CG is responsible for around 15% of the pending investment in sanitation and treatment. This is a very significant amount, especially considering that the original competence in these matters does not lie with the CG.

State intervention in sanitation and treatment over the last twenty-five years has been conducted mainly through the declaration of general interest of the State, thereby assuming the competence and financing of hundreds of measures. This enormous investment effort, amounting to more than 3,700 million euros over the last fifteen years, has been motivated by the need to comply with Directive 91/271/EEC on urban wastewater treatment, and is currently being maintained in order to continue to respond to the needs still pending. However, as shown in Figure 5, there has been a very significant drop in investment in recent years. This decrease is related both to a lower economic availability (crisis, extended budgets) and to greater difficulty in contracting works (new LCSP, complex procedures in relation to environmental and social aspects).

All these circumstances show that it is necessary to review the current intervention financing strategies, and that the formulas for collaboration between the CG and other competent authorities need to be reconsidered, as seen in the previous chapters. Furthermore, the current models of financing and cost recovery are also called into question, which will obviously have to be reinforced, at least in those cases where the CG has to intervene.

MITECO develops water policy through the DGA and the Hydrographic Confederations. There are also State Companies, created for the construction, operation, and execution of public water works. These companies are a key tool in water policy with regard to treatment, sanitation, and water reuse actions, since due to their nature as capital companies (entirely State-owned) they can offer a financing model for this type of work that is adapted to each case, with the possibility of accessing commercial financing. They are therefore a very useful resource for balancing the deficiencies in the CG's financing system for water treatment and sanitation works, works which, as has already been pointed out repeatedly, are not originally their responsibility or competence.

This lack of competence at source justifies the fact that the CG lacks the optimal tax tools to recover the cost of these investments. It should come as no surprise, therefore, that State Companies offer greater operational flexibility than the Trusteeship Administration itself to articulate solutions for collaboration with users or other Administrations, a circumstance that makes it easier for them to effectively tackle the execution of the sanitation, water treatment and water reuse actions entrusted to them.

Article 9 of the WFD establishes the need to consider the principle of recovery of the costs of water-related services, including environmental costs and resource costs. This Directive also assumes the principle that the polluter, pays, both being key in guiding water policy, especially in the areas of treatment and sanitation. In addition to cost recovery, the Directive aims, with the relevant economic instruments, to ensure that the necessary incentives are transferred to users to ensure efficient use of resources, on the basis that all water use leads to deterioration and pollution, so that the user is more aware of and contributes to bear the cost of these services.

In relation to the aforementioned principles, it is worth recalling STS 508/2017, of 23 March, which stresses that the principle of cost recovery cannot be imposed at the cost of infringing or simply rendering ineffective the polluter pays principle.

Finally, and no less important, in addition to the requirements imposed by European legislation, account must be taken of the aforementioned economic and budgetary framework in which the CG has been placed in recent years, marked by strong restrictions that require public expenditure to be strictly adjusted to principles of efficiency and effectiveness, and also, as a result, the obligation for measures financed by the CG to incorporate appropriate mechanisms to recover the costs of the public investments provided.

According to the information on cost recovery in the current RBMPs, in the urban water cycle 70% of public investments are recovered (Ministry for the Ecological Transition, 2018). This is a higher rate than the average recovery value for all uses and, in any case, reflects a high level of recovery of operation and maintenance costs and a significant gap in environmental and investment costs.

In view of the above, the proposals that have been addressed in this Plan are the following:

- Improve budgetary efficiency and analysis of allocation of measures to different CG bodies with competences in water matters.
- Establish mechanisms to ensure the general and systematic application of the principle of cost recovery in the integral water cycle.

5.1. IMPROVE BUDGETARY EFFICIENCY AND ANALYSIS OF THE ALLOCATION OF MEASURES TO DIFFERENT BODIES OF THE CG WITH COMPETENCES IN WATER MATTERS

This proposal seeks to lay the foundations for a better budgetary policy in the field of water within the CG, with the following priorities: 1) to meet the distribution of powers established in the legislation, 2) optimal use of its financial resources, oriented towards the achievement of the objectives of the water policy, and 3) to incorporate an adequate level of cost recovery of the services financed, totally or partially, by public budgets.

With this general objective in mind, the following analyses have been carried out

1) Analysis of the distribution of measures financed by the CG and establishment of criteria for the reallocation of measures: the objective of this analysis is to provide criteria for reallocating the sanitation and treatment measures currently pending financing by the CG[6] among the different organizations that comprise it (DGA, Hydrographic Confederations and State Societies). In order to carry out this reallocation, both the competences established in the legislation for each entity and the optimisation of the recovery of costs through the receiving agent of the different taxes and tariffs applicable, the existence or not of European funds allocated to each measure and the needs and investment capacities of each body should be considered.

[6] All this in accordance with the information contained in the current RBMPs (second cycle), which are in the process of review for the adoption of the third cycle plans. This update should involve significant variations with respect to the estimates made in this document as a result of integrating, in this review, the guidelines derived from this DSEAR Plan.

In the case of the execution and maintenance of hydraulic works that have cost recovery instruments, regardless of whether or not they have been declared works of general interest of the State, the aim is to avoid the generalized application of direct financing by the DGA, a management centre that lacks an revenue budget. Instead, the intervention of the State Companies (SSEE) should be promoted, which together with the Hydrographic Confederations (CCHH) have the capacity to collect recovered costs, a capacity which can also be improved. In relation to taxes, it will be necessary to ensure that the expenditure made in line with the purpose that justifies the income received and that, with the economic instrument applied, appropriate incentives for efficiency and responsibility are transferred to the users and beneficiaries of the public investment.

2) **Analysis of pressures, causative agents, and link with the measures, as a guiding criterion and support element to reformulate the economic and financial regime:** the aim is to determine whether the taxes and other economic instruments, and especially those of an environmental nature regulated in the TRLA, are taxing in an adequate and proportional manner those responsible for the pressures that make it necessary to implement the measures that need to be implemented. This will allow an assessment of the current degree of application of the polluter pays principles and the cost recovery of water services.

This analysis should serve as a basis for proposing guiding principles for a future reform of the economic-financial regime of the TRLA, aimed at improving the application of taxes, which must be modulated in a way that they generate the necessary incentives for efficient treatment, cover the costs associated with environmental protection (control of discharges and monitoring of quality, among others) and, as a whole, allow the financing of direct and indirect interventions associated with sanitation, water treatment and water reuse.

5.1.1. Analysis of the allocation of measures in order to establish new criteria for reallocation between agencies of the Central Government

These changes are necessary to:

- Facilitate the effective application of the cost recovery and polluter pays principles.
- Maximize budgetary efficiency by allocating the measure to the most appropriate body.
- Limit the participation of the State to those actions that fall within its competence, together with those in which its intervention can be justified based on objective and transparent criteria.
- Promote that the administrations involved in sanitation and wastewater treatment assume their competences to a greater extent.
- Ensure proportionality between the measures allocated and the financial and management capacities of each agency.

In order to materialize these changes, it is necessary to deepen the analysis of the factors that contribute to establish an efficient budget allocation, such as:

a) **Availability of European Funds:** regarding this factor, it should be borne in mind that certain state entities, such as the Hydrographic Confederations or the State Societies, can include in their budgets as a final purpose the fraction of the investment made that is recovered via European funds, while in the case of the MITECO DGA the funds are included in the Public Treasury, with no specific purpose defined. The consideration of this decision-making element and its relevance must be adapted to the future evolution of the amount and articulation of these funds.

b) **Availability of a cost recovery instrument:** to characterize the measures with respect to this criterion, the typification carried out is taken into account, considering the phase of the water cycle to which the service belongs as described in the name of the subtype of measurement (wastewater treatment, drinking water treatment, upstream distribution, etc.), as well as the relationship between Hydrological Planning Instruction (IPH) subtypes and cost recovery instruments. The classification is based on the following assumptions:

- The measure corresponds to regulation or upstream distribution works and is covered by a "Regulation Canon" (CR) or "Water Use Tariff" (TUA) in inter-community basins and is therefore the responsibility of the CG.
- Other typologies corresponding to wastewater treatment, sewerage, downstream distribution, drinking water treatment or irrigation improvement services may have specific fees, municipal tariffs or other types of cost recovery tools.
- The measure has taxes similar to the CR and the TUA enabled in intra-community basins, for flow regulation or upstream distribution.
- Other measures that lack a cost recovery mechanism.

c) **Competence allocation:** for those measures that do not have a defined cost recovery instrument and do not have EU Funds, the allocation is based on two criteria:

- In the event that the work belongs to an intra-community river basin district, the competence should remain with the DGA.
- In inter-community basins the allocation of the measure will depend on the distribution of functions established in the TRLA for the DGA and CCHH, which is summarized in ***Table 9***.

Table 9. Allocation criteria established in accordance with the Consolidated Text of the Water Law.

ORGANISM	MEASURES THAT WOULD CORRESPOND TO IT
GENERAL WATER DIRECTORATE	• Preparation of studies related to the public water domain • Preparation of national water-related reports and statistics • Granting of authorisations and concessions relating to works of general interest • Maintaining water censuses, records, and databases at the national level • Preparation and monitoring of the national RBMP and other related plans (floods, sanitation, and treatment) • Preparation of studies, services, manuals... to homogenize the work of the different Human Rights, planning, safety of dams, floods, water status and quality, coordination and management of the DPH, river nature reserves, climate change, etc. • Representation of Spain in international forums, notification to the European Commission and other international agents.
HYDROGRAPHIC CONFEDERATIONS	• Managing their assets • Inspection and surveillance tasks of the DPH. River guard • Quality control networks, flow gauging, piezometers and SAIH (maintenance and operation) • Environmental restoration of rivers: conservation, adaptation of riverbeds, restoration of riverbanks, improvement of river connectivity, invasive species, etc. • Conservation, maintenance, and operation of State infrastructure, including dam safety • Small works of replacement, renovation, or extension (not major repair) • Processing of concessions and authorizations (except those linked to works of general interest) • Flood defence works (even in the general case where there is no cost recovery)

In certain cases, the application of the above criteria is not straightforward, and exceptional solutions should be adopted, insofar as:

a) Other elements may come into play which are impossible to characterize individually, so a certain amount of discretion must be admitted. This is the case, for example, if the management capacity of one of the bodies concerned were to be overwhelmed by an excessive accumulation of measures attributed to it, which would make it advisable to reconsider the allocation while the necessary measures are being taken to adapt such capacities to the technical and economic optimum.

b) There is still a lack of adequate analytical tools, which should be overcome with the complete documentation of the measures in the third cycle plans. This could be the case of the application of socio-economic criteria which, for example, would make it possible to discriminate which actions may be considered eligible for exemption from cost recovery or more suitable for the declaration of general interest.

