



Accelerating Water Circularity in Food
and Beverage Industrial Areas around Europe

WP 10 Networking, Communication and Dissemination: Deliverable D10.1 “Report on Networking activities - Version 1”

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Number	958266
Acronym	AccelWater
Title	Accelerating Water Circularity in Food and Beverage Industrial Areas around Europe
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Duration	54 months

Partners

Beneficiary		Country	Logo
Agricultural & Environmental Solutions	AGENSO	EL	
National Technical University of Athens	NTUA	EL	
Institute of Communication and Computer Systems	ICCS	EL	
Athenian Brewery S.A.	AB	EL	
FrieslandCampina Hellas S.A.	FCH	EL	
Rezos Brands S.A.	REZOS	EL	
DIGNITY Private Company	DIGNITY	EL	
ProdAI Scarl	PRODAL	IT	
CALISPA SpA	CALISPA	IT	
Associazione Nazionale Industriali Conserve Alimentari Vegetali	ANICAV	IT	
University of Vic	UVIC	ES	
Associació Catalana D'Innovacio Del Serctor Carni Porci	INNOVACC	ES	
Mafrica	MAFRICA	ES	
University of Iceland	UoI	IS	
Matís	MATIS	IS	
Útgerðarfélag Akureyringa	ÚA	IS	
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Document History

Version	Date	Author	Remarks
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Executive Summary

The aim of this report is, based on the work done on deliverables D10.7 and D10.8 (reports on communication and dissemination activities), to distinguish all those dissemination events that members of the consortium participated during the first 35 months of the project and during which networking activities took place.

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Table of Abbreviations

Abbreviation	Explanation
ECESP	European Circular Economy Stakeholders Platform
EIT	European Institute of Innovation and Technology
HaDEA	European Health and Digital Executive Agency
KPI	Key Performance Indicator
LCA	Life Cycle Assessment
PC	Project Coordinator
WP	Work Package
WPL	Work Package Leader

1 Introduction

One of the main objectives of the AccelWater project is the promotion of water-smart society and economy.

This is expected to be realised by following closely the guidelines set in D10.3 “Communication and Dissemination Strategy and Action Plan” and monitor the progress using the KPIs that have been set.

The majority of networking activities will be performed during some of the non-project events where the project will be disseminated. Of particular significance are potential meetings with public authorities, elected officials and clusters.

This report will examine all the non-project events of the AccelWater project up to (and including) M35 (September 2023) and elaborate on which ones count as networking activities towards promoting water-smart society and economy.

2 Presentation of selected networking events

As identified in the updated report on communication and dissemination activities (see deliverable D10.8), during the first 35 months of the project's lifetime a total of 65 non-project events were identified, in which the project was disseminated. These events are described briefly in the table below.

TABLE 1: LIST OF ACCELWATER NON-PROJECT EVENTS

Code	Partner(s)	Event	Type of Event	Date	Month
AW_NPE_01	INNOVACC	Presentation in Meat Sector General Assembly	General Assembly	June 20 th 2020	-
AW_NPE_02	MATIS	Introduction for the Association of Municipalities in the Northeast Iceland	Conference	October 9 th 2020	-
AW_NPE_03	AGENSO	Presentation of the project in an online webinar entitled "Precision agriculture: The contribution of technological systems to the primary sector" organised by Democritus University of Thrace	Online Webinar	December 12 th 2020	M2
AW_NPE_04	REZOS	Meeting with ETVA VI.PE. S.A. to explore further collaboration opportunities and exploitation of the project's solutions	Bilateral Meeting	April 13 th 2021	M6
AW_NPE_05	AGENSO	"Recycling of Industrial Water", clustering event of projects funded under the topic "CE-SPIRE-07-2020 Preserving fresh water: recycling industrial waters industry"	Clustering Event	May 12 th 2021	M7
AW_NPE_06	REZOS	Meeting with the Greek Minister of Development and Investments regarding the project and its expected impact in the area of Patras, Greece	P2P Meeting	June 1 st 2021	M8
AW_NPE_07	UVIC	"Horizon Europe-Aigua" organized by the Catalan Water Partnership and ACCIÓ	Online Conference	June 8 th 2021	M8
AW_NPE_08	UVIC, MAFRICA & INNOVACC	Meeting with the Climate Action Department of the Catalan Government to present the AccelWater project and to explain some details about the meat processing demonstrator	Bilateral Meeting	June 8 th 2021	M8
AW_NPE_09	REZOS	Meeting with ETVA VI.PE. S.A. to explore further collaboration	Bilateral Meeting	June 18 th 2021	M8

