Cetaqua Barcelona

2017 Annual Report

Research. Collaboration. Thinking forward.

CETAQUA WATER TECHNOLOGY CENTRE | Aigües de Barcelona | UPC | CSIC

01

Opening messages

CETAQUA
BARCELONA

Carlos Montero

Cetaqua's General Manager

In 2017 Cetaqua celebrated its 10th birthday, giving us the opportunity to review our past activities and to look ahead to the future.

We began our operations by gathering the knowledge of the UPC and the CSIC, and thanks to the guidance of the scientific advisors appointed at Cetaqua, we have generated new expert knowledge of the water cycle.

The generation of sound scientific results has in barely a decade placed us at the forefront of research into water at the national and international level.

At the same time, thanks to the dedication and commitment of Aigües de Barcelona to innovation, we ensure that the knowledge and results we generate have a practical and concrete application, resulting in benefits for the water sector, the environment and society.

Collaboration remains the basis of our model. Our results are the fruit of the joint efforts of more than 350 public and private organisations from different countries, who we would also like to thank today for their openness and generosity.

Cetaqua has gradually adapted and transformed over the years, and we continue to do so. This year we restructured our operational method to achieve a more agile response to the challenges we face, transforming our offices and above all our way of working, so as to give us more dynamism, flexibility and collaboration.

"Our results are the fruit of the joint efforts of more than 350 public and private organisations from different countries, who we would also like to thank today for their openness and generosity".

It is the people who make up Cetaqua who ensured that the transformation was a success, through their enthusiasm and their dedication to the project.

Our challenge for the future as a Water Technology Centre remains the same: to provide sustainable solutions that have an impact on the water sector, the environment and society. In response we have addressed the impact of global change, water quality and treatment, environmental impact and sustainability, infrastructure management and the relationship with society. We have achieved advances that now allow us to place our focus on the challenges raised by our new context: the circular economy applied to the water sector and the region for genuine sustainable development, fostering resource recovery; the digitisation of water, so as to deliver new services for smart cities, and help build a new relationship with citizens; and the integrated management of water resources, promoting efficiency in urban, agricultural and industrial usage, by promoting reuse and security.

Through the involvement of all, we are in a strong position to address the challenges of the coming decade, contributing new knowledge and sustainable solutions for the water cycle and the environment.

Ciril Rozman

Chair of the Board of Trustees

The United Nations, the largest international organisation in existence, warns that by 2030 global demand for water could outstrip availability by 40% on average. The scientific community is likewise highlighting this issue, pointing to climate change, and in particular the process of global urbanisation, as the main causes. Since the water balance is a concept that must necessarily be addressed locally and regionally, this average figure for the global shortfall conceals situations of even greater vulnerability, as in the case of the Mediterranean river basins in this country.

We will be in a position to overcome the huge social and environmental challenges we face if we apply a new vision of resource management, known as the "circular economy", and implement this by applying the spectacular new human capabilities that we are now beginning to see, thanks to innovation and technological progress.

Some time ago, Aigües de Barcelona embarked on a committed transition to the circular economy in managing the water cycle of the Barcelona metropolitan area. A journey that will soon lead us to turn traditional waste water treatment plants into genuine biofactories, highly advanced systems that will allow us continuously to reuse urban water and so guarantee supply, while also being fully self-sufficient in energy terms, generating "zero emissions" and providing the system with green energy and crop fertilisers as byproducts. At Cetaqua we now know that biofactories are technologically feasible, although

"We will be in a position to overcome the huge social and environmental challenges we face if we apply a new vision of resource management".

there are still technological and regulatory barriers and issues of social acceptance that need to be overcome.

In order to turn our vision into a reality, it is vital to integrate the most advanced knowledge with an open and collaborative strategy of technological development. And it is precisely here that Cetaqua plays a fundamental role, as a lever to detect, validate and develop technologies that enjoy a pioneering position worldwide, allowing for fully sustainable management of water resources.

A vision shared with the Consejo Superior de Investigaciones Científicas (CSIC) and the Universitat Politècnica de Barcelona (UPC), each of them flagship institutions in their operational spheres, making Cetaqua a platform of huge social value.

Now more than ever we need the contribution of all agents to the United Nations vision set out in the 17 SDGs (Sustainable Development Goals). One positive step in this direction is that the Spanish Government is drawing up the Spanish Circular Economy Strategy, which will include an action plan up to 2020, fully aligned with the European Commission's Circular Economy Action Plan.

We likewise expect an unequivocal commitment from local authorities to address the challenges of fair and sustainable transformation and development, a commitment based on the very best know-how and professional excellence. These are in truth the characteristics that define the contribution by all the people and bodies that make up Cetaqua in order to resolve global challenges, people who every day put into practice a productive partnership between the worlds of science, universities and enterprise so as to build a better world.

Rosa María Menéndez López

President of the Consejo Superior de Investigaciones Científicas (CSIC)

To deliver a better response to society's present and future needs, it is essential to have in place a medium- and long-term research and development strategy. Europe is now promoting **research focused on missions**, in other words on specific objectives. This was recently reasserted at the headquarters of the CSIC by representatives of the leading European project funding bodies at the annual top-level meeting of Science Europe, the most influential association in terms of the direction followed by R&D in Europe.

It should be emphasised that in Spain, universities, businesses and research centres are successfully applying this concept, with the country achieving its best ever results in programmes such as Horizon 2020.

Meanwhile, the Spanish Government is keen to align itself with the European Union's development and innovation objectives, and the Spanish Secretariat of State for Research, Development and Innovation is already preparing its objectives with a view to the European Commission's next framework programme, Horizon Europe (2021-2027). In this regard, as the largest public institution dedicated to research in Spain, with some 2,800 contributing researchers at more than 120 centres nationwide, the CSIC focuses its research on five strategic strands: energy, global change, water resources, advanced instrumentation and quality of life.

We focus research on missions through the creation of Interdis-

"Another key aspect in driving research and development forward is the knowledge transfer to the different socio-economic sectors involved".

ciplinary Thematic Platforms, a tool that helps to make boundaries irrelevant, with organisations made up of people from different disciplines and origins, including vanguard companies in various sectors of interest, so as to fulfil a shared goal. At the same time, the cross-disciplinary nature of the teams is capable of addressing new challenges in science and innovation with greater precision and a more comprehensive vision.

Another key aspect in driving research and development forward is the **knowledge transfer** to the different socio-economic sectors involved, at both the national and the international level. The launch of the Interdisciplinary Thematic Platforms at the CSIC thus serves to add greater strength and dynamism to the generation and joint knowledge transfer, while organisational models such as Cetaqua, which incorporates public institutions and private enterprise, are important as the direct carrier of high-level scientific and technical knowledge to the main stakeholders, society itself, so as to foster the tangible technological and socio-economic changes that will enable a sustainable future.

In the case of Cetaqua this characteristic is reflected in the direction of its working approaches in direct response to real needs, such as the local application of a circular economy model, the pursuit of innovative and integrated water resource management solutions, and the adaptation of water systems within the context of SmartCities.

As the new President of the CSIC, I would like to congratulate the previous representatives of those institutions and businesses that have over the past ten years promoted the Cetaqua model, which we will continue to promote over the coming years by working together through this collaborative research approach, with a commitment to the knowledge transfer in a shared project in pursuit of sustainable development.

Francesc Torres

Rector of Universitat Politècnica de Catalunya (UPC)

For years now our university has been characterised, among many other aspects, by its pioneering role in social responsibility in general, and in particular its promotion and practical implementation of environmental, social and economic sustainability. In this regard, back in March we presented the document Keys to a New Energy Paradigm, a document that sets out strategic approaches for research and technology development allowing the UPC to work towards moving beyond the energy model that has taken hold over the last 150 years, based on a growing proportion of non-renewable resources.

Within this contextual framework, the UPC's involvement in Cetaqua takes on particular importance in that water is one of the major horizontal issues that affects every aspect of sustainability (environmental, social, economic). As a university we are open to the world, with our own, distinctive identity in pursuit of excellence. But above all we are a university that listens, a university connected and committed to society, a public service institution. And for us one of the challenges is to lead the social and technological changes that are to deliver a better future.

We share Cetaqua's values of knowledge, technology, sustainability, research, public-private partnership, transfer of research results and their distribution and dissemination.

We base our work on ethical and technological foundations allowing us to redress the harmful and inefficient inertia of misguided progress. Which involves gradually incorporating unequivocal values at the service of society, and doing so in this case with what is an essential and vital public asset for all human activity: water.

"For us one of the challenges is to lead the social and technological changes that are to deliver a better future".

02

Collaboration model

CETAQUA
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We are a model of public-private partnership

Cetaqua Barcelona is a foundation set up in 2007 by Aigües de Barcelona, the Universitat Politècnica de Catalunya (UPC) and the Consejo Superior de Investigaciones Científicas (CSIC). It is a model of public-private partnership created to guarantee the sustainability and efficiency of the water cycle, taking into account regional needs. The model has established itself as a benchmark for the application of academic knowledge to water and the environment, by creating products and services that benefit society. A model that has subsequently been applied at other Cetaqua centres, which are each independent, but share the same strategy and work in collaboration.

The board of trustees, the governing body

The board of trustees is Cetaqua's main governing body and is made up of the centre's founding members. It is responsible for defining the strategy, the annual plans and budgets, and for approving the main projects and activities and supervising economic management.

It is formed by:

Aigües de Barcelona

The public-private company Aigües de Barcelona, Empresa Metropolitana de Gestió del Cicle Integral de l'Aigua, owned by SGAB (70%), Àrea Metropolitana de Barcelona (AMB) (15%) and Criteria (15%), manages the entire water cycle and provides service to almost 3 million people in the municipalities of the Barcelona metropolitan area.