Finally, the proposed decision scheme is synthesized in ***Figure 15*** . Firstly, the possibility of cost recovery is assessed (blue area of the graph) and secondly (the green area) the best attribution of competence.

After the analysis conducted, the following conclusions can be drawn:

- As a result of the reallocation, the DGA registers a decrease in the number of measures and in the associated investment, a fact that confirms the trend in the direct financing conducted by this management centre over the last twenty-five years on measures that do not originally fall within its competence. The decrease in investment associated with the DGA means promoting other mechanisms that go beyond the direct financing of the measure, such as total or partial financing through objective criteria of public interest and social and territorial equity.

The results of the application of this criterion are in accordance with the first of the two recommendations made to the CG by the Court of Auditors in its **"Audit report of the direct management agreements in force between the Water SSEE and the Ministry of the Environment and Rural and Marine Affairs during the years 2010-2011"** (Court of Auditors (2014). This recommendation questions the existence of State Companies due to the low degree of progress in their real investment activity and the scarce real contribution to the purpose of their creation, which was to "constitute an instrument of direct management in order to provide an effective response to the investment and management of hydraulic works under the competence of the State".

The proposed reallocation, by strengthening their contribution to the State's public action in the field of water policy, meets the recommendation of the Court of Auditors by favouring the activity of these companies. Finally, it should be noted that State Companies could also intervene in actions not assigned in this scheme if the receiving agency of the measure considered it convenient in application of the above-mentioned discretionary power.

- After the reallocation, the Hydrographic Confederations have experienced an increase in the number of general measures derived from the DGA, thus making possible the recovery of costs through the tax elements described in Title VI of the TRLA. The intervention of the DGA in the financing of measures which present a "Regulation Canon," or "Water Use Tariff" implies indirect financing to the Hydrographic Confederations in actions which have identified beneficiaries and to whom the investment must be passed on. If recovery does not occur, it must be duly justified in the RBMPs with objective criteria of public interest and social and territorial equity (Art. 111bis of the TRLA).

- Part of the increase in the number of measures now assigned to the Hydrographic Confederations to the detriment of the DGA is due to the fact that, due to their type, they are specifically attributed to it in the TRLA, although they lack a financial cost recovery instrument.

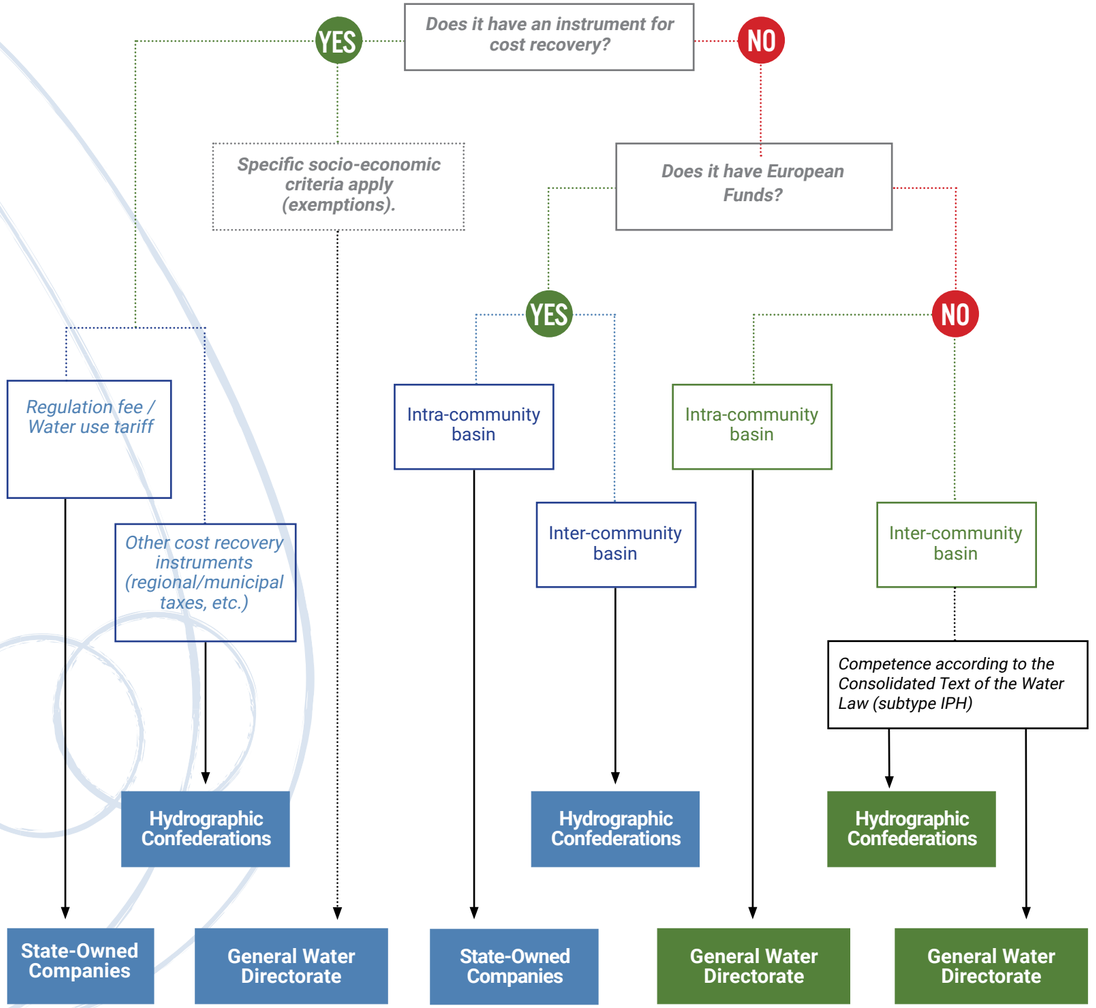


Figure 15. Decision diagram for the allocation of actions.

Within this group are the measures for the fulfilment of the environmental objectives established in the WFD and which, according to the polluter pays, principle, should be paid for by means of finalist canons for the protection and improvement of the public water domain that tax the causative agents according to the pressure exerted on the environment. It should be noted that the increase in the participation of the Confederations should inevitably be accompanied by a strengthening of its financial capacities through a better tax design (see section 5.2 of this chapter) and, in any case, ensuring the availability of the funds and human resources necessary for the volume of investment and management assigned.

- As a result of the reallocation, the DGA recorded a decrease in the number of measures and in the associated investment, a fact that confirms the trend in the direct financing carried out by this management centre over the last twenty-five years on measures that do not originally fall within its competence. The decrease in the investment associated with the DGA means promoting other mechanisms that go beyond the direct financing of the measure, such as total or partial financing through current and capital transfers or subsidies, according to objective criteria of public interest and social and territorial equity.

  The financing made by the DGA from public budgets would preferably be directed to those actions that constitute a good for the whole society and not for a certain group or sector, or in those cases in which for reasons of disproportionate costs the measures are unaffordable for the different Administrations and end users, as could be the case of certain wastewater treatment plants in small urban agglomerations without sufficient capacity to pay. The social criteria presented in Chapter 3.1 can support such justifications.

5.1.2. Analysis of significant pressures and drivers of deterioration of water bodies

The identification of the significant pressures and agents causing the poor state of water bodies determines what type of measures are necessary to reverse the deterioration, which is of vital importance for the correct application of the polluter pays principle and for the recovery of environmental costs.

The significance of this analysis derives from the fact that the measures of the RBMPs must be paid by means of canons or taxes for the protection and improvement of the public water domain or, failing that, by means of taxation through the Treasury or European Funds. The taxes set out in the TRLA include three finalist fees, of which the "Discharge Control Fee" (Art. 113 of the TRLA) is especially relevant for the DSEAR Plan. This instrument taxes point source pollution caused by the urban and industrial sectors in relation to the volume of discharge, the pollutant load, and the susceptibility of the receiving environment. On the other hand, a more widespread use of the "Water Use Tariff" (art.114 of the TRLA), especially if its collection capacity is optimized, may allow to cover part of the financial costs of measures (specific works) aimed at achieving environmental objectives, as is the particular case of actions in sanitation, wastewater treatment and water reuse. There are also other economic instruments, such as local and regional fees and charges – sanitation fee and other assimilable instruments specific to the Autonomous Communities – which transfer the cost of the measures to the agents responsible for them and, coherently, should participate in their financing.

5.2. ESTABLISH MECHANISMS TO GUARANTEE THE GENERAL AND SYSTEMATIC APPLICATION OF THE COST RECOVERY PRINCIPLE IN THE INTEGRAL WATER CYCLE

There is a lack of financial capacity of the basin organizations, which despite being beneficiaries of the tax instruments established in the TRLA are traditionally financed with budget items from the DGA, which again shows the aforementioned insufficiency and the inadequacy of the economic instruments available for cost recovery, so that they can have sufficient income of their own.

