D1.6 TECHNICAL PROGRESS REPORT

DUE DATE:
July, 30th 2024

DELIVERABLE RESPONSIBLE:
Aguas de Valencia, S.A. (AVSA)

10113771-LIFE22-ENV-ES-LIFE ELEKTRA

LIFE 2021-2027
Technical Progress Report

Project acronym and number:	LIFE ELEKTRA - 101113771
Date of submission of the report:	**22/07/2024**
Period covered by the progress report:	01/10/23 – 31/07/24
LIFE call topic:	LIFE-2022-SAP-ENV
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Project end date:	31/03/2027
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1 Progress of work plan in the period:

.WP 1 – Project management and coordination activities			
Key objectives	**Progress**	On track	Delayed
Objective 1. To ensure effective and reliable organisation, coordination, communication, and co-operation.	This objective has been initially achieved and in currently on track. It is ruled by the "Deliverable 1.2 Project management guideline and green procurement". It has been stablished the management structure as the project coordinator, work package leaders, and scientific and technical committees. Moreover, proper channels of communication, file sharing and project meetings have also been set. This objective will be periodically revised in order to ensure the compliance of the LIFE ELEKTRA project. Following this, periodic meetings are being held either monthly for each Work Package; semiannually for the Coordination Committee and annually in the case of the General Assembly.	X	
Objective 2. To enable the smooth running of the projects following the common work plan and schedule.	This objective has been developed in the "Deliverable 1.2 Project management guideline and green procurement" and the "Deliverable 1.4 Quality assurance plan". It has been arranged actions in order to ensure the smooth running of the project. For instance, it has been set a meeting calendar and fast and reliable communication channels to exchange information and data.	X	
Objective 3. To efficiently manage all aspects related to administration, finances and IPR.	This objective has been developed in the "Deliverable 1.2 Project management guideline and green procurement", "Deliverable 1.3 Data Management Plan" and the "Deliverable 1.4 Quality assurance plan". These deliverables set the course of the administration, finances and IPR management. These actions will be carried out during the whole span of the project and corrected if required.	X	

.WP 1 – Project management and coordination activities			
Objective 4. To ensure effective communication between all consortium members and the EC	This objective is being ensured by the meetings held periodically depending on the committee. In this sense, monthly meetings are held for each Work Package; semiannually for the Coordination Committee and annually for the General Assembly. Independently on the stablished meetings, fluent communication is being held among all the partners of the consortium by common communication channels, as file sharing platforms, emails, instant messaging applications and videoconferences in order to solve rapidly any doubt or issue.	X	

WP 2 – Process design on the prototypes			
Key objectives	**Progress**	On track	Delayed
Objective 1. To validate an ion exchange/osmosis/electrochemical denitrification tandem prototype applied to the treatment of streams with high nitrate concentrations, transforming nitrates to nitrogen gas.	This objective essentially covers the Specific Objective 1 and involves several tasks in WPs 2 and 3 and SKPI 1, 2, and 3. This objective is currently on track. The tandem prototype has been defined and established. Some innovations in the post-electrochemical denitrification treatment of the streams are in progress. These innovations will strongly contribute to optimize the performance of the tandem prototype. Milestones 11 (M21) and 14 (M30) are planned to be on due time.	X	
Objective 2. To achieve an efficient pre-treatment of reject water softening and its scalability.	The prototype for the treatment of reject water softening has been defined and designed. The resins used, and their regeneration processes have been established and tested. The process scaling up has been also determined. The prototype system has been tested and validated.	X	
Objective 3. To achieve a versatile electrochemical reactor design for the electrodenitrification stage that allows the incorporation of 3D electrodes	This objective is currently on track. The design of the electrodenitrification stage has been defined. Different key components of the electrochemical reactor have been designed and simulated in order to create a cathodic compartment capable of accommodating several designs of 3D electrodes. This Objective 3 is correlated with Objective 5 (in progress) in which an optimised 3D electrode will be designed, manufactured, and validated. The final design of the electrochemical reaction is in progress and will incorporate the improvements developed in the 3D electrodes.	X	
Objective 4. To validate the behaviour of the electrochemical reactor manufactured for the prototype.	This objective is currently on track and will validate the developments established in Objectives 3 and 5. Validation tests have been established to evaluate the performance of the electrochemical prototype that, subsequently, will be incorporate into the tandem prototype system.	X	

WP 2 – Process design on the prototypes			
Objective 5. To design, manufacture and test 3D electrode structures in the electrochemical reactor for the electrodenitrification stage.	Several 3D electrode probes have been designed, manufactured, and tested to determine their 3D/plane ratio area factors. The procedure has been validated at small scale and it is currently being scaled up for the manufacture of projected area electrodes. For this goal, different mold manufacturing procedures are being also developed. The 3D electrodes developed in this objective will be incorporated in the electrochemical reactors developed in Objective 3 and validated in Objective 4. Finally, this system will be incorporated in the tandem system and validated in Objective 1.	X	
Objective 6. To validate the coupling of the photovoltaic system (PVS) with the electrochemical reactor (ER) of the prototype for the electrodenitrification stage.	This objective is currently on track. Several data are being collected and analysed to evaluate the energy consumption parameters of the system. This analysis will allow designing and developing different approaches for the efficient energy management and renewable hybridization of the system.	X	
Objective 7. To achieve an approximate zero liquid discharge water process by re-using concentrate wastes of a given step in the whole process and recovering calcium carbonate.	This objective is currently on track. Different strategies are being tested to reach a zero liquid discharge. It is worth noting that this objective strongly depends on the performance of each individual step of the whole process. Different anionic and cations resins are being tested for the post-electrochemical treatment to optimize the recovery of calcium carbonate. Also, regeneration studies of both anionic and cations resins are in progress.	X	