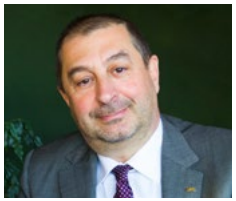
UPC

Universitat Politècnica de Catalunya is a public higher education and research institution, specialised in the fields of engineering, architecture and science. In a highly creative context of commitment to the environment, the research, teaching and knowledge transfer of UPC are the basis for the University's pivotal role in societal transformation.

CSIC
Consejo Superior de Investigaciones Científicas

The Consejo Superior de Investigaciones Científicas, is the largest public institution devoted to research in Spain and the third largest in Europe. Its essential goal is to develop and promote research for the benefit of scientific and technological progress and, to this end, it is open to collaboration with Spanish and foreign institutions.

Chairperson
Ciril Rozman
AGBAR



Deputy chairsperson
Francesc Torres
UPC

Trustee
Victor Ramón Velasco
CSIC

Trustee
Manuel Cermerón
AGBAR

Trustee
Fernando Rayón
AGBAR

Secretary
José Mª de Paz
AGBAR

The scientific and technical comittee, advisor on research strategy

Cetaqua Barcelona has a scientific and technical comittee, appointed by the board of trustees and acting as advisor to the board.

Chairperson
Damià Barceló
CSIC

Deputy chairsperson
Esther Real
UPC

Its functions are as follows:

- Provide guidance on research policy and propose new areas of research and technological development.
- Provide technical advice on projects to be undertaken and guidance on funding options.
- Evaluate the business needs put forward.

Member
Joan Grimalt
CSIC

Member
Jesús Carrera
CSIC

Member
Xavier Obradors
CSIC

Member
Emilio Custodio
UPC

Member
Joan de Pablo
UPC

Member
Joseba Quevedo
UPC

Member
Eduard Zaragoza
AGBAR

Member
Pere Malgrat
AGBAR

Member
Philippe Rougé
AGBAR

Member
Joan Ramón Morente
IREC

Member
Louis Lemkow
ICTA

03

Our research

CETAQUA
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Our outlook and our action on the future of water

Water is a key element for human wellbeing, due to its relation to quality of life and health, and it represents progress in an increasingly interconnected and more globalised world. Furthermore, its scarcity and its deterioration are synonymous with disagreement, dependency and vulnerability, both between regions and within societies. Technology, research, innovation and management models allow us to propose solutions that guide all the processes in the water cycle towards a circular economy. This outlook on water and other resources involved in its processes, and the actions that derive from it, is based on a future that can only be sustainable. Sustainable in technical, economic, social and environmental terms.

CETAQUA BARCELONA FOCUSES ON THE FOLLOWING AREAS OF RESEARCH:

Water resources, production and regeneration

Environmental and socio-economic impacts and risks

Water 4.0, solutions for digital transformation

Wastewater and reuse of byproducts

Quality, safety and health

Networks and infrastructures

Water resources, production and regeneration

We develop technologies that improve water purification and regeneration systems and propose solutions geared towards integrated water management.

Challenges

Climate change is forcing us to reconsider the way we use water resources. Managing water efficiently and with a comprehensive vision is essential to society. For this reason, the solutions cover several vectors, such as management of underground water, preventing it from being overused, advances in the search for alternative and efficient sources, and promotion of the regeneration and reuse of wastewater as a long-term sustainable solution, overcoming technical, environmental, social and economic challenges.

Priority work areas

- Drinking water treatment technologies
- Regeneration and reuse
- Conservation of groundwater and aquifer recharge
- Climate services and basin management

Managed aquifer recharge to address drought

Aquifers are a vital element in the integrated and sustainable management of water resources. The DESSIN project, which ended in 2017, has demonstrated that the injection of pre-potable water into aquifers can improve the economic and environmental sustainability of groundwater recharging. The technique has been tested for 18 months on an experimental basis at the Sant Joan Despí DWTP, demonstrating a positive impact on the quality and quantity of water in the Baix Llobregat aquifer, while allowing surplus water from the drinking water treatment process to be stored for subsequent extraction in periods of shortage. A tool developed during the project helps to integrate the technique with other innovative solutions in the integrated management of water resources, while evaluating its impact on ecosystems and the services that they provide us with.

Project
Demonstrate Ecosystem Services Enabling Innovation in the Water Sector (DESSIN)

Duration
January 2014 – February 2018

Coordinator
IWW Water Centre (Germany)

Partners
ADELPHI, CHEMiTEC, ECOLOGIC, Emschergenossenschaft, INRIGO, KWR i BdB, NTUA, SEGNO, SINTEF, TELINT, A21, Cetaqua Barcelona, DHI, EG, EYDAP, LKI, Oslo Kommune VAV, UDE, UFT

Environment, society and economy

We provide solutions to ensure sustainable development and citizens' welfare by promoting circular economy.

Challenges

Boosting circular economy, involves ensuring that proposed solutions are sustainable. It also involves providing methodologies and tools for performance and benefits evaluation. Innovative business models are required to reduce pressure upon resources, achieve the expansion of life cycles and waste valorisation and recycling options. Preparing for today's and future risks and becoming more resilient needs for the development of strategies and plans.

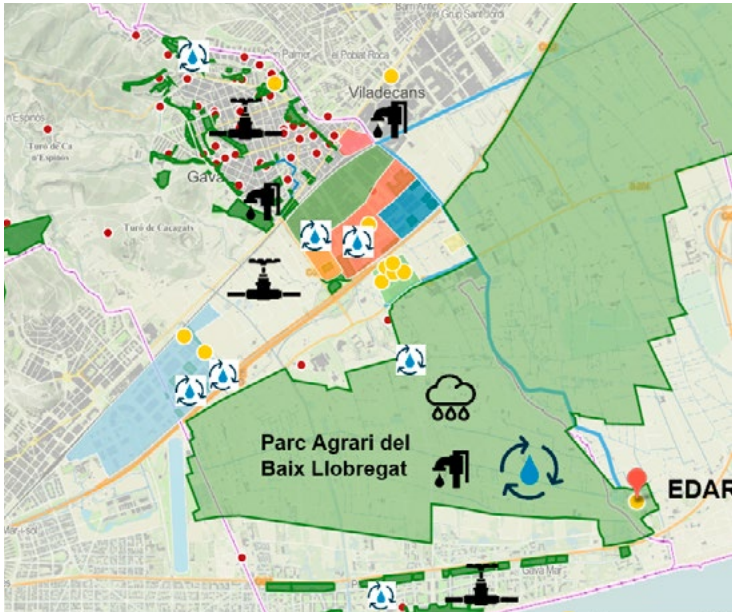
Priority work areas

- Environmental and socioeconomic impacts and risks
- Circular economy
- Water demand management and tariff models
- Nature and biodiversity

The circular economy model applied to the Gavà region

Promoting a circular economy means developing solutions to encourage the reuse of resources, the repurposing of waste and energy efficiency. It also, though, requires the application of this model to a whole region, by implementing the identified solutions together with the actors involved. With the Gavà Circular Economy project, in collaboration with Aigües de Barcelona and Gavà Town Council, 9 opportunities for circularity were detected at the municipal level, and two at the level. Two further opportunities were identified in individual businesses. All of them were linked either to water, energy or waste cycles.

Additionally, their environmental, economic and social impacts were quantified. An action plan was also defined for their implementation. Such plan included different collaborative, funding or business models to guarantee their sustainability over time.



Project
Application of circular economy methodology to Gavà

Duration
March 2017 – December 2017

Coordinator
Cetaqua Barcelona

Partners
Aigües de Barcelona and Gavà City Council

Water 4.0, solutions for digital transformation

The application of digital technology transforms infrastructure and water management processes into cyber-physical systems (CPS), in which data processing allows for more efficient, more sustainable and safer operations.

Challenges

Data are already driving digital transformation in all areas. Appropriate generation, capture, processing and analysis makes it possible to provide new information with high added value and, in the case of the water cycle, facilitate more efficient production and environmental processes. The search for new sensor and communication solutions, the coexistence of new developments and current systems, and the automation of processes are the challenges we must overcome to achieve optimum integration of physical devices and digital processes.

Priority work areas

- Smart solutions: IoT & Smart Cities
- Big Data & Data Analytics
- Computer Vision

Characterisation of the state of a distribution network to optimise maintenance

It is vital for proper management to understand the state of distribution networks, as this allows action to be taken before deterioration, so avoiding future problems. Thanks to deep learning, models based on data analysis applied to decision-making in the maintenance of infrastructure have gradually become more robust with each new implementation, ultimately proving themselves to be more agile and reliable than the previously available mathematical models. Using data obtained on the ground and in the laboratory, of differing sources and reliability levels, it has been shown that the current condition of a particular pipeline can be assured. By grouping pipelines of similar characteristics together, this diagnosis is extrapolated to those within the same group that have not been inspected, serving to characterise the state of the whole distribution network. This information is useful for operators in improving network efficiency, and focuses in particular on facilitating inspections and replacements of assets.

Project
Pipes clustering & Extrapolation of water pipes inspections for the NGP program (NETSCAN)

Duration
May 2017 – October 2017

Coordinator
SUEZ

Partners
Cetaqua Barcelona

Wastewater and reuse of byproducts

We develop technologies and optimize processes to make wastewater treatment more sustainable and to turn waste into resources.

Challenges

We are working towards a new model in this area, to move from treatment plants (urban and industrial) to biofactories or resource-generating facilities. Our goal is not only to ensure the quality of conventional parameters and be one step ahead of future requirements and regulations, but also to contribute to the recovery and reuse of the resources contained in wastewater.