The ultimate goal is to increase the cost recovery required by European and national legislation, and thereby obtain sufficient funding to be able to implement the measures and not delay the achievement of the required environmental objectives. From the perspective of a comprehensive reform, cost recovery must encompass service costs (investment in works, maintenance, replacement, and operation costs), environmental costs (prevention or environmental remediation with pending investments) and resource costs (water price).

To achieve this objective, it would be necessary to have a legal regulation with effective tax figures and the establishment of a distribution of revenue in accordance with the objectives to be achieved. Consequently, it is necessary to reform the economic-financial regime of the TRLA when circumstances make it advisable. After analysing the latter, it is considered that the reform of the system can be articulated through three degrees of intensity, mild, slight complemented and deep, as well as through the introduction of a new environmental tax on water. In any case, it cannot be ignored that changes in any of the taxes will affect the rest. Therefore, the chosen reform modality must be applied to all of them en bloc, except in the case of the "Effluent Control Fee" which, due to its unique purpose, would allow a different line to be followed.

The proposals presented focus on the tax instruments directly involved in the financing of the actions of the CG in terms of sanitation, treatment, and water reuse:

a) The "Water Use Tariff" (Article 114) to compensate the State's investment and the operating and maintenance costs of the works and, possibly, to cover other environmental costs generated and the costs of the resource.

b The "Discharge Control Fee" (Article 113) to finance the study, control, protection, and improvement of the water environment receiving the discharges.

Another complementary option presented to the debate is the introduction of a general environmental tax on water itself, for the private use of this public property which, currently, in accordance with article 112.1 of the TRLA, is exempt from taxation.

5.2.1. Guiding principles for a future legislative reform of the economic and financial regime of the Water Law

The aim is to establish guiding principles for a future reform of the economic-financial water regime. The proposed principles, which should be validated and discussed with experts and social agents during the development phase of the potential reform, are briefly stated:

- Improvement of the individualized definition of each element of the tax liability. All fees should follow the following structure:
  - ✓ Legal nature and purpose of the fee
  - ✓ Territorial scope
  - ✓ Taxable event
  - ✓ Taxable person/entity
  - ✓ Accrual, tax period and term of income.

- ✓ Taxable base, Tax rate and tax quota or form of quantification.
- ✓ Tax benefits
- ✓ Competent body
- ✓ Body benefiting from the tax collection

- Regarding the purpose of the fees, the recovery of environmental costs and the cost of the resource should be added; in addition to the need to generate adequate incentives for the efficient use of water resources by users.

- It is considered necessary to define or refer to the law where the technical concepts contained in the definition of the taxable event are defined, such as the current "regulatory work", "specific waterworks", "benefit or improvement in the availability of water", "improvement in the use of water", "occupation, use and exploitation", etc., so that there is no doubt about the factual assumption that it is subject to taxation.

- The determination of the taxable amount must be clearer and as far as possible not depend on third parties for its determination, that is, it must be easily verifiable by the Administration that has to determine the tax.

- Tax rates should be raised in pursuit of greater cost recovery. In some cases, it will be convenient to create a progressive scale to penalize those who use water in excess of their needs, to promote the efficient and rational use of the resource.

- In general, and given the annual periodicity of the fees, it is necessary to determine a fixed accrual date in the calendar. It should also be specified how each tax is levied in the first year, since the period will be less than a year, normally a prorate is applied according to the number of days.

- Consideration should be given to the possibility of implementing a self-assessment system for those taxes that do not provide for it, in order to reduce the administrative burden.

- Tax benefits such as exemptions or reductions should be eliminated or clarified, as they directly affect tax collection and the objective of cost recovery. It should not be forgotten that Law 8/1989, of April 13, on Public Fees and Prices stipulates that tax benefits are not permitted, except in favour of the State and other public entities or in cases where the economic capacity of taxpayers is taken into account.

- Systems must be established to avoid double taxation between the different taxes, especially in the event of conflict and in the case of analogous regional taxes that have appeared as taxes specific to the Autonomous Communities.

This is followed by an analysis of each tax element that could be subject to reform. In the analysis of each of them, the proposal will distinguish between the implementation of a minor reform and a profound reform when appropriate. The cases identified are the following

a) "Discharge Control Fee" (Art. 113 TRLA) and "Diffuse Pollution Tax" (new)

b) "Water Use Fee" (art. 114. of the TRLA)

Principles for the reform of the "Discharge Control Fee"

This fee stands out for its adequate tax regulation compared to the rest of the fees and tariffs. The only shortcoming that can be highlighted is the fact that it only takes into account point source pollution and not diffuse pollution.

The minor reform would consist of leaving the canon as it is currently regulated with some adjustment, and if it is considered pertinent, creating a new tax for diffuse pollution.

The profound reform would consist of incorporating into the canon the necessary measures to incorporate the tax for diffuse pollution.

The tax on diffuse pollution, or water pollution by nitrates or pesticides, would be an indirect tax that falls on the consumption of products classified as fertilizers, pesticides, phytosanitary products, etc., taxing deliveries, imports, intra-community acquisitions and self-consumption, as defined in the VAT Law.

Principles for the reform of the "Water Use Fee"

The "Water Use Fee" is regulated in Article 114 of the TRLA, together with the "Regulation Fee" and in Articles 304 to 312 of the RDPH.

The current wording of the "water use fee" needs a precise and clear definition of all the elements of the legal-tax relationship, since both taxes offer a series of problems that must be solved. In particular, the inclusion of sanitation, treatment and water reuse works as part of their taxable event should be consolidated.

Evidently, one of the key aspects to be analysed after the public consultation period of the DSEAR Plan will be the degree of agreement that can be found among the interested parties, and in particular among water users, on the need and opportunity to adjust the economic-financial regime regulated in the TRLA under approaches such as those indicated here. This need, which in any case, in order to be met, must be subject to legal reservation, cannot be resolved by the RBMPs. These planning instruments can point out these problems, as has already been done in many of the Provisional Outlines of Important Issues made available to the public throughout 2020, but they lack sufficient regulatory power to solve them. On the other hand, it seems more appropriate that the rules and taxes referred to are of basic nature, that is, they are of general application, avoiding heterogeneities between territories such as those which, in relation to these potential tax burdens, could be introduced if their regulation were established through river basin hydrological planning.

6

GO.6

Promotion of wastewater reuse

6

NEGATIVE PERCEPTION AND LACK OF ACCEPTANCE OF REUSED WATER

INSUFFICIENT KNOWLEDGE OF THE POTENTIAL FOR WATER REUSE IN SPAIN AND ITS IMPACT ON THE ALLOCATION OF WATER RESOURCES

NEED FOR UPDATING THE LEGISLATIVE AND FINANCIAL FRAMEWORK FOR WATER REUSE

LACK OF OBJECTIVE AND RATIONAL PRIORITISATION CRITERIA FOR THE PRIORITISATION OF WATER REUSE MEASURES

Water management in Spain has undergone a strong transformation over the last 25 years, achieving important advances in the development and integration of unconventional resources, such as those from desalination and the reuse of reclaimed wastewater.

As indicated above, the volume of reused water currently stands at around 380 hm3 per year, which represents slightly less than 10% of the water treated with a certain tendency towards stagnation. The reclaimed water is mainly destined to agricultural irrigation and, to a lesser extent, to urban uses less demanding than drinking water (irrigation of garden areas, mainly), being remarkable in some areas the use of reused water in irrigation of golf courses.

The sources of supply of reused water are wastewater treatment plants. The improvement in the number and characteristics of the facilities that incorporate advanced treatment processes has meant that there are currently 322 WWTPs in Spain and more than a thousand ERA with more advanced treatment than secondary treatment. With the appropriate modifications, many of these facilities would be ready to comply with the necessary quality requirements for reuse demanded by Royal Decree 1620/2007, of December 7, which establishes the legal regime for the reuse of treated water.

In any case, the above figures show that the potential growth of water reuse is still large, and this was understood in the Spanish Circular Economy Strategy, whose initial draft already proposed an investment of close to 500 million euros (478.2 million for a first action plan 2018-2020) for water reuse actions included in the RBMPs, with water reuse and treatment constituting one of its five main lines of action.

Water reuse in Spain has a very advanced legal framework when compared to that of other European countries and is fully consolidated. This legal framework is headed by article 109 of the TRLA and developed in Royal Decree 1620/2007, which establishes the legal regime of water reuse. This regulation addresses, among other issues: the requirements necessary to carry out the activity, the delimitation of the uses admitted with reclaimed water and the quality criteria demanded for said reclaimed water for each type of use, the characteristics of the contracts for the transfer of rights over reused water and the procedures for obtaining the relevant concession or administrative authorization for the development of the activity.

On the other hand, the European Union has approved in May 2020 Regulation 2020/741, on minimum requirements for water reuse in agriculture, to which both national legislation and current and future reuse facilities will have to adapt. By 26 June 2022, the EC will have to establish guidelines to support the implementation of this Regulation.

In a climate change scenario such as the one we find ourselves in, in which both the availability of water in terms of quantity and quality and the achievement of good status in water bodies become a challenge, reuse can contribute significantly to achieving the objectives of water planning, both by reducing extractive pressure and through its potential contribution to the reduction of the pollutant load.

Taking into account the above, the proposals addressed in this Plan are the following:

- To analyse the potential for water reuse in Spanish basins and its impact on the allocation and reserve of resources.
- To prioritize water reuse actions aimed at achieving the good status of water bodies.
- Improve the regulatory and financial framework for water reuse (revision and adaptation of RD 1620/2007 to Regulation 2020/741).
- Develop a section dedicated to water reuse on the MITECO website.
- Conduct a communication campaign on the use of reused water.

