

CASE STUDY:

Canal de Isabel II.

Accelerating the implementation of
SDG # 6 of the 2030 Agenda.



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Canal de Isabel II.

Accelerating the implementation of SDG # 6 of the 2030 Agenda.
Subdirección de Estudios y Programas. Secretaría General Técnica.
Canal de Isabel II, Comunidad de Madrid, 2023.

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The report Accelerating the implementation of SDG #6 OF THE 2030 Agenda is an accomplishment of Canal de Isabel II.

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Infographics: Canal de Isabel II

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Canal de Isabel II

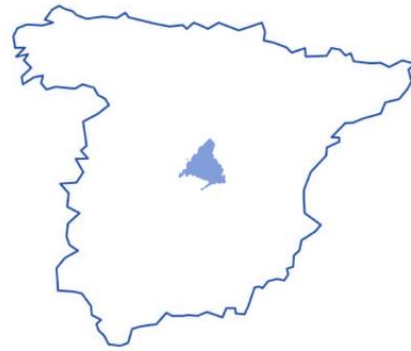
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Where do we stand?



The Madrid Region is one of the 17 Autonomous Communities that make up Spain. It is the most densely populated region and is home to the capital of Spain, the city of Madrid, the seat of the central government and the country's main economic and financial institutions

Madrid Region in figures

- 6.8 million inhabitants
- 8,073 km² in area
- 179 municipalities
- 13 reservoirs
- 14 drinking water treatment plants (DWTP)
- 493.50 hm³ of water derived for consumption
- 17,814 km. of supply networks
- 156 wastewater treatment plants (WWTP)
- 14,992 km. of sewerage networks
- 741 km. of reclaimed water network

Canal de Isabel II and the Agenda 2030

Canal de Isabel II is a 100% public company of the Region of Madrid created in 1861, whose shareholders are the Government of Madrid, as majority shareholder through the Public Entity Canal de Isabel II with 82.4%, and one hundred and eleven of the municipalities of the region with the remaining 17.6%. It currently reports to the Regional Ministry of the Environment, Territorial Planning and Sustainability.

Canal de Isabel II's mission is to manage the integral water cycle in the Region of Madrid. The cycle consists of two main phases, supply, and sanitation, which correspond to the actions necessary to bring drinking water to consumers and the collection and treatment of wastewater.

A third phase can be added to this cycle, which is the reuse of wastewater after appropriate treatment to guarantee its sanitary characteristics, which can be used to irrigate gardens, clean streets, water sports areas and even for industrial use. Canal de Isabel II currently manages all the phases and stages of management.

As the company responsible for the integral water cycle, since its creation 170 years ago, Canal has the mission of guaranteeing the water supply and promoting the social and economic development of the Region of Madrid, actively contributing to the protection and improvement of the environment, promoting the circular economy and the sustainable management of all its operations. All of this is based on transparency in management, efficiency, and sustainability.

Due to its size and population supplied, Canal de Isabel II is the largest public operator of the integral water cycle in Europe and one of the largest worldwide, leader not only in water management but also in energy production, innovation, or waste reuse, among others.

The Region of Madrid, through Canal de Isabel II, is actively committed to the global sustainable development initiatives promoted by the United Nations. In this regard, since 2015, Agenda 2030 has become the company's roadmap to achieve compliance with the 17 Sustainable Development Goals in 2030, positioning the Region of Madrid as one of the most sustainable regions in the world in terms of water management.

You can learn more about Canal de Isabel II and the integral water cycle in the Region of Madrid at the following link:

<https://www.canaldeisabelsegunda.es/ciclo-del-agua>

2018-2030 Strategic Plan

Sustainability is one of the five values on which Canal de Isabel II's Strategic Plan is based. The year 2030 is a date that is marked on the calendar of all the employees that form part of Canal, as it is the deadline to respond to the most important universal call of the 21st century regarding the main problems that compromise the future development of the planet. The 17 Sustainable Development Goals and their 169 targets are the compass for all public and private companies, nations, and governments, and society in whole, to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030.

The 2018-2030 Strategic Plan also sets 2030 as the deadline for the most ambitious roadmap in its history to meet these challenges, which a public company that manages a basic resource for the life and development of millions of people never imagined it would face: water shortages, extreme weather phenomena and population increases, among others.

The launch deployment of the Strategic Plan in 2018 marks the beginning of the deployment by Canal of 10 Strategic Lines, aligned with the work conducted by the Region of Madrid, each one of which was created to respond to the great challenges of modernisation and sustainability that a benchmark company in its sector must achieve. To this end, Canal defines a mission:

"We care for our Region by managing everyone's water with transparency, efficiency and sustainability".

Thanks to the core values on which the company is based: commitment, proximity, transparency, excellence, and sustainability, it manages with the resources of all, a common good of which it wants to continue to be proud for the more than 6 million Madrilenians who daily turn on their taps to get the water of Madrid, Canal's water.