Priority work areas

- Aerobic treatment
- Anaerobic treatment
- Treatment and reuse of gases
- Recovery and reuse of resources
- Micro- and nano-pollutants treatment

Reuse of treatment plant sludge for agriculture

As part of our commitment to the recovery and reuse of resources, in 2017 we began the new LIFE ENRICH project, with the aim of demonstrating that the recovery of nutrients (nitrogen and phosphorus) from urban waste water for reuse as fertiliser is technically, economically and environmentally viable. As well as optimising the technology to implement the recovery of nutrients, the agricultural value of the different products obtained (struvite, ammonia salts and dehydrated sludge) will be demonstrated in actual fields of crops, studying the most viable business model to put this contribution to the circular economy into practice.

Project
Enhanced Nitrogen and phosphorus Recovery from wastewater and Integration in the value Chain (LIFE ENRICH)

Duration
September 2017 – February 2021

Coordinator
Cetaqua Barcelona

Partners
Aquatec, IRTA, UPC, UPV, Aigües del Segarra Garrigues (ASG) i Emuasa

Quality, safety and health

We develop and optimise advanced control methods that ensure quality standards in water above and beyond legal requirements, both for the population and for the environment.

Challenges

Ensuring sanitary quality and safety requires everything from the control of compounds that might affect the taste of water to early detection of potential intentional contamination in the distribution network. Hence the importance of having tools that evaluate and measure the risk, and reliable solutions that make it possible to detect microbiological and chemical pollutants, reduce response time and ensure the appropriate management of incidents.

Priority work areas

- Advanced control of microorganisms
- Advanced control of chemical compounds
- Impact of quality on clients and the environment

Detection of pathogens in drinking water

The control of microorganisms in drinking water is vital in order to protect the health of the population. Within the context of the AQUAVALENS project that ended in 2017, protocols were developed to allow large volumes of drinking water (between 10 and 1000 litres) to be concentrated in situ, avoiding problems transportation of water samples, and the simultaneous concentration of viruses, bacteria and parasites. New molecular techniques have also been developed to detect pathogens. These innovations serve to save time and improve sensitivity in detecting the pathogens, and so achieve better microbiological control of drinking water treatment processes, and also of the drinking water supplied to the population itself.

Project
Protecting the health of Europeans by improving methods for the detection of pathogens in drinking water and water used in food preparation (AQUAVALENS)

Duration
February 2013 – January 2018

Coordinator
University of East Anglia

Partners
Belgrade, Ceeram, City Analysts Ltd, Desing, DVGW, ENKR, EPIGEM, Fruits and, GPS, HWU, HZI, IPU, IST, mbOnline, Moredun, MRI, MUW, Parker, PHL, Ribocon, SLU, SURREY, TU, UB, Ubern, UEDIN, UH, UI, UNIGE, URV, Vermicon, WRC, Cetaqua Barcelona, DTU, Hlab, NFA, NV, Scientific, Teagasc, THE JAMES HUTTON INS, Vegies, WIEN

Networks and infrastructures

We provide solutions that allow for more efficient management and greater performance of infrastructures in the water cycle.

Challenges

We develop network monitoring, automation and management solutions. Our aim is to provide infrastructure with intelligence in order to maximise its efficiency, safety and working life, while ensuring the quality of the service and respect for the environment.

Priority work areas

- Monitoring, automation and control
- Smart operations
- Smart asset management

Protection of critical infrastructure

Water infrastructure is essential for the health and well-being of the population, and it is therefore vital to increase security in response to potential risks. Ever since the H2020 STOP-IT project was launched in 2017, Cetaqua Barcelona has been part of a European consortium with the challenge of designing a management and operational framework to evaluate and prevent the impact of potential risks on critical water system infrastructure, to detect attacks, and mitigate their consequences. The infrastructure of Aigües de Barcelona represents one of the 4 case studies for this mission to detect internal system failures, cyberattacks, and other types of deliberate attack.

In parallel, as a result of the ICAB (Networks and Infrastructure) and Security Water (Quality, Security and Health) projects, commercial devices have been identified, capable of detecting small concentrations of organic and inorganic contaminants. For example, an online sensor has been validated for the detection of organic contaminants in real-time, and at concentrations well below a lethal dose, while a network model has been designed to simulate deliberate attacks.

Project
Strategic, Tactical, Operational Protection of water Infrastructure against cyber-physical Threats (STOP-IT)

Duration
June 2017 – June 2021

Coordinator
SINTEF (Norway)

Partners
Aigües de Barcelona, Aplicatzia Software House, ATOS, Bergen kommune, Berliner Wasserbetriebe, BWB, DeWatergroep, Emasagra, Eurecat, Hessenwasser, ICCS, IWW, KWR, Mekorot, Mnemonic, Oslo kommune Vann, OYLO, PNO Innovation, RISA, Technion, Worldsensing, WssTP

04

People and technology

CETAQUA
BARCELONA

A network of scientific and talent platforms to generate high-impact results

Talent

Cetaqua Barcelona attracts talent. An ecosystem of first-class scientific talent has been created, made up of people both from Cetaqua itself and other research centres and universities of international standing with which we share our projects.

Scientific platforms

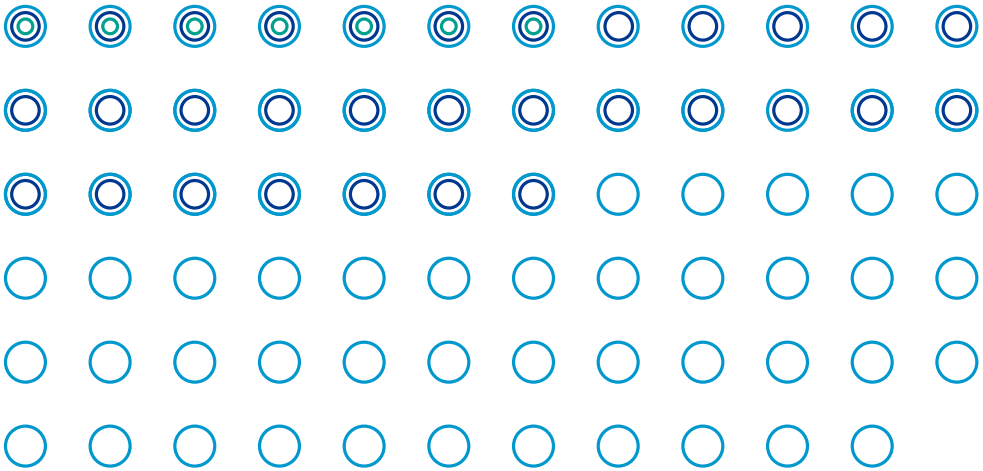
Cetaqua Barcelona has in place a network of scientific platforms to conduct study cases and the joint development of solutions and technologies. They comprise pilot facilities and prototypes that recreate real conditions in urban and industrial use, along with laboratories and other experimental facilities.

Partnership network

The partnerships we establish with organisations that fulfil the highest scientific standards, such as universities and technology centres, along with professional associations, private enterprise and the public sector, allow us to ensure that we are working on innovative, robust, relevant solutions, that also generate value for society as a whole.

We collaborate: our model to generate value

We attract talent



71
People

31
PhDs

7
Scientific Technical Advisors

Universitat de Barcelona
Dra. Montse Termes
Dr. Enric Brillas
Dr. Ignasi Sirés

UPC
Dr. José Luís Cortina
Dr. Oriol Gibert
Dr. Manuel Gómez

CSIC
Dra. Gabriela Centrano

4 scientific platforms

Evaluation of drinking water solutions

Design, validation, optimisation and adaptation of physical-chemical treatment systems for drinking water production. Tests on laboratory scale prototypes and semi-industrial scale prototypes, with the possibility of using real water of different types.

Evaluation of regeneration and reuse solutions

Design, validation, optimisation and adaptation of treatment systems using semi-industrial prototypes for the regeneration of urban water. Analysis of the functioning and development of strategies for the control of treatment and infrastructure, including regenerated water networks.

Evaluation of waste water treatment solutions

Development and testing of technologies through laboratory scale prototypes and semi-industrial scale prototypes for the treatment and optimisation of urban and industrial waste water. Solutions for the recovery and reuse of byproducts.

Evaluation of sensor solutions

Comparison and validation of sensors by simulating real and extreme conditions on a controlled platform and on the ground.

Partnership network

The scientific rigour of universities and research centres

A networked approach with with well-known institutions provides the scientific basis for the solutions proposed.