Code	Partner(s)	Event	Type of Event	Date	Month
		opportunities and exploitation of the project's solutions			
AW_NPE_10	UVIC, MAFRICA & INNOVACC	Meeting with the Public Health Department of the Catalan Government to discuss about the regulation applied for the authorization of reclaimed water in slaughterhouses (objective of the AccelWater's meat processing demonstrator)	Bilateral Meeting	July 6 th 2021	M9
AW_NPE_11	UVIC & MAFRICA	Food Intercluster Conference "Carbon and water footprint reduction in the agri-food sector", organized by Agroalim (the agri-food cluster of Nuevo Leon, Mexico) and INNOVACC (pig meat processing cluster, Spain)	Online Conference	July 7 th 2021	M9
AW_NPE_12	PRODAL	8th International conference on sustainable solid waste management", Thessaloniki (Greece)	Online Conference	July 23 rd -25 th 2021	M9
AW_NPE_13	AGENSO	Meeting with iWAYS project to discuss possible collaboration	Bilateral Meeting	July 28 th 2021	M9
AW_NPE_14	NTUA, ICCS & DIGNITY	LCM: The 10th International Conference on Life Cycle Management	Virtual Conference	September 8 th 2021	M11
AW_NPE_15	UVIC	"Agro&Aigua: tractament de l'aigua, reutilització i economia circular" organized by the Catalan Water Partnership (Spain), the Agri Sud-Ouest Innovation (France) and BioIB (France)	Conference	October 28 th 2021	M12
AW_NPE_16	UVIC, MAFRICA & INNOVACC	Meeting with the Catalan Waste Agency of the Catalan Government to discuss about the regulation applied for the valorisation of animal by-products generated in slaughterhouses	Bilateral Meeting	December 1 st 2021	M14
AW_NPE_17	AGENSO	Water Projects Europe 2021, presenting 5 of the most revolutionary projects developing water-smart strategies:	Clustering Event	December 15 th 2021	M14

Code	Partner(s)	Event	Type of Event	Date	Month
		Waste2Fresh, AccelWater, IntelWATT, AquaSPICE and iWAYS			
AW_NPE_18	AXIA	Boosting the EU Circular Economy transition through collaboration	Clustering Event	December 17 th 2021	M14
AW_NPE_19	INNOVACC	Presentation in Meat Sector General Assembly	General Assembly	December 21 st 2021	M14
AW_NPE_20	UVIC	Presentation of the project at the Water Innovation Day organized by Catalan Water Partnership	Conference	February 24 th 2022	M16
AW_NPE_21	AGENSO, NTUA & ICCS	Presentation of the project and participation with a stand at the 4 th International verde.tec exhibition, Athens, Greece	Exhibition	March 18 th -20 th 2022	M17
AW_NPE_22	UVIC & INNOVACC	Presentation of the meat processing demonstrator at the "Bioeconomy, Innovation and Technology (BIT) Congress", Catalonia, Spain	Conference	April 6 th -7 th 2022	M18
AW_NPE_23	MAFRICA, UVIC & INNOVACC	Resource Circularity Meeting in the Meat Industry	B2B Meeting	April 21 st 2022	M18
AW_NPE_24	PRODAL & ANICAV	Webinar for project presentation and problems in the tomato canning industry	Webinar	April 27 th 2022	M18
AW_NPE_25	AGENSO	Presentation of the project during the educational program "Innovative methods in the agricultural sector" of the Center for Education and Lifelong Learning (K.E.DI.VI.M.) of the University of Western Macedonia	Webinar	May 15 th 2022	M19
AW_NPE_26	PRODAL	2 presentations and 3 abstracts at the 8th PEF School on Pulsed Electric Field Applications in Food and Biotechnology, Compiègne, France - "Development of a water-waste-energy nexus model integrating conventional and innovative solutions of AccelWater project" (P/A) - "Metal release and secondary reactions during PEF-treatment" (A) - "Plant Tissues Electroporation" (P/A)	School	May 30 th – June 3 rd 2022	M19-M20