Not only because of its impact on the population, but also because of its 100% public nature and vocation, Canal, following in the footsteps of the Region of Madrid, reflects in its Plan its faithful commitment to the 17 SDGs through its more than 100 actions, 45 plans and 10 lines that, with the Strategic Plan, will be fulfilled in 2030. It is therefore Canal's responsibility to ensure the sustainability of its activities.



The 10 Strategic Lines and the 5 values of Canal de Isabel II

SDG # 6: to ensure availability and sustainable management of water and sanitation for all.

TARGET 6.1 By 2030, to achieve universal and equitable access to safe and affordable drinking water for all by 2030

TARGET 6.2 By 2030, to achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and people in vulnerable situations

TARGET 6.3 By 2030, to improve water quality by reducing pollution, eliminating dumping, and minimising the release of chemicals and hazardous materials, halving the proportion of untreated wastewater, and significantly increasing recycling and safe reuse globally

TARGET 6.4 By 2030, to significantly increase the efficient use of water resources in all sectors and ensure the sustainability of freshwater withdrawals and supplies to address water scarcity and significantly reduce the number of people suffering from water scarcity

TARGET 6.5 By 2030, to implement integrated water resources management at all levels, including through transboundary cooperation, as appropriate

TARGET 6.6 By 2020, to protect and restore water-related ecosystems, including forests, mountains, wetlands, rivers, aquifers, and lakes

TARGET 6.a By 2030, to scale up international cooperation and support to developing countries for capacity building in water and sanitation activities and programmes, such as water harvesting, desalination, water efficiency, wastewater treatment, recycling, and reuse technologies

TARGET 6.b To support and strengthen the participation of local communities in improving water and sanitation management.

Implementation of the 17 SDGs by Canal

The SDG integration process at Canal de Isabel II applies the United Nations methodology, starting with a first phase of understanding and awareness of the 17 Sustainable Development Goals within the organisation. Undoubtedly, this first stage is key to engage everyone in the company with the 2030 Agenda.

Likewise, the goals on which the company has a direct impact have been analysed and assessed to prioritise their implementation. Stakeholders are decisive for the real and effective achievement of the SDGs. Thanks to the participation in working groups with other companies in the sector at European level and in Latin America, as well as the holding of workshops with its own employees and shareholders, Canal was able to draw up a first map with the Sustainable Development Goals that have the greatest impact.

Without forgetting the rest of the SDGs, targets were established for each of them, selecting the appropriate indicators for their monitoring, which are part of Canal's 2018-2030 Strategic Plan. This whole process culminates with the regular communication of the quarterly progress results for each of the goals.

The synergies that the activity of the water cycle itself produces in the economy and society are the perfect scenario to globally demonstrate the transversality of water in the 2030 Agenda and its Sustainable Development Goals.

Finally, the irruption of COVID-19 has meant an additional and unexpected challenge for everyone. At Canal de Isabel II, following the guidelines of the Region of Madrid and its health authorities, the pandemic was faced from the beginning with the objective of guaranteeing the health and safety of the workers and employees as well as ensuring the water supply to all the people of Madrid.

From the point of view of sustainability, this situation has further highlighted the interconnection with other Sustainable Development Goals such as Health and Wellbeing (SDG 3) thanks to the collaboration with the Madrid Region in the development of an early warning tool on the presence of genetic material of the SARS-CoV-2 virus in wastewater or the fight against poverty (SDG 1) through the social rebates on bills approved for people economically affected by COVID-19.

In short, this cross-cutting integration of the 17 SDGs, beyond the mere fulfilment of all their targets, seeks to increase the positive impact of water on the economic and social development of the Region of Madrid.

Main projects

For this case study, we have chosen from among the more than 100 projects and lines of work of Canal, those that are most emblematic and that, by theme, are directly related to SDG 6.

You can consult the rest of the projects that are part of Canal's Strategic Plan and that have a connection with the rest of the Sustainable Development Goals on the website in the section OUR STRATEGY, as well as the quarterly results that are published periodically:

<https://www.canaldeisabelsegunda.es/quienes-somos>

1. Ensuring security of supply

Objectives and description

The Madrid Region is characterised by its geographical situation and the scarcity and limitation of its water resources.

In addition to being an essential good, water in adequate quantity and quality is a fundamental element for the wellbeing of the citizens and the sustainable development of the region.

Since its origins, Canal de Isabel II has developed action plans capable of guaranteeing supply in scenarios of population growth and drought, comprehensively managing the resource from adduction to treatment, including the protection of the ecosystems on which the water supply depends.

Faced with the challenges of water stress that may arise because of climate change, it is necessary to anticipate so that, even with different precipitation regimes than those known to date and a moderate increase in population, the current level of guarantee can be maintained or improved.

It is estimated that, in 2030, the Madrid Region will reach a population of close to 8.5 million inhabitants, as well as a greater pressure from the seasonal population. Canal must be able to respond to their demands. In this sense, the objective is to reduce per capita consumption by 25% in 2030, reaching 156 litres per inhabitant per day. This indicator currently stands at 202.7 litres per inhabitant per day.