WP 3 – Implementation of prototypes			
Key objectives	**Progress**	**On track**	**Delayed**
Objective 1. To demonstrate the effectiveness at pilot scale of the denitrification treatment to remove nitrates from water through its reduction to nitrogen gas, improving the results of previous lab-scale validations prior to this project.	This WP is yet to start. It will begin in month 30 of LIFE ELEKTRA project.	X	
Objective 2. To demonstrate the viability of in-situ hydrogen generation, storage, and valorisation.	This WP is yet to start. It will begin in month 30 of LIFE ELEKTRA project.	X	
Objective 3. To demonstrate the capabilities of energetic hybridisation applied to water treatments	This WP is yet to start. It will begin in month 30 of LIFE ELEKTRA project.	X	

WP 3 – Implementation of prototypes			
Objective 4. To evaluate the efficiency of the technology proposed in LIFE ELEKTRA in three different contexts	This WP is yet to start. It will begin in month 30 of LIFE ELEKTRA project.	X	
Objective 5. To ensure the replicability and long-term sustainability of the proposed technology.	This WP is yet to start. It will begin in month 30 of LIFE ELEKTRA project.	X	

WP 4 – Impact monitoring and evaluation			
Key objectives	**Progress**	On track	Delayed
Objective 1. To quantify the social, economic and environmental viability of the project.	The objective of quantifying the viability of the project in socio-environmental and socio-economic terms will be concluded at the end of the project implementation. However, the methodology to be followed to quantify it has already been defined and the list of performance indicators that will help to measure the viability of the project will be validated in the coming weeks.	X	
Objective 2. To implement an impact monitoring strategy, including project performance, socio-economic and environmental impacts, with the participation of citizens and stakeholders	The methodology to be followed to monitor the impacts of the project at the three levels, as well as the technical performance of the plant and the tasks of dissemination and transmission of knowledge, will be done through the measurement of performance indicators. As mentioned above, this list will be validated with partners in the near future.	X	
Objective 3. To decarbonise the set of processes required in the proposed solution.	This objective depends on the hybridisation between the electrical energy generated in the hydrogen fuel cell (generated in the process itself) and the photovoltaic installation that will supply the plant's electricity consumption. At this date, the behaviour of the fuel cell has already been studied and data is being processing in order to pre-evaluate the scalability of the plant. The photovoltaic installation will be sized once the plant's energy performance has been characterised, which depends on other work packages currently under development. Nevertheless, as reported in WP2, preliminary energy consumption data is being evaluated. It should be noted that in the design of the technical KPIs, special attention has been paid to defining KPIs that monitor each of the stages of the denitrification process from the energy impact perspective.	X	

WP 4 – Impact monitoring and evaluation			
Objective 4. To comply with the Do Not Significant Harm (DNSH) principles applying the life cycle considerations and demonstrate the best available levels of environmental performance in the water treatment and energy domains.	In this respect, work has started on the analysis of more ecofriendly alternatives for some of the components of the process.	X	

WP 5 – Sustainability, replication, and exploitation of project results			
Key objectives	**Progress**	On track	Delayed
Objective 1. To develop an exploitation and business strategy plan to maximise the market reach and impact of the results of this project and develop activities to promote replicability and transferability of this project beyond the LIFE project.	Partners involved in this task are working on the different aspects/issues that the business plan and exploitation strategy should be addressed. The main contents of the document has been defined.	X	
Objective 2. To attract business partners and potential stakeholders and to create market demand.	This objective is being developed and will be ensured also by the activities carried out in WP6. Within WP5, a visit of Gran Canaria Water Council technicians was organised to the AVSA facilities in Gandía, in order to know the capacity, operating conditions and performance of the prototype as well as its potential to treat different water matrices contaminated with nitrates.	X	
Objective 3. To ensure the replicability of the proposed technology through its validation in different European regions.	This objective will be evaluated when the tree prototypes will be tested within WP3.	X	

WP 5 – Sustainability, replication, and exploitation of project results			
Objective 4. To guarantee IPR management according to the Guidelines of the EC within the Consortium Agreement.	Partners involved in the WP are working on this issue, and an IPR Management is included in the Exploitation and Business Strategy Plan. On the other hand, this objective is also considered within WP1. Actions will be carried out during the whole span of the project and corrected if required.	X	
Objective 5. To contribute to European specific regulation on nitrate management.	The results obtained in the 3 different European locations as well as the participation/involvement of authorities with competences in the water cycle will allow to achieve this objective.	X	