Code	Partner(s)	Event	Type of Event	Date	Month
AW_NPE_27	AccelWater Greek partners	"Circular Economy Opportunities for Industries, Regions and Municipalities" during the EU Green Week 2022	Workshop	June 2 nd 2022	M20
AW_NPE_28	UVIC	Project presentation in an online event organized by General Council of Chambers of Commerce of Catalonia focused on the treatment of industrial wastewater and sludge	Conference	June 7 th 2022	M20
AW_NPE_29	PRODAL	"A case study of Italian tomato processing industry: a comprehensive evaluation from production, water, and energy consumption to waste valorization, and LCA point of view" at the 9th International Conference on Sustainable Solid Waste Management, Corfu, Greece	Conference	June 15 th -18 th 2022	M20
AW_NPE_30	UoI	"Water and energy use in aquaculture: a systematic review of Life Cycle Assessment studies" at Life Cycle Innovation Conference (LCIC) 2022	Conference	June 26 th -July 1 st 2022	M20-M21
AW_NPE_31	NTUA	"Presentation of AccelWater findings" at the 1st International Conference on Sustainable Chemical and Environmental Engineering, Rethymno, Greece	Conference	August 31 st -September 4 th 2022	M22-M23
AW_NPE_32	UVIC & INNOVACC	Project presentation (UVIC) and "Challenges and needs for the reuse of reclaimed water in the meat sector" (linked to the project, INNOVACC) in a hybrid event (face-to-face and online) about the water management in the agri-food sector, organized by the Catalan Water Partnership and UVIC	Conference	September 15 th 2022	M23
AW_NPE_33	ICCS	"Digital Platforms: End-To-End Data Integration Of Industrial Symbiosis Stages" at the 4th ISIE-SEM conference, Vienna, Austria	Conference	September 19 th -21 st 2022	M23

Code	Partner(s)	Event	Type of Event	Date	Month
AW_NPE_34	UVIC	Project presentation in an online webinar focused on innovative solutions in circular economy for the agri-food sector, organized by the Catalan Food Innovation Network (XIA)	Webinar	September 21 st 2022	M23
AW_NPE_35	UVIC	Project presentation in an online webinar focused on innovation projects for the meat industry, organized by INNOVACC	Webinar	September 27 th 2022	M23
AW_NPE_36	UVIC	Project presentation in a regional bioeconomy congress (BIT)	Conference	September 29 th 2022	M23
AW_NPE_37	AGENSO	Presentation of the project during the online event "Digital technology in the agri-food sector of Greece – New horizons of research and professional development" organised by the Agricultural University of Athens	Online Event	October 4 th 2022	M24
AW_NPE_38	PRODAL	"Pulse electric fields-assisted steam peeling of different fruits and vegetables" & "PEF for the extraction and recovery of health-related compounds from vegetable byproducts and wastes" at the 4th World Congress on Electroporation, Copenhagen, Denmark	Conference	October 9 th -13 th 2022	M24
AW_NPE_39	MATIS	"The Value in the Water – Accelwater" at the 50th Western European Fish Technologists Association (WEFTA) Conference	Conference	October 17-21 th 2022	M24
AW_NPE_40	UoI	"Sustainability in food research and innovation" at Icelandic Food and Nutrition association MNÍ day	Workshop	October 22 nd 2022	M24
AW_NPE_41	NTUA	"Proteins recovery from brewer's spent grains by microwave and coupled microwave- ultrasound assisted extractions using deep eutectic solvents and alkaline medium" at 21st International Union of Food Science & Technology (IUFoST) World Congress	Conference	October 31 st -November 3 rd 2022	M24-M25