Thanks to the implementation of this strategic line, it is possible to have an impact on water consumption thanks to the three plans that articulate it:

- Efficient use of resources.
- Increase in reused water.
- Efficient management of demand.

Relationship with the targets of SDG # 6

Ensuring the guarantee of supply to the current and future population of the Region of Madrid is directly related to the targets: 6.1 for access to drinking water; 6.4, to increase efficiency in the use of water resources; 6.5, for the implementation of a successful supra-municipal model that reflects an integrated management of water resources at all levels, and 6.6, to protect the ecosystems in the places where Canal's activity takes place. Finally, thanks to our international cooperation activity and the exchange of knowledge and good practices with other companies in the sector, this strategic line is also related to targets 6.a and 6.b.

Challenges

The main challenges faced by the Madrid Region and Canal to meet its 2030 target are mainly related to demand management. Faced with a growing population, water consumption is a variable that is difficult to manage due to the increase in new urban development projects due to the attraction of population and economic activity in the capital of Spain. But climate change is also showing its wildest face in recent years, with the appearance of extreme weather phenomena such as droughts, snowfalls or episodes of torrential rains that assess Canal's capacity to efficiently manage a resource that, in addition, is increasingly limited. An example of this is that, in recent years, the natural water inflows in our reservoirs have been reduced by 20% compared to the average of the last 30 years.

Lessons learned

Recently, it has become clear how unpredictable the weather is, which has a major impact on the objectives. Despite the efforts that have been made, dependence on the weather makes resource management increasingly demanding. Over time, it has been demonstrated that a balance between its three main lines of action (efficient use of resources, reclaimed water, and demand management) is essential to meet the objectives.

In addition, water consumption in the municipalities of the Region of Madrid has been strongly affected by the pandemic. Due to the severe confinement in the first half of 2020, consumption experienced a sharp decline caused by the drop in commercial and industrial activity. In the second half of the year, as many more citizens of the Madrid Region stayed within the region during the holiday period, weekends and various long weekends and holidays, consumption increased exponentially compared to similar periods. For this reason, the system must be flexible enough to deal with exceptional situations and changes in consumption patterns.

Results

In the last year, Canal de Isabel II has managed to consolidate the work conducted in all the areas of action involved in this strategic line, despite the difficulties experienced in 2020. The Region of Madrid, through Canal, has made a significant effort in the implementation of actions aimed at improving efficiency in the use of water resources. These actions have produced savings of more than 18 hm³. Among these actions is the continuous fight to reduce uncontrolled water, especially leaks, keeping real losses below 2% of the water derived.

In the field of reclaimed water, Canal had 33 reclaimed water production plants (tertiary treatments) with a capacity to produce 395,493 cubic meters per day. Thanks to the reclaimed water produced, 2,893 hectares are currently

irrigated: in 401 municipal green areas in the region (1,876 ha), in 11 golf courses with a total surface area of 789 hectares and in 13 companies and entities that have the reuse service (228 ha).

Canal continues to strive to improve efficiency through leak detection campaigns, pressure management in the network, the fight against fraud, the regularization of some municipal supplies and communication and awareness campaigns on the rational use of water. It is estimated that the combination of all these efforts and the implementation of the RED Plan throughout 2022 would have avoided the consumption of 18.3 million cubic meters of water, equivalent to 3.7% of the water derived for consumption in 2022 or the water needed to supply 244,213 people for one year.

The balance of these factors has allowed the total volume of water derived for consumption in 2022 to be 493.50 million cubic meters, practically the same as the average of the previous five years, despite an increase in the population in recent years, which has made it possible to meet the strategic objectives.



Water saving campaign (2022): " Ahorra agua con Isabel, la del 2.º".

2. RED Plan

Objectives and description

Water in the Madrid Region has always been characterised as a benchmark for quality in Spain. However, demographic pressure and society's growing awareness, together with the current and future increase in regulations, pose the challenge of satisfying ever greater demands.

It is true that raw water is exceptionally good at source; however, it must undergo advanced treatments and controls to maintain and improve its quality. Control of the quality of the water supplied begins at source, in the Sierra de Madrid, a protected area where a wide variety of natural ecosystems coexist and where Canal must face increasing pressure and reduced availability of the resource due to climate change. It is also essential to preserve its quality within our distribution networks, for which we must continue to modernise them, introducing new technologies, and make progress in the monitoring and response systems, in order to ensure the quality of the water up to the point of consumption.

In addition, some of the different materials that were used more than 30 years ago to develop the more than 17,000 km of Canal's distribution network are of a lower quality than those installed today.

With these premises, the RED Plan was born, which aims to renew 100% of the pipelines in accordance with the Canal's technical standards by 2030. The objective is to replace a total of 1,200 kilometers of pipelines with others made of more modern and break-resistant materials to continue guaranteeing the excellence of drinking water and prevent leaks in 163 municipalities. The first phase of this Plan is already underway with an investment of 350 million euros over the next four years.

