CASE STUDY:

Canal de Isabel II.

Accelerating the implementation of SDG 7 of the 2030 Agenda.

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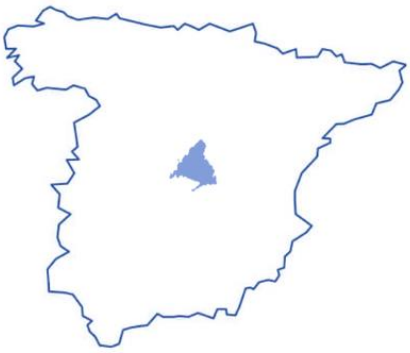
Where are we?



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

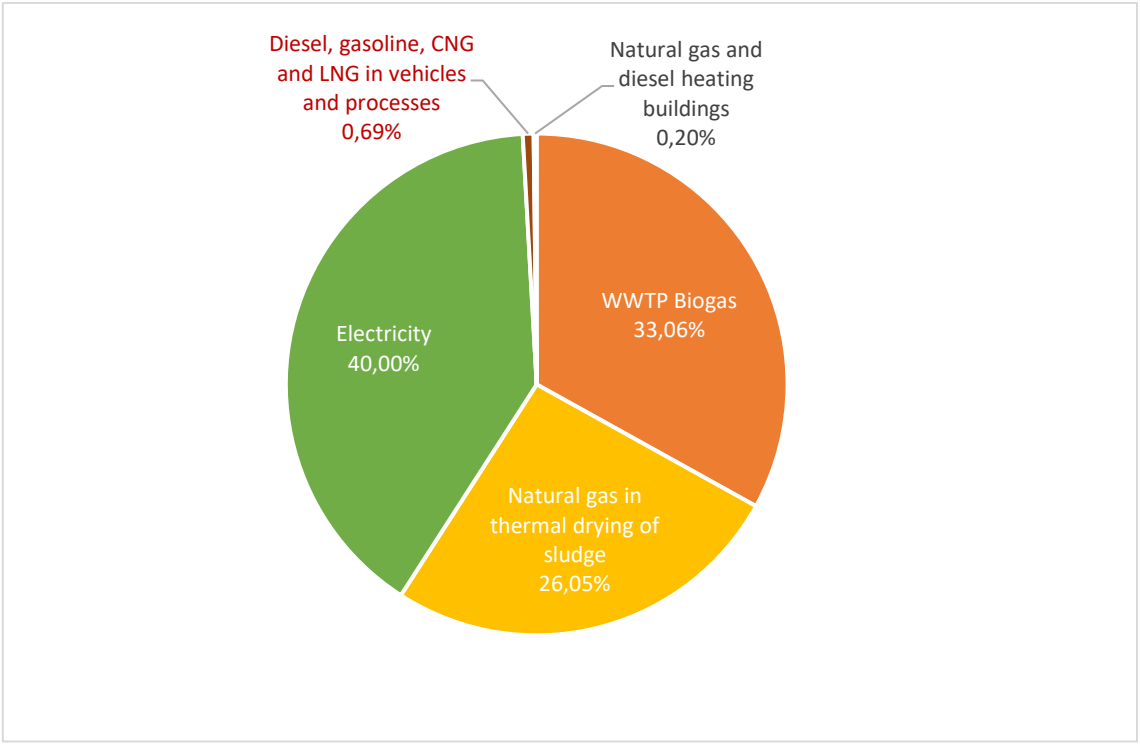
The Community of Madrid in figures (2022)

- 6.7 million inhabitants
- 8,073 km2 in area
- 179 municipalities
- 13 reservoirs
- 14 drinking water treatment plans (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