6.1. ANALYSE THE POTENTIAL FOR WATER REUSE IN SPANISH BASINS AND ITS IMPACT ON THE ALLOCATION AND RESERVATION OF RESOURCES

RBMPs contemplate water reuse in a specific way in each planning area, although there are issues that are common to all of them:

- Water reuse is always considered taking into account the requirements established in Royal Decree 1620/2007.
- Preference is given to those uses of the public water domain that are oriented towards a policy of saving water improvement of the status of the water body and he achievement of environmental objectives.
- In operating systems in which the existence of problems of insufficient guarantee (quality and quantity) has been evidenced, the reuse of water will be authorized or granted, where appropriate, exclusively to replace resources from conventional sources based on the endowments established in the plans, so as to ensure that consumption does not increase beyond what is required to solve the problems of guarantee. In this sense, water reuse will be encouraged when it allows for a reduction in endowments and, in particular, in the water footprint associated with urban consumption.

However, compared to the above general approach, from a territorial perspective there are clear differences in the treatment of reuse between the RBMPs of river basin districts in which problems of scarcity are detected and the plans of those in which they are not. Furthermore, the territorial differences in the degree of use of these unconventional resources are very pronounced, from being practically irrelevant in the northern basins to a very notable use in the Mediterranean basins and on the islands. In this way, three different cases can be distinguished:

- River basin districts where there is no significant water reuse (e.g., Cantabrian River basin districts).
- River basin districts in which systems considered to have supply problems coexist with other systems that do not have them. These are basins that do not have a significant volume of water reuse (e.g., Ebro).
- River basin districts in which water reuse plays or can play a strategic role (e.g., Segura y Júcar).

Figure 16 sample shows a summary of the evolution of reused water by Autonomous Communities, since information on this subject began to be recorded. It shows the percentage of wastewater reused as a percentage of the total treated water for the Autonomous Communities with the highest levels of reuse. As can be seen, those that reuse the most wastewater are the Region of Murcia, Valencian Community, Balearic Islands, Canary Islands and Andalusia, which corresponds to the territory of the river basin districts of the Segura, Júcar, Balearic Islands, Canary Islands and the internal basins of Andalusia.

Despite the analyses carried out, it was detected that there is a lack of detailed information for the Spanish river basin districts as a whole on the state of water reuse and, especially, on the real potential for reuse in each planning area, considering the viable demands and the costs involved

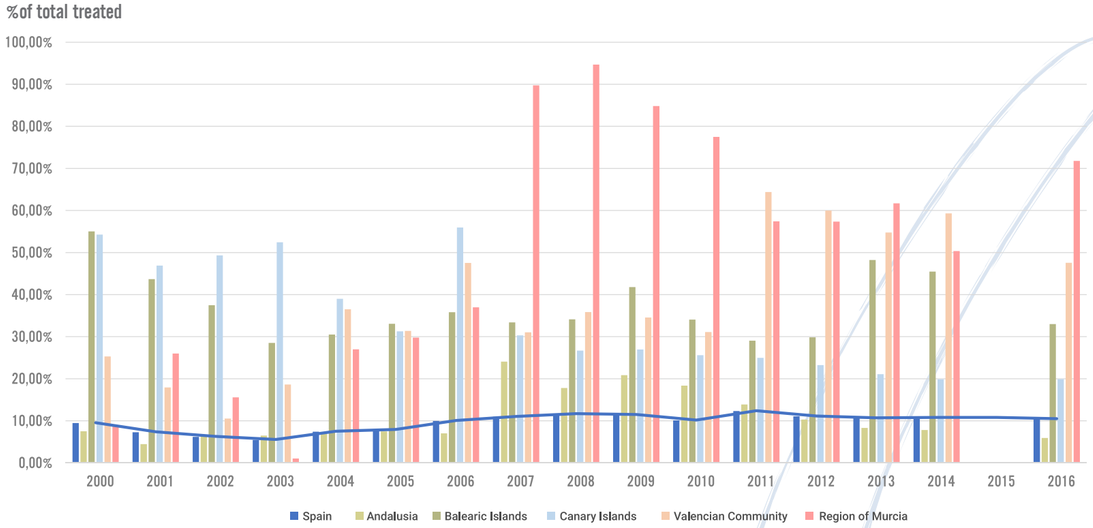


Figure 16. Evolution of the percentage of reused water by Autonomous Communities (Source: INE, 2019).

in the regeneration treatments and the regulation and conduction to the area of use and any other investments that may be necessary, such as improvements in the sanitation networks to prevent saline seepage. It is for this reason that a detailed study on the potential for water reuse in the Spanish basins and its impact on the allocation and reserve of resources established in the basin management plans has been identified.

The study would aim to update and clarify the current re-use landscape in the light of the requirements, conditions and risk analysis set out in the new EU Regulation, in order to guide priorities in this area. In addition, it should establish the bases for the reporting exercise that will need to be conducted in order to comply with the aforementioned Regulation 2020/741.

For water reuse in the integral urban cycle, the implementation of reuse master plans at local level will be encouraged, focusing on a reduction of the water footprint of this sector and the consequent release of resources.

Based on the consideration that the viability of these actions to address areas where scarcity and a significant capacity to pay on the part of users are combined, the relationships between the availability of reusable resources and solvent demands that can take advantage of them, the adequacy of treatments to the required quality, distribution and storage, and cost control and recovery must be analysed,. The aforementioned analysis will allow the integration of these aspects in future revisions of the RBMPs, determining the currently used volumes of reused water and their recipients, the additional volumes that could advantageously replace resources of another origin in pre-existing uses, and the additional volumes that could be used for new uses without causing deterioration in the status of water bodies.

Considering that the critical aspect in assessing the potential of water reuse is the identification and quantification of its costs and benefits (in terms of reducing water stress and nutrient pollution), such a study should consider the following elements:

- Compilation of water reuse initiatives proposed in the framework of hydrological planning or other sectoral planning, such as irrigation and urban uses or adaptation to climate change (**National Plan for Adaptation to Climate Change 2021-2030 (PNACC)**).
- Identification of threats and opportunities offered by water reuse from the perspective of the fight against climate change (mitigation and adaptation).
- Detailed analysis of the WWTPs: level of treatment, discharge volumes, current method of treatment and status of the receiving water bodies.
- Spatial relationship of WWTPs with water bodies, seeking to select those cases with plants that treat a relevant flow and are related to water bodies subject to significant pressure due to water abstraction or high nutrient content.
- Inventory of existing water regeneration stations (ERA), specifying their real reuse capacity, qualities, recipients, financing system and effective use.
- Identification of potential demand units that could take advantage of these resources considering their peculiarities with regard to the use of reclaimed water (distance and difference in level with the WWTPs, payment capacity and possibility of implementing tariffs in order to apply cost recovery principles, organization of users and management structure of users, etc.).
- Identification of units of potential demand that could take advantage of these resources taking into account their peculiarities with regard to the use of reclaimed water (distance and difference in level with the WWTS, collection capacity, user organization, etc.)
- Design of scenarios of potential increase of water reuse, depending on the cost of treatment and the conditions of regulation and transport to the areas of use.
- Analysis of the potential contribution of water reuse to improve compliance with the European Directives concerned (D. 91/271/EEC on urban wastewater treatment, D. 91/676/EEC on nitrates, D. 2000/60/EC Water Framework, D. 92/43/EEC, on natural habitats and D. 2006/7/EC on bathing water quality).
- Study as 'pilot cases' of one or more river basins, of territorial areas where there is a specific demand for reused water.
- Differentiation of cases in which water reuse will lead to positive or negative environmental effects, applying the same criteria as indicated in section 2.1.1

6.2. PRIORITIZING WATER REUSE ACTIONS AIMED AT ACHIEVING THE GOOD STATUS OF WATER BODIES

The strategic priority of the DGA is to encourage the use of reused water wherever it is possible in order to reduce abstractions in water bodies subject to significant pressures and which, therefore, not to reach good status or to avoid discharges of nutrients or pollutants. As an added value, the increased use of reused water, being a source linked to urban supply with maximum security, will contribute to improving the guarantees in the exploitation system that integrates these unconventional resources.

In accordance with the above, this work proposal defines criteria for prioritising the actions linked to the promotion of reuse that are programmed in the third cycle RBMPs. As a general criterion, the proposed prioritization rules (see section 1.1.2 of the chapter) favour reuse when it entails the reduction of pressures that are making it difficult to achieve good status in water bodies or that contribute significantly

to the achievement of other planning objectives without jeopardizing environmental objectives. These are cases such as:

- Substitution of catchments from bodies of groundwater in poor quantitative status or surface water bodies that do not reach good status due to extractive pressures.
- Substitution of natural sources in order to allocate better quality water resources for priority uses (especially for water supply).
- Prevention of pollution of coastal water bodies receiving discharges (reduction of pollution pressure).
- Prevention of contamination of inland water bodies receiving discharges, especially in vulnerable and sensitive areas or those affected by hazardous substances with very strict quality standards, provided that the abstraction of discharges does not significantly alter the hydromorphological functioning of these, the flow regime of the river or lead to a deterioration of the good ecological status of the associated water bodies.
- Consideration of reused water as an emergency resource in situations of drought, provided that the necessary infrastructures for this purpose have been designed, built and authorized in advance, given that rigorous planning is necessary, since without this it is not possible to deal with specific emergencies.

Additionally, other criteria of a technical, economic, social and environmental nature will need to be taken into account in the prioritization, which will transfer and converge with other priorities of water policy and, eventually, of other national strategies (circular economy, climate change, energy transition, demographic challenge, etc.) or sectoral policies.

6.3. IMPROVING THE REGULATORY AND FINANCIAL FRAMEWORK FOR WATER REUSE (REVISION AND ADAPTATION OF RD 1620/2007 TO REGULATION 2020/741)

Since the entry into force of Royal Decree 1620/2007, of 7 December, which establishes the legal regime for the reuse of treated water, the development of water reuse in Spain has been promoted, guaranteeing adequate protection of human health and the environment. However, the high potential for reuse indicated by some previous studies does not seem to have materialized, and can even be said that in recent years the expansion of the sector has been limited.

