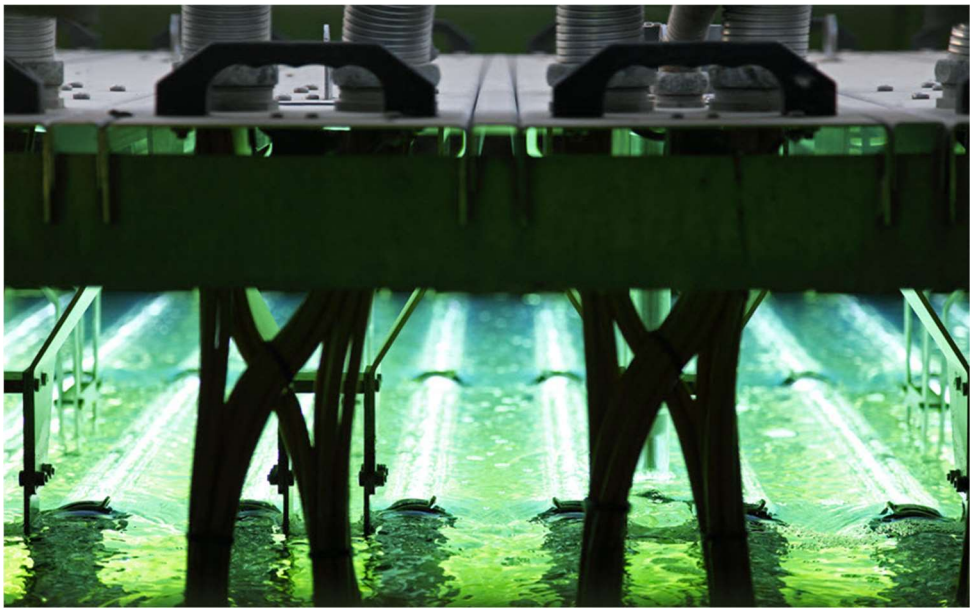

LIFE WASTE-WATER TREATMENT PLATFORM MEETING

Making Water Fit for LIFE

January 29th and 30th 2020, Barcelona, Spain

HOSTED BY

CETAQUA
WATER TECHNOLOGY CENTRE

Including:

- Background
- Agenda
- Workshop details
- Workshop questions
- Policy background
- Logistic details
- Registered projects and participants

The venue of the platform meeting: The Agbar Water Museum, Cornellà de Llobregat, Barcelona, Spain

LIFE Waste-Water Treatment Platform Meeting
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The meeting is hosted by Cetaqua (Water Technology Centre), Spain a regular LIFE beneficiary since 2007

Tweet about the LIFE Waste-Water Treatment Platform in Barcelona and don't forget to tag us!

@Cetaqua, @LifePlatformMeeting

Promote the event using **#LIFEpmEnvironment**

Take this opportunity to share your thoughts and experiences on the topic

Table of Content

INTRODUCTION 5
SETTING THE SCENE 6
Background 6
The Urban Waste Water Treatment Directive 7
The Outcome of the Background Studies 9
Thematic Report – Life and the Water Sector (2015) 9
EIP for Water (2017) 10
The Ex-post Study (2018-2019) 10
The Active Project Survey (2019-2020) 12
Barriers encountered 12
Needs from policy makers and investors 12
FOCUS OF THE PLATFORM MEETING 13
The Expected Outcomes of the Platform Meeting 13
AGENDA 15
Format of the Meeting Day 1 17
Field trip parties 18
Format of the meeting Day 2 19
Mentimeter 19
INTRODUCTION TO THE WORKSHOPS 20
General information 20
Format of workshops 20
Main Discussion Topics 20
Workshop 1 – Circular Economy of Water and Sludge 21
Workshop 2 Contaminants of Emerging Concern 22
Workshop 3 – Urban Runoff and Storm Water Overflows 22
Workshop 4 - Monitoring 22
Summary 23
Questions to be raised within the workshops at the discussion (preliminary list of questions) 23
Workshops - suggested participation based on the registration 25
Annex 1: List of participating projects 26
Annex 2: List of participants 30
Annex 4: Project Summaries 34
LIFE PROJECTS 34
H2020 PROJECTS 46

Annex 5: LOGISTIC INFORMATION 49
The venue of the platform meeting: 49
How to reach the meeting venue 50
Connections between Barcelona and the museum and back: 50
Connections between the airport and the venue and back: 50
Travel to Barcelona 50
Connections between Barcelona and the airport and back: 51
A few words about Barcelona 52
Contacts 52

INTRODUCTION

LIFE platform meetings aim to promote the exchange of knowledge and good practices, and to facilitate networking and synergies among LIFE projects active in the same broad policy area.

The LIFE WASTE-WATER TREATMENT PLATFORM meeting will be hosted by Cetaqua (Water Technology Centre), Spain. Cetaqua has participated in 18 LIFE projects between 2007 and 2020, 18 H2020 and some other regional projects (funded by RIS3CAT and FEDER).

Cetaqua is a public-private partnership created to guarantee the sustainability and efficiency of the water cycle, taking into account the regional needs. Cetaqua 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. It was set up in 2007 by Aigües de Barcelona, the Polytechnic University of Catalonia (UPC) and the Spanish National Research Council (CSIC). The same model has subsequently been applied at other Cetaqua centres, which are independent from each other, but share the same strategy and work collaboratively.

Cetaqua is proud to host the Platform Meeting and celebrates its wide experience in the development of Life Projects, in particular related to wastewater topic. The projects developed by Cetaqua cover water reclamation and reuse, nutrient recovery, energy optimization and recovery and bio-based fuel production, and projects related to integrated management of WWTPs and drainage networks. In this sense, during the platform meeting Cetaqua will introduce the participants to these projects.

The meeting aims to bring together practitioners working in the field of waste-water treatment and to engage other relevant stakeholders, including policy makers, from the European institutions, national and local authorities, civil society and the private sector.

The objective of the current LIFE WASTE-WATER TREATMENT platform meeting is to provide practical solutions for decision makers in the context of water policy. In addition, we hope to enumerate and summarise the experience of the most relevant wastewater related projects for stakeholders in the Member-States, raise awareness about the topics under discussion and provide an opportunity for networking.

Particularly, it will address how LIFE can contribute to policy development and implementation in very different national and regional contexts but with an emphasis on the forthcoming impact assessment of the Urban Waste-Water Treatment Directive (UWWTD). How can the meeting influence the discussions on the future of the UWWTD especially in the areas identified as deficient? What works in the Directive and what does not work (impact of existing national policies, projects, grass-route initiatives)? what are the challenges and how they can be addressed?

SETTING THE SCENE

Background

The Urban Wastewater Treatment Directive (91/271/ECE) (UWWTD), which came into force in 1991, is one of the oldest pieces of EU water legislation. The Directive requires all urban areas with the population equivalent (p.e) of more than 2,000 to collect wastewater and in most cases to conduct at least secondary (biological) treatment of their wastewater. For those in sensitive areas, and with more than 10,000 population equivalent, more stringent than secondary treatment (e.g. N and P removal) is required. Many Member states are still struggling with reaching compliance with the Directive. Some Member States which were previously compliant find it difficult to maintain their collection and treatment systems at an appropriate level.

This 30-year old directive has been undergoing a 'refit' evaluation since 2018 which includes a review of the effectiveness, relevance, efficiency, coherence and EU-added value. The evaluation was coordinated with the WFD and Floods Directive Fitness Check. Consultation activities for this evaluation included an online public consultation, three expert workshops and a stakeholder conference. The results of the evaluation of the UWWTD were published in 2019[1].

The water sector, and wastewater treatment, form a significant part of the LIFE-Environment portfolio. Recent and older assessments of water treatment projects[2] have reviewed the contribution of LIFE projects to the water sector in general and particularly wastewater treatment. The results of the ex-post study conducted in 2018 suggest that LIFE projects in the past demonstrated a range of different possible technical solutions designed to improve the quality of treated wastewater and promote reuse and addressing the resource efficiency agenda. Since 2014, projects have placed more emphasis on market sustainability as well as innovation and demonstration. Projects are now encouraged to be closer to market and there is an expectation that projects should make a positive contribution to improving water quality in a sustainable manner, both within and after the project lifetime.

Since 1991, when the Directive was adopted, there have been new developments in EU law on water. For example, in 2000 the Water Framework Directive (WFD) was adopted, and the law on bathing waters (BWD) and drinking water (DWD) has also been revised. There have also been technical advances on treatment techniques for wastewater, and emerging pollutants have been identified that might require removal. Also, since 1991, the EU has been enlarged from 12 to 28 countries, increasing the total amount of wastewater to be collected and treated, and presenting different experiences and challenges in the new Member States (e.g. in Scandinavia, Central and Eastern Europe and the Mediterranean islands).

For more information about wastewater management in Europe, please check out these websites: The European Commission's website about the Urban Waste Water Treatment Directive:

http://ec.europa.eu/environment/water/water-urbanwaste/index_en.html

[1] https://ec.europa.eu/environment/water/water-urbanwaste/pdf/UWWTD%20Evaluation%20SWD%20448-701%20web.pdf

[2] Contribution of LIFE ENV/INF/NAT projects to the implementation, dissemination and further development of EU environmental policies and legislation. Water Sector – Report (2012)

Contribution of LIFE ENV/INF/NAT projects to the implementation, dissemination and further development of EU environmental policies and legislation. Water Sector – Report Update (2015)

Ex-post study on LIFE and the Urban Waste Water Treatment Directive (91/271/EEC) (2019)

The European Environment Agency's interactive map where you can check out the situation in your country and individual wastewater treatment plants:

https://www.eea.europa.eu/themes/water/european-waters/water-use-and-environmental-pressures/uwwtd/interactive-maps/urban-waste-water-treatment-maps-2

Links to various national sources of information:

https://www.eea.europa.eu/themes/water/water-pollution/uwwtd/links-to-national-water-waste/links-to-national-water-waste

The Directive's interactive map with a compliance assessment

https://uwwtd.eu/

Given the impressive legacy of the LIFE programme in wastewater treatment this platform meeting is expected to make a positive contribution to the implementation and the impact assessment of the UWWTD by providing information on successful and sustainable examples in the four areas (please see the list of topics in Section 2). Contributions on water re-use may also be of interest as the new 'Re-use Water Regulation' has just been agreed on and the findings related to emergent pollutants may provide insight into the communication on a strategic approach to 'Pharmaceuticals in the Environment' which includes water and is not legally binding.

Summarising, this platform event could provide a timely contribution to the impact assessment.

The Urban Waste Water Treatment Directive

Just a reminder about the specific requirements of the Directive:

- To collect and treat wastewater from all agglomerations of more than 2,000 population equivalents (p.e.).
- To apply secondary treatment, addressed to remove organic pollution from all collected wastewater from agglomerations of more than 2,000 p.e., or of more than 10,000 p.e. if they discharge in coastal waters or estuaries.
- To apply more advanced treatment (removal of nutrients or other types such as disinfection) for agglomerations of more than 10,000 p.e. in designated sensitive areas (e.g. where waters are at risk of receiving too high nutrient loads, bathing waters etc.).
- If it is economically infeasible or the establishment of a collecting system does not result in an environmental benefit, individual systems or other appropriate systems (IAS) which reach a similar level of environmental protection, may be used.
- A requirement for authorisation of all discharges of urban wastewater (such as a permit or license), of discharges from the food-processing industry, and of industrial discharges into urban wastewater collecting systems.
- Storm water overflows: Member States can decide on measures to limit pollution from storm water overflows. These measures can be based on dilution rates or capacity in relation to dry weather flow or can be to specify a certain number of acceptable overflows per year.

- Re-use of sewage sludge and treated wastewater re-use is allowed whenever appropriate.
- Monitoring the discharges from urban wastewater treatment plants to verify compliance with the Directive.

The Outcome of the Background Studies

The LIFE programme has had a long legacy of financing projects in the Water Sector, many of which have dealt with wastewater treatment. The nature and geographical distribution of the LIFE wastewater treatment projects have been determined by the objectives of successive LIFE multi-annual work programmes and over the years we have assessed the impact of the project on wastewater treatment using thematic studies, specific ex-post analyses on closed projects and more recently questionnaire based approaches to further our understanding of the topic. A summary of these analyses is presented below.

Thematic Report – Life and the Water Sector (2015)

In 2015 we published a thematic report on the water sector and the involvement of LIFE projects in the sector since 2000 – the year when the Water Framework Directive was launched. As part of this study we looked at projects contributing to the UWWT. Of the 54 LIFE projects contributing to the UWWT many older projects focussed on providing new technical solutions for the treatment of wastewater. There are numerous examples ranging from the development of Best Available Technique (BAT) for water reuse in textile SMEs (LIFE05 ENV/IT/846 BATTLE) to the improved treatment of storm water (LIFE05 ENV/IT/000894 ESTRUS). Several projects funded between 2005 and 2007 developed new membrane filtration techniques to improve water purification.

By 2008, projects were aspiring to more complex objectives with concepts designed to link improved wastewater treatment to alternative water uses in semi-arid regions, thereby addressing resource efficiency agendas as well alongside better treatment of wastewater. For example, the main objective of the LIFE08 ENV/P/237 WW4ENVIRONMENT project was to implement an optimising tool for the management of wastewater treatment facilities, using operational and energy consumption data to determine and minimize the carbon footprint of wastewater treatment plants. This helped to achieve both the EU's environmental impact and energy efficiency objectives. The Spanish project LIFE08 ENV/E/118 GREENLYSIS looked at the production of hydrogen and oxygen via electrolysis powered by renewable energies to reduce the environmental footprint of a WWTP.

Throughout the period 2005-2010 a steady number of LIFE projects focussed on pioneering techniques such as ultrasound treatment (LIFE05 ENV/F/67 SOUND SLUDGE), thermo-catalytic low temperature conversion techniques (LIFE06 ENV/D/458 LOTECOTEC) and pyrogasificiation (LIFE08 ENV/F/489 PYROBIO) for reducing and removing sludge in waste water and sewage treatment plants. Other projects, such as LIFE06 ENV/D/460 SLUDGE2ENERGY, dealt with waste prevention through sewage sludge reuse for efficient energy generation in wastewater treatment plants.

The overall analysis from the study for LIFE success factors and threats in in the projects focussed on the UWWTD are shown in the table below:

Thematic Focus of the Project	Success Factors	Threats
UWWT	• Be active in raising awareness in the local target groups (farmers, tourists, local communities) through a range of interactive means • Innovative technical solutions have widescale implications for implementation of directives	• Different countries have different planning and financing requirements and have different interpretations of the directives • Some prototype technologies cannot be easily reproduced • Local scale demonstrations with no national representation in partnership

		make replication difficult

EIP for Water (2017)

Additional inputs have resulted from the EIP for Water LIFE event on wastewater treatment that took place in Porto in 2017. The event made the following recommendations which moves the agenda forward from simply considering improving the technologies without considering the potential benefits that could accrue from wiser resource application and extraction:

- A great number of WWTP use old technologies. While these current technologies may be deemed adequate, improvements could be achieved, taking into consideration issues like emerging pollutants but also energy production. New technologies or combinations of technologies could render WWTP more efficient and effective. Even so, such improvements should be made taking into account the holistic design of a WWTP, as a change in one part of the system could have impacts on another part.
- There needs to be a mind-set change on how we view WWTPs. They should be considered as energy producing and resource extraction refineries.
- WWTPs are capable of producing energy even in excess of their needs, thus turning them into energy sources rather than sinks. Even so, regulatory bottlenecks have appeared, in particular relating to the insertion of the excess WWTP energy to the grid, which in some cases make it cheaper for the WWTP to switch-off its energy producing capacity.