In addition, in recent years our network renewal actions were in the range of 100 to 120 kilometers per year, but in 2022, the effective start-up of the Plan was carried out, which meant that the kilometers renewed almost doubled with respect to our historical average, reaching 190.

Relationship with the targets of SDG # 6

The Red Plan is directly related to the targets: 6.1, for access to drinking water; 6.4, to increase efficiency in the use of water resources; 6.5, for the implementation of a successful supra-municipal management model; and 6.6, to protect the sources of supply at the source.

Challenges

Canal de Isabel II's supply network has been designed under a set of regulations that have evolved over the years. Therefore, some materials used in the past have become obsolete and it has been proven that they affect the

quality of the water distributed. The main challenge of this plan is to address the renovation of an important part of the network in order not to compromise the safety and quality of the supply. The other challenge is to commit the municipalities, which are legally responsible for supply, to conduct all the planned renovation work. The aim is therefore to increase the rate of annual network renewal, which will not only improve water quality, but also the continuity of service.

Lessons learned

For a correct fulfilment of the Plan, the planning and coordination of actions is vital, so that unforeseen events that may arise do not hinder the execution of the project.

Results

Pipe renewal continued in 2022, with 83.54% of the network meeting internal high quality standards. The rate of renewal over the last five years represents an average of 120 kilometers of network per year.

This Plan is evolving on a positive trend with the clear objective of reaching 100% of the network under the Canal's internal standard by 2030.

In this way, the performance of Canal's distribution network will continue its decreasing rate of breaks per kilometre of network.

3. Sanea Plan

Objectives and description

Having adequate systems for the collection of wastewater and rainwater from urban centers through efficient sewerage networks and urban drainage systems is a vital element for guaranteeing the quality of life of citizens. However, the current reality is that many of the municipal sewerage networks, many of which have been incorporated into Canal's management in recent years, require major improvement works which, in turn, require a considerable technical and investment effort.

To respond to these problems, the 2019-2030 Strategic Plan of Canal de Isabel II incorporated the Sanea Plan, an ambitious plan whose main objective is to improve the sewerage networks of the municipalities of the Community of Madrid to make them the most efficient and modern in our country, ensuring water sanitation in a sustainable manner and avoiding overflows in the drainage systems. By means of this Plan we want to ensure that all the municipalities in which we provide sewerage maintenance services have sewerage and urban drainage master plans, documents in which the necessary measures and actions are established, setting the priorities of the actions to renew the networks and estimating the investments that will be necessary to avoid incidents and inconveniences to users, as well as to contribute to the protection and improvement of the environment.

Relationship with the targets of SDG # 6

This Sanea Plan is directly related to the targets: 6.2, to not only guarantee sanitation for the entire current population, but also for future generations thanks to a more modern and efficient network; 6.3, regarding the implementation of the latest technology to favour a more efficient purification process; 6.5, for the extension of a management agreement for all municipalities, and 6.6, for the optimisation of the collection of wastewater and rainwater to minimise the effects of extreme rainfall events on the different ecosystems present in the Region of Madrid. Finally, this programme is also related to target 6.b. since, through the municipal master plans, the participation of local communities in the improvement of water and sanitation management is encouraged.

Challenges

Canal de Isabel II faces the challenge of achieving a more direct and fluid relationship with the local councils to improve the services it provides. The great difficulty arises when negotiating the agreements with each of the town councils as, in some cases, the people in charge of decision making have changed due to electoral processes.

In addition, the financing of this programme by means of a supplementary fee allows the municipalities to pass on the cost in the water bill, thus spreading the payment over several years and softening the impact on the finances of the municipalities and their citizens.

Lessons learned

The lesson learned refers to the management of the process. To this end, a specific regulatory framework has been created (Law 17/1984, Decree 137/1985 and Bases Reguladoras de los Convenios del Plan Sanea) and Canal has taken on the preparation of the sewerage master plans, establishing by common agreement with the local councils the criteria for the planning, execution and financing of the works defined according to the priorities identified in the master plan. Finally, the development of the plan is facilitated by the financing of the works by Canal until the real cost of the works agreed to be undertaken is fully recovered, which may be done in terms of up to thirty years.

Results

In the five years between the start of the Sanea Plan and the end of 2022, a total of 33 town councils with a population of 1.25 million inhabitants in our region had adhered to the Plan. This means that investments worth 374 million euros have already been committed, which will enable 569 actions to be carried out to renew 293 kilometers of municipal sewerage networks.

It should be remembered that the sewerage agreements predate the definition of the Sanea Plan, although this strategic programme aims to promote the incorporation of all the municipalities in the Region of Madrid.



4. Social fees

Objectives and description

Poverty goes beyond a lack of income and resources to ensure more sustainable livelihoods. Poverty is a human rights issue. The different manifestations of poverty include hunger, malnutrition, lack of decent housing and limited access to other basic services such as education or health. Canal de Isabel II, following the guidelines of the competent bodies of the Region of Madrid, is aware of this problem, and has therefore created in recent years new formulas to subsidise the tariff that may affect the most vulnerable groups.