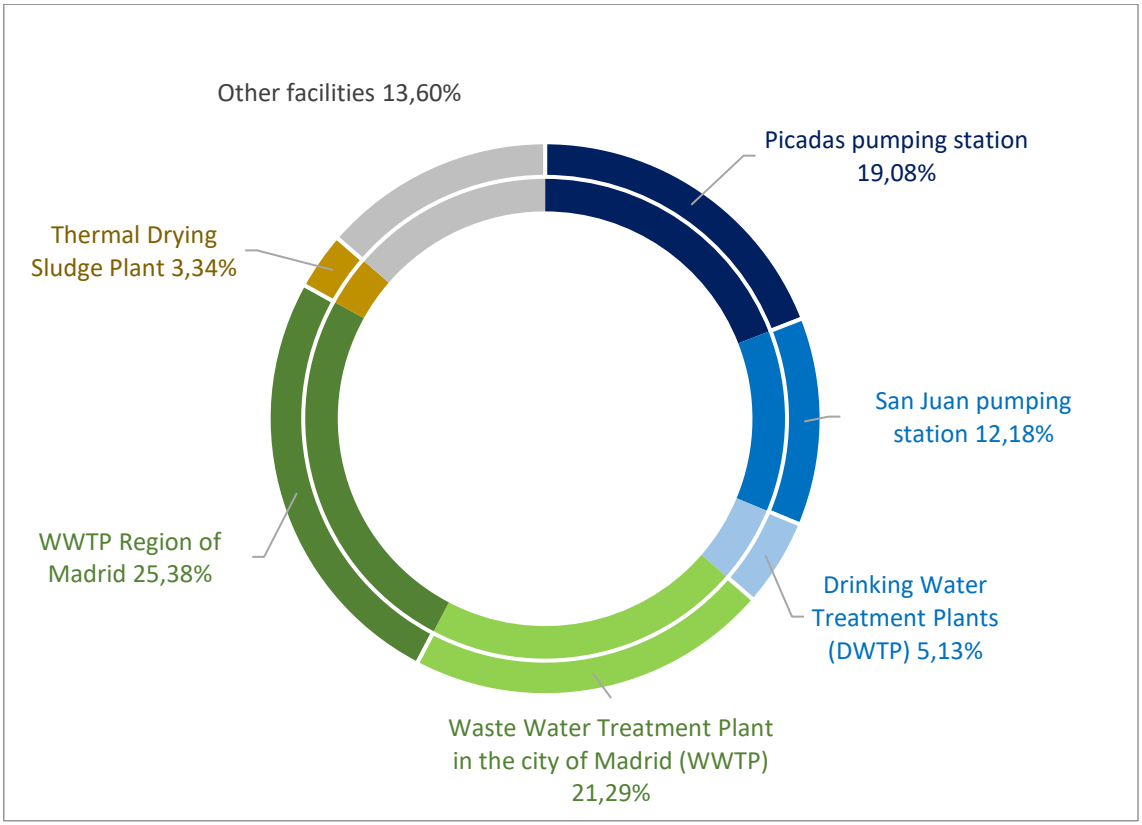
Canal de Isabel II. Water and energy management.

Canal de Isabel II needs to consume a large amount of energy to carry out all its processes. In 2022, the direct energy consumption for the operation of our facilities has been reduced by 19.98 % with respect to that recorded in 2021 (which was a historical maximum) and was 3,960,369 gigajoules. This decrease is mainly due to the decrease in the consumption of natural gas in the cogenerations of the thermal sludge drying plants of EDAR de Loeches and EDAR SUR (54.33 % less than in 2021). This is due to the fact that these plants, due to breakdowns, scheduled maintenance and the high price of gas, have only operated the equivalent of 2,842 hours (5,606 in 2021).

The reduced operation of cogenerations for thermal sludge drying meant that in 2022 our main energy consumption was electricity, which accounted for 40 % of the total. In 2022 we consumed 542.46 million kilowatt hours of electricity, 11.73 % more than in 2021, mainly due to a hydrological situation that in 2022 (dry year) made it necessary to use more water transfers from the Alberche River (San Juan and Picadas reservoirs), having consumed 169.59 million kilowatts for these transfers, 73.40 more than in 2021. Thanks to this consumption, which represents 31.26 % of the total, we have been able to transfer 169 million cubic meters in 2022 (74.2 hm3 more than in 2021).



Distribution as a percentage of energy consumption in 2022



Distribution of electricity consumption by facility in % of total consumption (542,46 GWh).

Aware of the importance of our consumption, for decades Canal has been equipping itself with facilities for the generation of electric power through processes that are synergistic with water management.

At the end of 2022, we were the company with the largest installed power generation capacity in the Community of Madrid, with a total of 109.31 megawatts (2 MW more than at the end of 2021) in the following facilities:

- 9 hydroelectric power plants, with a total installed power of 35.52 megawatts.
- 18 WWTP equipped with motor-generators (39) and turbines (7) that generate electricity using biogas produced in the purification processes as fuel, with a total installed power of 26.60 megawatts.
- 9 microturbines installed at different points of the GRI supply network: [with a total installed power of 0.83 megawatts.
- 2 cogeneration plants (Loeches WWTP and South WWTP), associated with the thermal drying process of WWTP sludge, with an installed capacity of 44.70 megawatts.
- 3 wastewater waterfalls equipped with hydroelectric microturbines at the South WWTP (2) and La Gavia WWTP, which take advantage of the difference in level at the discharge point, with an installed power of 0.26 megawatts

- 9 solar photovoltaic installations located at seven WWTPs, one elevator, at the Loeches WWTP and in some offices, with a total power of 1.39 megawatts.
- A small installation that acts as pumping and turbine in the Vallecas reservoir with a power of 0.012 megawatts.