The Ex-post Study (2018-2019)

In 2018 we conducted a survey of the closed LIFE projects in the wastewater sector. Between 2000 and 2017 the LIFE programme has financed 138 projects dealing with wastewater treatment[3]. According to our records 94 of these projects are closed and questionnaires were sent to all these projects to determine how effective they had been in the longer term. Questions focussed on the impact of the project through assessing its sustainability, replication and transfer of results. A subset of ten projects were selected to go forward for further analysis by structured face to face interview. Specific questions focussed on improvements in water quality as a result of the project, whether any monitoring had been undertaken to confirm the results and what was the innovation character of the project. All ten projects were selected from the southern European states as the majority of projects answering the questionnaire were from the south and by far the highest number of projects were in Spain and Italy. This provided a further focus for the study.

The results of the questionnaire showed that:

- The most frequently addressed issue across the projects was water re-use and energy efficiency and primarily in the southern European States. One project measured energy savings.
- All 38 projects self-reported that their projects were successful and achieved their expected results.
- Volumes of material treated were generally very low – commensurate with the demonstration or pilot nature of the projects – three projects reported volumes treated above 300 m^3/day.
- Response rate to pollution types was high – the majority of projects focussed on nutrient reduction, organic matter and suspended solids (and this was also true of the more detailed ex-post surveys). However, the Spanish projects also showed some attention to emergent pollutants.
- Where reported (although the response rate for this was low) reductions in pollutants was generally successful at 90% reductions.

3 http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=home.getProjects&themeID=77&projectList

- The most frequent response concerning the AfterLife plans were that further testing and monitoring would be required prior to operationalisation.
- When asked about the current status of the technology, 71% of respondents reported that the technology was still in use, which does not correlate well with the findings of the more detailed surveys where a much lower percentage was discovered in reality.
- An impressive 63% of respondents reported that the process/technology was still in use 3 years after the project close.
- The projects were asked about the maintenance of the process/technology and while the majority reported that no maintenance had taken place, those that did maintain the equipment reported that they did so annually.
- Approximately 40% of projects reported that there were no barriers to sustainability, the remaining projects suggested that correct design and affordability (in the open market) were the principal drivers of sustainability.
- There were 34 cases of replication reported across all projects (some with several replications).
- There were fewer transfers of technology to other countries (7) or sectors (16), with the exception of one project which has individually transferred the technology to 27 EU countries and 40 countries outside the EU.
- The two most commonly cited reasons for lack of replication and transfer are lack of investment and cost.

We selected 10 projects for a more in-depth study which required a visit from a member of the external monitoring team and an interview with some specific questions. Some conclusions from this assessment provide us with a starting point for possible discussion during the Platform Meeting:

- Legalisation is a key driver for development of emergent systems, without a legal requirement, industry is unlikely to find the financing to make progress with advanced techniques.
- Water pricing policies need to be favourable so that the cost of remediation (large capital investments) is lower than the cost of existing remediation.
- Having the right partners e.g. appropriate investors and access to the right funds e.g. structural or regional development funds – the need for more joined up thinking to deliver major water infrastructure projects.
- High initial investment costs cited as a barrier, even though pay back periods are reasonable and cost benefit is high.
- Technology is often superseded because the field moves on so quickly.
- Maintenance of highly technical systems in operational plants can be an issue. Operators of WWTPs are not willing to invest in technology that has no back up support for servicing and maintenance.
- Attitudes among stakeholders for changing practice is difficult to address e.g. end users were reluctant to re-use treated wastewater and preferred to use river sources even though the levels of pollutants in the rivers was higher than in the treated wastewater. It appears the real barrier may be cost rather than the need for behavioural change.
- C2M could be a significant driving force in increasing product uptake and making projects more sustainable.

The Active Project Survey (2019-2020)

In advance of the Platform Meeting we undertook a survey of the LIFE projects in the wastewater sector which were still open and so were not canvassed during the ex-post exercise and so we expected some different responses to some of the same questions. We also asked some more penetrating questions about the policy landscape. A good response rate was received with 32 completed questionnaires from the 66 open and closed projects approached providing 48% response rate. Most of the projects were LIFE 2014 and beyond.

In the ex-Post Study on LIFE and the Urban Waste Water Treatment Directive, produced in April 2019, the closed projects examined were seen to be highly innovative, but with often low potential for replication. Technology Readiness Level (TRL) was less than 6 or 7. In the review of pre-platform questionnaires, the results show a much higher proportion of projects at TRL8 with some at TRL9. Which suggests a significant change of emphasis from innovation to market readiness. It remains to be seen whether the beneficiaries will convert the high TRL projects into market products.

We asked a series of questions related to the themes for discussion in the platform meeting. The responses have helped to guide our thinking in the workgroup sessions and the results will be presented in the Platform Meeting.

Barriers encountered

All projects were asked what the main barriers were for achieving self-sufficiency across each of the thematic areas and financial and policy barriers were reported as the most common barriers across all 4 themes. Technical barriers were reported as less critical (with the exception of emerging pollutants where it still ranked highly). There is more prevalent social component to the barriers reported for stormwater overflow than for the other themes. 'Other' barriers were reported (1 result) for monitoring only.

The relevance of financial barriers mirrored the barriers for sustainability/replication in the 2019 ex-post where funding, maintenance issues (which are likely to have a financial component), and expense of operation and production were all the most prevalent barriers encountered. However, it is notable that regulatory barriers did not rank highly in this survey unlike the pre-platform questionnaire.

Needs from policy makers and investors

Projects were asked about knowledge gaps that need to be filled to achieve self-sufficiency across each of the thematic areas.

The participants were asked how filling those gaps could be funded and most projects indicated that they would expect these gaps to be filled using a cross section of funding sources, although European funding provided a majority in most cases, with LIFE financing high on most lists.

FOCUS OF THE PLATFORM MEETING

During initial consultations, DG ENV expressed a wish for the platform to focus on the following seven topics:

1. Energy efficiency (integrated approaches in MS)
2. Sludge management (holistic perspective: how to deal with sludge that might contain increasing amounts of pollutants of emerging concern, link to other pieces of legislation)
3. Pollutants of emerging concern and MS approach to deal with them
4. Urban run-off
5. Storm water overflows
6. Individual appropriate systems
7. Dealing with designated sensitive areas and their catchments (links with WFD, NVZ, catchment areas for drinking water, delineation)

Further discussions with the Water Policy Unity provided a better insight into the scope and direction of the UWWTD consultation and evaluation process. This knowledge, together with an initial review of the LIFE projects which may be able to participate, allowed us to combine some themes and exclude others. The final topic areas are:

1. Circular Economy of Water and Sludge.
2. Pollutants of emerging concern (e.g. pharmaceuticals and microplastics).
3. Urban run-off and storm water overflows.
4. Monitoring

This platform meeting will attempt to provide some practical examples of solutions deployed in the projects to address the issues identified, while at the same time to provide feedback to the policy makers. An example might be that pricing policies are not currently mentioned in the UWWTD, but they are considered in the WFD, pricing strategies could be an important mechanism to encourage the uptake of more effective treatment systems.

The Expected Outcomes of the Platform Meeting

The participants of the platform meeting will include representatives of the water industry, water managers, regulators, government, non-governmental organizations and academic and technical institutions. In addition, we will be joined by representatives from the European Commission, including policy makers, and other European institutions such as the European Investment Bank and the Joint Research Centre.

We will use our joint expertise to explore how the projects financed by the LIFE and H2020 programmes could provide innovative ways forward for the industry and provide some pointers to policy makers for the issues identified.

The principal messages of the interventions and presentations will be based around a series of questions, some of which are generic and some which are specific to the workgroup. We will draw upon the experience in each workgroup to discuss and agree some of the issues that have been raised within the background documentation (see Section 5). Besides the positive effects and advantages of the different programmes, the barriers experts faced will be also addressed by the speakers and workshop participants.

As the intention is to provide policy feedback our final sessions will gather the feedback from the various sessions and try to achieve consensus on some of the most important questions raised throughout the meeting.

We will align this interpretation with the outcome of the recent European Commission's evaluation of the UWWTD which focussed on whether the Directive is still fit for purpose and still meets today's challenges. The workshops will provide feedback based on project experiences in relation to the following policy development processes:

Effectiveness: In the light of project and practitioner experience, could the Directive be more effective and meet the water treatment challenges of the future? Or is it still fit for purpose?

Efficiency: Does improved effectiveness mean increased cost of an already expensive Directive? Do the consequences of not improving the effectiveness outweigh the costs? Can we be smarter in the way we address the costs of not improving the treatment? Are there viable alternative approaches?

Coherence: Are the requirements of the Directive consistent with those of more recent water policies? Does any inconsistency cause practical problems?

Relevance: Are the objectives of the UWWTD and the way the Directive seeks to deliver these still correct today? Is the UWWTD still needed or could the main elements be embodied in other water policy to provide a more coherent approach?

The outcomes of the meeting, which will include relevant case studies and a summary of the conclusions for each of the 4 issues identified, will be shared with policy makers, will be widely disseminated and will create the right atmosphere to create new partnerships to identify and implement new ideas for the future

AGENDA

Venue: The Agbar Water Museum, Cornellà de Llobregat, Barcelona, Spain

POSTER set up opens at 16:00 on 28th January 2020 – you can also register at this time

AGENDA DAY 1 29TH January 2020		
REGISTRATION desk will be open from 08:30-9:15 on 29th January 2020 – you can also set up your poster now		
Morning session 09:15 – 12:30 - FIELD TRIPS Please report to the registration desk by 09:15 to receive instructions and be shown to your transport. **1) Barcelona Baix Llobregat WWTP with Cetaqua LIFE projects aWARE, WIRE and ENRICH**. **2) IBathwater**.		
12:30-14:00 Lunch and networking session – an opportunity to visit poster displays		
Afternoon Plenary Session from 14:00 – 18:00		
14:00 – 14:15	EASME Chairperson – Solon Mias Catalan Water Agency - Isabel Gandullo Cetaqua - Carlos Montero	Welcome and objectives of the meeting 3 * 5 mins slots EASME/ACA/Cetaqua
14:15 – 14:30	Anna Marczak, Water Policy Unit, DG Environment	EU policy implications: Wastewater The UWWTD – the story so far – next steps
14:30 – 14:45	Agència Catalana de l'Aigua Marc Moliner (Head of Strategy and Regulation in the Sanitation Department)	Local Perspective on the Application of Regulations
14:45 - 15:00	The Environment Agency of England, Dave Marshall (Programme Manager)	Natural Course – Integrated Project for Water Challenges of Collaboration
15:00 - 15:15	Cetaqua Celia Castro (Technical Manager Biofactory and Resource Recovery)	The Cetaqua experience in LIFE: results from projects in Wastewater treatment
15:15 – 15:30	Aigües de Barcelona Oriol Mas (Project Director)	From wastewater treatment to resource recovery: the case of Aigües de Barcelona
15:30 - 15:45	Q & A session	
15:45 - 16:30	**Coffee break / posters / networking** Alternatively, there will be an opportunity to have a guided tour of the Agbar Water Museum if you would like to do so	
16:30 – 16:50	Bernd Gawlik, JRC-ISPRA (via video- conferencing)	Pollution Challenges as opportunities for innovation
16:50 – 17:10	The European Investment Bank (Spain) Alex Saz-Carranza	Investing in waste-water management – water reuse and the circular economy
17:10 - 17:55	Hannah Wilson (Neemo)	Speed presentation of posters
17:55 – 18:00	EASME Chairperson Solon Mias	Wrap up and closing remarks
Joint Dinner 20:00 at the Teleferic (https://www.teleferic.es/barcelona)		

AGENDA DAY 2 30TH January 2020		
Morning Plenary Session from 09:00 – 11:00		
09:00 - 09:10	EASME Chairperson Malgorzata Piecha Introduction to the day	
09:10 – 09:30	EASME Solon Mias	The current portfolio of LIFE WWT projects
09:30 – 09:45	DG ENV LIFE Unit Miguel Albuquerque (Deputy Head of Unit)	The LIFE Programme 2021 – 2027
09:45 – 10:00	LIFE SEALEAU, LIFE Brine mining and H2020 WATER MINING Dimitris Xevgenos, Innovation Manager	Difficulties in operationalizing technologies in the market-place – showing innovation and C2M in LIFE water projects
10:00 – 10:15	EASME Evdokia Achilleos	H2020 funding for wastewater treatment and management: project portfolio and trends
10:15 – 10:30	H2020 – NextGen. Xavier Martínez	Taking the Waste out of Waste-Water
10:30 – 10:45	Neemo (Lynne Barratt)	Results of the ex-post study and pre meeting survey – setting the scene for the workgroups
10:45 – 11:00	Q & A session	
11:00 – 11:30 Coffee break / posters /		
Breakout groups – four different rooms - each breakout group will have a presentation from a LIFE project		
11:45 – 14:00	H2020 project presentation - Theme 1 – circular economy of water and sludge H2020 HYDROUSA Simos Malamis (Room Can Serra)	
	LIFE project presentation - Theme 2 – pollutants of emerging concern LIFE 14 ENV/PT/000739 IMPETUS Dr Maria Joao Rosa LNEC - National Civil Engineering Laboratory, Portugal (Room Sala Noble)	
	LIFE project presentation - Theme 3 – Urban Runoff and storm water overflows LIFE 15 CCA/ES/000091 LIFE CERSUDS Ignacio Andrés Doménech, Universitat Politècnica de València – IIAMA, Spain (Room Biblioteca)	
	LIFE project presentation - Theme 4 – monitoring effectiveness LIFE 17 ENV IE LIFE ECOSens Aqumonitrix Sandra Lacy, TE Laboratories Ltd, Ireland (Room Juntas)	
14:00 – 15:15 Lunch and networking		
15:15 – 16:15	Group facilitators – feedback on group sessions Moderated panel discussion on feedback from groups and findings from previous studies Prioritisation on the main conclusions - Mentimeter Consolidation of the outcomes	
16:15 – 16:30	Closing statements and end of conference	

Format of the Meeting Day 1

We will commence the proceedings with the **Fieldtrips** to LIFE projects which have been specifically selected to meet the four themes of the Platform Meeting. These visits will set the scene for our plenary and workshop sessions and provide context to the presentations and discussions. Please report to the registration desk by **09:15 on the 29th January at the latest** to receive instructions and be shown to your transport. You will receive more detailed information about the visit from the registration desk and your trip leader. We will have a record of which trip you selected during registration and will make sure you are in the correct group. If you did not select a group at registration, we have assigned you to a group.

Please check the table below to find out which trip you are on!