Canal's objective with this Plan is to promote social work directly related to the daily activities of the company, such as the application of the social tariff to the groups that need it most. In addition to this social aid, the project contemplates the study and implementation of new social fees that can be extended to vulnerable groups that may benefit from them in the future.

At present, the following groups can benefit from Canal's social fees:

- Recipients of a widow's or widower's pension.
- Large families or households.
- Non-profit organisations owning community housing or supervised flats.
- Beneficiaries of a non-contributory pension.
- Beneficiaries of the minimum insertion income.
- Beneficiaries of the active insertion income.
- Recipients of the minimum living income.

And, of course, all people in a situation of special exclusion with a certificate by their social worker.

Relationship with the targets of SDG # 6

Canal's social bonus programme is directly related to target 6.1, to achieve universal access to water supply without limiting the quality of life of some people who do not have the economic capacity of the rest. In addition, this project is also connected to SDG 1 of the fight against poverty, due to the desire to support the most vulnerable groups, where Canal's social workers are directly involved in the entire management process to support and include the beneficiaries in the aid programme. In addition, it is also linked to target 6.b as the approval of the fees depends on the Region of Madrid, with a mandatory report from the Consumer Council, a body in which the Region of Madrid, local councils, consumer organisations, business associations and trade unions are represented.

Challenges

The main challenge of this plan is to adopt a new model that ensures sustainable, affordable, and solidarity-based fees, simplifying and adapting the tariff structure to new standards that allow rational and optimised demand management. In addition, with advanced consumption analysis, valuable services can be offered to customers, such as adapting consumption to the tariff and tariff to consumption.

You can consult in detail Canal's entire rebate system on the website: <https://www.canaldeisabelsegunda.es/clientes#bonificaciones>

Lessons learned

More and more groups are benefiting from some kind of social rebate or assistance in their fees. Without going any further, during the last year, due to the pandemic, many companies, freelancers, and individuals affected by a temporary lay-off were the groups that most benefited from the social fees thanks to the aid programme that Canal created at the beginning of the coronavirus crisis.

Results

During 2022, we subsidized a total of 61,651 contracts, 3.91 % of Canal's total contracts with its customers, which means that 260,277 people were benefiting from our social tariffs at the end of 2022 (in some months of 2022, the number exceeded 262,000). The number of beneficiaries has grown by 24% since the start of the 2018-2030 Strategic Plan until 2022.

5. Reused water

Objectives and description

Canal de Isabel II considers that the reuse of treated wastewater is an essential component of the integral management of the resource, as it contributes to the net increase of water availability in the region. For this reason, since 2005, Canal has developed at an increasing rate its activity of distribution of reclaimed water for facilities that do not require drinking water, especially for industrial uses, street cleaning or the irrigation of public parks.

Thanks to water reuse, it is possible to increase the volume of available resources without diverting more water for consumption and without increasing the reservoir capacity. For this reason, extending and promoting the consumption of reclaimed water is a strategic objective for Canal.

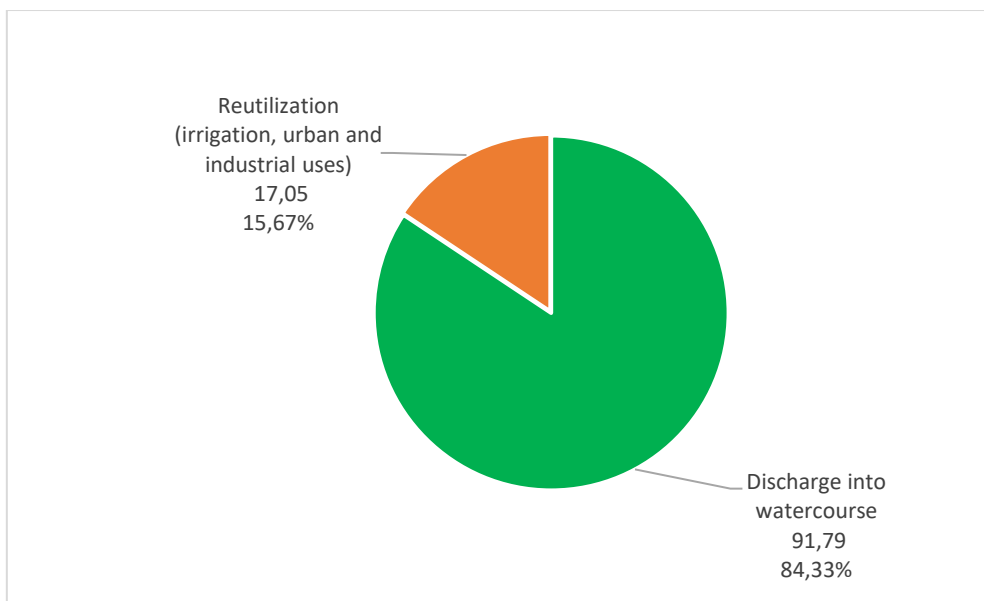
The objective of this plan is to increase the volume of reclaimed water produced and distributed, extending, and promoting its use in the Region of Madrid, thus preserving the natural resource at its source.