In addition to the facilities in operation, by the end of 2022, a new 420 kilowatt biogas motor-generator was being installed at the Arroyo de la Vega WWTP, a 100 kilowatt photovoltaic plant at the Velilla de San Antonio Elevator and a 1,698 kilowatt floating solar photovoltaic plant at the Torrelaguna Lower Reservoir. This floating plant is the first to be installed in the Community of Madrid and will serve as a pilot experience to extend this technology to other Canal facilities in the future.

Thanks to the energy generated both in processes associated with supply and sanitation, Canal has a high degree of electricity self-sufficiency that in 2021 allowed us to generate up to 86.49 % of our consumption (410 million kilowatt hours produced). However, in 2022 the lower operation of the cogenerations of the thermal drying plants and the lower hydroelectric production, being a dry year, have caused our production to drop to 275.2 million kilowatt hours. This low production, together with a very high consumption due to the increased use of the transfers from the Alberche River, means that the energy produced in 2022 will account for only 50.8% of the energy consumed. Despite the lower generation of electricity in 2022, our production has managed to avoid the emission of 39.36 thousand tons of CO2 . In addition, by purchasing electricity with a 100% renewable energy guarantee, we have avoided the emission of 60.26 thousand tons of CO2 in 2022.

Canal de Isabel II and the 2030 Agenda

Canal de Isabel II is a 100% public company of the Community of Madrid created in 1861, whose shareholders include the Community 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.

The mission of Canal de Isabel II is the management of the integral water cycle in the Community 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: 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 purposes. Canal de Isabel II currently manages all the phases and stages.

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 Community 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 the population supplied, Canal de Isabel II is the largest public operator of the integral water cycle in Europe and one of the largest worldwide, a leading company not only in water management but also in energy production, innovation or waste reuse, among other things.

The Community 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, the 2030 Agenda has become the company's roadmap to achieve compliance with the 17 Sustainable Development Goals in 2030, positioning the Community of Madrid as one of the most sustainable regions in the world in terms of water management.

You can learn about the integral water cycle in the Community of Madrid at the following link:

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

2018-2030 Strategic Plan

The values informing the Strategic Plan of Canal are 5: transparency, closeness, excellence, commitment and sustainability. The year 2030 is a date that is marked on the calendar of all of Canal's employees, as it is the deadline for responding to the most important universal call of the 21st century regarding the main problems that jeopardise 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 ultimately for society as a 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 of the Strategic Plan in 2018 marks the beginning of the deployment by Canal of 10 Strategic Lines, aligned with the work carried out by the Community 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 Community by managing everyone's water with transparency, efficiency and sustainability"

Thanks to the core values informing the Company, Canal uses everybody's resources to manage a common asset which it wants to continue being a source of pride for the more than 6 and a half million people of Madrid who turn on their taps every day to obtain the water of Madrid, the water of Canal.

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 Community of Madrid, reflects its faithful commitment to the 17 SDGs in its Plan, through its more than 100 actions, 45 plans and 10 lines that, with the Strategic Plan, will be fulfilled by 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 7: Ensuring access to affordable, safe, sustainable and modern energy for all

TARGET 7.1 By 2030, ensuring universal access to affordable, reliable and modern energy services.

TARGET 7.2 By 2030, significantly increasing the share of renewable energy in all energy sources.

TARGET 7.3 By 2030, doubling the global rate of improvement in energy efficiency.

TARGET 7.a By 2030, increasing international cooperation to facilitate access to clean energy research and technology, including renewable sources, energy efficiency and advanced and cleaner fossil fuel technologies, and promoting investment in energy infrastructure and clean technologies.

TARGET 7.b By 2030, expanding the infrastructure and improving technology in order to provide modern and sustainable energy services for all in developing countries, especially the least developed countries, Small Island developing States and developing landlocked countries, in line with their respective support programmes.

Canal de Isabel II Energy commitments

Canal de Isabel II is the company with the largest installed capacity of electricity generation in the Community of Madrid, with a total of 109,3 Megawatts, and it intends to reach 100% self-consumption with renewable energies and clean energy. It has facilities that, in synergy with the water supply and sanitation processes, allow the generation of renewable energy, the use of energy from process by products and the cogeneration of electricity.