Recent experience has highlighted various aspects of the legal and institutional framework of water reuse that need to be modified in order to really and effectively promote this type of water use, aspects that need to be discussed among the agents involved. Water reuse is a complex process, which offers a wide variety of casuistry, and in which numerous actors may be involved. Therefore, it is necessary to consider the various possible uses of reclaimed water, the variety of administrative situations related to the production and use of reclaimed water, the cost and financing of all this, as well as the various conditions of scarcity, which overall can lead to different degrees of interest in this type of use.

In these circumstances, the main challenge identified in relation to reuse is the removal of institutional and financial barriers that limit the use of reused water. It is a question of overcoming the difficulties arising from two specific issues: on the one hand, the complexity of our country's competence in relation to the urban water cycle and the authorization or concession of reused water and, on the other hand, the differential costs of reuse compared to other sources of resource, which can make reused water very unattractive for its potential end users compared to other sources of the resource that are more economically affordable .

On the other hand, following the approval of the European Regulation 2020/741, on minimum requirements for water reuse, it is necessary to adapt RD 1620/2007. The European Regulation is directly applicable, so it does not need to be transposed, but there are aspects of our internal regulations that are not aligned with the new Community standard, which will have to be adjusted. Both national legislation and, in the operational field, current and future reclamation facilities intended for agricultural use must be adapted within three years to the provisions laid down in this new Community standard. Although the Community Regulation refers exclusively to irrigation, it seems appropriate to gradually extend the application of this type of rules, adjusted under similar criteria, to other types of use.

As a preamble to the establishment of guiding principles for this purpose, it is pertinent to conduct an analysis of Royal Decree 1620/2007 and Regulation 2020/741, which will facilitate the detection of compatibilities and differences.

The general outline is very similar in both provisions, determining that:

- The reuse of treated water requires authorization from a public authority. The European Regulation does not establish what type of authorization, nor which authority.
- Wastewater must be regenerated prior to reuse, establishing certain physicochemical and microbiological characteristics of the water that can be reused.

The European Regulation, as stated in its own introduction (points 10 and 11), seeks to establish certain levels of harmonisation in the quality criteria in balance with allowing sufficient leeway for Member States that reuse their water to decide how to organise their systems and how to establish the responsibilities of the different actors ensuring the protection of human health.

Considering the interrelation between both proposals (it would not make sense to revise the legal framework for water reuse without the necessary adaptations imposed by the new European Regulation), it has been decided to develop them jointly in a single document of **"Guiding principles for the revision of the legislative framework for water reuse"**, which accompanies this Plan as complementary documentation.

The aforementioned document aims to establish the guiding principles with which to address the necessary legislative reforms regarding water reuse, both of the strategic contents of the legal texts that frame the activity and of the technical elements set out in the Royal Decree and in the European Regulation. The regulatory integration component is being developed with the support of CEDEX's Centre for Hydrographic Studies, which has conducted an analysis of the compatibility between the national and European standards and is preparing an implementation plan.

In relation to the reform of the legal texts that frame the activity of water reuse, it is considered appropriate to meet the following criteria:

- It is necessary to strengthen the consideration of reused water in the TRLA as a resource, to the detriment of its treatment as a discharge, even considering that the fact that the reused water is the subject of a concession already gives it the character of a resource. It should also be considered whether it is necessary to maintain the figure of modification of the discharge authorization as a formula for accessing the use of reclaimed water or whether it would be better to unify the regime of the private use of reused water within the framework of concessions.
- Consideration should be given to the advisability of giving different legal treatment to reuse, depending on the different types of actors and their combinations, within the framework of the necessary adaptation of our internal regulations to the changes introduced by the

European Regulation. It would basically be a matter of providing a legal framework for those formulas that are already working successfully and promoting those that best suit the general objective of promoting water reuse in Spain.

- Similarly, the modulation of their legal treatment according to the contribution of water reuse projects to the planning objectives should be considered. Actions that contribute to the achievement of environmental objectives should be clearly promoted.

- Finally, it is considered necessary to adopt an equitable approach in the distribution of costs, considering the application of the polluter pays principle, which entails modifying the current wording of the TRLA and the corresponding regulatory standard. In this sense, it seems possible to consider the formula of making the integral urban cycle responsible for supplying water with a quality such that it does not compromise [A052] the uses downstream of the discharge -which requires a careful consideration of the necessary conditions in each case. It will be necessary to decide whether or not this cost allocation is independent of whether or not reuse will occur.

- In addition, users benefiting from reclaimed water should bear the additional costs necessary to ensure the safety of their production or the services they provide. In any case, it will be convenient for the regulation to maintain some flexibility in order to adapt to the particularities of each case, overcoming the current difficulties.

In addition, with regard to the problems arising from the integration of the European Regulation, other elements need to be considered:

- **The most appropriate formula for the adoption of the new Regulation:** The European Regulation introduces new approaches not included in our regulations (control of produced water, risk management) that represent an advance in the safety of this practice. In fact, the Reclaimed Water Risk Management Plan (PGRAR) introduced by this regulation becomes the cornerstone on which the integration of reclaimed water pivots. It is a mechanism that is not exempt from implementation difficulties, given the difficult traceability of water in a real irrigation system with different origins of the resource, mixtures, and intermediate storages. It would be difficult to justify why such safety improvements are not equally necessary for other uses that are as much or more sensitive than agricultural, such as urban or home, so the most coherent approach would be to propose a complete modification of the National Royal Decree. The future national standard should also contemplate other aspects, such as including excess nitrates in groundwater as an environmental risk in the PGRAR and try to enable the production of 'irrigation water' as foreseen in the new standards developed by the MAPA, despite the difficulties that this entails.

- **Water reuse actors and responsible parties:** it is necessary to identify the reuse actors with their responsibilities for the determination of the points of compliance indicated by the European Regulation and the consequent establishment of responsibilities for water quality and its control. While Royal Decree 1620/2007 grants these responsibilities to the holder of the concession or authorization from the moment the treated water enters the reuse system until the point of delivery of the reclaimed water, Regulation 2020/741 exempts the operator of the regeneration plant from liability beyond the point of compliance, at which point the following actors of the chain come into play, each with their share of responsibility. The fit can be complicated, because the casuistry in Spain is very varied, according to the configuration of the different facilities, more or less dependent and related or not to the wastewater treatment plant.

- **Assignment of a permit to WWTP-ERA operators:** this permit should be additional and compatible with the existing title of right to use reclaimed water in Spain. Although it may seem that it is exclusively a matter of validating the good facilities and the operation of the treatment system, the consideration of the risk management system as a fundamental element of the permit suggests that in reality what is being granted is a more complex authorization that validates the entire water reuse activity, beyond what is strictly the responsibility of the operator. With regard to the competent authority granting the permit, it seems that the most operative approach would be for both concession and permit to be granted in coordination (with their mutual conditions) by the basin agencies or authorities, requesting, as has been done up to now, a binding report from the health authorities (and whoever else may be appropriate). The procedure for the adaptation of existing concessions and authorisations and the conditions of deadlines are also aspects that will require regulatory adaptation together with the possibility of establishing a simplified procedure for cases of minor importance in rural areas.

- **Reclaimed Water Risk Management Plans:** these new risk plans are a central element in the implementation of the European Regulation, whose development will be complex insofar that the requirements, risks, mitigation measures and responsibilities of the various actors must be clearly transferred. The CEDEX in Spain and the Joint Research Centre (JRC) of the EC in the EU are already working on guidelines for the elaboration such plans. One of the aspects to consider is the incorporation of environmental risks.

- **Other novel aspects:** finally, the treatment of the multi-barrier approach in the application of reclaimed water must be carefully analysed, which requires technical clarification in order to assess the barriers, or application systems, to evaluate their effectiveness and, finally, to establish protocols for their monitoring and control.

6.4. DEVELOPING A SECTION DEDICATED TO WATER REUSE ON THE MITECO WEBSITE

With a dissemination purpose, it is proposed to enable a specific section dedicated to water reuse within the 'Water' section of the MITECO website. This development will be implemented once the public consultation of the DSEAR Plan is completed. This initiative aims to facilitate the exchange of information and experiences, as well as the extension of good practices, allowing a clear message of confidence in reclaimed water and its benefits to be conveyed to society. This platform could serve as a basis for communication and promotion campaigns to promote this activity, which is referred to in the proposal set out in the following section.

6.5. CONDUCT A COMMUNICATION CAMPAIGN ON THE USE OF REUSED WATER

A communication campaign is planned to highlight the value of reused water as a strategic resource in meeting uses and demands, to accredit the health safety of agricultural products irrigated and cultivated with water from reuse, and also to highlight the capacity of reuse to advance towards the achievement of the good status of water bodies. This campaign will be linked to the traditional message of the need to save water and to manage water resources in a strategic and rational way, especially in a scenario of climate change.

The main objective of the communication campaign is to improve the perception and social acceptance of reused water, overcoming the distrust that is currently present in society regarding this activity and the consumption of agricultural products irrigated with these waters. The aim is to achieve this goal by generating and launching messages of trust and guarantee, as well as by disseminating the numerous benefits associated with reuse. In addition, the main consumer countries of Spanish agricultural products will be included among the targets of this campaign.

Some possible contents and relevant aspects for this campaign would be:

- Available water supply options.
- Water reuse within the framework of planning. Perspectives from integrated water management.
- Contaminants present in the different sources of supply (pathogens and chemical agents).
- Available technologies and procedures for the control and monitoring of contaminants.
- Available technologies for the elimination of contaminants.
- Controls and guarantees for reused water.
- Language used in communication.
- Dissemination of success stories.
- Benefits of water reuse.

On the other hand, it must be taken into account that the Secretary of State for the Environment has established the so-called " Urban Water Cycle Round Table", which was created as a meeting place for all the actors in the water sector. It involves operators and the main companies and associations in the sector, the Spanish Federation of Municipalities and Provinces, trade unions, consumer organizations and the Administration. This dialogue initiative aims to establish an agreed roadmap for the implementation of an Observatory of the Urban Water Cycle.