Solutions applied to the real economy

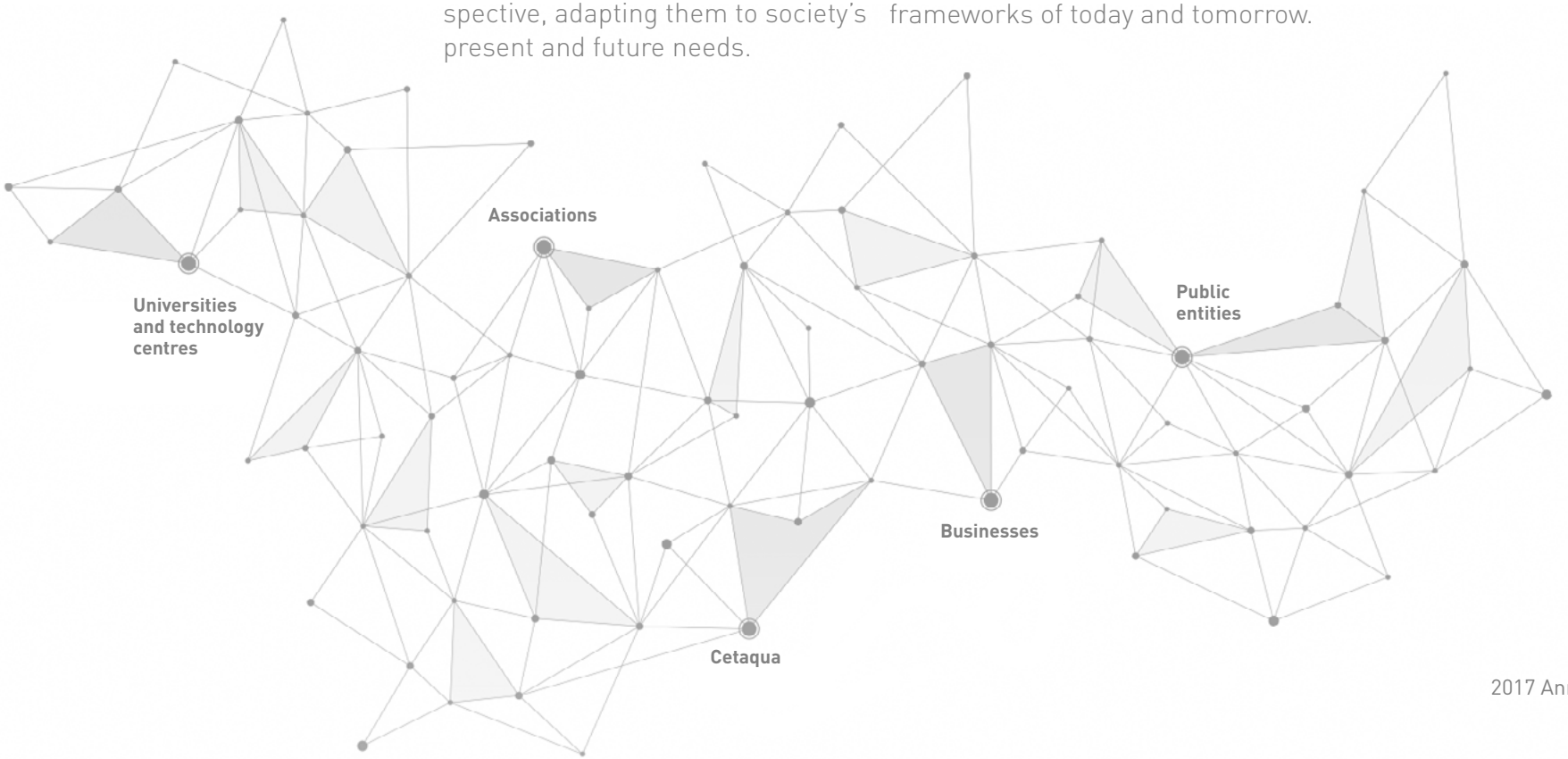
The vision of companies from different sectors (water, energy, waste, agriculture, etc.) helps to detect opportunities and to translate them into viable and sustainable solutions from the social, economic and environmental perspective, adapting them to society's present and future needs.

The value of public-private partnership

The continuous involvement of public bodies helps to guarantee that the proposed solutions respond to the real challenges our society is facing, and ensures that they can be implemented in the regional contexts and regulatory frameworks of today and tomorrow.

Influence and positioning of associations

Participation at national and international associations brings us into contact with new trends and potential partnerships, as well as promoting the exchange of knowledge.



05

Dissemination of results

CETAQUA
BARCELONA

We disseminate our results

Because the results we generate have a real impact, we work on the dissemination and communication of the R&D we conduct, seeking out and selecting the most appropriate and efficient channels for each type of message.

We participate actively in congresses and conferences

Cetaqua Barcelona has taken part at 52 national and international conferences and congresses connected with our activities, with active speakers and poster presentations.

We publish in scientific journals

Cetaqua Barcelona has published 14 peer-reviewed articles in leading publications in the sector of water, the environment, sustainability and new technologies.

We stage dissemination events

Cetaqua Barcelona stages events and workshops to explain the advances and results of the projects we coordinate or are involved in. Efforts that resulted in more than 400 attendees at these events where we presented our research alongside other participant organisations, addressing different issues within the context of the circular economy. For example, the reuse of urban water for industrial uses, life cycle analysis (LCA) or technologies for the recovery of nutrients and energy at urban treatment plants. Other gatherings focused on issues of risk management, environmental risk and water resources, and also microbiological risk in drinking water, urban resilience to the effects of climate change, sustainable aquifer management and the handling of treated water from the food and drink industries.

53
Congresses

14
Publications

7
Cetaqua's events

06

10 years of Cetaqua

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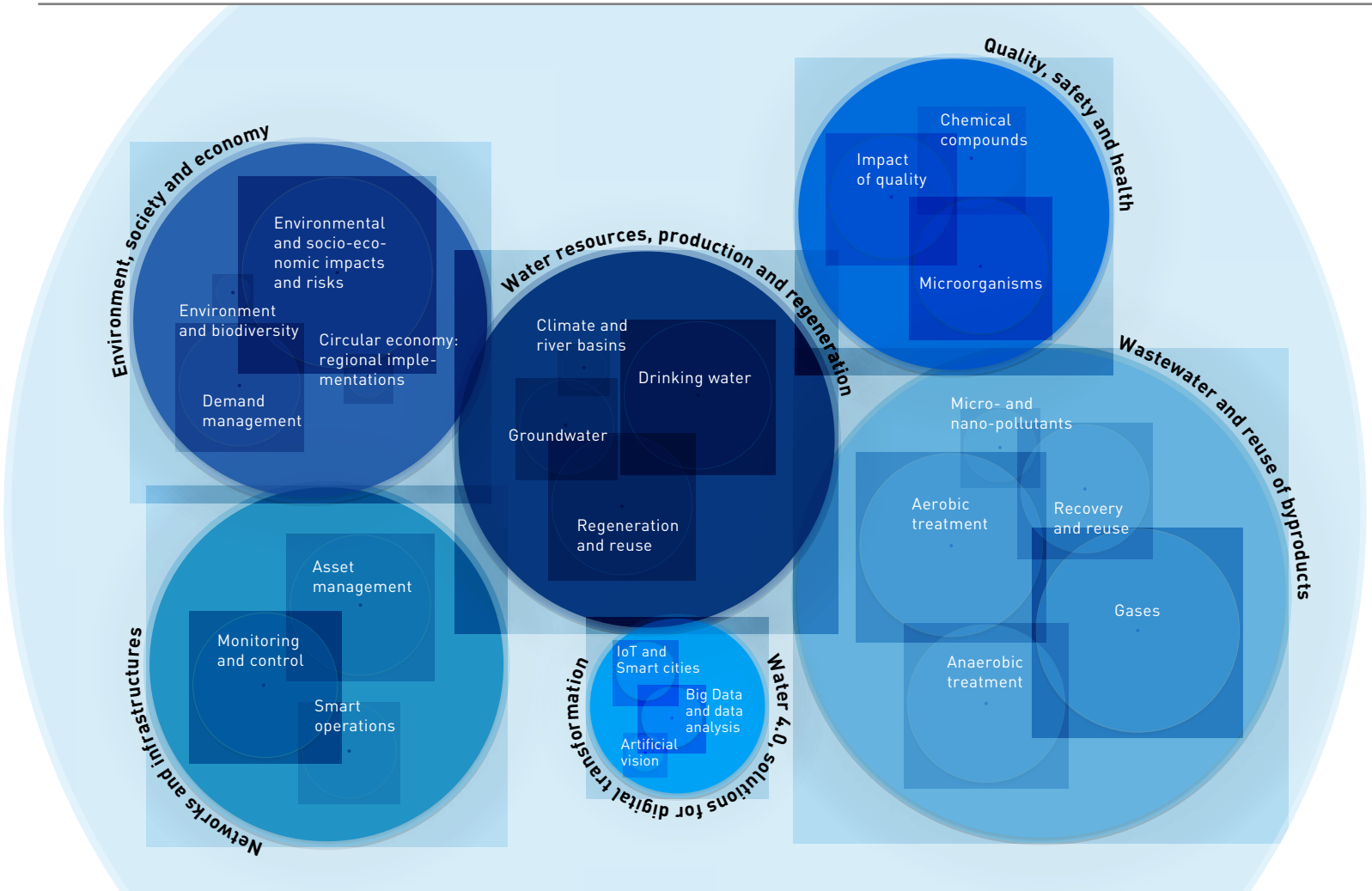
Cetaqua turns 10