Relationship with the targets of SDG # 6

The production of reclaimed water is linked to target 6.1 to achieve greater water availability, given that reclaimed water can be used for other purposes, avoiding the use of drinking water. With target 6.2, because it contributes to an improvement in the treatment of wastewater, increasing the quality of the treated water discharged into the river. With target 6.4, because it is a tool for efficient resource management, limiting the use of drinking water. In addition, thanks to the benefits that higher quality water returned to rivers has on the ecosystems of the Region, it is related to target 6.6. Furthermore. By involving different agents such as local councils, companies, or different industries, we can link it to target 6.b.

Challenges

In addition to the current uses of reclaimed water, new uses will be added in the future, due to the pressure that climate change is exerting on the available resource. As reflected in the European Union's Green Pact, reuse is one of the main axes and for this reason new uses for reclaimed water that comply with the demands of the regulations and health and safety requirements are being analysed



Reclaimed water production in 2022

Lessons learned

The increase in the production of reclaimed water is undoubtedly an ambitious plan with positive synergies not only for the environment but also for the economy and industry. For some time now, reclaimed water has been supplied to industries such as paper mills and golf courses, as well as being used by street cleaning services and for watering parks and gardens. However, the authorisation of new uses for reclaimed water by the competent authorities is necessary to extend its use to other sectors and companies. However, it is not yet a competitive resource in terms of price, which is sometimes an impediment to its use.

Results

Canal manages 33 reclamation plants, 741 kilometers of reuse networks and 64 reclaimed water reservoirs. With these infrastructures, we serve 26 municipalities and 11 golf courses (789 hectares), as well as one industry (International Paper) and 13 other entities (228 irrigated hectares). Thanks to the agreements signed with the municipalities, 401 municipal parks and green areas in the region will be irrigated with reclaimed water by 2022.

During 2022, we regenerated for subsequent reuse the largest amount ever recorded, reaching a total of 17.05 million cubic meters of water, beating our previous record recorded in 2021 (16.08 hm³), Additionally, a total of 91.79 million cubic meters of regenerated water was discharged into riverbeds to improve the quality of their water bodies. The reused water consumed in 2022 is equivalent to 3.45 % of the total potable water consumption in the region. In the last 10 years (from 2013 to 2022), 137.5 million cubic meters of reclaimed water have been reused in the Community of Madrid, equivalent to slightly more than the capacity of the Valmayor and Navacerrada reservoirs combined.



Reused water production in m³

5. Early warning system (VIGÍA)

Objectives and description

The appearance of the SARS-CoV-2 coronavirus causing the COVID-19 pandemic had a major impact on the health of the people of Madrid, which resulted in heavy pressure on the health system of the Region of Madrid.

As a tool to support the management of the pandemic, the Region of Madrid has entrusted Canal de Isabel II with the development of a tool for the detection of the virus in wastewater through the quality controls conducted in Canal's extensive sewerage network.

For this reason, "VIGÍA" has been developed, a system with 290 sampling points in different parts of the region to track and monitor the presence of genomic chains of SARS-CoV-2 in wastewater.

But the objective of this system is not only to track the coronavirus but also to establish itself as a permanent laboratory for the detection and monitoring of other diseases that may occur in the sanitation network of the Region. Canal will also be able to share its experience with other regions and countries where mass clinical tests are difficult to perform, thus reducing costs and time in decision making to eradicate other infectious diseases.

Relationship with the targets of SDG # 3 and # 6

The creation of an early warning system such as VIGIA is directly related to SDG 3 because of its great impact on the lives and health of citizens, becoming a working tool used by the health authorities of Madrid to adopt the measures to fight the epidemic required by the epidemiological situation of the municipalities and health areas of the region.

It is also directly related to target 6.2 on achieving access to adequate and equitable sanitation and hygiene services for all and ending open defecation, paying special attention to the needs of people in vulnerable situations. By having decent sanitation and hygiene systems in place, it is possible to track the most critical areas and support early detection and prevent the possible spread of a virus by developing appropriate measures

Challenges

The main challenge of this system has been to locate the sampling points in the optimal areas to achieve the maximum possible representativeness and minimise errors. For this reason, it was decided that the maximum distance between the sampling point and the centre of the population should be less

than 3.5 km and that the distance between the final discharge point of the population and the sampling point should be less than 2.5 km.

In addition, as this system has been permanently incorporated into the company's processes, new challenges arise such as the detection of new strains or the monitoring of other diseases present in the wastewater.

Lessons learned

The virus is usually not active in wastewater. What is found are traces of the virus. Due to the variability of virus residues that a person excretes (which depends on the intensity of their infection) there is no direct relationship between values found in sewage and infected persons. Therefore, we work with trends, which are comparable.

Different testing methodologies and laboratories give different results for the same sample, so it is necessary to standardise the values to make them comparable. For this reason, a screening task for statistically outliers was conducted to avoid methodological flaws in both sampling and analytical processes.