Participants will return to the Agbar Water Museum in time for lunch. We hope that the field trips provide plenty of opportunities to carry on networking.

The two Fieldtrips are:

1. **Barcelona Baix Llobregat WWTP with Cetaqua LIFE projects aWARE, WIRE and ENRICH**: an opportunity to visit one of the biggest WWTP in Europe which housed two LIFE projects dealing with water reuse and one dealing with recovery of by-product. Here you will receive information that is relevant to theme 1: Circular economy of water and sludge and theme 2: Emergent pollutants.

   Your trip leader will be Naiara Saenz Martinez from the host project Cetaqua.

2. **IBathwater**: a LIFE project concerning the integrated management of the urban sewage system of Barcelona to minimize untreated spills to water bodies including bathing waters. Here you will receive information that is relevant to theme 3: Urban run-off and Storm Water Overflows and theme 4: monitoring.

   Your trip leader will be Mariona Salvatella from the Neemo External Monitoring Team.

The afternoon **Plenary Session** will provide an overview, examining the bigger picture, understanding the policy relevance and exploring non-technological solutions that might include behavioural change models. During this session we will hear from the European Commission, European Investment Bank and the Joint Research Centre, our hosts and Spanish policy makers. The final session of Day 1 will be a speed introduction to some of the posters – an opportunity for you to recognise some of the delegates that you might be interested in engaging with further during the networking sessions.

If you have signed up for the evening event at the Telefric, please confirm your place and make your payment upon registration where you will be provided with a receipt which will form part of your eligible expenditure. The cost for the dinner and two drinks is €40 – cash only please!

Field trip parties

Fieldtrip 1 - Barcelona WWTP	Fieldtrip 2 - iBathwater
Ana Jiménez Banzo	Andrea Turolla
Antonio Giménez-Lorang	Anna Llopart-Mascaró Bassols
Arturs Tribis	Anna Marczak
Bilgehan Nas	Antonio Sanna
Carlos Echevarría	Audrey Thenard
Carmen Biel	Blanca Aznar Soler
Carmen Falomir	Carme Bosch
Celia Castro	Cecilia Caretti
Coert Petri	Chris Kaper
Daniel Rodriguez Jimenez	Clara Rull
David Pacheco	Cora Uijterlinde
Dimitris Xevgenos	Dave Marshall
Elena Zuriaga-Agustí	David Bermejo Plana
Francisco Corona	Elena Gretchina
Fulgencio Contreras López	Evdokia Achilleos
Giulia Molinari	Ewa Les
Gorka Garcia	Federico De Filippi
Isaac Fernández Rodríguez	Francesco FATONE
Isabel Garrido Martín	Frank Rogalla
Jeroen Wubben	George Romanos
Joachim Hölle	Ida De Michelis
Johanna Van Riel	Ignacio Andrés-Doménech
José Fenoll Serrano	Ignacio Martin
Jose Antonio Gabaldón Hernández	Irene Carlos
Jose F. Cabeza	Joan Garcia
Julian Mamo	Jordi Cros
Lidia Garrote Moral	Jordi Meseguer Amela
Marcel Baars	Josie Martin
Margherita Sforza	Juan Antonio Alvarez Rodríguez
Maria Joao Rosa	Koen De Witte
Martin Polidano	Lynne Barratt
Matthew John Vella	Malgorzata Piecha
Miguel Albuquerque	María José Chesa Marro
Mindaugas Šilininkas	Marina Arnaldos
Mònica Reig	Mariona Salvatella
Naiara Sáenz	Montserrat Batlle
Patrik Enfält	Nicolas De Arespacochaga
Pavlos Doikos	Nuria Vela De Oro
Petros Gikas	Núria Basset
Philipp Kuntke	Sandra Lacey
Primož Oprčkal	Solon Mias
Raul Cano Herranz	Steven Van den Broeck
Sara Seršen	Tanel Mätlik
Simos Malamis	Zane Pupola
Tamara Fernandez-Arevalo	
Virginia Pérez	
Zsuzsanna Kocsis-Kupper	

Format of the meeting Day 2

The **second plenary session** on the morning of day 2 is intended to be more technical and cover the specific topics related to the workshops. We will hear from invited LIFE and H2020 projects and about these programmes moving forward. Each workgroup session will be introduced by a representative project designed to set the scene and provide some food for thought.

Mentimeter

Throughout both days we will use Mentimeter to judge the mood of the meeting and try to reach consensus on the most important points raised in the different sessions. We will supply you with a URL and passcode for the Metimeter surveys at the beginning of the Platform meeting. You can operate the Mentimeter through your smart phone. This means that everyone will be given every opportunity to contribute to the discussion, please engage with Menimeter so your voice can be heard.

INTRODUCTION TO THE WORKSHOPS

LIFE projects are invited to participate in the meeting which will seek to provide some positive feedback to DG ENV Water Policy Unit on the following topic areas of significant importance to the restructuring of the UWWTD:

1. Circular Economy of Water and Sludge (e.g. is recovery of energy from water treatment cost efficient? Real LIFE examples helping to get the facts right).
2. Pollutants of emerging concern (e.g. pharmaceuticals and microplastics, real examples of how these can be identified and feasibly removed, cost-effective solutions, considerations to new WWTP and retrofitting).
3. Urban run-off and storm water overflows (e.g. innovative solutions for reducing pollution from both, recovery systems).
4. Monitoring (working towards an overview of what is feasible to monitor – good examples needed)

General information

Format of workshops

Workshops are around 2 hours per sessions.

The Introductory session lasts 20-30 minutes and will be organised by the facilitator. This is followed by the Keynote presentation which should last between 20-30 minutes with time for questions. Finally, the discussion part will take around 60 minutes.

Introductory session aims that the workshop participants introduce themselves and provide a feedback on their topic interests (max 1 minutes per participants with short introductory statements). The main questions to be discussed in each workgroup (see the table below) are introduced.

The Keynote session includes the keynote speech of the workshop topic. Keynote speech outlines the topic of the workshop and gives the impetus to the discussions.

The discussion session allows the participants to present their main thoughts/experiences in relation to the workshop topic and the focused questions. The thoughts and experiences will be tested on the workshop group using Mentimeter and put to the whole audience in the final plenary session.

Main Discussion Topics

- What is currently technically possible/feasible and cost-effective?
- What are the gaps in knowledge?
- What are the bottle necks in application, implementation, replication, etc.? This could include economic, policy, reputational, other etc.
- What do policy-makers need to consider when updating their policies (e.g. feasible technical improvements with significant environmental impact; cost-effectiveness, bottlenecks that could be addressed by policy; policy supporting upscaling of solutions and thus increased environmental impact; supporting public/private partnership)?

Generic barriers

- What is the nature of the financial and policy barriers encountered across all themes?
- What are the most important financial barriers currently encountered? Availability of funding, and/or costs of operation, maintenance and/or production?
- What are the social barriers, encountered or foreseen, for that may prevent rather than cure the problems associated with wastewater treatment (e.g. public perceptions on reusing wastewater, reducing the use and dependency on pharmaceuticals).

Generic needs for policy makers and investors

i. What are the other funding sources envisaged?
ii. Why is there are higher proportion of R&D funded development for circular economy and monitoring? Where would the projects anticipate this being undertaken?
iii. Are there any barriers experienced with receiving funding from the private sector? Do projects understand how private sector investment can be arranged? Or are there other issues here (for example with Intellectual Property)?

The European Commission published the findings of the Evaluation of the Urban Waste Water Directive in December 2019. The findings of this evaluation have provided background information for the workgroup sessions. A copy of the working document can be found via the following link:

https://ec.europa.eu/environment/water/water-urbanwaste/pdf/UWWTD%20Evaluation%20SWD%20448-701%20web.pdf

Workshop 1 – Circular Economy of Water and Sludge

As regards circular economy potentials, the UWWTD contains limited provisions on wastewater and sludge reuse or recovery of valuable components. These have never been strictly enforced, partly due to the lack of strong harmonised standards at EU level and the potential risks to human health. The adoption of the Commission proposal on water reuse will create further incentives to reuse water. Sludge reuse in agriculture is governed by the 1989 Sewage Sludge Directive, but over the past decades, Member States have either set stricter requirements than those imposed by the Directive or have simply banned sludge use in agriculture on public health grounds.

The removal of pollutants from wastewater can lead to polluted sludge and there is a risk of spreading these pollutants if contaminated sludge is used for agricultural purposes. Control at source of targeted pollutants would reduce treatment requirements. With regards to energy, the annual energy consumption of the wastewater treatment sector is estimated at 0.8 % of all energy consumed in the EU. This is contrasted by a number of WWTPs in the EU being re-designed to be energy producers. The UWWTD and other EU water legislation have also created a strong basis for innovation. At the time of the Evaluation, eight out of the top 15 worldwide water businesses were based in the EU, showing clearly the global business leadership of this sector.

Furthermore, the EU has taken action on a number of other issues relating to urban wastewater discharges, in the context of its strategy to boost a circular economy. The need for sufficient water quantities is reflected in the recently adopted EU Energy Strategy and Energy Union.

Workshop 2 Contaminants of Emerging Concern

The UWWTD does not include any definition or requirements on Contaminants of Emerging Concern (CEC) but there is mention in the Priority Substances Directive.

The analysis of relevance and effectiveness of the UWWTD shows that the scientific community, policy makers and general public see the growing evidence of contaminants of emerging concern, including pharmaceuticals and microplastics, in water bodies, as an increasingly important issue.

The need for action on pharmaceuticals and microplastics was also noted in the Commission's 2019 Strategic approach to pharmaceuticals in the environment and its 2018 Plastics strategy. Plants covered by the UWWTD also receive significant amounts of industrial waste waters containing a range of chemical pollutants. Overall, the treatment required under the UWWTD reduces such pollutants of wastewater to some extent but does not target them directly.

More recently, the Commission adopted the European strategy for plastics in a circular economy ('Plastics Strategy') and the Strategic approach to pharmaceuticals in the environment ('PIE Strategic Approach'). These strategies highlight the potential role of the UWWTD (and wastewater treatment more generally) as a means to tackle end-of pipe contaminants of emerging concern, such as microplastics and pharmaceuticals.

Workshop 3 – Urban Runoff and Storm Water Overflows

Storm water overflows, a sizeable remaining source of loads, are referred to only in a footnote in the Directive. The Court of Justice of the European Union has pointed out the need to develop guidance in this area. Urban runoff, which is only covered by the Directive in connection with combined sewage, is an increasingly important source of pollution, and may contain heavy metals, plastics and microplastics. The loads from these two sources are increasing due to, among others, heavy precipitation becoming more frequent and intense under the changing climate.

Furthermore, the Directive does not require the monitoring of SWOs, including the constituents of urban runoff.

Workshop 4 - Monitoring

In view of technological progress, some of the Directive's provisions on information gathering and dissemination are less effective today than when it was adopted. Monitoring under the Directive has proven effective to demonstrate compliance. However, over time, research and innovation outcomes enable advances in monitoring methods allowing more efficient and accurate monitoring of both existing and emerging pollutants. A number of Member States – depending on local conditions – set stricter emission limit values than those minimum requirements set in the Directive. Further research is required to establish whether the provisions on e.g. the frequency of sampling provisions at wastewater treatment plants to demonstrate compliance under the Directive are fit for purpose.

Overall, the Directive is fixed when it comes to monitoring to a number of parameters, frequencies and methodologies that were deemed important and sufficient for effluent quality in the 1990s. Although the UWWTD requires that competent authorities consider the receiving waters to a certain extent (either because they are sensitive to eutrophication or to meet the objectives of other Council directives), there is no provision that requires the monitoring of new or emerging substances in the influent, or the amounts of them that still appear in the effluent. Monitoring technologies have been further developed over the past 30 years and more can be detected today in influent and effluent, often online. The Directive does not directly incentivise the

uptake of new technologies (see contaminants of emerging concern). The advantages and disadvantages, as well as the costs and benefits, of taking EU action based on these technological advances would need to be assessed in a follow-up to this Evaluation. It would need to be ensured that any changes to the monitoring requirements do not come at the expense of valuable information that is required to check implementation progress in the Member States.

Summary

In the future, more attention should be given to both existing and emerging sources of pollutants with regards to environmental and human health perspectives, and, from the socio-economic perspective, to both sustainable investment strategies and affordability. To achieve this in a global and climate change context, continuous research and innovation efforts and investments are needed, in particular to develop advanced and resilient treatment and monitoring solutions, to enable cost-effective management of micropollutants and to better integrate circular systems for water/sludge reuse and recovery of components.

Questions to be raised within the workshops at the discussion part (preliminary list of questions)

Workshop #	Questions
Workshop 1	Do projects consider 'wastewater' to be a 'resource water' right now? And if not, how long might it take for this to happen?
	What about the views of the rest of the industry and stakeholders (i.e. outside of the platform participants)? Are these similar or are they different?
	Is perceptual change needed for industry and stakeholders in order to facilitate the change in categorisation?
	What (else) needs to happen for these strategic/organisations/behavioural changes to occur?
	What are remaining/residual technical challenges in place that are needed to enable full roll-out and adoption of this approach?
	What are the actual challenges to reuse sludge (legislative, health concerns, political will to use or not use it)?
	What are technologies to remove microplastics from wastewater before it ends up in the sludge? Are there any new developments in this regard?
	Is work being carried out on determining what "high quality" sludge is? When is sludge safe to be used in agriculture? What are risk-based approaches to determine when to use sludge in agriculture?
	What are the main challenges/market barriers for putting materials recovered from sludge on the market?
	How could sludge be made truly circular if we can for now not prevent micropollutants to enter the sludge?
Workshop 2	What are remaining/residual technical challenges in place that are needed to enable full roll-out and adoption of the approaches needed to remove EPs in a cost-effective manner?
	Does the treatment of each of the different categories of EPs receive sufficient attention and funding? If no, which categories need more attention?
	Would a reduction in pollution load (through behavioural change, enhanced regulation etc) make the removal of EPs more effective and/or more cost effective? What are the highest-priority substances that need a reduction in pollution load

	Over what sort of timescale can EPs be removed to mitigate the risks associated with their presence? Is this sufficient?
	What technologies remove the broadest range of contaminants of emerging concern? What is the energy use of these technologies?
	What proxy substances could be used if one does not want to focus on a substance per substance approach?
	Is it more practical to have a substance per substance approach or rather a broader approach (proxies) like in Switzerland?
	Which substances that could be in wastewater do not receive enough attention (e.g. PFAS maybe?)?
	Is there a trend for technologies that are usually used for fourth treatment to become cheaper?
Workshop 3	What are remaining/residual technical challenges in place that are needed to justify and enable scale-up of small-scale and rural flood risk measures
	Are there sufficient large scale (catchment or river basin) demonstration projects available in evidence to support strategic/regional planning decisions? If they are present, are they sufficiently disseminated and available to facilitate wider planning purposes? What are the factors that could influence their relevance and replication potential?
	Are CSO necessary in all circumstances or are there viable alternatives? Is this based on local/national legislation, location, geography, population density/requirements etc.?
	Which are the well-established nature-based solutions to deal with overflows and runoff and what are more innovative solutions? How do these solutions compare in CAPEX and OPEX to more traditional solutions such as storage tanks?
	What are the newest developments in monitoring storm water overflows?
	How can better use be made of rainwater before it reaches the treatment plant (rainwater recycling in buildings)?
Workshop 4	What are priority areas for monitoring from an operational, regulatory and thematic/technical perspective? E.g. compliance with permits and licensing? Nutrients vs emerging pollutants etc.
	Are the monitoring needs to comply with regulation/permits/licenses sufficient, too onerous, or not sufficiently protective/inclusive of all pollutants of concern?
	Is online monitoring of BOD, COD, TSS, TOC, coliform, N, P and other substance (e.g. pollutants of emerging concern) developed enough to use it in all EU countries for checking compliance?
	How much do online results differ on e.g. BOD compared to the techniques suggested in the UWWTD? Could online monitoring techniques be used for IAS (e.g. individual small-scale treatment system per dwelling)? What are the costs?
	Are there cost effective and time efficient ways for continuous and in-line water monitoring systems which might act as early warnings?