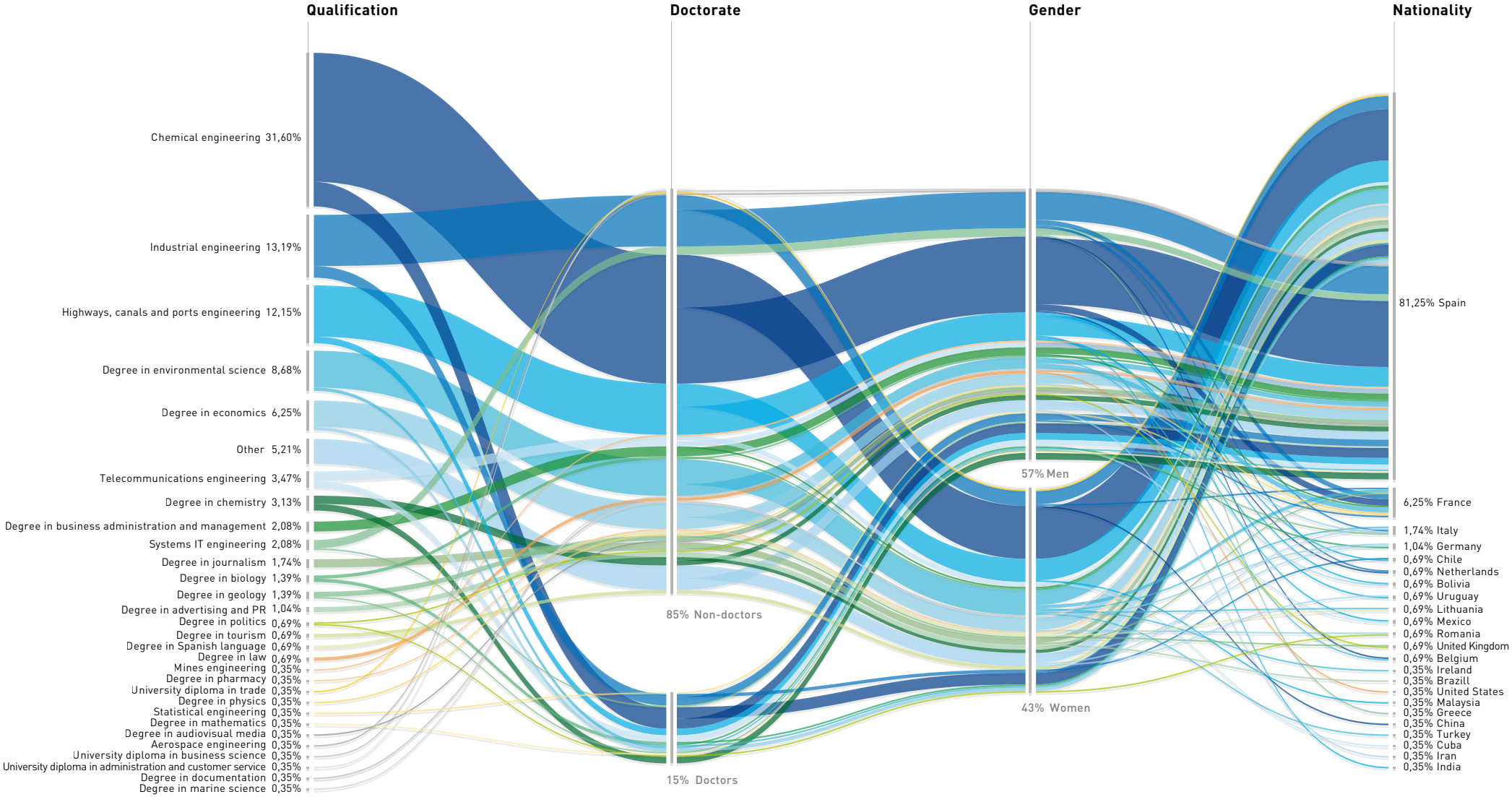
Cetaqua Barcelona has celebrated its tenth birthday, taking the opportunity to look back over our activities to date. Through collaborative projects grouped into six areas of research, we have committed ourselves to sustainable development, steering the processes of the water cycle towards a circular economy model (this figure represents the relative amount of resources invested in each research area and sub-area, in proportion to the size of the circles).



Over 200 scientific publications with international impact

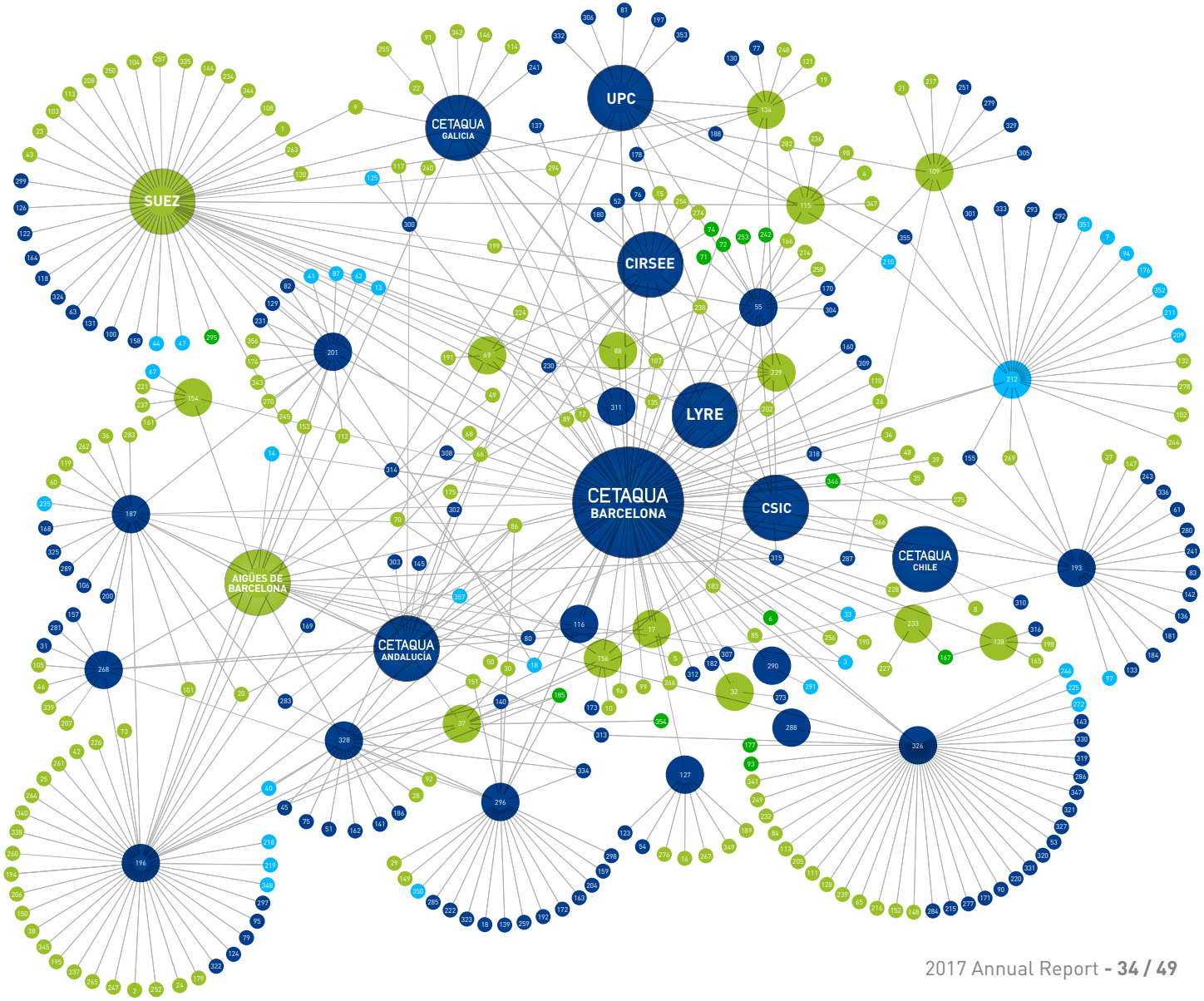
During the past 10 years we have taken part at more than 400 conventions and published over 200 scientific publications in more than a hundred leading journals in the sector. Articles that have been cited on more than 1,000 occasions in publications worldwide.

300 direct people have worked at Cetaqua



We have worked with more than 350 organisations

We believe that alliances are essential in order to fulfil our mission. The achievements that make up our track record are the result of collaborative efforts with more than 350 public and private entities.



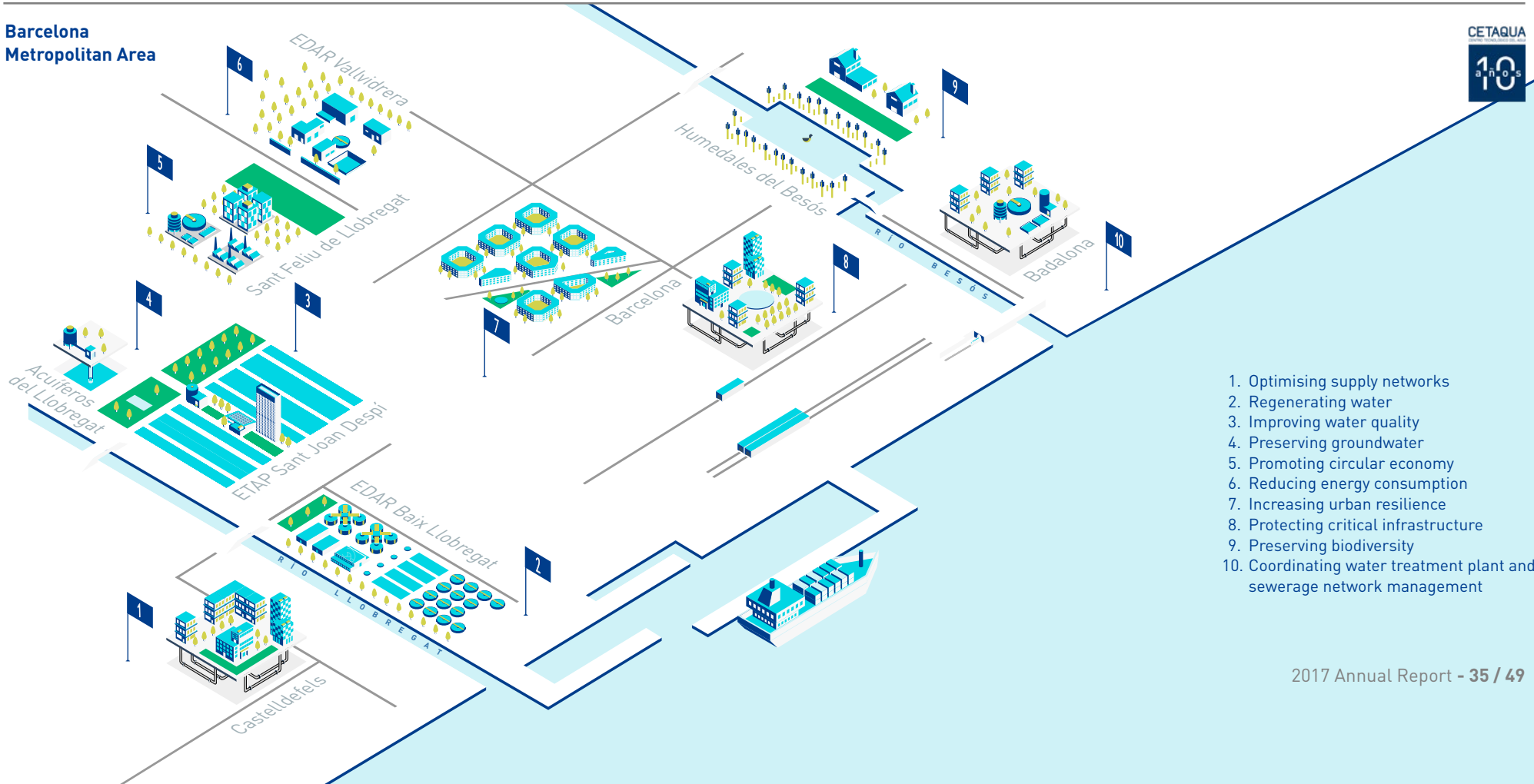
The **number** identifies the partner entity