Voluntary Commitments

a. Short Description

The public company Canal de Isabel II, aware of the importance of the implementation and compliance of the Objectives of the Agenda 2030 for Sustainable Development and supporting the Energy Compact initiative is committed to producing enough electricity to cover the company's needs, which range between 450 and 500 GWh annually, with the goal of reaching 100% by 2030 and commits that this electricity will be produced through renewable (Hydro, biogas and solar) and clean sources (cogeneration). The company currently generates around 51% of its annual electricity consumption from these sources. All of our generation facilities are owned and operated by the company.

b. Timeline

All commitments will be completed by 2030.

c. Measurable Indicators

The proposed indicators to measure the progress of our commitments are:

1. The % of self-generated electricity with respect to the electricity used by the company for its activities.
2. The cumulative energy savings produced by the energy efficiency measures implemented thanks to Canal Energy Hub in terms of MWH.
3. The number of MW installed of new infrastructures to produce new electricity based on renewable energies (MW installed).
4. Number of projects and cooperation agreements developed and signed, as well as capacity building and training courses.

d. SDG 7 Targets

In this way, Canal de Isabel II's commitments also comply with some of the targets of SDG 7 of the 2030 Agenda for Sustainable Development, especially targets: 7.2; 7.3 and target 7.a.

e. Strategy summary

Therefore, Canal de Isabel II's commitments are as follows:

1. By 2030, to produce 100% of the electricity necessary to self-supply the Company's activities, and that this electricity be renewable and/or clean.
2. To increase the company's energy efficiency by 2025, in which we have the goal of saving 6.8%, that is, 34,830 MWh in relation to base consumption.
3. Increase activities that encourage the circular economy in the company's production processes and production, through the generation of initiatives based on the bioeconomy such, the production of green hydrogen, the valorization of sludge to produce fertilizers or biofuel for vehicles.
4. Increase the installed capacity of electricity production, although energy efficiency will be increased, to go from an installed capacity of 107 to 157 megawatts, the excess of the electricity produced will be delivered to the central system.
5. To carry out development cooperation actions to improve research and new technologies that support the production of renewable energies and energy efficiency for the development of actions focused on the integral water cycle in developing countries.

f. Geographic coverage

The actions will be carried out in the Territory of the subnational government of the Community of Madrid.

g. Beneficiaries

The aforementioned commitments are designed to be developed in 174 municipalities in the territory of the Community of Madrid, Spain, whose beneficiaries will be the citizens of these municipalities (6.7 million persons). As well as developing agreements with developing countries and creating alliances with cooperation agencies to support the implementation of concrete actions in these countries with our experience and capabilities. The commitments are expected to be fulfilled between 2025 and 2030 and performance will be communicated annually.

i. Finance and Investment

In order to carry out these energy commitments, Canal de Isabel II has planned its own investment of more than 80 million euros for the next 10 years (around 8 million per year).

Thanks to these resources, ambitious projects will be implemented, such as the Solar Plan to increase production capacity or the increase of power in some facilities, as well as the energy efficiency improvements necessary to achieve the expected energy savings. Additionally, this investment includes the implementation of the latest technologies in terms of telemetry and automation of the facilities, which will accelerate the digital transformation process in the company.

j. Enabling Actions

The measures proposed by Canal de Isabel II include, among others, the 0.0 kWh Plan and the Canal de Isabel II's Integrated Energy System (SIEC), through which it aims to consolidate its efforts to become the first Carbon Neutral Company in the water sector.

The 0.0 kWh Plan aims to make Canal a self-sufficient company from the energy point of view, producing the same amount of energy it needs for its activity.

The purpose of this platform (SIEC) is to integrate the information from the energy area with that of the integral water cycle operations in a common data repository to feed applications that support decision making in energy efficiency, purchase and management of electricity contracts and investment in renewable energies.

Monitoring and Reporting

Every year Canal de Isabel II prepares Sustainability Reports where the annual actions developed by the company are reported, and in which the actions developed for the fulfilment of the commitments will be included.

Specific reports will also be prepared to follow up and monitor compliance with the commitments.

Implementation of the 17 SDGs in Canal

The SDG integration process at Canal de Isabel II applies the United Nations strategy, 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 engaging everyone in the company with the 2030 Agenda.