GO.7

Innovation and technology transfer in the water sector

INSUFFICIENT COORDINATION AND ADMINISTRATIVE COOPERATION MECHANISMS IN WATER R&D&I.

LACK OF SUPPORT TOOLS TO FOSTER PUBLIC PROCUREMENT OF WATER INNOVATION

DISCONNECTION BETWEEN THE R&D&I NEEDS OF THE PUBLIC WATER ADMINISTRATION AND EXISTING DEVELOPMENTS

NEED FOR BETTER TRAINING ON INNOVATIVE TOOLS IN PUBLIC PROCUREMENT OF R&D&I WATER

The DSEAR Plan, in its original conception contained in the Guidelines document (MITECO, 2018b), did not include among its objectives the exploration of innovation and technology transfer in the water sector. However, during the discussion of the Guidelines, several contributions were received requesting to extend the analysis on innovation and technological transfer in the water sector. Therefore, recognizing the interest of the topic, this proposal was incorporated into the DSEAR Plan as a governance objective (GO7) with its own entity. In any case, it is important to clarify that, despite the convenience of promoting innovation and technology transfer activity in the water sector, its application cannot be done only through the implementation of RBMPs but requires more specific instruments through sectoral planning.

Indeed, water policy in recent decades has evolved from the priority of meeting demands, 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, optimization and reduction of energy consumption and water losses; issue that are addressed in GO4 on Improving the energy and integral efficiency of wastewater treatment, regeneration and water reuse plants. Likewise, the new national and Community regulations result in an increase in the quality required in the processes of treatment, sanitation and water reuse, which add to the pressure derived from the current breaches of the Water Framework Directive, in which there are a large number of exemptions to the fulfilment of the environmental objectives due to their technical unviability or disproportionate costs, although extensions of the deadline will not be possible beyond 2027.

This context advises that the Public Water Administration explore new technological solutions through innovative projects that respond to real needs that conventional technologies are not able to solve. The adoption of innovative products or services requires a prior effort to consolidate administrative mechanisms that favour both communication and cooperation with the scientific-academic field in the search for new solutions.

In brief, this diagnosis can be summarized in the following needs:

a) The application of innovative technology by the Public Water Administration is based on the identification of needs around the management and planning of water resources in Spain, and in particular with regard to the improvement of treatment, sanitation and water reuse processes that could be covered through innovation and contribute to the reduction of pressures on water bodies and protected areas, contributing to the achievement of environmental objectives. An example of this are nature-based solutions, sustainable drainage, and low-cost treatment and sanitation solutions adapted to small and medium-sized municipalities and requiring low maintenance. [In 2015, the DGA identified the major issues in water planning and management in which R&D&I can play a relevant role in supporting the competences of the water Administration. However, it is necessary to get down to the detail of each water planning and management need, and at this level it is necessary to strengthen cooperation within the Public Water Administration. These needs that could be covered through R&D&I must be reflected in the strategies and plans on innovation and technology transfer that are developed at a higher or different administrative level, such as national strategies, agendas, and operational programs in the field of water and R&D&I.

b) There is a disconnection between the diverse technological offer of the public and private sector and the real needs of the administration, a fact that slows down the incorporation of innovative technology in the management of water resources and which is reflected in the scarce integration of innovative proposals or research projects in the programmes of measures. Furthermore, the framework of competence surrounding R&D&I in Spain, whose origin is to be found in the Spanish Constitution, which refers to the shared competence between the State and the Autonomous Communities for the promotion of R&D, can lead to a fragmentation that hinders the application of common models and the harnessing of synergies. Proof of this is the high number of strategies, agendas, and programs in the field of water and R&D, as well as the large number of events and conferences held around the different agents and institutions that make up the R&D&I system, at European, national and regional level.

c) **It is proposed that those local entities that provide service to more than 50,000 inhabitants may conduct this delegation in the Committee of Competent Authorities.**

d) The lack of active participation of the Public Water Administration, or its incipient involvement, in public research organizations, universities, the most advanced national and international technology centres, that make up the Spanish Science, Technology and Innovation System, and the private sector, results in a lack of knowledge of the actions developed by the different agents in R&D&I in the field of water. On the other hand, the public procurement system itself makes it difficult to formalize collaboration agreements between the Water Administration and research centres and universities, since these agreements can easily be interpreted as

e) A fundamental element for the acquisition of innovative technology by the Public Administration are the contracting procedures established by the LCSP that incentivise innovation. This is the case with the Innovation Partnership and Competitive Dialogue procedures. However, the application of these procedures is incipient in the water sector. So much so that the contracting procedure subject to Innovation Partnership has not had any practical application by the Public Water Administration, while only four cases of success can be cited through Competitive Dialogue, two of which (Santiago de Compostela and Muskiz) correspond to treatment facilities that not only aim to achieve better effluent quality, but also to incorporate improvements in efficiency and sustainability in the use of resources. To a certain extent, the low level of application of these procedures is due to a lack of knowledge and the suspicion of procedural difficulties in successfully processing these contracts, usually resorting to more familiar contracting models, such as the open procedure in any of its modalities. In these of open procedure, the criteria that encourage innovation represent only between 3 and 7% of the value judgment criteria, while price remains the dominant factor for awarding the contract.

In view of the above, the proposals to be developed are as follows:

- Enable administrative coordination and cooperation mechanisms to promote innovation and technology transfer in the field of water.
- Periodically update the document "Innovation and research in the water sector. Strategic lines".
- Organize a conference on innovation and technology transfer in the water sector.
- Create a section on R&D&I in the 'Water' section of the MITECO Web portal.
- Develop tools to support Public Procurement of Innovation by the Water Administration.
- Establish a training plan on innovative recruitment tools.

7.1. ENABLE ADMINISTRATIVE COORDINATION AND COOPERATION MECHANISMS TO PROMOTE INNOVATION AND TECHNOLOGY TRANSFER IN THE FIELD OF WATER

There is a need to improve coordination and collaboration within the Public Water Administration, and with other administrative units in order to identify the technological needs of water planning and management that are not well covered by the application of the usual technologies. This deficiency can be reduced by enabling administrative mechanisms to promote coordination, proposing in this sense:

a) Optimize innovation efforts avoiding inefficiencies and duplications.

b) To take advantage of the capacities of the different public administrations for a better distribution of competence in R&D&I towards a collaborative culture.

c) Extend these synergies to the European framework taking advantage of funding opportunities.

The aim of improving coordination between the public water administration and other units is to participate effectively in the establishment of the national strategy regarding water R&D&I, also seeking to ensure that these needs are positioned at the European level. To this end, the Spanish Science, Technology and Innovation System and the European Research Area, they will be the channel through which the Water Administration must find the opportunity to communicate its needs. In this regard, several options are considered for channelling this communication, either through the National Water Council, in which there must be a representative of the Ministry of Science and Innovation, or through the Government's Delegated Commission for Scientific, Technological and Innovation Policy. In the latter, MITECO, together with the rest of the ministerial departments, will try to define the Spanish position regarding the EU R&D&I Framework Programme and establish the technical position for the negotiation of the new Horizon Europe, as a continuation of Horizon 2020.

In this way, the needs that are considered to be covered by R&D&I should be reflected in the calls for proposals and, consequently, Spanish interest groups will be able to take better advantage of these financing opportunities. It should be borne in mind that Horizon Europe covers precisely the third planning cycle, i.e., from 2022 to 2027.

In relation to the above, the DGA may be part of the **European Partnership Water Security for the Planet** within the Water4all partnership, within the framework of Horizon Europe. The aim of the initiative is to drive systemic transformations across water research. The innovation pipeline should foster matching between those demanding specific needs and solution providers. The system proposes a portfolio of multinational, multifaceted and cross-sectoral approaches, encompassing political, environmental, economic, technological, and social considerations to achieve long-term water security for all. In this way, and in line with the European Green Deal, it is intended that by 2030 it will be possible to reduce water stress, increase the protection of water resources and dependent ecosystems, and improve the resilience, mitigation, and adaptation of water systems to global changes.

Likewise, in the **State Plan for Scientific and Technical Research (2020-2023)** the DGA will work with the corresponding Ministry so that it contemplates the needs of the Water Administration, so that the Annual Action Program that establishes the economic distribution of the annual research budget by areas and programmes is reflected.

7.2. PERIODICALLY UPDATE THE DOCUMENT "INNOVATION AND RESEARCH IN THE WATER SECTOR. STRATEGIC LINES"

This proposal will be developed through a parallel action to this Plan, which will consist of updating the document on (MAGRAMA, 2015) mentioned above, which will require the activation of the administrative coordination mechanisms described above.

In this document, the DGA established the strategic lines in the field of R&D&I necessary for the achievement of the objectives of water policy in Spain. Its update will seek to define a medium and long-term strategy that connects the needs of the public administration and the public-private sector with the new demands and commitments related to and emerging from water management (pharmaceutical products, emerging pollutants, microplastics, etc.), with the application of national and community regulations, and incorporating technologically innovative products and services that allow progress to be made at the same time in energy efficiency and the efficient use of resources.

The periodic update of this document should include the following aspects:

- **R&D&I entities related to the field of water:** for this purpose, a review of Annex III "R&D&I entities related to the field of water" will be carried out, which includes a list of Public Research Organizations (OPI) of the CG, technological and research centres of the Autonomous Communities, universities, R&D&I platforms and networks.
- **A list of the topics in which the Water Administration needs to make progress,** reflecting those lines of action considered a priority by the DGA, which, logically, will be based on hydrological planning objectives and the needs of the programme of measures of the RBMPs, focusing on those issues for which there may not be a sufficiently developed technological solution, especially with regard to the quality parameters required in the processes of water treatment, sanitation, and water reuse. This will be the result of a previous analysis of the available technologies, identifying those that should be promoted and the existing barriers to their adoption.
- **Action plan,** indicating the available sources of funding according to their possible fit with the specific innovation programmes. This action plan will propose a roadmap for R&D&I within the water sector.
- **Differentiation between the needs of the Water Administration and those of the academic sector,** and which were addressed jointly in the 2015 document. In this way, it is intended not only to define the needs in a clear and differentiated way, but also for the document to serve as a tool to establish the synergies between both types of needs.