Workshops - suggested participation based on the registration

Workshop 1 – Circular economy of water and sludge	Workshop 2 – Pollutants of emerging concern	Workshop 3 – Urban runoff and storm water overflows	Workshop 4- Monitoring Effectiveness
Presenter: Simos Malamis	**Presenter:** Maria Joao Rosa	**Presenter:** Ignacio Andrés-Doménech	**Presenter:** Sandra Lacey
Moderator: Evdokia Achilleos	**Moderator:** Malgorzata Piecha	**Moderator:** Solon Mias	**Moderator:** Federico De Filippi
Rapporteur: Hannah Wilson	**Rapporteur:** Zsuzsanna Kocsis-Kupper	**Rapporteur:** Audrey Thenard	**Rapporteur:** Mariona Salvatella
Ana Jiménez Banzo	Andrea Turolla	Anna Marczak	Anna Llopart-Mascaró Bassols
Antonio Giménez-Lorang	Bilgehan Nas	Antonio Sanna	Carlos Echevarría
Arturs Tribis	Carmen Biel	Blanca Aznar Soler	Cecilia Caretti
Carlos Echevarria	Elena Zuriaga-Agustí	Carme Bosch	Clara Rull
Carmen Falomir	Fulgencio Contreras López	Elena Gretchina	Cora Uijterlinde
Celia Castro	George Romanos	Ignacio Martin	Cristian Mesa Garcia
Chris Kaper	Giulia Molinari	Isaac Fernández Rodríguez	Daniel Rodriguez Jimenez
Coert Petri	Helena Villalba	Joan Garcia	Dave Marshall
David Bermejo Plana	Isabel Garrido Martín	Jordi Meseguer Amela	David Pacheco
Dimitris Xevgenos	Jeroen Wubben	Josie Martin	Jordi Cros
Ewa Les	José Fenoll Serrano	María José Chesa Marro	Juan Antonio Alvarez Rodríguez
Francesco FATONE	Jose Antonio Gabaldón Hernández	Nicolas De Arespacochaga	Koen De Witte
Francisco Corona	Julian Mamo	Steven Van den Broeck	Martin Polidano
Frank Rogalla	Marcel Baars	Tanel Mätlik	Montserrat Batlle
Gorka Garcia	María Eugenia Suárez-Ojeda	Zane Pupola	Nuria Oliver Rajadel
Ida De Michelis	Matthew John Vella		Nuria Vela De Oro
Irene Carlos	Miguel Albuquerque		Sandra Lacey
Joachim Hölle	Pavlos Doikos		
Johanna Van Riel	Sara Seršen		
Jose F. Cabeza			
Lidia Garrote Moral			
Margherita Sforza			
Mindaugas Šilininkas			
Naiara Sáenz			
Nicolas De Arespacochaga			
Núria Basset			
Patrik Enfält			
Philipp Kuntke			
Philippe Rougé			
Primož Oprčkal			
Raul Cano Herranz			
Tamara Fernandez-Arevalo			
Virginia Pérez			
Xavier Bernat			

Annex 1: List of participating projects

No	Project Title – LIFE	Acronym	Project Code
1	Decentralized innovative treatment of ammonium-rich urban wastewater	DeNTreat	LIFE16 ENV/IT/000345
2	Advanced urban water management to efficiently ensure bathing water quality	iBATHWATER	LIFE17 ENV/ES/000396
3	Waste streams treatment for obtaining safe reclaimed water and biomethane for transport sector to mitigate GHG emissions	METHAMORPHOSIS	LIFE14 CCM/ES/000865
4	Innovaive circular businesses on energy, water, fertilizer & constuction industries towards a greener regional economy	LIFE Icirbus	LIFE14 ENV/ES/000688
5	Advanced nutrient solutions with Electrochemical Recovery	LIFE Answer	LIFE15 ENV/ES/000591
6	Capacity building for LIFE programme implementation in Latvia	CAP LIFE LAT	LIFE14 CAP/LV/000002
7	New water solutions for the mining industry: towards minimum liquid discharge and by-product recovery	REMINE WATER	LIFE17 ENV/ES/000315
8	Green solutions for treating groundwater pollution to meet drinking water directive standards	LIFE SPOT	LIFE 18 ENV/ES/000199
9	Innovative wireless tool for reducing energy consumption and GHGs emissions of water resource recovery facilities	LESSWATT	LIFE16 ENV/IT/000486
10	Reducing pressure of fish canneries on the marine environment with novel effluent treatment and ecosytem monitoring	SEACAN	LIFE14 ENV/ES/000852
11	Innovative sludge reduction	LIFE+ Project ISR	LIFE13 ENV/NL/000178
12	Water factory for the future	Life Water Factory	LIFE18 ENV/NL/000217
13	Implementing the river basin managment plan in the North West of England	Natural Course	LIFE14 IPE/UK/000027
14	Demonstration of an innovative technology for the minimization of the environmental impact of the metal finishing processes	LIFE DIME	LIFE16 ENV/ES/000410
15	Demonstration of an advanced technique for eliminating coal mine wastewater (brines) combined with resource recovery	BRINE-MINING	LIFE18 ENV/GR/000019
16	Innovative combination of WWT technologies for water rescue: anaerobic-aerobic, microalgae and AOP processes	LIFE AMIA	LIFE18 ENV/ES/000170
17	Low energy technology for leachate valorisation	LIFE LEACHLESS	LIFE15 ENV/ES/000530
18	Membrane for energy and water recovery	LIFE MEMORY	LIFE13 ENV/ES/001353
19	Inovative hybrid INTensive EXTensive resource recovery from wastewaters in small communities	LIFE INTEXT	LIFE18 ENV/ES/000233

No	Project Title – LIFE	Acronym	Project Code
20	Upgrading wastewater treatment plants by low cost innovative technologies for energy self sufficiency and full recycling	LIFE ULISES	LIFE 18 ENV/ES/000165
21	IN farm remediation by solar photocatalysis of agro-wastewater with pesticides from remnants, cleaning and rinse	AQUEMFREE	LIFE13 ENV/ES/000488
22	Pollutant photo-NF remediation of agro water	LIFE PureAgroH2O	LIFE17 ENV/GR/000387
23	High performance multiphase anaerobic reactor for agroindustrial wastewater treatment	Multi-AD 4 Agro SMEs	LIFE17 ENV/ES/000331
24	Pilot technology for aerobic biodegradation of spent TMAH photoresist solution in semiconductor industries	LIFE BITMAPS	LIFE15 ENV/IT/000332
25	Ceramic sustainable urban drainage system	LIFE CERSUDS	LIFE15 CCA/ES/000091
26	Innovative hybrid MBR-{PAC-NF} systems to promote water resuse	LIFE aWARE	LIFE11 ENV/ES/000606
27	Innovative secondary wastewater treatment with resource recovery	LIFE GREEN SEWER	LIFE17 ENV/ES/000341
28	Runoff water pruification from pavements: A novel integral system of pervious concrete pavement & insitu water treatment	LIFE DRAIN RAIN	LIFE15 ENV/ES/000394
29	Agrochemical remediation of farm soils by combining solarisation and ozonation techniques	AGREMSO3IL	LIFE 17 ENV/ES/000203
30	Use of immanent energy for sludge treatment – a central step towards self -sustaining sewage flow managment	SusTreat	LIFE08 ENV/D/000026
31	Efficient integrated real-time control in urban drainage and wastewater treatment plants for environmental protection	LIFE EFFIDRAIN	LIFE14 ENV/ES/000860
32	Validation of adsorbent materials and advanced oxidation techniques to remove emerging techniques to remove emerging pollutants in treated wastewater	LIFE CLEAN UP	LIFE16 ENV/ES/000169
33	New urban wastewater treatment based in natural coagulants to avoide phosphorus pollution allowing mud's agri-valorization	LIFE_NEWEST	LIFE16 ENV/ES/000156
34	Optimising the implementation of the 2nd RBMP in the Malta river basin district	IP RBMP-MALTA	LIFE16 IPE/MT/000008
35	Belgian initiative for making a leap forward towards good status in the river basin district of the Scheldt	LIFE BELINI	LIFE15 IPE/BE/000014
36	Adding sustainability to the fruit and vegetable proceddinf industry through solar powered algal wastewater treatment	LIFE ALGAECAN	LIFE16 ENV/ES/000180
37	Two stage autotrophic N remval for mainstream sewerage treatment	SAVING-E	LIFE14 ENV/ES/000633
38	Improving current barriers for controlling pharmaceutical compounds in urban wastewater treatment plants	LIFE IMPETUS	LIFE14 ENV/PT/000739
39	Nutrient reclycling circular economy model for large cities – water treatmentsludge and ashes to biomass to bio-energy	NutriBiomass4LIFE	LIFE17 ENV/LT/000310

No	Project Title – LIFE	Acronym	Project Code
40	Enhanced portable sensor for water quality monitoring, moving to genuinely integrated water resource managment	Ecosens Aquamonitrix	LIFE17 ENV/IE/000237
41	Enhanced nitrogen and phosphorus recovery from wastewater and integration in the value chain	LIFE ENRICH	LIFE16 ENV/ES/000375
42	Demonstration of a unique cleaning and recovery process for amonia/nitrogen, enabling 100% recycled fertilizer products	RE-Fertilize	LIFE18 ENV/SE/000265
43	New concept for energy self-sustainable wastewater treatment prcess and biosolids managment	B2E4Sustainable-WWTPs	LIFE16/ENV/GR/000298
44	Nitrogen extraction from water by an innovative electrochemical system	LIFE-NEWBIES	LIFE17 ENV/NL/000408
45	Upgrading wastewater treatment plants by low cost innovative technologies for energy self-sufficiency and full recycling	LIFE ULISES	LIFE18 ENV/ES/000165
46	Demonstration wastewater treatment system dedicated to freshwater reuse and recycling	LIFE Biosolware	LIFE13 ENV/FR/000711
47	Sustainable water managment in high water demanding industries	LIFE HIDAQUA	LIFE18 ENV/SI/000673
48	Modelling, measurement and improvement of the water managment environmental impact of the food industry	LIFE MCUBO	LIFE15 ENV/ES/000379
49	Development of sustainable and climate resilient urban storm water management systems for Nordic municipalities	UrbanStorm	LIFE17 CCA/EE/0122
50	Wastewater sludge solar drying for energy recovery through gasification gas	LIFE-DRY4GAS	LIFE 16 ENV/ES/000342
51	Water Cycle Efficiency Improvement by Boosting Industrial Water Reuse	LIFE WIRE	LIFE12 ENV/ES/000545
52	Nutrient and Energy Recovery in WasteWater Treatment Plants by up-concentration and Adsorption processes	LIFE NECOVERY	LIFE12 ENV/ES/332
53	Integrated anaerobic system for wastewater reclamation at ambient temperature in European climates	LIFE SIAMEC	LIFE14-EN-ES-000849

No	Project Title H2020	Acronym	Project Code
1	Water Reuse in the oil and gas sector	INTEGROIL	ID. 688989
2	Towards the Next Generation of Water Systems and Services for the Circular Economy	Next Gen	ID. 776541
3	Recovery and Utilization of Nutrients 4 low impact fertilisers	Run4life	ID. 730285
4	Innoative eco-technologies for resource recovery from wastewater	INCOVER	ID. 689242
5	Demonstration of water loops with innovative regenerative business models for the Mediterranean region	HYDROUSA	ID. 776643
6	Demonstration of planning and technology tools for a circular, integrated and symbiotic use of water	Project Ô	ID. 776816
7	Environmental control of carotenoid biosynthesis: a novel straegy to improve photosythetic capacity	SmartPlant	ID. 321649

Annex 2: List of participants

No	Surname	First name	Organisation	Project
1	Achilleos	Evdokia	EC, EASME	
2	Albuquerque	Miguel	European Commission	
3	Alvarez Rodríguez	Juan Antonio	AIMEN Technology Centre	LIFE18 ENV/ES/000233 LIFE INTEXT; H2020 INCOVER
4	Andrés-Doménech	Ignacio	Universitat Politècnica de València - IIAMA	LIFE15 CCA/ES/000091 LIFE CERSUDS
5	Arnaldos	Marina	Cetaqua	
6	Aznar Soler	Blanca	Barcelona Cicle de l'Aigua, BCASA	LIFE17 ENV/ES/000396 iBathwater
7	Baars	Marcel	Hoogheemraadschap van Schieland en de Krimpenerwaard	LIFE13 ENV/NL/000178 LIFE+ project ISR: Innovative Sludge Reduction
8	Barratt	Lynne	NEEMO Monitoring Team	
9	Basset	Núria	Cetaqua	LIFE16 ENV/ES/000375 LIFE ENRICH
10	Batlle	Montserrat	Adasa Sistemas	LIFE17 ENV/ES/000396 LIFE iBATHWATER
11	Bermejo Plana	David	Condorchem Envitech, S.L.	LIFE16 ENV/ES/000410 LIFE DIME
12	Bernat	Xavier	Cetaqua	
13	Biel	Carmen	IRTA	LIFE18 ENV/ES/000199 SPOT
14	Bosch	Carme	Fundació Eurecat	LIFE17 ENV/ES/000396 LIFE iBATHWATER; H2020Next Gen
15	Cano Herranz	Raul	FCC aqualia	LIFE18 ENV/ES/000165 LIFE ULISES; LIFE Intext; LIFE Biosolware
16	Caretti	Cecilia	University of Florence	LIFE16 ENV/IT/000486 LESSWATT
17	Carlos	Irene	Aqualia	LIFE13 ENV/ES/001353 LIFE MEMORY; H2020 Run4Life
18	Castro	Celia	CETAQUA	LIFE14 ENV/ES/000852 SEACAN
19	Chesa Marro	María José	Ajuntament de Barcelona - Barcelona Cicle de l'Aigua	LIFE17 ENV/ES/000396 iBATHWATER
20	Contreras López	Fulgencio	Instituto Murciano de Investigación y Desarrollo Agrario y Alimentario (IMIDA)	LIFE13 ENV/ES/000488 AQUEMFREE
21	Corona	Francisco	Fundación Cartif	LIFE15 ENV/ES/000530 LIFE LEACHLESS
22	Cros	Jordi	ADASA	LIFE17 ENV/ES/000396 iBATHWATER
23	De Arespacochaga	Nicolas	SUEZ	