Likewise, the goals on which the company has a direct impact have been analysed and assessed in order 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 a 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, goals and targets were established for each of them, selecting the appropriate indicators, which are part of Canal's Strategic Plan 2018-2030, so that they are monitored. This entire process culminates with the regular communication of 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 transversal character of water in the 2030 Agenda and its Sustainable Development Goals.

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

Main projects

For this case study, have been chosen, from among the more than 100 projects and lines of work of Canal, those that are most emblematic and that, due to their characteristics, are directly related to SDG 7.

It is worth mentioning that these projects are part of Canal's energy strategy in the Community of Madrid and that, thanks to the efforts carried out over the years, it has now managed to position the public water company as a leading one in energy production. The projects described in this case study are just a few examples of the actions and programmes launched as a result of the 2018-2030 Strategic Plan and now still in their implementation phase, their purpose being to meet the established objectives and goals by 2030.

You can consult the other projects that are part of Canal's Strategic Plan and are connected 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. Solar Plan (photovoltaic)

Objectives and description

This plan is being developed with the aim of boosting energy production through highly efficient renewable generation sources to reduce network consumption and thus contribute to mitigating greenhouse gas emissions.

The Solar Plan in its initial phases (0, 1 and 2) contemplates a total of 27 installations with an installed capacity of more than 37 megawatts and which will require an investment of close to 55 million euros, which will be financed in part with European Union funds.

Thanks to this plan, we want to achieve the goal of being the first European company in our sector to produce an amount of energy equal to or greater than what it consumes.

The Solar Plan is a backbone of sustainability and the Water-Energy nexus. Maximizing the energy use of all the elements of the integral water cycle, from the reservoirs to their return once purified to the river courses is a priority for Canal. The Solar Plan involves the installation of photovoltaic and other renewable technology in the facilities in an effort to improve the environment and distributed generation, as well as to ensure the resilience of the water management system.

The initial objective is that of growing in self-consumption, which means that most electricity production will be consumed in situ although, in some of these facilities, there will be occasional surpluses that can be discharged to the electricity network, thus contributing to increasing the participation percentage of renewables in the energy mix.

It should be noted that, in some of these infrastructures, the photovoltaic installations will be hybridized with pre-existing generation technologies (hydraulic, micro-hydraulic, motor-generation with biogas, micro-biogas turbines and cogeneration), thus increasing the possibilities of energy management and optimising the use of existing resources.

The objective of the plan is to maximize existing synergies in the water-energy nexus, so it will aim to take advantage of existing available surfaces in any location for which no other use has been foreseen. Thus, we intend to build photovoltaic panel installations in sewage plants, elevators, water treatment stations and, obviously, on the roofs of water tanks. In addition, two pilot projects will be carried out for the installation of floating parks in reservoirs.

Relationship with SDG 7 targets

This plan is directly related to the following targets: 7.1, for guaranteeing universal access to affordable, reliable and modern energy services; target 7.2, for significantly increasing the share of renewable energy in the energy mix, and target 7.3, as it contributes to doubling the global rate of improvement in energy efficiency.

Challenges

This being a new opportunity in energy production, the Community of Madrid and Canal have several challenges ahead of them to fulfil in the year 2030:

Transformative nature: These facilities will be monitored by the Integrated Canal Energy System, a data hub, currently under development, which aims to integrate the information on the energy generated with that on operations in a common data repository that will serve as a support for decision-making and favour a better management of energy demand and production.

Impact on digitization and Smart Cities: The installation of solar panels in Canal facilities may involve the hybridization of different renewable technologies in one single location, which provides greater energy flexibility and allows better management and efficiency of the plant. In addition, it is an element of resilience in supply cut situations. The applications of the Integrated Energy System will allow a better management of this energy, which stems from the distributed generation of renewable energy, with a consequent impact on the digitization of our company and contributing to the development of the Smart City.

Viability or maturity: All renewable generation and information exchange technologies and management are of proven maturity and technical viability.

Lessons learned

The main lessons learned are that the "Solar Plan" centres on the novelty in Spain of floating photovoltaic technology, which has required the involvement of different management areas of the company in the planning and design of these infrastructures, the processing of administrative authorisations and the contracting of its construction. This process has brought about an opportunity to improve the technical training of Canal personnel in order to include new processes and protocols in the water – energy system.

There are no previous experiences of the industrial use of this technology as it has yet to gain maturity, at least in Europe. An analysis has been made of the best solutions to optimize the energy production of such facilities, as well as to solve administrative matters while the mandatory authorisations of the competent bodies are still in process.

Results

By the end of 2022, one plant was in operation, one was under construction and 22 were under tender.