7.3. ORGANISING A CONFERENCE ON INNOVATION AND TECHNOLOGY TRANSFER IN THE WATER SECTOR

This proposal will be materialized through a parallel development to this Plan, which in this case will consist of the design and organization of an annual conference or event on innovation and technology transfer in the water sector, promoted by the DGA as part of its tasks. The conference, which is still a claim of the sector as was evidenced in the participatory workshops that were held on the subject in 2019, would enable the creation of a space for the exchange of information and cooperation networks between administrations (DGA, Hydrographic Confederations, Administrations of intra-community basins and other elements of the CG) and the technical scientific field. Initially it is considered that the conference should be held on an annual basis.

The aim of this conference on R&D&I in water is twofold: on the one hand, it seeks to promote the transfer of results from research to society and the water administration; and on the other, to promote the connection and creation of networks linking the public and private sectors, universities, and research centres specifically related to water. Other objectives of this conference will be to present examples of successful experiences or lessons learned that serve as a model on the path to innovation.

For the development of this type of conference, it may be of interest to seek the collaboration of regional clusters and other interested agents, such as those who already participated in the preparatory workshops of this Plan referred to the GO7.

7.4. CREATE A SECTION ON R&D&I IN THE 'WATER' SECTION OF THE MITECO WEB PORTAL

The development of this proposal will be materialised in the creation of a section on R&D&I in the water sector on the MITECO website. The objective of this new section is to give greater visibility to the needs and lines of action of the Water Administration in R&D&I, and at the same time to serve as a forum for the exchange of information between all those involved in innovation and technology transfer in the water sector. The information contained on the website should be related to and updated in a coherent manner with the document and the conference presented in the previous proposals.

Some of the contents that could be included in this web section would be:

- Publication of the conferences and other events held in the field of R&D&I, in order to reach all the interested public.
- List of institutions and organizations, both public and private, that do not directly finance actions or are research centres, but which seek sources of funding and lines of research and which serve as a nexus for bringing together and coordinating efforts between different sectors of interest in order to carry out various projects. Mention can also be made of instruments related to R&D&I through which financing could be obtained.
- List of research centres, universities, institutions, public and private companies, etc., dedicated to R&D&I, individually or in collaboration, forming consortia or networks between the different entities; as well as a broader ecosystem that in the era of digitalization can respond from R&D&I to unmet needs of the water sector, such as start-ups, spinoffs and large companies that develop R&D&I.
- Attached documentation, databases, statistics, etc., related to R&D&I in water, which may be useful.
- Record of successful experiences in the application of innovative technology in the water sector, especially with regard to the optimization of water treatment, sanitation and water reuse processes, where promising results have been achieved.
- Sources of funding (European and national) available to the Public Water Administration for R&D&I activities.

7.5. DEVELOPING TOOLS TO SUPPORT PUBLIC PROCUREMENT OF INNOVATION BY THE PUBLIC WATER ADMINISTRATION

In order to encourage, incentivise, and facilitate innovative public procurement through procedures in line with the LCSP, which allow for innovation while providing legal certainty to officials participating in these procedures, several support materials complementary to this Plan have been prepared. Specifically, these are:

7.5.1. Guide to public procurement of innovation and contracting procedures in the Public Water Administration

This guide has been prepared with the aim of being a practical tool that can be used by all those agents involved in the Innovation contracting procedure, through any of the procedures contemplated in the LCSP. The guide contains:

a) An introductory part in which an attempt is made to clarify the fundamental concepts surrounding Public Procurement of Innovation.

b) A section that considers the different existing modalities for the implementation of Public Procurement of Innovation

c) A third section that describes the process of Public Procurement of Innovation. This section includes the identification of needs, the search for solutions, the drafting and processing of the contracting specifications by any of the procedures included in the LCSP, and the monitoring and evaluation phase of the contract during its execution.

With regard to the search for innovative solutions in the market, reference is made to some useful tools in any Public Procurement of Innovation process (early demand map, preliminary market consultations, etc.), for which not only the procedure for their execution is mentioned, but also models or templates of the documents required for their implementation are included.

On the other hand, the guide explains two specific types of procedures: Competitive Dialogue and Innovation Partnership, for which the complete contract processing procedure is developed, as a roadmap. In these sections, and as the explanation of the process progresses, a proposal is included for the documentation and models or templates required for the processing of the contract.

It also includes a list of innovative contracting experiences launched by the DGA in any of the procedures and modalities used.

As best practise guideline, the guide concludes with a list of lessons learned and recommendations that can be taken into consideration when implementing any of these procedures.

7.5.2. Set of pro-innovation criteria for the procurement procedure for public procurement of innovation

The document presents a series of pro-innovation criteria that can be used successfully used in the specifications and contracts to be processed in order to encourage innovation and technology transfer in the final awardees. These criteria seek to differentiate not only the offers that respond to the best value for money, but also the most solvent bidders from an R&D&I point of view, both technically and economically. Its content is as follows:

a) List of minimum requirements applicable to determine technical or professional solvency and economic and financial solvency in the specifications or descriptive documents of the public procurement procedure. These are requirements that the contracting authority may use to assess the solvency part. The requirements are established for the different types of contracts included in the LCSP, nevertheless, others specific to the R&D&I activity of the applicant entity or organization are listed, attending to aspects purely related to the innovative nature of this, and which may be added to those described above.

b) List of selection criteria for candidates applying to participate in the recruitment procedure. These criteria may or may not be related to the minimum requirements previously established. While the former establish a minimum requirement to continue with the assessment as part of the contracting procedure, the scoring selection criteria indicate scores for each established unit (publications, patents, R&D&I projects developed, etc.). The criteria refer to general aspects of technical and professional and economic or financial solvency of the entity or organization submitting the application to participate, as well as other specific aspects of its R&D&I activity. For the latter, a degree of suitability is established for each of them according to the TRL[7] to be achieved after the execution of the service that is the object of the contract. In this way, the contracting authority may indicate those criteria that it considers most appropriate for inclusion in the corresponding section of the descriptive document or Specific Administrative Clauses.

c) Award criteria favourable to R&D&I applicable to the tenders or projects submitted by the candidates selected to participate in the procurement procedure. These criteria respond to the excellence, impact and implementation of the proposal or offer. The contracting authority may use these criteria for the assessment of preliminary proposals, research and innovation projects, final tenders, etc. It also establishes a methodology for the assessment and weighting of the award criteria used in the procurement documents based on three components (excellence, impact, and implementation).

7.5.3. Draft model of the Standard Specifications (descriptive document) subject to the Competitive Dialogue Procedure

Articles 172 to 176 of the LCSP regulate the procurement procedure through competitive dialogue, which is a tendering mechanism with negotiation. The mechanism is supervised by a special table that directs the dialogue with a group of previously selected candidates in order to develop one or more solutions capable of satisfying the needs that are object to the contract, instead of starting from a set of technical specifications drawn up by the contracting administration itself, which is of little flexibility. The solution reached through the dialogue will serve as a basis for the elected candidates to submit their offer.

The descriptive document that has been prepared aims to facilitate the development of the procurement procedure by competitive dialogue for both the administration and potential bidders. The document has been drafted on the basis of experiences of unsuccessful and successful procedures and taking as direct reference two cases subject to this contracting procedure: Santiago de Compostela WWTP (ACUAES) and Muskiz WWTP (Bilbao-Vizcaya Water Consortium). Its content is as follows:

The first part (PART A) corresponds to the Table of Characteristics, which includes provisions relating to clauses referring to:

a) **The characteristics of the contract:** the most relevant variables of the contract are listed, showing the data related to the definition and object of the contract, its necessity, the expected deadlines, the budget, etc. It also refers to the legal regime governing the contract and identifies the contracting authority tendering the file.

b) **The characteristics of the contracting procedure:** among which are those referring to the capacity to act and the accreditation of the required solvency, as well as the information regarding the documentation required to prove compliance with these prerequisites for the acceptance of participants in the dialogue process. Finally, the phases of the procedure and the deadlines foreseen for each of the phases are described.

c) **The execution of the contract after the award:** it refers to aspects related to the modification and assignment of the contract, confidentiality and data protection issues, ownership of pre-existing and derived works and products of the contract, as well as, among other issues, a series of special conditions of execution.

The second part (PART B) corresponds to the Descriptive Document. This is a specific document for this type of procedure, which replaces the Technical Specifications and Particular Administrative Clauses used in other tendering procedures.

a) In its first section, this document defines the justification, definition, and scope of the contract, as well as identifying the need to be met through the competitive dialogue procedure in accordance with the previously defined context and the justification for the use of this procedure. This builds upon the clauses described above for Part A.

b) The second section contains the clauses referring to the different phases and stages of the competitive dialogue procurement procedure, from the opening of the award procedure and sending applications for participation in the dialogue, to the award and formalization of the contract. In this section of the specifications, orange boxes refer to contents of the aforementioned document 'Guide to Public Procurement of Innovation and contracting procedure in the Public Water Administration', which will serve to guide the contracting authority in the complete tendering procedure.

c) The third and final section refers to the competent jurisdiction and the appeals that can be filed in this procedure.