24	De Filippi	Federico	European Commission EASME	
25	De Michelis	Ida	University of l'Aquila	LIFE15 ENV/IT/000332 LIFE BITMAPS
26	De Witte	Koen	Vlaamse Milieumaatschappij	LIFE15 IPE/BE/000014 LIFE BELINI
27	Doikos	Pavlos	NEEMO Monitoring Team	
28	Echevarría	Carlos	Cetaqua	LIFE17/ENV/ES/000315 LIFE REMINE WATER
29	Enfält	Patrik	Easymining Sweden AB	LIFE18 ENV/SE/000265 RE-Fertilize
30	Falomir	Carmen	SERVYECO SL	
31	Fatone	Francesco	Polytechnic University of Marche	H2020 SmartPlant
32	Fenoll Serrano	José	Instituto Murciano de Investigación y Desarrollo Agrario y Alimentario (IMIDA)	LIFE13 ENV/ES/000488 AQUEMFREE
33	Fernández Rodríguez	Isaac	CETIM Technological Centre	LIFE17 ENV/ES/000341 LIFE GREEN SEWER; LIFE15 ENV/ES/000394 LIFE DRAIN RAIN
34	Fernandez-Arevalo	Tamara	Ceit-IK4	LIFE15 ENV/ES/000379 LIFE MCUBO
35	Gabaldón Hernández	Jose Antonio	Universidad Católica de Murcia	LIFE16 ENV/ES/000169 LIFE CLEAN UP
36	Gandullo	Isabel	Catalan Water Agency	
37	Garcia	Gorka	AGUA, ENERGÍA Y MEDIOAMBIENTE SERVICIOS INTEGRALES S.L.U.	LIFE17 ENV/ES/000331 LIFE Multi-AD 4 Agro SMEs
38	Garcia	Joan	Universitat Politècnica de Catalunya-BarcelonaTech	H2020 INCOVER
39	Garrido Martín	Isabel	Instituto Murciano de Investigación y Desarrollo Agrario y Alimentario (IMIDA)	LIFE17 ENV/ES/000203 AGREMSO3IL
40	Garrote Moral	Lidia	FUNDACIÓN CARTIF	LIFE16 ENV/ES/000180 LIFE ALGAECAN
41	Gikas	Petros	Technical University of Crete	LIFE16/ENV/GR/000298 B2E4Sustainable-WWTPs
42	Giménez-Lorang	Antonio	FCC Aqualia	LIFE14 CCM/ES/000865 METHAMORPHOSIS; LIFE Icirbus; LIFE Answer
43	Gretchina	Elena	Friends of the Baltic/ Coalition Clean Baltic	
44	Hölle	Joachim	Sweco GmbH	LIFE08 ENV/D/000026 SusTreat
45	Jiménez Banzo	Ana	ACCIONA Agua SAU	H2020 INTEGROIL
46	Kaper	Chris	Waterboard Zuiderzeeland	LIFE13 ENV/NL/000178 LIFE+ Project ISR: Innovative sludge reduction
47	Kocsis-Kupper	Zsuzsanna	NEEMO Monitoring Team	
48	Kuntke	Philipp	Wetsus	LIFE17 ENV/NL/000408 LIFE-NEWBIES

49	Lacey	Sandra	TE Laboratories Ltd	LIFE17 ENV/IE/000237 Life Ecosens Aquamonitrix
50	Les	Ewa	CCB	
51	Llopart-Mascaró Bassols	Anna	Barcelona Cicle de l'Aigua S.A. (BCASA)	LIFE17 ENV/ES/000396 iBATHWATER
52	Malamis	Simos	National Technical University of Athens	H2020 HYDROUSA
53	Mamo	Julian	The Energy and Water Agency	LIFE16 IPE/MT/000008 LIFE-IP RBMP-MALTA
54	Marczak	Anna	European Commission, Water Policy Unit	
55	Marshall	Dave	Environment Agency	LIFE14 IPE/UK/000027 RBMP-NWRBD UK Natural Course
56	Martin	Ignacio	Cetaqua	aWARE
57	Martin	Josie	Environment Agency	LIFE14 IPE/UK/000027 RBMP-NWRBD UK Natural Course
58	Martinez	Xavier	Eurecat Technology Centre of Catalonia	
59	Mas Alcazar	Josep Oriol	AIGÜES DE BARCELONA	
60	Mätlik	Tanel	Viimsi Rural Municipality Government	LIFE17 CCA/EE/000122 UrbanStorm
61	Mesa Garcia	Cristian	ABEMGCIA	
62	Meseguer Amela	Jordi	Cetaqua	LIFE14 ENV/ES/000860 LIFE EFFIDRAIN
63	Mias	Solon	EASME	
64	Molinari	Giulia	IRIS Srl	
65	Moliner	Marc	Agència Catalana de l'Aigua	
66	Montero	Carlos	Cetaqua	
67	Nas	Bilgehan	Konya Technical University	
68	Oliver Rajadel	Nuria	Global Omnium	LIFE16 ENV/ES/000390 LIFE BACTIWATER
69	Oprčkal	Primož	Slovenian National Building and Civil Engineering Institute	
70	Pacheco	David	SUEZ	
71	Pérez	Virginia	CIEMAT	LIFE 16 ENV/ES/000342 LIFE-DRY4GAS
72	Petri	Coert	Waterschap Vallei en Veluwe	LIFE18 ENV/NL/000217 Life Water Factory
73	Piecha	Malgorzata	EASME	
74	Polidano	Martin	Water Services Corporation	
75	Pupola	Zane	State Regional Development Agency of Latvia	LIFE14 CAP/LV/000002 CAP LIFE LAT
76	Reig	Mònica	Condorchem Envitech S.L	LIFE16 ENV/ES/000410 LIFE DIME
77	Rodriguez Jimenez	Daniel	AIChE UPC Student Chapter	

78	Rogalla	Frank	Aqualia	LIFE13 ENV/ES/001353 LIFE Memory; LIFE14 CCM/ES/000865 Methamorphosis; LIFE18 ENV/ES/000233 Intext; LIFE 18 ENV/ES/000165 Ulises
79	Romanos	George	NCSR "Demokritos"	LIFE17 ENV/GR/000387 LIFE PureAgroH2O
80	Rosa	Maria Joao	LNEC - National Civil Engineering Laboratory	LIFE14 ENV/PT/000739 LIFE IMPETUS
81	Rougé	Philippe	SUEZ	
82	Rull	Clara	UPC AIChE Student Chapter	
83	Sáenz	Naiara	Cetaqua	
84	Salvatella	Mariona	NEEMO Monitoring Team	
85	Sanna	Antonio	European Commission	
86	Saz-Carranza	Alex	The European Investment Bank	
87	Seršen	Sara	Slovenian National Building and Civil Engineering Institute.	LIFE18 ENV/SI/000673 LIFE HIDAQUA
88	Sforza	Margherita	NEEMO Monitoring Team	
89	Šilininkas	Mindaugas	UAB "Pageldyniu plantacija"	LIFE17 ENV/LT/000310 NutriBiomass4LIFE
90	Suárez-Ojeda	María Eugenia	Universitat Autònoma de Barcelona	LIFE14 ENV/ES/000633 SAVING-E
91	Thenard	Audrey	NEEMO Monitoring Team	
92	Tribis	Arturs	State Regional Development Agency of Republic of Latvia	LIFE14CAP/LV/000002 CAP LIFE LAT
93	Turolla	Andrea	Politecnico di Milano	LIFE16 ENV/IT/000345 DeNTreat
94	Uijterlinde	Cora	STOWA	LIFE13/ENV/NL/613 ISR Innovative Sludge Reduction; LIFE13/ENV/NL/178 Waterfactory; LIFE18/ENV/NL/217 Waste2Neo Alginate; ENV/NL/217Cellu2PLA
95	Van den Broeck	Steven	Flemish Environment Agency	LIFE15 IPE/BE/000014 LIFE BELINI
96	Van Riel	Johanna	Waterschap Zuiderzeeland	
97	Vela De Oro	Nuria	Universidad Católica de Murcia	LIFE17 ENV/IE/000237 Life Ecosens Aquamonitrix
98	Vella	Matthew John	Water Services Corporation	
99	Villalba	Helena	SUEZ	
100	Wilson	Hannah	NEEMO Monitoring Team	
101	Wubben	Jeroen	HHSK	LIFE13 ENV/NL/000178 LIFE+ Project ISR: Innovative Sludge Reduction
102	Xevgenos	Dimitris	SEALEAU	LIFE18 ENV/GR/000019 LIFE BRINE-MINING
103	Zuriaga-Agustí	Elena	FACSA	LIFE18 ENV/ES/000170 LIFE AMIA

Annex 4: Project Summaries

LIFE PROJECTS

LIFE08 ENV/D/000026 – SusTreat - Use of immanent energy for sludge treatment – a central step towards self -sustaining sewage flow management

The overall objective of the project is to create an energy self-sufficient wastewater treatment plant (WWTP) out of a conventional WWTP in Koblenz. At present 54% of the plant's energy demand is already covered mainly by the usage of the biogas and the waste heat of the digester. By the project end the total energy demand should be covered by various measures, which are partly very innovative such as sludge dryer, thermal treatment and recovery of heat of the sludge dryer. Other measures are conventional like the optimisation of the sludge de-watering. Beside the energy savings and the CO2 reduction the amount of sewerage sludge will be reduced by two-thirds. Annually 12.000 tonnes sludge are generated and were transported to an incineration plant by trucks before the dryer was in operation. By the end of the project this amount will be reduced to 4.000 tonnes per year.

Project website: www.sustreat.eu

LIFE11 ENV/ES/000606 - LIFE aWARE - Innovative hybrid MBR-{PAC-NF} systems to promote water reuse

The final objective of the aWARE project was to promote the use of reclaimed water in water management organisations, reducing the negative environmental impact related to the overexploitation of natural water resources. The main technological challenges related to water reuse can be summarised as reliability, removal of recalcitrant compounds and environmental impact (decrease of energy consumption, low reagents costs, etc.). To this end, the aWARE project aimed to demonstrate the technical feasibility and assessing the economic and environmental viability of two different Membrane bioreactors-powdered activated carbon-Nanofiltration (MBR-PAC-NF) configurations. In addition, the project also contributed to the knowledge of best practices for production of reclaimed water, through the demonstration of alternative configurations to the conventional tertiary treatment.

Project website: http://www.life-aware.eu/

LIFE12 ENV/ES/000545 - LIFE WIRE - Water Cycle Efficiency Improvement by Boosting Industrial Water Reuse

The main objective of LIFE WIRE project is to promote the industrial reuse of reclaimed urban water. LIFE WIRE aims to demonstrate the viability of industrial reuse of reclaimed water by means of the technical and economic evaluation of various treatment schemes based on the combination of nanostructured carbon-graphite adsorbent materials with membrane technologies such as ultrafiltration - UF and reverse osmosis - RO. These technologies will be used to produce water of different qualities depending on the uses required in the chemical sector, liquid waste treatment and metal coating industries.

Project website: http://www.life-wire.eu/

LIFE12 ENV/ES/332– LIFE NECOVERY - Nutrient and Energy Recovery in WasteWater Treatment Plants by up-concentration and Adsorption processes

The present project aims to demonstrate, using a prototype, the technical, economic and environmental viability of an innovative wastewater treatment scheme that breaks with the schemes of conventional treatment processes applied so far and that focuses on the recovery of nutrients and energy from wastewater.

Project website: http://www.life-necovery.eu/

LIFE13 ENV/NL/000178 - LIFE+ Project ISR - Innovative sludge reduction

This LIFE+ ISR project demonstrates the environmental and economic benefits of two highly innovative sludge pre-treatment technologies that substantially reduce waste (sludge) production at WWTP. Themista (formerly Thermocrack) is a technology based on thermal pre-treatment of sludge. Implementing Themista results in sludge reduction, chemicals reduction and enhanced biogas production. Ephysta (formerly Optigest) is a technology for sludge digestion in which the hydraulic retention time and solids retention time are separated. Implementing Ephysta results in sludge reduction, increased sludge volume handling capacity, and enhanced biogas production.

Project website: https://www.royalhaskoningdhv.com/ephyra

LIFE13 ENV/ES/001353 - LIFE MEMORY - Membrane for energy and water recovery

The main objective of this project was to demonstrate an anaerobic technology at industrial scale, using Submerged Anaerobic Membrane Bioreactor (SAnMBR) technology, which combines anaerobic digestion and membranes, as an alternative to traditional urban wastewater treatment. This new approach focuses on a more sustainable concept, where wastewater turns into a source of energy and nutrients, and also a recyclable water resource by membrane disinfection. The results obtained during the pilot plant's operation showed that the technology is optimal at temperatures higher than 20ºC and for effluents with high organic load. The proposed project objectives were achieved, regarding reductions of energy consumption (70%), GHG emissions (80%) and waste generation (50%), compared to traditional wastewater treatments (e.g. conventional activated sludge). The environmental sustainability of the technology needs to enhance energy recovery, addressing nutrient content in the effluent and reducing sludge production. Moreover, the reduction of SAnMBR's carbon footprint necessarily involves improving dissolved methane recovery technologies, which could also increase energy production (biogas valorisation).

Project website: www.life-memory.eu

LIFE13 ENV/ES/000488 – AQUEMFREE - In farm remediation by solar photocatalysis of agro-wastewater with pesticides from remnants, cleaning and rinse

The main result of the project was the development of an on-site waste-water decontamination plant able to completely degrade pesticides without generating any other residue. The main expected long-term achievement of the project is the implementation of the AQUEMFREE system in medium-size and large farms, which would provide a solution for 80-90% of this environmental problem, at least in Mediterranean farms thanks to their solar irradiation conditions.

Project website: www.life-aquemfree.eu

LIFE13 ENV/FR/000711 - LIFE Biosolware - Demonstration wastewater treatment system dedicated to freshwater reuse and recycling

The project aims at improving wastewater treatment in order to fight water scarcity and the degradation of water ecosystems. BioSolWaRe-LIFE will develop and test an innovative and more efficient wastewater treatment method based on an ecological process called bio-solar purification (BSP). This process uses biological and solar technologies to enable 80% water reuse and the recovery of greenhouse gas and organic wastes. BSP technology uses phytoplankton photosynthesis and photo-oxidation (oxidation caused by the action of light) in closed tubular systems to remove a wide range of dissolved compounds and hazardous bacteria from the wastewater.

Project website: http://www.life-biosol.eu/

LIFE14 CCM/ES/000865 – METHAMORPHOSIS - Waste streams treatment for obtaining safe reclaimed water and biomethane for transport sector to mitigate GHG emissions

LIFE METHAmorphosis aims at improving waste management, reducing energy consumption and producing high quality biomethane as a vehicle fuel, thereby mitigating climate change and promoting sustainable mobility. It proposes to demonstrate two innovative waste treatment systems at industrial level: the UMBRELA system in urban waste plants, which combines a new anaerobic membrane process (AnMBR) with autotrophic nitrogen removal (Annamox ELAN®); and the METHAGRO system in agro-industrial and other organic waste treatment plants (for mainly slurry), which is a high efficiency system that combines pre-treatment processes. This will improve the profitability of treatment plants and will enable and encourage the reopening of many currently closed plants.