The **size** represents the intensity of the collaboration

- Universities and research centres
- Public entities
- Associations
- Businesses

Research applied to the territory: one example for each year in our history

Aigües de Barcelona conducts some of its R&D through Cetaqua in the form of case studies at different facilities and locations in the Barcelona Metropolitan Area, focused on improving service and increasing sustainability. This map of the metropolitan area of Barcelona shows 10 examples of our research applied in different areas.
Link to the original file: https://bit.ly/2KKBIX1



07

Sustainable development

CETAQUA
BARCELONA

Our commitment to society and our environment

Cetaqua Barcelona believes in the importance of involving citizens and different regional actors in joint efforts to improve their relationship with their environment. Together with Aigües de Barcelona, we collaborate with public entities, businesses and local stakeholders, promoting synergies and identifying opportunities for the circular economy, so as to apply more sustainable resource management models. We are also involved in educational initiatives, such as the Cornellà River Festival on World Water Day, the Cornellà Research Project Exhibition and Exporecerca Jove. In the latter, Cetaqua Barcelona's researchers are involved as jury members.

Cetaqua Barcelona is fully committed to the development of sustainable solutions and technologies for the integrated water cycle. Additionally, we do everything we can to ensure that our daily work is ever more environmentally responsible. We in turn help protect our environment by calculating the carbon emissions generated by our activity, including travel by our employees. This allows us to apply the necessary measures to reduce or offset our emissions based on objective data. In 2017, Cetaqua Barcelona emitted some 145.50 tonnes of CO_2 equivalent.

The transformation to paperless and carbon-neutral offices brought in halfway through the year, has achieved a reduction of 1.2 tonnes in CO_2 equivalent emissions by the end of the year. In parallel, we offset our carbon emissions by funding the Mariposas hydroelectric project in Chile which generates electricity from renewable sources, with the corresponding environmental and social benefits for the local community.

145,50
tonnes of CO_2 equivalent

EsAgua, a pioneering water footprint network in Spain

EsAgua is a remarkable initiative in sustainable development, promoted by Cetaqua, the Water Footprint Network and Aenor, and managed by Cetaqua. This network, which is the first of its kind in Spain, acts as a meeting point for organisations interested in the water footprint, in publicising the concept, and in promoting sustainable water management.

EsAgua arose from the growing need for information on the water footprint of organisations, processes and products, with the aim of achieving a more sustainable and equitable use of freshwater. Since its launch in 2016 until the end of 2017, 27 organizations have joined the EsAgua network. The members of this network can access a private forum with expert support to share experiences, questions and technical queries regarding the water footprint, together with material and documentation of interest. Besides its private area, EsAgua is also a tool for bringing the concept of the water footprint to society and the scientific community via the internet and social media.

EsAgua

PROMOTED BY

CETAQUA
WATER TECHNOLOGY CENTRE

water footprint network

AENOR
Asociación Española de Normalización y Certificación

08

Appendices

CETAQUA
BARCELONA

Annual accounts 2017

INCOME STATEMENT	
SUEZ funding	750.303 €
Public funding	1.647.346 €
Third-party orders	1.068.337 €
Donations	2.856.000 €
Other income	139.630 €
Total income	**6.461.616 €**
Expenditure on projects	5.066.493 €
Expenditure on structure	1.395.123 €
Total Expenditure	**6.461.616 €**

BALANCE SHEET	
Non-current assets	596.900 €
Current assets	3.428.351 €
Assets	**4.025.251 €**
Equity	1.022.287 €
Liabilities	3.002.964 €
Equity and liabilities	**4.025.251 €**

List of Projects 2017

ACRONYM	TITLE	START DATE	END DATE	FUNDING ENTITY	CETAQUA ROLE	TOTAL BUDGET (€)	CETAQUA BUDGET (€)
Water resources, production and regeneration							
RESOURCE ALLOCATION	Development of a Next Generation Tool for Efficient River Basin Water Resource Management	15/12/17	28/2/18	SUEZ	Coordinator	50.000 €	50.000 €
BIOBESÒS	Evaluation of the treatment capacity of the Besòs wetlands to achieve improved biodiversity in the region	15/6/16	15/8/17	Aigües de Barcelona	Coordinator	194.944 €	194.944 €
ESTRELLES	The study of operating scenarios of the ESTRELLES wells with regard to historic 1,1,2-Trichloroethane pollution in Baix Llobregat	2/1/17	31/12/17	Aigües de Barcelona	Coordinator	22.600 €	22.600 €
ExIMA	Evaluation of the fouling and integrity of ultra-filtration membranes in the drinking water treatment process	1/12/14	30/4/17	Aigües de Barcelona	Coordinator	235.228 €	235.228 €
Sant Feliu Reuse	Demonstration project to promote reuse in Sant Feliu de Llobregat	17/7/17	28/2/18	Aigües de Barcelona	Coordinator	92.253 €	92.253 €
VALIMO	Validation of microwave technology to regenerate activated carbon	15/7/15	31/1/18	Aigües de Barcelona	Coordinator	80.544 €	80.544 €
EQVAL	EqTech: technology validation	18/9/17	30/4/18	SUEZ	Coordinator	121.500 €	52.095 €
RP1402	Evaluation of alternative UF membranes	14/9/14	31/3/17	SUEZ	Partner	463.400 €	33.800 €
SC IR	Industrial Reuse - Scoping Study on Advanced Recovery Technologies	4/7/16	16/6/17	SUEZ	Coordinator	57.515 €	57.515 €
DESSIN	Demonstrate Ecosystem Services Enabling Innovation in the Water Sector	1/1/14	28/2/18	European Comission	Partner	9.068.643 €	688.306 €
EUPORIAS	EUropean Provision Of Regional Impact Assessment on a Seasonal-to-decadal timescale	1/11/12	31/1/17	European Comission	Partner	13.048.572 €	233.716 €
IMPREX	Improving PRedictions and management of hydrological EXtremes	1/10/15	1/10/19	European Comission	Partner	7.996.850 €	180.460 €
LIFE CO2FORMARE	Use of CO2 as a substitute of chlorine-based chemicals used in O&M industrial processes for macrofouling remediation	1/7/14	30/11/17	European Comission	Partner	4.064.144 €	315.362 €
LIFE WIRE	Water Cycle Efficiency Improvement by Boosting Industrial Water Reuse	1/10/13	30/3/17	European Comission	Coordinator	1.721.875 €	924.353 €
RED_SCOPE	Recovery of Effluent Discharge for Sustainable Copper Processing in Europe	1/11/16	31/12/18	European Comission (KIC Raw Materials)	Partner	1.182.213 €	179.649 €
ReTiCo	Real-Time Control System for waste water membrane cleaning operations	1/12/17	30/4/18	AGBAR	Coordinator	20.000 €	20.000 €
-	Treatability analysis	1/3/17	30/3/18	SUEZ	Coordinator	23.169 €	23.169 €
Environmental and socio-economic impacts and risks							
TERRITORIO CIRCULAR	Circular Territory: Levers for effective implementation of the circular economy in a region	18/12/17	30/4/18	SUEZ	Coordinator	50.000 €	50.000 €
CARBOWEB 3.0	Support in managing the carbon footprint of Aigües de Barcelona	13/4/17	28/2/18	Aigües de Barcelona	Coordinator	44.629 €	44.629 €
ECOCIRC GAVA	Development of a regional data analysis prototype and application of circular economy methodology in Gavà	20/3/17	15/12/17	Aigües de Barcelona	Coordinator	51.300 €	51.300 €
ECO-EFICIENCIA SUBMINISTRAMENT	Building supply eco-efficiency analysis	15/12/15	31/1/17	Aigües de Barcelona	Coordinator	23.200 €	23.200 €
HH AB	Management of the overall water footprint of Aigües de Barcelona operations: HH AB Project	16/5/17	29/6/18	Aigües de Barcelona	Coordinator	43.700 €	43.700 €
CM1601Ph3	CM1601 CARE Ph3 Customer Analysis and Revenue Enhancement	16/10/17	31/5/18	SUEZ	Partner	140.000 €	70.000 €
PI Customer Relationship	Programme Instruction - Customer Relationship	18/9/17	31/12/17	SUEZ	Coordinator	25.000 €	25.000 €
DI-UdG	Industrial Doctorate in socio-cognitive frameworks and narrative building in water policy and the circular economy	16/2/17	16/2/20	AGAUR	Coordinator	78.352 €	66.000 €
BINGO	Bringing INnovation to onGOing water management – A better future under climate change	1/6/15	1/5/19	European Comission	Third party	7.822.425 €	43.754 €