The Solar Plan facilities will join the 9 photovoltaic plants we already have in operation with 1.4 MW of installed capacity, which will add almost 35 MW. In this way, we reduce grid consumption and contribute to mitigating greenhouse gas emissions. In addition, in 2022 we have started the construction of the first floating photovoltaic energy project, in the Torrelaguna reservoir.

2. Green hydrogen production

Objectives and description

Hydrogen is the most abundant element in the universe. Its enormous versatility, flexibility and storage possibilities will be key to decarbonising the economy in the mid and long term. Experts are of the opinion that, in the year 2050, renewable and low-carbon-footprint hydrogen could cover a fifth of energy needs worldwide.

The objective of this "Green Hydrogen Production" plan is to boost its production in the Community of Madrid through Canal de Isabel II. For this purpose, a pioneering plant in Europe will be developed from reclaimed water as a source of green hydrogen.

Relationship with SDG 7 targets

This plan is directly related to targets 7.1, for guaranteeing universal access to affordable, reliable and modern energy services; target 7.2, for significantly increasing the share of renewable energy in the energy mix, and target 7.3, as it contributes to doubling the global rate of improvement in energy efficiency.

Challenges

The challenge now, as set out by the European Union in its Hydrogen Strategy, is to develop green hydrogen to significantly reduce greenhouse gas emissions globally and promote its competitiveness in relation to fossil fuels, mainly in such sectors as industry or transportation.

For Canal, this is the first experience in this field with this technology. Another of the more ambitious challenges is the creation of a market for the green hydrogen produced as, at present, it focuses on public transport, industrial mobile machinery and, as a third option, the enrichment of natural gas by injecting hydrogen into the network. Finally, the need to create the necessary logistical capacity to deliver hydrogen to the points of consumption is also a challenge.

Lessons learned

The lesson learned stems from the development of the project itself, from the initial idea to the tendering, construction and operation of the plant, which has shown that it is possible, with the resources generated in Canal's daily activity, to design a comprehensive project that takes advantage of endogenous

resources (regenerated water treated by reverse osmosis), green energy from the Canal's photovoltaic facilities and scalable technology.

Results

In 2022 we have advanced in the development of the installation of the green hydrogen plant at the Arroyo Culebro Cuenca Media-Alta WWTP. The forecast is that the works will be carried out over the next 13 months and that the new facility will be operational in mid-2024.

This project, with an investment of more than 7 million euros, will be an important milestone in the decarbonization process.

3. Biogas for fuel

Objectives and description

The Community of Madrid's commitment to sustainability, thanks to Canal's activity in the integral water cycle, turns wastewater treatment plants into true biofactories, thanks to the use of the resources they contain.

In wastewater treatment plants, thanks to the appropriate technologies, it is possible to produce green electricity from domestic wastewater, which is duly treated in these facilities and converted into biogas.

Biogas, composed mainly of methane and carbon dioxide, can be converted into renewable fuel if the carbon dioxide is removed, thus converting it into biomethane, a "zero emission" fuel with a high calorific value.

The possibilities of biogas are not limited to electricity generation. This biogas is composed of approximately 65% methane and 35% CO2. If we remove this CO2 we can convert it into biofuel and use it in vehicles, a utility that we are already testing at the Viveros WWTP (Puerta de Hierro). There we have installed one of the facilities known as 'gas stations', where more than twenty cars can refuel with biomethane, a zero-emission fuel with high calorific value. Vehicles that use biogas do not give off particles or sulfur dioxide and their CO2 emissions are zero, since this biogas, being of human origin, does not cause a greenhouse effect. Furthermore, their use reduces both nitrogen oxides released (85% less) and noise emissions (50% less).

This plan lies within the ECO-GATE project, which aims to promote the use of compressed biomethane in the Atlantic corridor (Portugal, Spain and France) and its interconnection with the Rhine-Danube corridor, creating a network of refuelling points to make it viable

Relationship with SDG 7 targets

This plan is directly related to the following targets: 7.1, for guaranteeing universal access to affordable, reliable and modern energy services; target 7.2, for significantly increasing the share of renewable energy in the energy mix, and target 7.3, as it contributes to doubling the global rate of improvement in energy efficiency.

Challenges

The main challenge with this facility is the production of biomethane in quantity and quality for being injected into the biogas distribution network.

Lessons learned

The use of biomethane as a vehicle fuel is one more example of the advantages of the circular economy and of how wastewater has ceased to be a problem to become an opportunity, as, if treatment plants in the early 19th century stopped the pollution of rivers in urban areas and thus prevented deaths from diseases such as cholera or typhoid fevers, they now open a new path towards models of sustainable mobility.