Project website: http://www.life-methamorphosis.eu/en/home

LIFE14 ENV/ES/000688 - LIFE Icirbus - Innovative circular businesses on energy, water, fertilizer & construction industries towards a greener regional economy

The project aims to demonstrate the feasibility of using biomass fly ash (wastes from biomass power plants) as adsorbent agent for the heavy metal contents and other hazardous organic compounds contained in local WWTP sludge to use the latter as low-impact fertiliser. At a second stage, used biomass fly ash is subsequently valorised as an inert by-product for recyclable construction materials. The technical key of the project is this two-step use of biomass fly ash. The project provides a relevant innovation towards a zero-waste approach.

Project website: http://www.icirbus.eu/

LIFE14-EN-ES-000849- LIFE SIAMEC - Integrated anaerobic system for wastewater reclamation at ambient temperature in European climates

The overall objective of LIFE SIAMEC project is to promote the change of mainstream wastewater treatment concept from resource consuming processes into more sustainable treatment schemes which allow in turn to increase treated water quality and the implementation of water reuse practices across Europe. To this end, LIFE SIAMEC project will be focused on the demonstration of anaerobic treatment of municipal and industrial wastewater at ambient temperature in European climates, which remains a great challenge, in order to obtain a less-energy consuming, less-biomass producing and less-footprint integrated technology for wastewater reclamation. Moreover, this technology will enable to overcome the main drawbacks associated with anaerobic wastewater treatment at low temperature, greenhouse gas (GHG) emissions and nitrogen removal, since the dissolved methane present in the effluent will be used as carbon source for denitrification in both, a membrane and a non-membrane-based post-treatment.

Project website: http://www.life-siamec.eu/

LIFE14 ENV/ES/000852 – LIFE SEACAN - Reducing pressure of fish canneries on the marine environment with novel effluent treatment and ecosystem monitoring

The overall objective of LIFE SEACAN is to reduce the environmental pressure exerted in the marine environment by the effluents generated by fish canneries located in coastal areas. LIFE SEACAN aims at demonstrating effective treatment systems that will allow decreasing the impact of the industrial activity on marine ecosystems. One of the specific objectives of the project is to demonstrate the feasibility of applying biofilm-based wastewater treatment systems to reduce the impact of the effluents generated from industrial facilities of fish canneries located in coastal zones.

Project website: www.life-seacan.eu

LIFE14 IPE/UK/000027 - Natural Course - Implementing the river basin management plan in the North West of England

The overall strategy of this LIFE Integrated Project (IP) is for better implementation of plans under the Water Framework Directive (WFD) by working in a more integrated way with project beneficiaries and stakeholders to address the barriers, gaps and shortcomings preventing achievement of Good Ecological Status (GES). This will catalyse delivery of the IP outcomes that are to improve the trajectory towards GES, increase confidence of meeting targets, and reduce numbers of waterbodies where solutions are considered technically infeasible or disproportionately costly. The IP objectives were designed to address underlying challenges for WFD delivery relating to capacity, affordability, technical feasibility, stakeholder engagement, and adoption of innovative approaches.

Project website: www.naturalcourse.co.uk

LIFE14 ENV/ES/000860 - LIFE EFFIDRAIN - Efficient integrated real-time control in urban drainage and wastewater treatment plants for environmental protection

The main goal of LIFE EFFIDRAIN project is to demonstrate an integrated real time control (RTC) strategy of urban drainage networks (UDN) and waste-water treatment plants (WWTP) to minimise the pollution of receiving waters, through the use of real-time quantity and quality data.

Project website: http://www.life-effidrain.eu/

LIFE14 ENV/ES/000633 - SAVING-E - Two stage autotrophic N removal for mainstream sewerage treatment

Responding to this urgent need, SAVING-E deals with the radical re-engineering of current waste-water treatment processes in order to improve energy trades and flow of materials. The project has proved at pilot scale (1-3 m3/day) that the SAVING-E technology is feasible at mild and low temperatures. It has increased the Technology Readiness Level from TRL-4 up to almost TRL-6. Still some technical issues have to be solved during the year 2019, after the project end date, to achieve TRL-6. Then, the consortium of the project has a plan to increase the TRL up to TRL-7 in the next two or three years, the last level before achieving a commercial application of the technology.

Project website: www.saving-e.eu

LIFE14 ENV/PT/000739 - LIFE IMPETUS - Improving current barriers for controlling pharmaceutical compounds in urban wastewater treatment plants

LIFE Impetus aims at demonstrating feasible improvement measures to enhance PhC removal in urban WWTPs with conventional activated sludge (CAS) treatment. As CAS is the most common biological process in urban WWTPs, the solutions may be easily transferred to wastewater treatment Europe-wide. The main expected result will be the demonstration of a low-cost investment (CAPEX) and easy to implement solution to improve PhC control in conventional wastewater treatment plants, i.e. CAS WWTPs, while keeping to the minimum the operating costs (OPEX) and maximizing the resources recovery and the energy efficiency.

Project website: www.life-impetus.eu

LIFE14 CAP/LV/000002 - CAP LIFE LAT - Capacity building for LIFE programme implementation in Latvia

The strategic vision of CAP LIFE LAT is to increase the number of Latvian LIFE projects applied, to increase their success rate at the European LIFE competitions and support a high-level implementation quality leading to new proposals.

Project website: www.lifeprogramma.lv

LIFE15 ENV/ES/000591 - LIFE Answer - Advanced nutrient solutions with Electrochemical Recovery
The purpose of this project is to demonstrate the technical and economic feasibility of electrocoagulation and bioelectrogenesis microbial treatments (electrochemical treatments) in medium to small industry wastewater treatment plants (brewery or other food and drink sector) for zero effluent discharge (obtaining products with high quality to allow recovering and meeting the most stringent discharge standards).

Project website: www.life-answer.eu

LIFE15 ENV/ES/000530 - LIFE LEACHLESS - Low energy technology for leachate valorisation
The project aims to demonstrate the technical and economic feasibility of an innovative concept for leachate treatment based on solar evaporation/condensation plus forward osmosis, reducing the environmental impact associated with the leachate generated at waste management activities.

Project website: https://lifeleachless.eu

LIFE15 CCA/ES/000091 - LIFE CERSUDS - Ceramic sustainable urban drainage system
The main objective of LIFE CERSUDS is to improve the resilience of cities to climate change and promote the use of green infrastructure in their urban plans through the development and implementation of a demonstrator consisting of a low carbon emissions SUDS for rehabilitation of urban areas. These SUDS consist of a permeable surface with a very low environment impact, based on the use of low commercial value tiles. This demonstrator will have enough dimension to validate its technical and economic viability.

Project website: http://www.lifecersuds.eu/

LIFE15 ENV/ES/000394 - LIFE DRAIN RAIN - Runoff water purification from pavements: A novel integral system of pervious concrete pavement & in-situ water treatment
The aim of the LIFE DrainRain project is to mitigate the environmental impact of runoff in water bodies (coastal, surface and ground waters) by coupling SUDS to treatment systems for diffuse pollution, with the aim of complying with Environmental Quality Standards (EQS) for water. The project will contribute to improving the efficient use of water resources and will help achieve the microbiological quality needed for irrigation and other applications, according to the Spanish Water Re-use Regulation.

Project website: www.lifedrainrain.com

LIFE15 ENV/ES/000379 - LIFE MCUBO - Modelling, measurement and improvement of the water management environmental impact of the food industry
The objective of the LIFE MCUBO project is to minimise environmental impacts related to water use and related energy consumption in the three, food industry sub-sectors with highest water consumption (meat, juices and canned vegetables) by developing an integral management system. This system includes wireless monitoring technology, in detail modelling of processes and its continuous improvement.

Project website: www.lifemcubo.eu

LIFE15 ENV/IT/000332 - LIFE BITMAPS - Pilot technology for aerobic biodegradation of spent TMAH photoresist solution in semiconductor industries

The project will establish a pilot plant that will demonstrate a new process for the treatment of effluents from electronics and semiconductor manufacturing. The project will contribute to the implementation of the WFD by introducing more efficient treatment technologies that will help reduce TMAH pollution at source. By recycling wastewater, it will also demonstrate the application in practice of the circular economy priority of water reuse and savings in industrial processes. Moreover, in proposing a more efficient, effective and innovative solution for industrial wastewater treatment, the project will also contribute to one of the priority areas of the European Innovation Partnership on Water. The project's specific objectives are to: 1. Design, construct, and validate a pilot plant for treatment of effluent from electronics and semiconductor manufacturing that contains photoresist/TMAH (PR/TMAH), ammonium fluoride solution, and nitric, acetic and hydrofluoric mixed solutions; 2. Demonstrate the use of microorganisms to facilitate TMAH biodegradation; 3. Demonstrate the financial viability of the process using a life-cycle costing method; 4. Demonstrate more-efficient water management and evaluate the reuse of treated wastewater in the industrial plant; 5. Increase awareness of environmental issues among electronics and semiconductor manufacturers, influencing industrial investments in innovative and safer technologies.

Project website: www.lifebitmaps.eu

LIFE15 IPE/BE/000014 - LIFE BELINI - Belgian initiative for making a leap forward towards good status in the river basin district of the Scheldt

The overall objective of the LIFE Belini is to support the targeted and coordinated implementation of the RBMP measures that will achieve significant progress towards the good status of water bodies in line with the WFD. It will carry out a set of measures that have been identified as most effective for improving the Scheldt RBD, in particular the three selected catchment areas. Special focus will be on implementing the WFD and RBMPs in a multi-functional way, implementing the Floods Directive and Flood Risk Management Plans, and strengthening local, interregional and international cooperation.

Project website: www.lifebitmaps.eu

LIFE16 ENV/ES/000180 - LIFE ALGAECAN - Adding sustainability to the fruit and vegetable processing industry through solar powered algal wastewater treatment

The LIFE ALGAECAN project will demonstrate the technical and economic feasibility of an innovative concept for wastewater treatment in the FVPI (fruit and vegetables processing industry) based on applying solar-powered algal treatment to the effluents generated. On the one hand, this will reduce the environmental impact of the sector and on the other hand, it will provide a valuable algae based market product of interest as raw material for the production of biofertilisers, animal feed, bioplastic, etc. The quality of the final effluent will be high, enabling reuse for equipment cleaning and irrigation purposes.

Project website: https://www.lifealgaecan.eu/es/

LIFE16 ENV/IT/000345 – DeNTreat - Decentralized innovative treatment of ammonium-rich urban wastewater

LIFE DeNTreat aims to demonstrate innovative decentralised wastewater pre-treatment modules, based on the Anammox (ANaerobic AMMonium Oxidation) microbial process, and to show that this technology can substantially reduce nitrogen pollutants linked to discharges from the textile industry, hence reducing the nitrogen content of urban wastewater.

Project website: www.life-dentreat.eu

LIFE16 IPE/MT/000008 - LIFE-IP RBMP-MALTA - Optimising the Implementation of the 2nd RBMP in the Malta River Basin District

The main aim of the LIFE-IP RBMP-MALTA project is to support the implementation of the second RBMP through the establishment of an integrated framework for the optimised management of all water resources on the Maltese islands. To achieve this, it will seek to address the key horizontal challenges identified during a gap analysis undertaken as part of the development process for the second RBMP. The challenges will be addressed through the implementation of best practice, demonstration, pilot study, and capacity building actions.

Project website: https://www.rbmplife.org.mt

LIFE16 ENV/IT/000486 – LESSWATT - Innovative wireless tool for reducing energy consumption and GHGs emissions of water resource recovery facilities

LIFE LESSWATT aims to target both the environmental issues related to the energy consumption of WRRFs and their direct GHG emissions. The project will develop an innovative tool for assessing and minimising both direct and indirect contributions of aerated compartments in WRRFs to the facility's overall carbon footprint. This tool incorporates two innovative elements: the LESSDRONE, an automated, wireless and self-moving device for monitoring Oxygen Transfer Efficiency (OTE) and GHG emissions under normal operating conditions; and a model-based user-friendly tool (protocol) for converting complex information into concrete actions aimed at minimising the carbon footprint. The tool's effectiveness will be demonstrated and validated in the WRRFs of tannery CUOIODEPUR and in five other plants, three in Italy and two in the Netherlands.

Project website: www.lesswattproject.eu

LIFE16 ENV/ES/000410 - LIFE DIME - Demonstration of an innovative technology for the minimization of the environmental impact of the metal finishing processes

LIFE DIME will validate an innovative solution for treating wastewater from metal industry finishing activities. In particular, the project will integrate three technologies (extraction, crystallisation and membrane distillation) in a new pilot plant. This solution has never been tested before at pilot scale and it is expected to recover raw materials from this hazardous waste-stream of a value estimated at over €550 000 per plant per year.

Project website: www.lifedime.eu/

LIFE16 ENV/ES/000169 - LIFE CLEAN UP - Validation of adsorbent materials and advanced oxidation techniques to remove emerging techniques to remove emerging pollutants in treated wastewater

LIFE CLEAN UP aims to improve the management of wastewater depuration by an efficient and environmentally friendly technology that allows obtaining treated wastewater free of emerging pollutants.

Project website: https://www.lifecleanup.eu

LIFE16 ENV/ES/000156 - LIFE_NEWEST - New urban wastewater treatment based in natural coagulants to avoide phosphorus pollution allowing mud's agri-valorization

The project has two main objectives. On the one hand, it aims at the industrial demonstration of a new innovative and environmentally friendly technology for phosphorous removal in urban and industrial wastewater treatment plants (WTPP). On the other hand, at the valorisation of the generated sludge for its

use in agriculture. The proposed technology is based on a new natural-based organic polymer capable of improving the coagulant efficiency and replacing the currently used hazardous chemicals.

Project website: www.lifenewest.eu

LIFE16 ENV/ES/000375 - LIFE ENRICH - Enhanced nitrogen and phosphorus recovery from wastewater and integration in the value chain

The project aims to contribute to circular economy through the recovery of nutrients from Waste Water Treatment Plants (WWTPs) and its valorisation in agriculture (either direct use on crops or through the fertilizer industry). ENRICH will tackle this value chain by developing a new treatment train that will be designed, built and operated in an urban WWTP. The products obtained will be mixed in order to find optimal mixtures and the agronomic properties of these products will be validated at full-scale through field tests in order to ensure the viability of the products obtained. Moreover, a business model of the whole value chain will be defined, involving several partners from different sectors, in order to ensure the replicability in other case studies or other EU regions.

Project website: http://www.life-enrich.eu/

LIFE 16 ENV/ES/000342 - LIFE-DRY4GAS - Wastewater sludge solar drying for energy recovery through gasification gas

DRY4GAS proposes an environmentally sustainable technology solution for the management and reuse of sewage sludge generated in a WWTP. The proposed solution will integrate a solar drying system, a thermochemical gasification process and an energy recovery system that reuses the gas output from the gasification process to produce 120 MWh/year by means of an Organic Rankine Cycle (ORC). In addition, the project proposes an alternative agricultural valorisation method of the sludge by evaluating the reuse of gasification ashes mixed with sewage sludge for improving the quality of sludge as an organic amendment and analysing the associated effects on soil.