On the other hand, it is also necessary to analyse the contamination values in the wastewater to ensure that the values obtained correspond to a normal wastewater discharge and to avoid data with extraordinary discharges. If this is not the case, the sample is repeated the following day.

It has also been found that when it rains the sample is diluted, so it is necessary to normalise the results based on the contamination data or repeat them the following day if a day without rain is expected.

Results

The information obtained in "VIGIA" is used by health authorities as a tool in the adoption of relevant measures to fight the pandemic.

In 2002, given the evolution of the COVID-19 pandemic, the frequency of sampling of wastewater related to SARS-CoV-2 has been reduced. As of April, the frequency of updating the presence map has been changed to monthly. However, a reduced network is maintained which, on a weekly basis, performs these same analyses as an early warning indicator and whose results are currently still published in the weekly report format.

Since its inception, Vigía has aroused the interest of institutions such as the United Nations or the European Union; of medical events such as the World Pandemics Forum; of dozens of relevant scientific publications such as The Lancet or Environmental Research, among others. As a result of this interest,

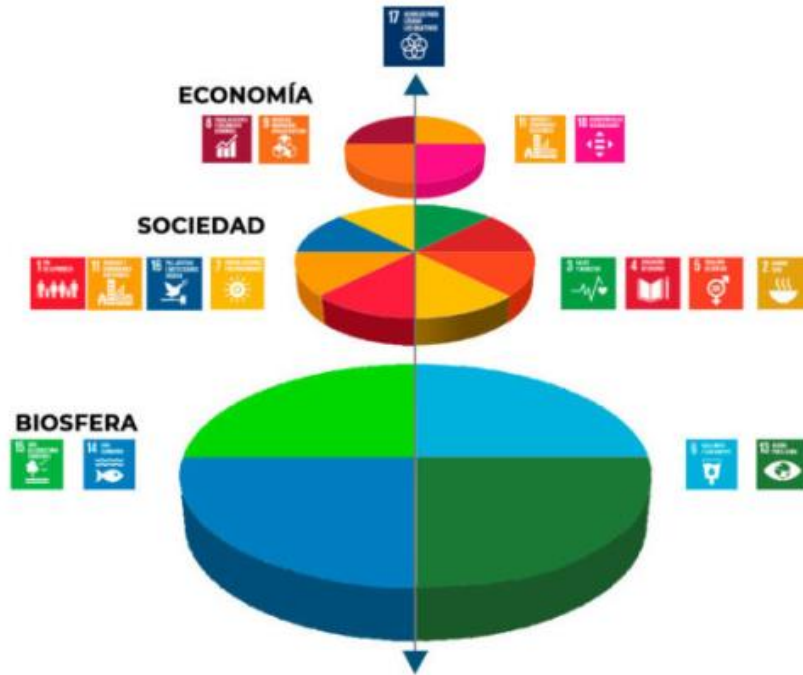
Canal de Isabel II was chosen by the EU-WOP program to develop the Watch System for tracking, monitoring and early warning of COVID-19 in wastewater in the metropolitan areas of Lima and Callao, which have more than nine million inhabitants and are managed by the Peruvian state-owned company SEDAPAL. In 2022 we have continued to develop this project, highlighting the visit made to our company in November by a delegation of SEDAPAL project managers.