Results

By 2022, we have installed gas stations at the Viveros WWTP (Puerta de Hierro), where more than twenty cars can fill up with biomethane, a zero-emission fuel with high calorific value. These cars could have driven 40 to 45 times around the world using only wastewater as a raw material.

4. Integrated energy system in Canal (Energy hub)

Objectives and description

The Integrated Canal Energy System (SIEC, from its Spanish initials) is a unit created with the purpose of bringing together information from the energy area along and that of the integral water cycle operations in a common data repository to feed applications that support decision-making bearing on energy efficiency, the purchasing and management of electricity contracts and investment in renewable energy.

Canal's energy activity involves a considerable volume of information, as well as a level of expenditure that takes up approximately 20 % of the company's general expenses.

The significant increase in these expenses with respect to those of 2021 (14.4% more) is due to the increase in market prices, especially the increase in the price of electricity, gas and reagents used in our plants, the implementation of new activities and other improvements in the quality of the processes.

Canal, with this system, centralizes the knowledge of all its energy management experts in order to optimize the consumption of the facilities, by means of a continuous control and monitoring of the results, thus guaranteeing significant energy saving and a lower ecological impact.

To achieve energy optimization, SIEC has a multidisciplinary team made up of 10 collaborators who specialise in various areas of the company and work together to fulfil improvement and efficiency objectives. There are four profiles in this respect: project managers, analysts, auditors and technicians.

Relationship with SDG 7 targets

This plan is directly related to target 7.3, as it contributes to doubling the global rate of improvement in energy efficiency. Moreover, it also impacts on targets 7.1 and 7.2.

Challenges

Given the need for integrated and efficient management to achieve the volume and representativeness of this information, the main challenge for Canal consists in an adequate and efficient management of energy through a multidisciplinary team that ranges from the areas of operations to those of studies, as well as the economic and financial area and the innovation,

environment and engineering areas. The challenges may be summarised as follows:

- Energy transition in a large company, guaranteeing its supply and purification tasks at all times.
- The management of the huge Canal network, which includes 171 treatment facilities, the use of different energy sources and the need for redundant energy supply.
- The enormous amount of information that is generated and must be managed for proper decision-making.
- The creation or consolidation of a new management culture in the company, based on energy saving and efficiency.
- Minimising the environmental impact by reducing the carbon footprint in energy processes.

Lessons learned

Efficient energy management must include two points of view: the economic point of view, which includes the management of the purchase and sale of energy, and the technical point of view, with actions aimed at continuing to increase energy efficiency, also taking into account its impact on the environment. In order to be able to tackle them jointly, energy management must be carried out by a multidisciplinary group and the information regarding energy consumption must be transparent to the entire company.

Moreover, another lesson learned is that it is necessary to train the multidisciplinary team in energy issues. Likewise, transparency in the definition of objectives and measures favours the full involvement of Canal staff in the achievement of the objectives.

Results

In 2022 we have continued to improve the quality of the data represented by the SIEC, the reports and analyses performed by the work team will be increased, and energy efficiency measures based on these analyses will be promoted.

Thanks to this platform, it is possible to feed applications that support decision-making on energy efficiency, purchasing and management of electricity contracts and investment in renewable energies.