Project website: http://dry4gas.ciemat.es/

LIFE16/ENV/GR/000298 - B2E4Sustainable-WWTPs - New concept for energy self-sustainable wastewater treatment process and biosolids management

-To achieve total energy self-sufficiency on the demonstrative plant.
-To improve the performance of extended aeration WWTPs due to upfront removal of TSS and BOD.
-To significantly reduce the energy requirements of existing extended aeration WWTPs.
-To reduce the environmental impact of sewage sludge management.
-To reduce carbon footprint due to significant reduction of the process energy requirements.
-To remove up to 60% of Total Suspended Solids at very early stage prior to aeration tank treatment.
-To produce electric energy by means of gasification of 100% organic carbon of biosolids.
-To demonstrate the feasibility of avoiding sewage sludge disposal in small and medium sized WWTPs.
-To integrate life cycle and environmental risks assessment and contribute to new standards for WWT.
-To produce new, environmentally friendly, standards in municipal wastewater concept.
-To promote the new process in EU municipalities, water industries and the whole chain of stakeholders.
-To determinate the potential transferability of the technology to other European regions.

Project website: http://www.biosolids2energy.eu/home.html

LIFE17 ENV/ES/000396 - iBATHWATER - Advanced urban water management to efficiently ensure bathing water quality

iBATHWATER's aim is to demonstrate in two cities (Barcelona and Berlin) the efficiency of the integrated management of the urban sewage system to effectively minimise untreated waste-water spills, reduce pollution and environmental impact in the receiving water bodies and minimise the sanitary risks of bathing areas during short-term contamination episodes. The project will provide an open platform capable of combining operational and managerial information with innovative online microbial measurements to ensure bathing water quality during rain events. The proposed solution will demonstrate in large and real scale scenarios the usefulness of holistically management under a standard and interoperable framework (open data sharing). Indeed, existing systems will be coordinated with online water quality monitoring and control tools, sewer treatment technologies, knowledge-driven decision support system (KDSS) and external systems (e.g. coastal and tidal models).

Project website: www.ibathwater.eu

LIFE17 ENV/ES/000315 - REMINE WATER - New water solutions for the mining industry: towards minimum liquid discharge and by-product recovery

The goal of the REMINE-WATER proposal is to protect the environment from discharges of industrial process brines (e.g. high salinity) and to contribute to circular economy through the recovery of water, metal salts and strong acids and their on-site valorisation. REMINE-WATER will tackle this objective by developing a new water treatment process train that will be designed, built and operated in a mineral processing industry. Therefore, the project will demonstrate the technical viability and the economic and environmental benefits against conventional solutions, reducing CO2 footprint and treatment costs, enhancing its application for environmental protection around Europe.

Project website: n/a

LIFE17 ENV/ES/000331 - Multi-AD 4 Agro SMEs - High performance multiphase anaerobic reactor for agro-industrial wastewater treatment

The LIFE Multi-AD 4 AgroSMEs aims to design and industrialise a high performance multiphase anaerobic reactor that generates methane-rich biogas, tailor-made for treating waste-water generated in Food and Drink (F&D) Small and Medium Enterprises (SMEs).

Project website: http://lifemultiad.eu/

LIFE17 ENV/ES/000341 - LIFE GREEN SEWER - Innovative secondary wastewater treatment with resource recovery

The LIFE GREEN SEWER project will pilot a new secondary waste water treatment, to be used on municipal and municipal-like effluents using resource-efficient technologies and control processes, to monitor and diminish discharges of emerging pollutants and pathogens, whilst reducing the energy consumption and water losses expected from such a process. Moreover, the operational cost of the secondary treatment will be reduced.

Project website: www.lifegreensewer.com

LIFE 17 ENV/ES/000203 - AGREMSO3IL – Agrochemical remediation of farm soils by combining solarisation and ozonation techniques

The main objective of the project is to develop and fine-tune a new technology for the agrochemical remediation of soils by combining solarisation and ozonation in situ. To achieve this objective, the project will develop a prototype and test different methods (advanced oxidation processes as ozonation and H2O2 or solarization) for soil remediation and disinfection. Ozonation generates hydroxyl radicals that together with

light radiation attack and destroy any organic molecule to CO2, H2O and mineral salts. Solarization is based on the placement of a transparent plastic on the floor during the summer months, when temperature and light radiation are more intense. The developed prototype will be tested under controlled conditions in the experimental plots of IMIDA and in real conditions in two commercial farms in order to tests its applicability.

Project website: http://agremso3il.eu

LIFE17 ENV/GR/000387 - LIFE PureAgroH2O - Pollutant photo-NF remediation of agro water

1. To develop and demonstrate a novel purification system for the sustainable management of the end-of-pipe effluents in the fruit industry, preventing losses of contaminants to the environment, and to recycle/reuse the purified water.
2. To develop, standardise and disseminate a management plan for the adaptation of the PNFR system to various conditions, common practices and specific requirement of the Mediterranean fruit industry.
3. To raise awareness of all interrelated stakeholders (e.g. agro-industry head managers) on the implementation of best practices in WW management and water reclaim, in line with the EU Water Framework Directive 2000/60/EC and the Water Reuse Directive.
4. To set an action plan for the integration of the project outcomes to European and National environmental policy in close collaboration with policy makers.

Project website: www.pureagroh2o.com

LIFE17 ENV/LT/000310 - NutriBiomass4LIFE - Nutrient recycling circular economy model for large cities – water treatmentsludge and ashes to biomass to bio-energy

The objective of the project is to create and demonstrate a full-scale self sustainable closed loop circular economy model for nutrient rich waste recycling for Vilnius, the largest city in Lithuania. The project will aim to:

- recycle municipal wastewater treatment sludge and biomass ashes into renewable energy through environment friendly biomass plantation phytoremediation filter;
- develop new business models to make biomass growing/forestry on marginal and less suitable to agriculture soils economically attractive;
- implement the Roadmap to a Resource Efficient Europe and support the implementation of Sludge Directive, Water Framework Directive, Waste Framework Directive and Nitrates Directive by addressing the issues of nutrient recycling from MWTS and biomass ashes

Project website: http://www.nutribiomass.eu/

LIFE17 ENV/IE/000237 - Ecosens Aquamonitrix - Enhanced portable sensor for water quality monitoring, moving to genuinely integrated water resource management

The project aims to demonstrate a cost-effective portable water monitoring solution for the Water sector. The innovative technology, at a competitive cost allows increased frequency of water quality monitoring with remote access to the device & to results. This affordable solution results in more monitoring, making it easier for management decisions & compliance with regulations. Moreover, its efficient power consumption allows longer deployment periods, diminishing maintenance needs, providing an integrated monitoring solution that is cost effective.

Project website: https://www.ecosensaquamonitrix.eu/

LIFE17 ENV/NL/000408 - LIFE-NEWBIES - Nitrogen extraction from water by an innovative electrochemical system

The project will validate Nitrogen Extraction from Water By an Innovative Electrochemical System (NEWBIES) on different waste water streams. This novel ammonium recovery system combines both, energy efficiency and high removal rates. The NEWBIES system will be designed and built as a containerised pilot, which can be deployed at any suitable location. During the project's lifetime, the pilot will be tested and evaluated at three different geographical locations, on three different waste streams (rejection water, digestate and urine).

Project website: http://newbies.eu

LIFE17 CCA/EE/0122 – UrbanStorm - Development of sustainable and climate resilient urban storm water management systems for Nordic municipalities

The main objective of the LIFE UrbanStorm project is to increase the climate resilience of Estonian municipalities, especially their ability to manage flush flooding caused by heavy rainfall. It will facilitate the development and implementation of integrated approaches for climate change adaptation strategies and action plans, at local, regional or national level, prioritising, where appropriate, ecosystem-based approaches. The project will also focus on setting up an innovative complex storm water management system, which entails storm water collection and re-use. The demonstration site will be the focal point for engaging local inhabitants to promote the sustainable use of storm water and a change in water habits.

Project website: https://www.viimsivald.ee/development-sustainable-and-climate-resilient-urban-storm-water-management-systems-nordic

LIFE18 ENV/NL/000217 - Life Water Factory - Water factory for the future

The LIFE WATER FACTORY project intends to establish a paradigm change in sewage management and to demonstrate a sustainable and circular sewage treatment model, by building and implementing an innovative full-scale demonstration plant, the LIFE WATER FACTORY., Only physical processes will be implemented in this demonstration plant, whereas traditional STPs rely on biological processes in which organic and other compounds are destroyed and cannot therefore be recovered.

Project website: https://www.vallei-veluwe.nl/

LIFE18 ENV/GR/000019 - BRINE-MINING - Demonstration of an advanced technique for eliminating coal mine wastewater (brines) combined with resource recovery

LIFE BRINE-MINING aims to facilitate the implementation of the Water Framework Directive and the Circular Economy package by enabling the coal mining industry to improve its wastewater management performance in a way which yields cost-effective, resource efficient and legally compliant results. It will develop and apply an economically viable, innovative system to eliminate products from and fully recover resources in coal mining wastewater, at source. The system will be able to treat and directly recover end-products (minerals/salts and water) of high quality and purity.

The project will involve the consumers of the recovered materials to ensure that the end products satisfy market specifications and that the recovered materials are exploited. LIFE BRINE-MINING will contribute to the objectives of the Water Framework Directive, the Circular Economy package, and other water environmental policy.

Project website: n/a

LIFE18 ENV/ES/000170 - LIFE AMIA - Innovative combination of WWT technologies for water rescue: anaerobic-aerobic, microalgae and AOP processes

LIFE AMIA aims to reuse wastewater in agricultural irrigation and aquifer recharge to protect the aquatic environment against pollution caused by pathogens and micropollutants not removed by conventional

wastewater treatment plants (WWTPs), at significantly reduced energy requirements. To this end, a novel process consisting of an anaerobic-aerobic compact treatment, a microalgae raceway and a combination of adsorption and advanced oxidation process (AOP) will be validated. The new concept of WWTP will recover nutrients (algae) and reduce the net energy consumption. Consequently, this will reduce the emissions of greenhouse gases (GHG).

Project website: https://www.facsa.com/

LIFE 18 ENV/ES/000199 - LIFE SPOT - Green solutions for treating groundwater pollution to meet drinking water directive standards

The main objective of LIFE SPOT is to develop a new treatment process which removes nitrates and micropollutants from polluted groundwater and produces drinking water of good quality that meets the requirements of Council Directive 98/83/EC on drinking water quality. This will be applied in rural areas (with 50 inhabitants or <10m3/day water consumption) in the Mediterranean region. It will also help make rural areas more sustainable and resilient and support the agriculture and tourism sectors.
The project will build and operate two microalgae (MA)-cork pilot treatment plants, one treating 10 m3/day and another 1 m3/day. Both MA-cork pilot plants will use photobioreactors (bio-solar purification) and dissolved air flotation technology to enable microalgae separation, and a filtration system based on granulated cork as a substrate. LIFE SPOT will support the Council directives on drinking water quality (Directive 98/83/EC) and nitrates pollution (Directive 91/676/EEC).

Project website: http://www.irta.cat/en/

LIFE18 ENV/ES/000233 - LIFE INTEXT - Innovative hybrid intensive extensive resource recovery from wastewaters in small communities

LIFE INTEXT aims to develop innovative solutions based on a combination of intensive and extensive technologies for dealing with wastewater treatment and reuse to tackle water scarcity in small communities (below 2,000 population equivalent), in both Mediterranean and continental climate. It will also provide a smart monitoring and evaluation system for consistent operation of the technologies and criteria for supporting the decision-making process of operators real-time.

Project website: n/a

LIFE 18 ENV/ES/000165 - LIFE ULISES - Upgrading wastewater treatment plants by low cost innovative technologies for energy self-sufficiency and full recycling

The main objective of the LIFE ULISES project is to demonstrate a set of technologies to improve the resource efficiency of wastewater treatment plants. This will include:

- an anaerobic pretreatment and aeration process to reduce energy demand;
- an upgrading process to increase biogas production;
- an enzymatic hydrolysis and membrane-based struvite precipitation for the use of sludge as fertiliser; and
- a solar-based tertiary treatment for water reuse.

Project website: https://www.aqualia.com/es/

LIFE18 ENV/SE/000265 - RE-Fertilize - Demonstration of a unique cleaning and recovery process for amonia/nitrogen, enabling 100% recycled fertilizer products

The overall goal of the LIFE RE-FERTILIZE project is to demonstrate a new, innovative cleaning and recovery process for ammonia/nitrogen which can be used for a number of different ammonia products such as fertilisers. LIFE RE-FERTILIZE should simplify full compliance with the Urban Waste Water Treatment Directive (91/271/EC) by applying a cheaper, more robust technique to urban wastewater management. It will help wastewater treatment plants achieve stricter discharge limits, and demonstrate how nitrogen can be recycled, thereby supporting the Water Framework Directive (2000/60/EC). The project also supports the EUs roadmap towards a competitive low carbon economy in 2050 (COM/2011/0112 final) by giving data to help this new full-scale fertiliser treatment technology move closer to market.

Project website: http://easymining.se/

LIFE18 ENV/SI/000673 - LIFE HIDAQUA - Sustainable water management in high water demanding industries

The main objective of LIFE HIDAQUA is to demonstrate a sustainable water management approach in high water-demanding industries such as the automotive industry by applying the zero-liquid-discharge and the zero-waste concepts. The ultimate aim is to decrease emission of pollutants and preserve the quality of natural water bodies and natural drinking water resources while exploiting alternative water sources.

Project website: http://www.zag.si/en/

H2020 PROJECTS

INTEGROIL Water Reuse in the oil and gas sector

The main goal of INTEGROIL is to develop and demonstrate a robust but flexible integrated solution for treating water flows with variable compositions up to be reused.

Project website: https://integroil.eu/

Run4life Recovery and Utilization of Nutrients 4 low impact fertilisers

The project proposes a radical new concept for wastewater treatment and nutrient recovery. It is based on source-separated collection of domestic wastewaters and kitchen waste, with each flow receiving optimal treatment for resource recovery and subsequent safe reuse. Nutrient recycling from wastewater opens a new paradigm in society. Therefore, active measures such as knowledge brokerage activities will be developed as engagement strategy to advocate the institutional, legal and social acceptance of Run4Life nutrient recovery technologies.

Project website: https://run4life-project.eu/about/

INCOVER Innovative eco-technologies for resource recovery from wastewater

INCOVER was a collaborative project funded by the European Commission under the Horizon 2020 Research and Innovation programme. It aimed at developing innovative and sustainable technologies for a resource recovery-based treatment of wastewater. INCOVER solutions permitted to recover energy (biomethane) and bioproducts (bioplastics, organic acids, biofertiliser, biochar, irrigation water) from municipal, industrial and agricultural wastewater, while reducing the overall operation and maintenance costs of wastewater treatment.