ACRONYM	TITLE	START DATE	END DATE	FUNDING ENTITY	CETAQUA ROLE	TOTAL BUDGET (€)	CETAQUA BUDGET (€)
EDgE	End-to-end Demonstrator for improved decision-making in the water sector in Europe	1/10/15	31/12/17	European Comission	Coordinator	1.598.100 €	105.100 €
PEARL	Preparing for Extreme And Rare events in coastaL regions	1/1/14	30/4/18	European Comission	Partner	6.500.760 €	298.350 €
RESCCUE	RESCCUE - RESilience to cope with Climate Change in Urban arEas - a multisectorial approach focusing on water	1/5/16	1/5/20	European Comission	Partner	8.023.343 €	934.625 €
Water 4.0, solutions for digital transformation							
PredPump	Predictive Maintenance of Pumps	30/3/17	28/12/18	SUEZ	Partner	476.580 €	130.800 €
Almonds	Fruit Counter	25/11/17	28/2/18	SUEZ	Coordinator	10.850 €	10.850 €
NGP_MIDAS	Model for Interpretation of Diagnosis and Assessment of the State	1/12/17	31/1/18	SUEZ	Partner	10.000 €	4.800 €
SGP_AMR_WP3	Singapore WP3 - Customer Engagement Analysis	1/11/17	31/12/17	SUEZ	Partner	17.600 €	17.600 €
NGP_Extr	NETSCAN - Extrapolation of water pipes inspections	1/8/17	31/10/17	SUEZ	Partner	180.000 €	20.000 €
oLORES BESOS	Scoping Study Priorització Oportunitats Digitalització d'EDARs	24/10/16	24/10/17	Aigües de Barcelona	Coordinator	73.000 €	73.000 €
LyRE - BM	Consumption Estimation for Network Management	1/1/17	30/9/17	SUEZ	Coordinator	24.000 €	24.000 €
LyRE - SGP	Data Analysis Process for Customer Engagement	1/1/17	30/9/17	SUEZ	Coordinator	16.000 €	16.000 €
COp_SM	Connected Operators	20/6/16	15/9/17	SUEZ	Partner	54.500 €	12.000 €
NGP_Clust	Pipes clustering for the NGP program (NETSCAN)	8/5/17	15/6/17	SUEZ	Partner	180.000 €	8.000 €
Wastewater and reuse of byproducts							
ALTERNAB	Evaluation and proposal of alternatives for the treatment of N (and P) at the Gavà & Viladecans WWTP and Sant Feliu WWTP	2/10/17	31/7/18	Aigües de Barcelona	Coordinator	77.631 €	77.631 €
H2SOCA	Study of the reduction of reactant consumption for the elimination of hydrogen sulphide in a section of the Castelldefels sewerage system inflow	4/7/16	1/2/17	Aigües de Barcelona	Coordinator	29.828 €	29.828 €
MEMBOOSTGyV	Strategies to minimise dirtying of membranes and energy consumption at Gavà and Vallvidrera WWTPs	1/6/16	30/11/17	Aigües de Barcelona	Coordinator	114.872 €	114.872 €
OLORES BESOS	Online odour emissions monitoring system at the Besòs WWTP	15/9/16	30/6/18	Aigües de Barcelona	Coordinator	72.388 €	72.388 €
ARIP PANAMA Ph2	Partial nitrification and deammonification on mainstream - Phase 2	1/7/15	31/12/17	SUEZ	Partner	1.000.000 €	124.000 €
DAnano	Anaerobic digestion with nano-particles	25/7/16	31/5/17	SUEZ	Partner	161.000 €	146.000 €
F&B by-products recovery	Identification, recovery and valorization of high added value products from food & beverage industry effluents	2/5/17	30/9/17	SUEZ	Coordinator	25.000 €	25.000 €
CoSin	Synthetic Fuels	1/9/16	31/10/19	Acció	Partner	2.696.244 €	575.643 €
LIFE ENRICH	Enhanced Nitrogen and phosphorus Recovery from wastewater and Integration in the value Chain	1/9/17	28/2/21	European Comission	Coordinator	2.786.531 €	866.783 €
LIFE NECOVERY	Nutrient and Energy Recovery in WasteWater Treatment Plants by up-concentration and Adsorption processes	1/7/13	31/12/17	European Comission	Coordinator	1.813.054 €	1.467.852 €
LIFE SEACAN_BCN	Reducing the pressure of fish canneries on the marine environment with novel effluent treatment and ecosystem monitoring	16/7/15	31/5/19	European Comission	Partner	1.721.873 €	268.588 €
LIFE WOGAnMBR	Development and demonstration of AnMBR for the treatment and valorisation of waste water from the food industry	1/7/14	30/6/17	European Comission	Partner	1.232.647 €	408.231 €
Quality, safety and health							
Drinking Water Library	Development of a MALDI-TOF profile library to identify bacterial strains present in public water (DRINKING WATER LIBRARY)	1/10/15	1/10/18	Aigües de Barcelona	Coordinator	455.550 €	455.550 €

ACRONYM	TITLE	START DATE	END DATE	FUNDING ENTITY	CETAQUA ROLE	TOTAL BUDGET (€)	CETAQUA BUDGET (€)
CYTO-WATER	Integrated and portable image cytometer for rapid response to Legionella and Escherichia coli in industrial and environmental waters	1/6/15	30/5/18	European Comission	Partner	2.368.299 €	371.351 €
FEPS1304Ph2	Assessing the benefits of Watershed Management Programs and Water Safety Plans - Phase 2	1/1/15	31/3/18	SUEZ	Partner	615.000 €	65.000 €
AQUAVALENS	Protecting the health of Europeans by improving methods for the detection of pathogens in drinking water and water used in food preparation	1/2/13	30/1/18	European Comission	Partner	11.851.569 €	325.605 €
VT CONTAMI-NANTES 2016	Technological support activities: State of the Art and Monitoring of Research into Emerging Pollutants 2015	1/7/16	30/6/17	Aigües de Barcelona	Coordinator	7.250 €	7.250 €
RP1403Ph3+Ph4	Development of automated methods for analytical control of radionuclides in water (European council directive for radioactivity) - Phase 3 and Phase 4	1/1/16	30/6/17	SUEZ	Coordinator	91.000 €	91.000 €
NiqETAP	Validation of an online Nickel analyser to provide tools so as to improve management at drinking water treatment plants	7/4/16	15/3/17	Aigües de Barcelona	Coordinator	47.750 €	47.750 €
Security-Water	Validation of an online sensor to detect deliberate events in distribution networks	20/6/16	28/2/17	Aigües de Barcelona	Coordinator	53.900 €	53.900 €
Networks and infrastructures							
Avaries AB 2.0	Study of breakages in the supply network	1/5/17	1/5/18	Aigües de Barcelona	Coordinator	64.200 €	64.200 €
Avaries_AB	Study of breakages in the distribution network	1/8/14	31/3/17	Aigües de Barcelona	Coordinator	86.456 €	86.456 €
Formigó	Concrete pipeline support	1/5/17	1/5/18	Aigües de Barcelona	Coordinator	139.500 €	139.500 €
HIDRANTES Antifraude AB	Hydrant fraud control	17/10/16	28/7/17	Aigües de Barcelona	Coordinator	38.900 €	38.900 €
ICAB	AB Critical Infrastructure Protection: analysis and implementation of improvements	1/12/16	31/1/18	Aigües de Barcelona	Coordinator	112.720 €	112.720 €
PredMan	Predictive Maintenance and Data Analysis	25/10/16	30/6/17	Aigües de Barcelona	Coordinator	59.278 €	23.600 €
DN1401 Ph3	Smart AMR Deployment: Bringing forward the benefits of AMR through optimized deployment Phase III	4/10/16	31/1/17	SUEZ	Partner	60.000 €	35.000 €
RTC1201Ph2	CORAL. Upgrading tools for optimal RTC of urban drainage systems - Phase 2	31/12/13	31/3/17	SUEZ	Coordinator	400.000 €	400.000 €
SC_CALM_ NETWORK	Towards Calm Network: Holistic approach for OPEX reduction and CAPEX deferral	11/4/17	30/11/17	SUEZ	Coordinator	25.000 €	0 €
SCHydraulicModels	The future of hydraulic models	11/4/17	27/9/17	SUEZ	Partner	25.000 €	10.870 €
SM1302Ph3	Phase 3 Advanced management of sediments in sewers	13/5/15	31/12/17	SUEZ	Coordinator	287.255 €	96.319 €
WC1502 - Ph2	Improved methods for investigations & evaluation of inflow and infiltration -Phase 2	9/2/16	31/10/17	SUEZ	Partner	177.000 €	17.500 €
WC1601	Innovative new services using Computer Vision technology in sewer management.	18/4/16	15/3/17	SUEZ	Coordinator	23.000 €	23.000 €
WC1603	Asset Management – sewer cleaning and inspections operations	10/6/16	27/10/17	SUEZ	Partner	71.500 €	26.500 €
WT1504	SC INTEGRATED MANAGEMENT OF SANITATION SYSTEMS	1/10/15	7/4/17	SUEZ	Partner	95.000 €	17.500 €
LIFE EFFIDRAIN	Efficient Integrated Real-time Control in Urban Drainage and Wastewater Treatment Plants for Environmental Protection	1/10/15	29/3/19	European Comission	Coordinator	2.170.801 €	699.296 €
STOP-IT	Strategic, Tactical, Operational Protection of water Infrastructure against cyber-physical Threats	1/6/17	1/6/21	European Comission	Partner	9.616.525 €	453.375 €
ECO-EFICIENCIA SUBMINISTRAMENT	Eco-efficiency analysis of building supply	15/12/15	31/1/17	Aigües de Barcelona	Coordinator	23.200 €	23.200 €

List of scientific contributions to congresses and conferences 2017

Water resources, production and regeneration

O. Ferrer, M. Pastur, M. Aceves, C. Gómez, A. M. Mateo, A. Ayuso, C. Mesa, A. Vega. "Fit-for-use reclaimed urban wastewater for industrial purposes combining membrane filtration technologies". International conference on membranes in drinking and industrial water production. Leeuwarden, Netherlands (8 February 2017)