7.5.4. Draft model of the Standard Specification (with specific administrative clauses) subject to the Innovation Partnership Procedure

Negotiated contract through the innovation partnership procedure is regulated in Articles 177 to 182 of the LCSP. It is a contracting mechanism whose purpose is the development of innovative products, services or works, as well as the

[7]TRL: Technological Readiness Levels (TRLs) are the building blocks of a method for estimating the maturity of technologies during the acquisition phase of a program..

subsequent purchase of the resulting supplies, services or works provided that these meet the performance levels and maximum costs agreed between the contracting bodies and the individuals.

The purpose of these standard administrative specifications is to facilitate the development of the innovation partnership procurement system for both the administration and potential participants in the procedure. The document has been developed on the basis of experiences of unsuccessful and successful procedures and having as a direct reference a single file subject to this contracting procedure: Galician Health Service (Xunta de Galicia).

7.6. ESTABLISH A TRAINING PLAN ON INNOVATIVE PROCUREMENT TOOLS

This proposal is materialized in the design and configuration of a "Training Plan in Public Procurement of Innovation and New Mechanisms of Public Procurement and Technological Innovation: Application and Experiences in the Public Water Administration".

This training plan would be aimed at all Public Administration staff involved in innovative contracting procedures. Its objective is to offer specific training in this area through MITECO's own training programme, with the aim of encouraging the use of this type of contracting mechanisms, which favour innovation, as opposed to the traditional procedures most often used by the Public Water Administration, as has been seen above.

This training plan has been developed in parallel to the DSEAR Plan, and its configuration has been based on the development of the following contents:

- A first part presenting the description of the course, which alludes to the justification of the course, its target audience, and the objectives pursued with its delivery.
- A second part concerning the description of the course: In order to make the course compatible with the daily activity of the employees and the MITECO training program, it is proposed that the training be given online or in a blended format.
- The program consists of a theoretical part (50% load) composed of two modules and 7 topics, and a practical part, composed of a single module accompanied by three workshops (50% load).
- For the telematic sessions and the on-line tutoring process, a list of experts in the field is proposed, people from the public administration sector, scientific-technical field, or private sector who develop their activity in R&D&I within and outside the water sector. The teaching proposal is made for each subject of the proposed course.
- The list of necessary training material is established, both for the teaching of the course by the teacher, and for the monitoring of the course contents by the student.

Finally, the evaluation and certification system are considered, as well as the registration fees.

03

Conclusions

The monitoring of the programmes of measures of the second cycle management plans (2015-2021) has revealed two key issues. On the one hand, a significant delay in the implementation of many of the programmed measures, with a very low rate of execution in relation to the commitments made, and on the other, a lack of execution of the basic measures, that is, priority measures in the hydrological planning and which must be considered as the instrument for achieving the minimum requirements for compliance with the obligations established by EU regulations in the field of water.

All this translates into delays in complying with legal obligations in terms of sanitation and water treatment and with respect to the objective of achieving and maintaining the good status of water bodies, making the aquatic environment a healthy, productive system capable of generating economic, environmental, and social benefits.

As a result of the above, the Ministry for Ecological Transition and the Demographic Challenge, through its General Water Directorate, has prepared the National Plan for Water Treatment, Sanitation, Efficiency, Savings and Reuse (DSEAR Plan), with the aim of reviewing in depth the intervention strategies defined in the current second cycle RBMPs, at the time of addressing the preparation of the management plans of the third cycle (2022-2027).

The Plan makes a critical diagnosis of the problems associated with the water treatment and sanitation measures that are currently the responsibility of the CG, with reference to administrative cooperation with other competent administrations, and the reasons for the delay in the execution of the basic measures of the plans; and proposes a set of actions to be carried out by the CG to resolve the above.

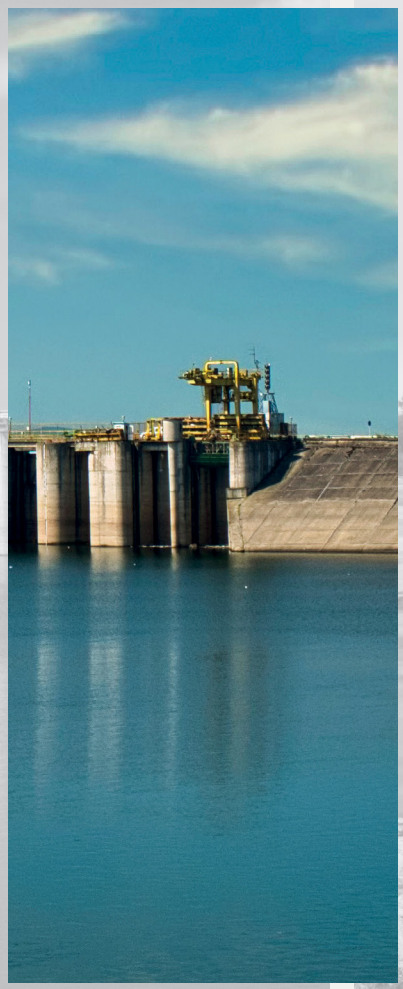
On the other hand, the Plan aims to promote water reuse, considering it a key element in the achievement of a circular economy, also promoting water savings under the conviction that an adequate management of demand is preferable to a policy of increasing the resources to be used. The climate change scenarios we face make this an unavoidable issue.

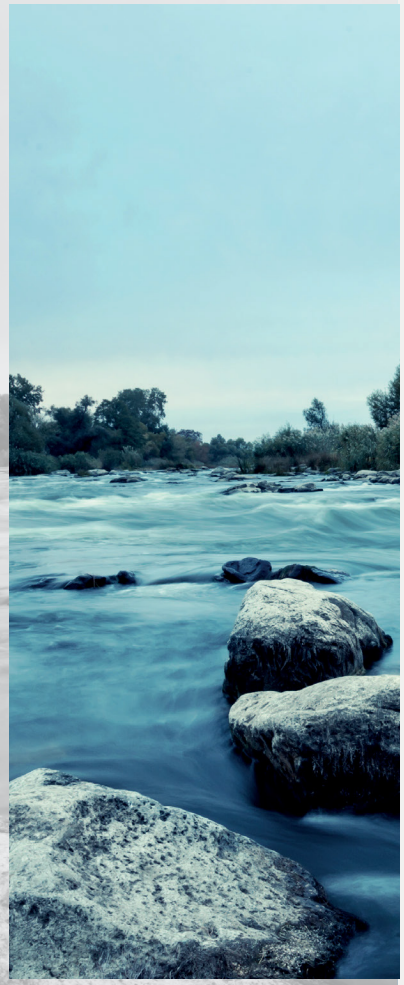
The DSEAR Plan is a governance instrument for third-cycle management plans to incorporate improved procedures and well-aligned work methodologies to achieve compliance with the objectives of hydrological planning. The aim is to make progress in resolving strategic problems detected after two planning cycles, complying with the Water Framework Directive, and meeting the obligations that correspond to the Kingdom of Spain as a Member State of the European Union without further delay. In this way, the proposals of the DSEAR Plan seek to be part of a comprehensive response from the new water policy, contributing to a sustainable management of wastewater treatment and sanitation, and providing transparency and rationality to the scenarios in which this management is conducted.

04

References

- Spanish Association of Water Supplies and Sanitation / Spanish Association of Water Services Management Companies (AEAS / AGA) (2018). ***XV National Study. Drinking Water Supply and Sanitation in Spain.***
- International Environmental Association of Odor Managers (AMIGO): Basic Guide to Odor Management. November 2019 ISBN: 978-84-09-16239-0
- European Commission (2019): **The European Green Deal. Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions.** COM (2019) 640 final.
- Government of Spain (2020): **Recovery, Transformation and Resilience Plan**. Spain Can. Presidency of the Government. Madrid.
- Spanish Ministry of Agriculture, Food and the Environment **Innovation and research in the water sector. Strategic lines.** General Water Directorate.
- Spanish Ministry of Agriculture, Fisheries, Food, and the Environment (2016): First evaluation of the suitability of the instruments for *recovering the cost of water services in Spain*. General Water Directorate Unpublished report.
- Spanish Ministry of the Environment, Rural and Marine Affairs (2010): **National Water Reuse Plan. Preview**. General Water Directorate
- Ministry for the Ecological Transition (2018a): **Synthesis of Spanish water plans. Second cycle of the WFD** (2015-2021). Technical General Secretariat. Publications Center. NIPO: 013-18-124-7.
- Ministry for the Ecological Transition (2018b): Guidelines, programme of work, timetable and formulas for participation. Version for public consultation: Spanish National Wastewater Treatment, Sanitation, Efficiency, Savings and Reuse Plan (DSEAR Plan)
- Ministry for the Ecological Transition (2019): **Monitoring report of the RBMPs and water resources in Spain**. Year 2018. Draft.
- Spanish Ministry for Ecological Transition and the Demographic Challenge (2020a): **Integrated National Energy and Climate Plan 2021-2030.**
- Ministry for the Ecological Transition (2020b): **Spanish Circular Economy Strategy.** Circular Spain 2030.
- Spanish Ministry for Ecological Transition and the Demographic Challenge (2020c): **Green Paper on Water Governance in Spain.**
- Setuáin Mendía, B. (1998): T*he legal regime for wastewater: Perspectives of the Autonomous Community of Aragon.* Zaragoza. Egido D.L. ISBN: 84-89714-25-8.
- Setuáin Mendía, B. (2002): *Wastewater Sanitation in Spanish Law: Legal Regime.* Lex Nova, 2002. ISBN 84-8406-346-1. Publication of the doctoral thesis of the year 2000, directed by Dr. A. Embid Irujo (University of Zaragoza).
- Court of Auditors (2014): **Audit report of the direct management agreements in force between the WATER SSEE and the Ministry of the Environment and Rural Land Marine Affairs during the years 2010-2011.**





GOBIERNO DE ESPAÑA
MINISTERIO PARA LA TRANSICIÓN ECOLÓGICA Y EL RETO DEMOGRÁFICO
SECRETARÍA DE ESTADO DE MEDIO AMBIENTE
DIRECCIÓN GENERAL DEL AGUA