Project website: https://incover-project.eu/

HYDROUSA Demonstration of water loops with innovative regenerative business models for the Mediterranean region

HYDROUSA water loops will include water from non-conventional sources including wastewater, rainwater, seawater, groundwater and vapour water, all resulting in recovered and marketable products. HYDROUSA will demonstrate at large scale the feasibility and sustainability of innovative, low-cost water treatment technologies to recover freshwater, nutrients and energy from wastewater, salt and freshwater from seawater, and freshwater from atmospheric water vapour. Water conservation solutions including aquifer storage and sustainable agricultural practices including fertigation will be applied. The solutions will be demonstrated on 3 major touristic islands in Greece. Detailed technical and financial deployment plans will be established for replication in additional 25 locations worldwide. Through the on-site water loops of HYDROUSA, complex supply chains for resource recovery are not required, as producers are directly involved as consumers of derived products. HYDROUSA will combine traditional skilled workmanship with modern ICT integration in beautiful and smart automation systems. HYDROUSA will revolutionise water value chains in Mediterranean areas and beyond, from water abstraction to sewage treatment and reuse. The proposed HYDROUSA solutions show massive potential to change the way humans interact with water, food and energy.

Project website: https://cordis.europa.eu/project/id/776643

Next Gen Towards the Next Generation of Water Systems and Services for the Circular Economy

The NextGen initiative will evaluate and champion innovative and transformational circular economy solutions and systems that challenge embedded thinking and practices around resource use in the water sector. We will produce new understandings to underpin the exploitation of techniques and technologies that enhance our ability to recover, refine, reuse, repurpose, capture value from, and extend the use-life of, an ever-increasing range of resources and products, thereby projecting the European water and allied sectors as global circular economy pioneers. NextGen will demonstrate innovative technological, business and governance solutions for water in the circular economy in ten high-profile, large-scale, demonstration cases across Europe, and we will develop the necessary approaches, tools and partnerships, to transfer and upscale. The circular economy transition to be driven by NextGen encompasses a wide range of water-embedded resources: water itself (reuse at multiple scales supported by nature-based storage, optimal management strategies, advanced treatment technologies, engineered ecosystems and compact/mobile/scalable systems); energy (combined water-energy management, treatment plants as energy factories, water-enabled heat transfer, storage and recovery for allied industries and commercial sectors) and materials (nutrient mining and reuse, manufacturing new products from waste streams, regenerating and repurposing membranes to reduce water reuse costs, and producing activated carbon from sludge to minimise costs of micro-pollutant removal).

Project website: https://cordis.europa.eu/project/id/776541

Project Ô: demonstration of planning and technology tools for a circular, integrated and symbiotic use of water

Project Ô intends to demonstrate approaches and technologies to drive an integrated and symbiotic use of water within a specific area, putting together the needs of different users and wastewater producers, involving regulators, service providers, civil society, industry and agriculture. The project seeks to apply the pillars of integrated water management (IWM) as a model for "water planning" (akin to spatial planning) and to demonstrate low cost, modular technologies that can be easily retrofitted into any water management infrastructure at district/plant level, hence enabling even small communities and SMEs to implement virtuous practices. Technologies and planning instruments complement each other as the first make possible the second and the latter can provide as example or even prescribe the former (and similar technologies allowing virtuous water use practices). Indeed the technologies support the regulators in implementing policy instruments, as foreseen by IWM, for convincing stakeholders (like developers and industry) to implement

water efficiency strategies and could include instruments for e.g. rewarding virtuous behaviours (for example: advantageous water tariffs), planning regulations that award planning consent more swiftly or even prescribe the use of water from alternative sources (including recycling). Project Ô has in summary the overall objective of providing stakeholders (everybody using or regulating the use of water in an area) with a toolkit that enables them to plan the use of and utilise the resource water whatever its history and provenance, obtaining significant energy savings in terms of avoided treatment of water and waste water and release of pressure (quantity abstracted and pollution released) over green water sources.

Project Website: https://cordis.europa.eu/project/id/776816

SMARTPLANT: Environmental Control of Carotenoid Biosynthesis: A Novel Strategy to Improve Photosynthetic Capacity

Security of our future food supply will depend on our improved understanding of how plants regulate photosynthesis in response to a changing environment. Carotenoids are important for photosynthetic efficiency because they expand the range of wavelengths for photosynthesis and protect the photosystems against photo-oxidative damage. We aim to characterize they key molecular events, the dynamics and emerging properties of the signalling for carotenoid production as a basis for future development of crops resilient to climate alterations.

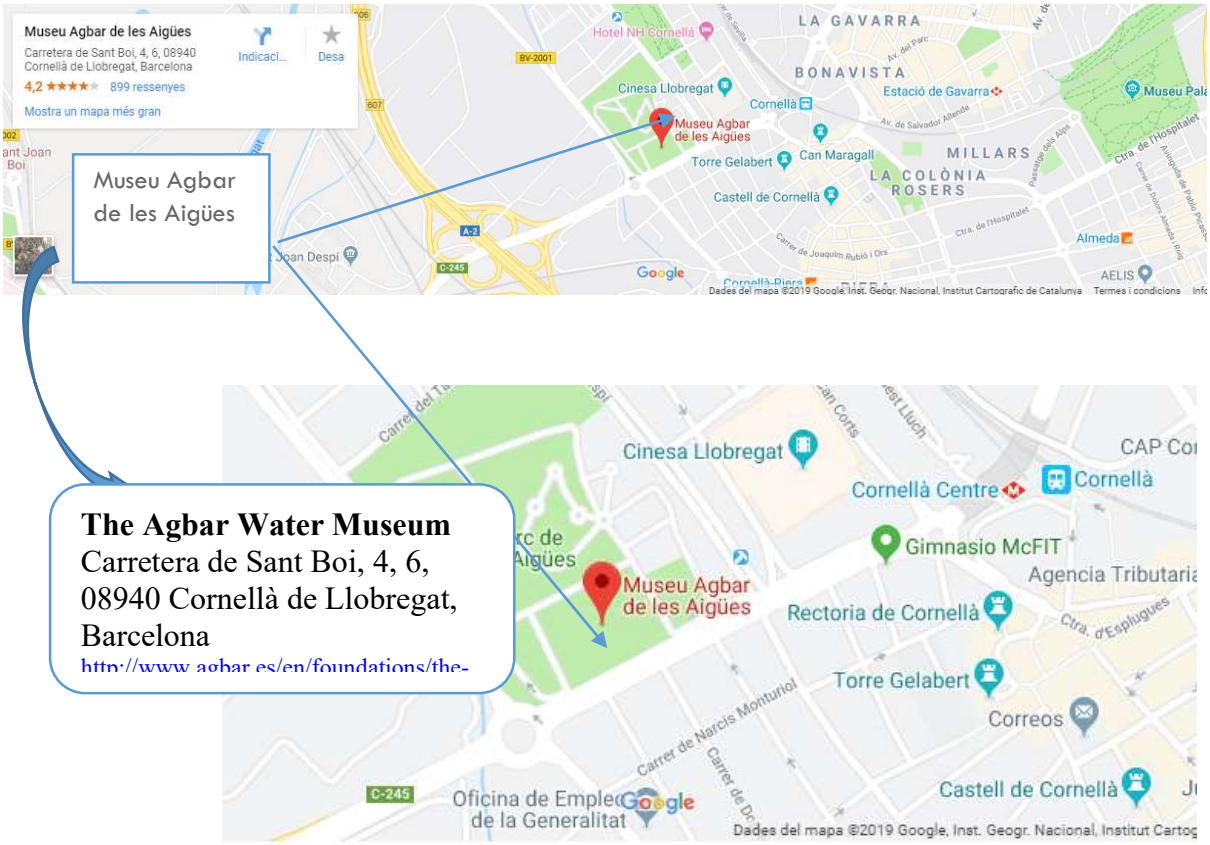
Project Website: https://cordis.europa.eu/project/id/321649

Annex 5: LOGISTIC INFORMATION

The venue of the platform meeting:

The meeting will take place at the Agbar Water Museum that is located in Cornellà del Llobregat.

The museum occupies an old building designed in 1905 by the modernist architect Josep Amargós i Samaranch to house a pumping station. The museum maintains a representative sample of the steam machine which was originally used to distribute water to the city. Architecture and machinery from the beginning of the 20th century is integrated in an innovative museography, which describes the history of water supply in a big city. In 2010, the Museu Agbar de les Aigües won the Micheletti award, one of the most important European museology prizes.



The museum, which lies in the neighbouring town of Cornellà del Llobregat, is 13 kilometres from Barcelona city centre.
Contact details: Museu de les Aigües – Crta. de Sant Boi, 4-6. 08940 Cornellà de Llobregat. | Tel: 93 342 35 38 | Mail: museudelesaigues@agbar.es | Web: https://www.fundacioagbar.org/en/museum

How to reach the meeting venue

Connections between Barcelona and the museum and back:

- **Train** (RENFE): Connections with Cornellà from the RENFE (Spanish Rail) station at Clot Aragó, Arc de Triomf, Plaça Catalunya and Sants. Frequency: every 30 minutes. Journey time: beween 5 and 20 minutes. For further information about train services: www.renfe.es.
- **Metro** (TMB): L5 metro line connects the city and Cornellà daily. Frequency: every 7 minutes. Approximate journey time: 32 minutes (from Diagonal). For further information: www.tmb.cat.
- **Bus** (TMB): The 67 bus runs from Ronda Universitat to Cornellà during the day. Frequency: every 25 minutes. For further information: www.tmb.cat.
- **Tram:** T1 and T2 lines connect the city and Cornellà. Frequency: every 10 minutes. Approximate journey: 35 minutes (from Francesc Macià). For further information: https://www.tram.cat/?hl=es
- **Night bus** (NITBUS): The N13 night bus operates from Plaça Catalunya to Cornellà (from 11 pm to 5 am). Frequency: every 20 minutes. Further information about the night bus service to Barcelona is available on the website: www.emt-amb.com.
- **By car:** The C-31 Barcelona-Castelldefels road leads to Cornellà. From the Avinguda Diagonal, the Ronda de Dalt and Ronda Litoral ring roads also connect with the C-31. The estimated journey time from Barcelona city centre to the museum is about 20 minutes.

Connections between the airport and the venue and back:

- **Bus L77** (Baixbus): The bus runs every 30 minutes from the terminal T1 and T2 to the front door of the venue: Ctra Sant Boi-Campoamor. Approximate journey time: 30-35 minutes. More information at: http://www.baixbus.cat/es/linea-autobus-l77
- **Metro** (TMB): L9sud (from Airport to Collblanc) + L5 (from Collblanc to Cornellà Centre) + 650 m walk. Approximate journey time: 50 minutes
- **Metro + Train**: L9 sud (from Airport to Europa Fira) + R6 (from Europa Fira to Cornellà Riera + 800 m walk. Approximate journey time: 50 minutes
- **Taxi**: Approximate journey time: 20 minutes

More information:
http://meet.barcelona.cat/en/visit-barcelona/how-to-get-to-barcelona
http://www.barcelonaturisme.com/wv3/en/page/31/how-to-get-there.html

Travel to Barcelona

The participants are expected to arrange and cover the cost of their own travel. You are strongly advised to use travel options that do not include air transport, especially if your travel distance is less than 350 km. Please do not forget to include the LIFE project reference on your travel cost documents, if you represent a LIFE project and wish to include the costs in your eligible expenses.

There are direct flights to Barcelona (Aeropuerto de Barcelona-El Prat) from the major European cities. Barcelona can also be reached by transport links from other regional airports, including Girona, Reus and Lleida -Alguaire.

Barcelona-El Prat, which is in the neighbouring town of El Prat de Llobregat, is 20 kilometres away from the Barcelona city centre and 14 kilometres from the venue. It has two large passenger terminals, T1 and T2, which are organised in terms of carriers and not according to the destination or place of origin.

Contact details: Aeroport de Barcelona - 08820 El Prat de Llobregat, Barcelona | Tel: 902 404 704 | Fax: 933 799 957 (Sala Renfe) | Web: www.aena.es

Connections between Barcelona and the airport and back:

- **Aerobús** (A1 and A2): Service between Plaça de Catalunya and Barcelona Airport. Frequency: every 10 minutes. Approximate journey time: 35 minutes. For further information about the Barcelona Aerobús: Tel. 902 100 104.
- **Train** (RENFE): Connections with Barcelona Airport from the Renfe (Spanish Rail) station at Sants. Frequency: every 30 minutes. Journey time: 18 minutes. For further information about train services: www.renfe.es.
- **Metro** (TMB): L9 sud metro line connects the city and Barcelona airport (T1 and T2) daily. Frequency: every 7 minutes. Approximate journey time: 32 minutes (from Zona Universitària). For further information: www.tmb.cat.
- **Bus** (TMB): The 46 bus runs from Plaça d'Espanya to Barcelona Airport (T1 and T2) during the day. Frequency: every 25 minutes. For further information: www.tmb.cat.
- **Night bus** (NITBUS): The N17 night bus operates from Ronda Universitat / Plaça Catalunya to Barcelona Airport T1, stopping at Pl. d'Espanya. The N16 night bus operates from Ronda Universitat / Plaça Catalunya to Barcelona Airport T2, stopping at Pl. d'Espanya. Frequency: every 20 minutes. Further information about the night bus service to Barcelona Airport is available on the website: www.emt-amb.com.
- **Barcelona Airport Taxi:** Taxi Stops in front of terminals 1 and 2.
- **By car:** The C-31 Barcelona-Castelldefels road leads to Barcelona Airport, and connects with the C-32 Barcelona-Sitges road. From the Avinguda Diagonal, the Ronda de Dalt and Ronda Litoral ring roads also connect with the C-31. The estimated journey time from Barcelona city centre to the airport is about 20 minutes.

More information:
http://meet.barcelona.cat/en/visit-barcelona/how-to-get-to-barcelona
http://www.barcelonaturisme.com/wv3/en/page/31/how-to-get-there.html

A few words about Barcelona

Barcelona, the capital of Catalonia, is a Mediterranean and cosmopolitan city with Roman remains, medieval quarters and the most beautiful examples of 20th century Modernism and avant-garde. It is no surprise that emblematic constructions by the Catalan architects Antoni Gaudí and Lluís Doménech i Montaner have been declared World Heritage Sites by UNESCO.

The city's origins are Roman, and its long history and economic dynamism have made Barcelona a cultural city, which can be seen in the historic-artistic heritage and the promotion of the most innovative artistic trends. A wide selection of cultural activities is on offer for visitors, including museums, exhibitions, open-air sculptures and many concerts, plays and dances.

More information about what to do and see in Barcelona can be found here.

Contacts

If you need any further information about the event please don't hesitate to get in touch with the Platform Meeting organisers. Our team for this event is:

Chris People (chris.people@neemo.eu) project contact point
Hannah Wilson (Hannah.wilson@neemo.eu) registration and logistics
Mariona Salvatella (mariona.salvatella@neemo.eu) coordinator in Spain
Naiara Saenz Martinez (naira.saenz@suez.com) representing the host organisation
Lynne Barratt (lynne.barratt@neemo.eu) overall coordinator

We look forward to welcoming you to Barcelona.