Visit of the SEDAPAL delegation to the Majadahonda laboratory

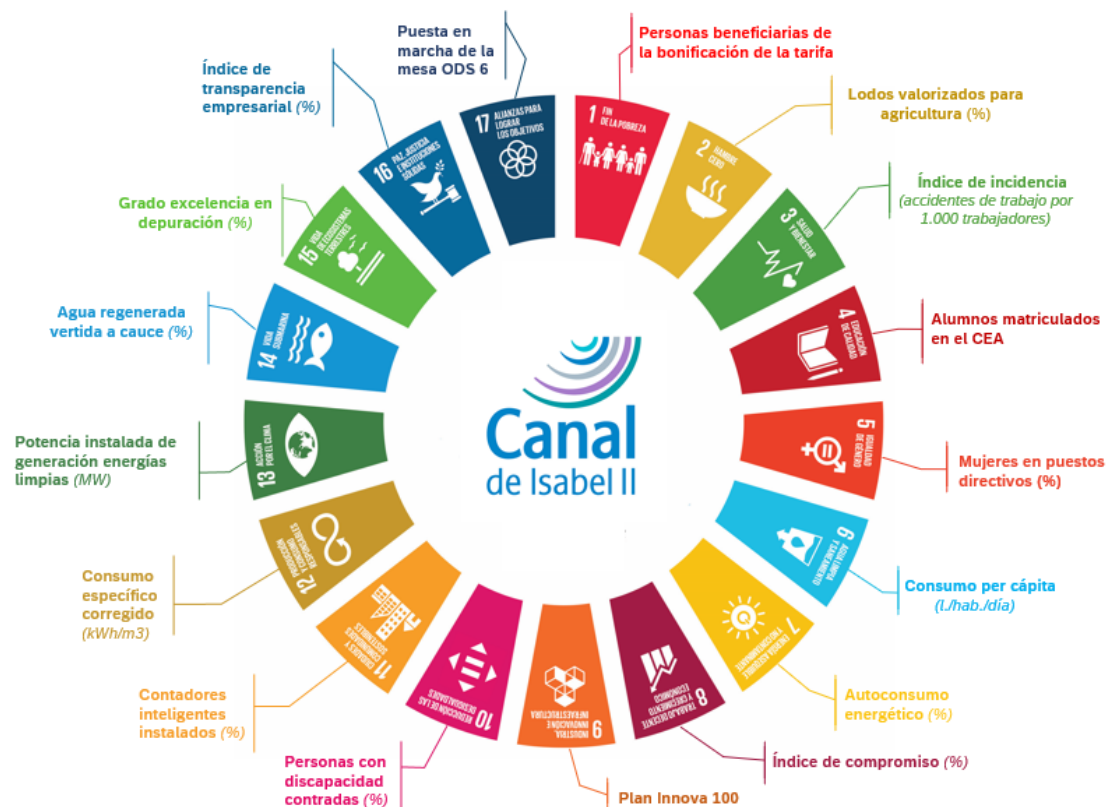
Linkage with other SDGs

The role of water as a major accelerator on the road to achieving the SDGs contributes in an integral way to the sustainable development of the other lines of action through its impact on hygiene, health, education, equality, livelihoods, and food. Water is a vital resource for sustainable development, and, for this reason, it has become one of the pillars underpinning the United Nations 2030 Agenda.



The 3 pillars of Agenda 2030

The strategy of the Region of Madrid to comply with the United Nations 2030 Agenda goes beyond the achievement of the Sustainable Development Goals directly related to Canal's own activity. As a public company that provides an essential service and due to the cross-cutting nature of water with the rest of the SDGs, Canal de Isabel II established from the outset an interconnection with the 17 SDGs through the deployment of the 10 strategic lines of its 2018-2030 Plan, working together and following the guidelines of the Region.



Example of certain SDG-related Canal's Monitoring Indicators

Thanks to the efforts in the 10 lines of work of the Strategic Plan, the 17 goals can be connected in a cross-cutting manner, through more than 45 plans and 100 actions that have been implemented. All progress is monitored on a quarterly basis thanks to the more than 50 indicators that have been developed to measure the degree of compliance, aligned with the United Nations indicators for the 2030 Agenda.

This measurement of Canal's contribution to the SDGs is conducted through a proprietary monitoring tool, which allows real-time consultation of the degree of compliance with each SDG based on the associated performance indicators.

All results are published on Canal's website on a quarterly basis and reports are prepared with the main achievements and progress of each of the actions that comprise Canal's Strategic Plan. In addition, this commitment to the SDGs also translates into a part of Canal's staff salary, as it is linked to the fulfilment of the objectives of these plans.

Conclusions

The accelerated evolution and transformation of society has generated new challenges in all sectors in recent years, especially in the water sector. Climate change, the circular economy and technological development represent new opportunities for progress and advancement, but at the same time, given this global perspective of accelerated growth, it is more necessary than ever to ensure the sustainability of social, economic, and environmental development.

The integration and interconnection of all the Sustainable Development Goals is essential for the real fulfilment of the 2030 Agenda. For this reason, it is necessary, in this decade of action, to accelerate the implementation of more ambitious projects to achieve a stronger impact. This call to action by the United Nations is driven by 5 accelerators: financing, information, capacity building, innovation, and governance.

In this regard, and to promote the fulfilment of the 17 SDGs, the Region of Madrid, through Canal de Isabel II, will implement an investment of 1,700 million euros during the period 2020-2030. This investment programme not only involves the modernisation of the facilities, but also favours the economic reactivation and the generation of more than 50,000 direct and indirect jobs.

To consolidate excellence in the management of water resources and sanitation in, Canal de Isabel II faces the challenges with an initiative-taking attitude and, above all, supported by research, development, and innovation. Through digital transformation and the incorporation of the latest smart technologies, they help to consolidate Canal de Isabel II as a leading company in the water sector. One example is the plan to deploy remote meter reading, with the aim that by 2030, 100% of the meters in the Madrid Region will be smart. Thanks to this project, it will be possible to offer users complete and detailed information on their consumption, detect incidents or water losses in indoor facilities and increase the efficiency in the management and operation of the distribution network, thus reinforcing Canal's commitment and proximity to users.

The management of a resource such as water by a public company like Canal has the duty to be considered an example of transparency and good governance in all its actions, promoting the development of open and participatory activities with society. In this sense, the collaboration of all the municipalities of the region is essential to consolidate the Region of Madrid as an international reference in the fight against climate change, the protection of biodiversity or the circular economy, among other major challenges.

The Region of Madrid, together with Canal de Isabel II, faces this decade with the responsibility of making the 2030 Agenda a reality, joining efforts to accelerate the fulfilment of the 17 Sustainable Development Goals.

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