M. Hernández, O. Gibert, K. Nödler, C. Kienle, E. Simon, C. Sprenger, **S. Casas**, J. Martín. "Managed aquifer recharge with active layer as polishing step for reclaimed water". BIOREMID 2017. Granada, Spain (10 March 2017)

P. Camprovin. "Recàrrega artificial d'aigües subterrànies". II Congrés de l'Aigua a Catalunya. Barcelona, Spain (22 March 2017)

R. Mujeriego, J. Molist, F. J. de Fuentes, J. Pinyol, I. Corbella, **X. Bernat**. "Regeneració i reutilització de l'aigua". Jornada: Regeneració i reutilització de l'aigua. Barcelona, Spain (5 July 2017)

G. Viader, O. Casal, E. Licon, **B. Lefevre, N. de Arespacochaga, C. Echevarria**, C. Valderrama, **J. L. Cortina**. Integration of membrane distillation as volume reduction technology for desalination brines management: scaling limitations. 11th International Congress on Membranes and Membrane Processes (ICOM 2017). San Francisco, United States (29 July 2017)

J. López, **M. Reig**, X. Vecino, C. Valderrama, **O. Gibert**, A. Yaroshchuk, **J. L. Cortina**. Transport performance of nanofiltration membranes in metallurgical and mining effluents: modelling these parathion of oxyacids (H2SO4 and H3AsO4) from metallic species (Cu, Zn). Congrés: 11th International Congress on Membranes and Membrane Processes (ICOM 2017). San Francisco, United States (29 July 2017)

M. Reig, X. Vecino, J. López, C. Valderrama, **O. Gibert**, **J. L. Cortina**. Valorisation of industrial brines by selectrodialysis to promote a circular economy approach. 11th International Congress on Membranes and Membrane Processes (ICOM 2017). San Francisco, United States (29 July 2017)

M. Termes. Why dare to involve people in water reuse projects? WRE Conference and Exhibition on Innovations in Water Reuse. Bruges, Belgium (9 October 2017)

Environmental and socio-economic impacts and risks

M. J. Amores. "Projecte Economia Circular Gavà: Desenvolupament i aplicació de la metodologia d'economia circulara Gavà". Pla d'Acció Made in Gavà. Gavà, Spain (10 March 2017)

M. J. Amores. "Presentación de EsAgua y la Huella Hídrica". 100 Jornadas Corresponsables, Taller Comunicación y RSE en el ODS 11: Ciudades y comunidades. Barcelona, Spain (9 March 2017)

M. J. Amores. "AQUAENVEC tool for LCA of Urban water system". Congrés: Advanced training course 4 "Modelling assessment and decision support tool". Girona, Spain (15 March 2017)

M. J. Amores, M. Calvet, Y. Lorenzo, D. Marín, M. Termes, M. Salamero, R. Bellido. "Promoting Sustainable Circular-Economy Regions through an integrated assessment of Energy, Water and Waste flows (Sant Feliu Llobregat project, SFLL)". Congrés: SETAC Europe 27th Annual Meeting. Brussels, Belgium (7 May 2017)

Y. Lorenzo, A. Silva, D. Marín, L. Rodríguez. "Environmental assessment and GHGs emissions monitoring of SIAM technology in Mediterranean and Atlantic climates". SETAC Europe 27th Annual Meeting. Brussels, Belgium (7-11 May 2017)

Y. Lorenzo, M. Calvet, D. Marín, S. Longo, A. Hospido, **A. Mosquera**, M. Gómez, F. Aneiros, **I. Rodríguez**. "Environmental and economic evaluation of biofilm-based technologies for the treatment of fish-canning effluents". SETAC Europe 27th Annual Meeting. Brussels, Belgium (7-11 May 2017)

D. Marín. "L'eco-eficiència com a eina de suport a la decisió cap a una gestió sostenible del cicle de l'aigua a les ciutats". Mesas de Urbanismo de AMB. Barcelona, Spain (10 May 2017)

P. Malgrat, E. Martínez-Gomariz, B. Russo, **S. Vela, M. Velasco,** A. Gabàs, **Marin, D.** "La resiliencia de Barcelona frente al cambio climático: el Proyecto RESCCUE". V Jornadas de Ingenieria del Agua. A Coruña, Spain (25 October 2017)

E. Martínez, M. Gómez, B.Russo, P.Sánchez, J.A.Montes. "Metodología para la evaluación de daños a vehículos expuestos a inundaciones en zonas urbanas". V Jornadas de Ingeniería del Agua (JÍA 2017). A Coruña, Spain (26 October 2017)

M. Isasa, M. J. Amores, M. Calvet, D. Marín, M. Salamero, **M. Termes**, R. Bellido. "Análisis de flujos para la detección de oportunidades de economía circular para un territorio". IV Simposio esLCA "Análisis de ciclo de vida y economía circular: herramientas para la toma de decisiones en la gestión de residuos". Santander, Spain (27 October 2017)

E. Martínez, E. Reitg. "Marbella Case Study". IWW 2017. Amsterdam, Netherlands (30 October 2017)

D. Marín. Promoting water footprint management. IWW 2017 - International Water Week. Amsterdam, Netherlands (1 November 2017)

Popartan, M. Poch, **M. J. Amores**. "Water management as discursive battlefield: the importance of narratives in the struggle for 'remunicipalisation' of water in Barcelona". 13th Conference of the European Sociological Association, Athens, Greece (29-31 August 2017)

Water 4.0, solutions for digital transformation

M. Mussons. "Digital Water Panel". Congrés: 4th Connected Smart Cities Conference. Brussels, Belgium (12 January 2017)

R. Giménez. "Citysensia: Sensorització mediambiental móvil sobre la xarxa de telelectura". Fòrum d'innovació tecnológica del sector de l'aigua. Barcelona, Spain (27 April 2017)

Wastewater and reuse of byproducts

A. De la Puente, N. Basset, N. de Arespacochaga. "LIFE WOGANMBR". 6º Foro Transfiere. Málaga, Spain (15 February 2017)

I. Martín. "Experiencias de Cetaqua en reutilización de agua". Foro Agua y agua residual. Reutilización. Santiago de Compostela, Spain (21 March 2017)

J. Manzano. "Ground water treatment: MBDEN technology". Jornada Anàlisi de l'eficiència i l'eficàcia dels sistemes de descontaminació i tractament de nitrats en aigües subterrànies contaminades. Barcelona, Spain (9 May 2017)

C. Ovejero, J. Manzano ,N. de Arespacochaga, T. Ortigosa, J. C. Ruiz, C. Picard, B. Hefferman. "Oxymem MABR as an Energy Efficient Technology for secondary urban wastewater treatment: industrial pilot case". 10th International Conference on Biofilm Reactors (BIOFILM2 017). Dublin, Ireland (9 May 2017)

C. M. Castro, P. Carrera, A. Val del Río, **J. Manzano, A. Mosquera, I. Rodriguez**. "Aerobic pilot-scale biofilm-based technologies for the treatment of high strength saline wastewater". 10th International Conference on Biofilm Reactors (BIOFILM 2017). Dublin, Ireland (9 May 2017)

R. Reif, N. de Arespachochaga, S. Cheret, B. Barillon, F. Ovalle. Towards a circular economy: new metal recovery strategies from mining and metallurgy wastewaters. Water in industry 2017: primer congreso internacional de aguas en procesos industriales. Santiago de Chile, Chile (7 June 2017)

S. Tena, B. Lefèvre, J. Ortiz, M. Blasi, D. Vázquez, Y. Aguilera, **R. Reif**. Development and demonstration of a new 3D electrochemical technique for recovering Copper in the mining industry. Water in industry 2017: primer congreso internacional de aguas en procesos industriales. Santiago de Chile, Chile (7 June 2017)

D. Sánchez, B. Andreo, R. Reif, S. Casas, X. Bernat, E. Lupiani. Characterization of sulfide mine waste rock leachates: methodology. Water in industry 2017: primer congreso internacional de aguas en procesos industriales. Santiago de Chile, Chile (7 June 2017)

S. Tena, B. Lefèvre, J. Oriz, M. Blasi, D. Vázquez, Y. Aguilera, **R. Reif**. "Development and demonstration of a new 3D electrochemica l technique for recovering Copper in the mining industry". Congrés: Water in industry 2017: primer congreso internacional de aguas en procesos industriales. Santiago de Chile, Chile (7 June 2017)

C. Ovejero, S. Beltrán, J. Gassó, R. Estany. "Nueva herramienta de monitorización avanzada de la filtración en plantas tipo BRM". VI Jornada sobre Biorreactores de Membrana. Barcelona, Spain (14 June 2017)

N. Basset, T. Alvariño, M. Ruiz, **M. Calvet, M. J. Amores, N. De Arespacochaga**. "Anaerobic membrane bioreactor treating high complex food industry wastewater: overall performance. Life Project WOGAnMBR". VI Jornada sobre Biorreactores de Membrana, Barcelona, Spain (14 June 2017)

I. Ruiz, B. Gomez, H. Gorisse, **I. Martín**. "RED_SCOPE Discharge Effluent Recovery for a Sustainable Copper Processing in Europe". IMWA 2017 Conference. Rahua, Finland (29 July 2017)

X. Vecino, **M. Reig**, J. López, C.V alderrama, **O. Gibert, J. L. Cortina**. "Integration of liquid membrane contactors on the valorization of ammonia from treated wastewaters as liquid fertilizers: process limitations due to water transport". 11th International Congress on Membranes and Membrane Processes (ICOM 2017). San Francisco, United States (29 July 2017).

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