Linkages with other SDGs

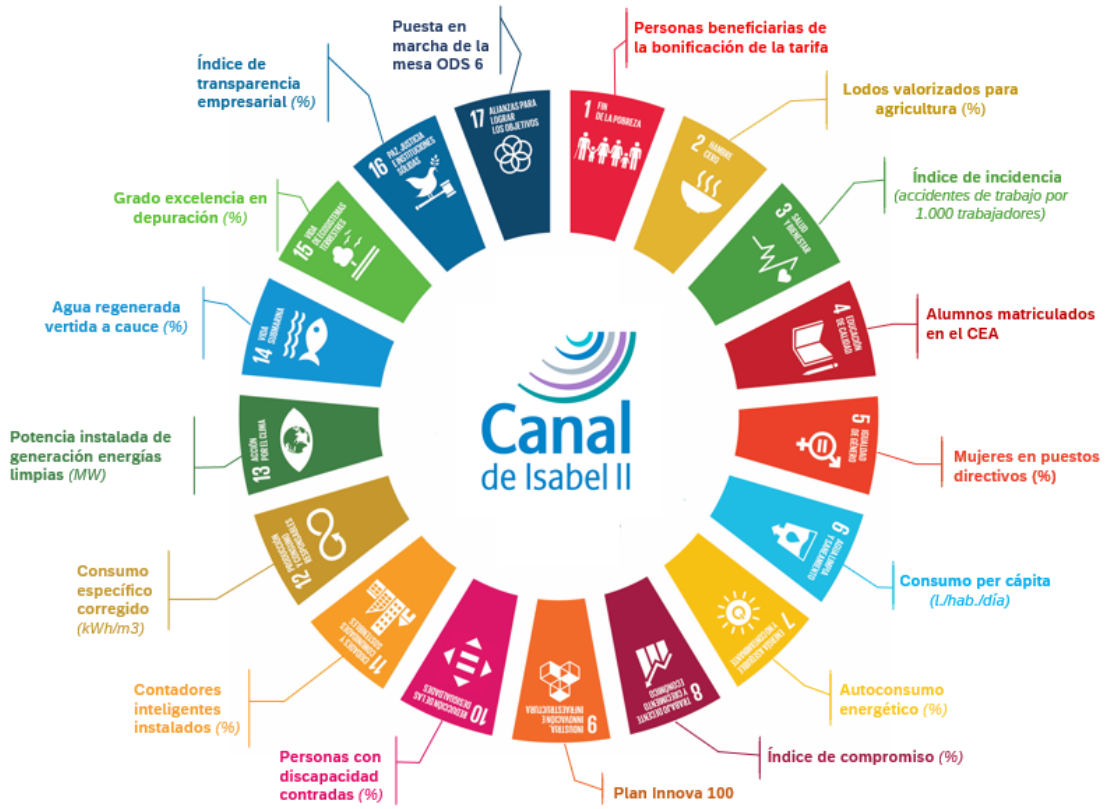
Water and energy as a binomial are key to the path towards compliance with the SDGs, fully contributing to the sustainable development of the rest of the lines of action due to their impact on hygiene, health, education, equality, lifestyle and food. Our daily lives depend on reliable and affordable energy services to run smoothly and fairly.

A well-established energy system supports all sectors: from business, medicine and education to agriculture, infrastructures, communications and high technology. And conversely, a lack of access to energy supply and transformation systems is an obstacle to human and economic development.

The 3 pillars of the 2030 Agenda

In this sense, the Community of Madrid's strategy to comply with SDG 7, on affordable and non-polluting energy, of the United Nations 2030 Agenda represents a great opportunity for Canal thanks to its activity in the integral water cycle. Along with water, energy is a cross-cutting element in the 2030 Agenda as it supports the fulfilment of the rest of the SDGs thanks to its strong interconnection with all of them. Thanks to the deployment of the 10 strategic lines of Canal's 2018-2030 Strategic Plan, jointly created with the Community of

Madrid, it has been possible to establish all the actions needed to meet all the goals of the 2030 Agenda in 2030.



An example of some of the monitoring indicators associated with the SDGs

The effort carried out in the more than 10 lines of work of the Strategic Plan has made it possible to transversally connect the 17 objectives through the more than 45 plans and 100 actions that have been implemented. All progress is monitored on a quarterly basis thanks to the 50 indicators that have been developed to measure the degree of compliance, in accordance with the United Nations indicators for the 2030 Agenda.

This measurement of the Canal's contribution to the SDGs is carried out with its own monitoring tool, which makes it possible to check the degree of compliance with each SDG in real time on the basis on the associated performance indicators.

All results are published on the Canal website on a quarterly basis, and reports are prepared on the main achievements and progress of each of the actions that comprise the Canal's Strategic Plan. In addition, this commitment to the SDGs also translates into a part of the salary of Canal staff, since 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. The climate change, the circular economy and technological development represent new opportunities for advance and progress, but at the same time, given this global perspective of accelerated growth, it is now 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 actual fulfilment of the 2030 Agenda. For this reason, it is necessary, in this decade of the 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 Community 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 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 the Community of Madrid, Canal de Isabel II faces the challenges with a proactive attitude that is, moreover, supported by research, development and innovation. Digital transformation and the incorporation of the latest smart technologies 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, whose aim it is that by 2030, 100% of the meters in the Community of Madrid will be smart. Thanks to this project, it will be possible to offer users complete and detailed information on their consumption, detect possible incidents or water losses in indoor facilities and increase efficiency in the management and operation of the distribution network, thus reinforcing Canal's commitment and proximity.

The management of resources 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 participative activities with society. In this sense, the collaboration of all the municipalities of the region is essential to consolidate the Community 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 Community 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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