WP 6 – Communication and dissemination of the Project results			
Key objectives	**Progress**	On track	Delayed
Objective 1. To enable potential future exploitation of the project results by disseminating them to the relevant stakeholders.	The actions to accomplish this objective have started. The "Deliverable 6.1 C&DP – Plan for the Dissemination, exploitation and communication activities" and the "Deliverable 6.5 Stakeholder's identification and engagement" has set the initial steps to begin with the dissemination and enable the potential future exploitation of the project.	X	
Objective 2. To ensure project's findings are widely communicated to the scientific community and the general public.	The broad communication will be mainly carried by the project website (https://www.elektralifeproject.eu/) and the social network profiles (https://www.instagram.com/elektra_project_eu/; https://www.youtube.com/channel/UCL5A42G40PaEhzfHglT0wpQ; https://x.com/ElektraLifeEu) that have been already launched (Milestones 6 and 7). This work will be uninterrupted during the whole duration of the project. Scientific communication will be carried out in specialized journals after the collection, curation, and analysis of the data. For instance, it has been published a paper in the prestigious journal "Science of the Total Environment" (https://doi.org/10.1016/j.scitotenv.2024.172060). Moreover, it will be used the already prepared dissemination material as the project brochure and video (Milestones 2 and 4).	X	
Objective 3. To document undertaken and proposed dissemination and communication activities.	This objective will be carried out for the whole span of the LIFE ELEKTRA project and will be ruled by the initial "Deliverable 6.1 C&DP – Plan for the Dissemination, exploitation and communication activities".	X	
Objective 4. To ensure the project results reach the relevant stakeholders who will use and implant them.	The "Deliverable 6.1 C&DP – Plan for the Dissemination, exploitation and communication activities" and the "Deliverable 6.5 Stakeholder's identification and engagement" will point out the adequate actions for each relevant stakeholder. These activities will improve the chances of future transference and implantability to other locations from which relevant stakeholder may come from.	X	

WP 6 – Communication and dissemination of the Project results			
Objective 5. To ensure clustering and coordination with other related EU/National projects and initiatives.	This objective will be attained by participating and networking in workshops, congresses, conferences as well as other kinds of ways of getting involved in other projects. Following this, the partners have already participated in the XXXVII Congress of the *Asociación Española de Abastecimiento de Aguas y Saneamiento* held in Castellón or the I Young Water Professionals Congress held in Copenhagen. The synergies obtained after the clustering with the project will improve the development of LIFE ELEKTRA project.	X	
Objective 6. To deliver policy recommendations to relevant Water policy makers.	The “Deliverable 6.1 C&DP – Plan for the Dissemination, exploitation and communication activities” indicates the stablished plan to deliver the policy recommendations that will be extracted during the development and implementation of the project. The experience gathers in the LIFE ELEKTRA project will be communicated to Water policy makers in order to improve the water management and the integral water cycle.	X	

2 Progress on milestones (optional if Continuous reporting tab is up-to-date)

Milest. no.	Milestone title	Delivery date in Annex 1	Means of verification	Achieved	If not achieved, forecast date	Comments
MS 1	Partnership Agreement Signature	08/11/2023	Document signed	YES	NA	NA
MS 2	Kick-off meeting	27/10/2023	Minutes signed	YES	NA	NA
MS 3	Constitution of the Project Coordinating Committee	27/10/2023	Minutes signed	YES	NA	NA
MS 4	Start of the activities for monitoring	29/11/2023	Standard files	YES	NA	NA
MS 5	Coordinating Committee meeting 1 and General Assembly meeting 1	27/03/2024	Minutes signed	YES	NA	NA
MS 6	Launch of project website	31/03/2024	URL of website shared internally and externally (e.g., social media). URL/English & Spanish.	YES	NA	NA
MS 7	Launch of project social network	15/11/2023	The project will be presented in the social media project accounts. URL/English.	YES	NA	NA
MS 8	Launch of the market analysis	30/05/2024	Internal report	YES	NA	NA
MS 9	Coordinating Committee meeting 2	22/07/2024	Minutes signed	YES	NA	NA

3 Other issues

The LIFE ELEKTRA project has been implemented for ten months. During this period, the development of the solution herein proposed has been adequate and is on track. Up to date, no major issues have been faced in terms of the progress of the project.

4 Use of resources

The development of the LIFE ELEKTRA project is according the original planning. In this sense, no major deviations have been observed in the disbursement up to the issue date of this deliverable. The execution of the task are on track according to the planned budget of person/month. Furthermore, no unforeseen expenses not included in the original proposal have been recorded.

Common financial errors to be avoided

While you are not required to provide detailed financial information, please check the Section Guidance how to report under the LIFE Reporting webpage in particular the PowerPoint presentation summarising common financial errors identified so far in view helping you avoid some costs ineligibilities. Please always consult your Grant Agreement and Annotated Grant Agreement when in doubt.

HISTORY OF CHANGES		
VERSION	PUBLICATION DATE	CHANGE
1.0	10/07/2024	Initial version
2.0	18/07/2024	First version
3.0	22/07/2024	Second revision