Code	Partner(s)	Event	Type of Event	Date	Month
AW_NPE_42	PRODAL	"On improving the sustainability tomato processing industry by minimization of water and energy consumption" & "Environmental impact assessment of tomato processing industry: A case study of Italian tomato processing company with considering improvement scenarios" at the 36th EFFoST International Conference 2022, Dublin, Ireland	Conference	November 7 th -9 th 2022	M25
AW_NPE_43	NTUA	"Evaluation of meat industry's environmental impact via LCA: Current state and future/alternative perspectives for sustainability" at 36th European Federation of Food Science and Technology (EFFoST) International Conference 2022	Conference	November 7 th -10 th 2022	M25
AW_NPE_44	UoI	15th Meeting of the Rotary Club of Reykjavik	Event	November 24 th 2022	M25
AW_NPE_45	MAFRICA & UVIC	Pilot plant inauguration with Catalan authorities (Catalan Water Agency, Catalan Residues Agency)	Workshop	November 25 th 2022	M25
AW_NPE_46	UVIC	Explanation of the project and its impact in Catalonia during a radio interview (El 9FM)	Radio show	November 29 th 2022	M25
AW_NPE_47	MAFRICA	Report on water reclaiming initiatives shown in Catalan Public TV news (TV3)	TV Report	December 9 th 2022	M26
AW_NPE_48	INNOVACC	Presentation in Meat Sector General Assembly	General Assembly	December 19 th 2022	M26
AW_NPE_49	UoI	"Food production and the environment" at The Icelandic Medical Association Conference	Conference	January 23 rd 2023	M27
AW_NPE_50	UVIC & INNOVACC	Bilateral meeting with Environmental Health Department (Catalan Government)	B2B Meeting	March 2 nd 2023	M29
AW_NPE_51	AGENSO	Presentation of the project and its results at the "Water management projects, Agriculture, Environment" meeting during the AgroThessaly Exhibition 2023, Larisa, Greece	Exhibition	March 9 th -12 th 2023	M29

Code	Partner(s)	Event	Type of Event	Date	Month
AW_NPE_52	MATIS	"Processing Water: An Underutilized By-Product – Potentials for Valorisation" at 1st Bremerhaven Conference on Blue Economy and Fish Processing	Conference	March 15 th -16 th 2023	M29
AW_NPE_53	UVIC & MAFRICA	Presentation of the project in an online webinar focused on innovation projects for the meat industry, organized by INNOVACC	Webinar	March 29 th 2023	M29
AW_NPE_54	UVIC	Project presentation in the second edition of Bioeconomy congress in Vic	Conference	March 31 st 2023	M29
AW_NPE_55	AGENSO	Presentation of the project at the KYKNOS canning factory	B2B Meeting	April 4 th 2023	M30
AW_NPE_56	UVIC	Project presentation in a regional workshop titled "Circularity Day of resources in the meat industry" about the meat demonstrator was organized by INNOVACC with UVIC and MAFRICA	Workshop	April 21 st 2023	M30
AW_NPE_57	AGENSO	Presentation of the project and its equipment at the BEYOND 2023 exhibition in Thessaloniki, Greece	Exhibition	May 23 rd -27 th 2023	M31
AW_NPE_58	AGENSO, NTUA & ICCS	Presentation of AccelWater and results at the Water Innovation and Circularity Conference (WICC)	Conference	June 7 th -9 th 2023	M32
AW_NPE_59	AGENSO	Presentation of the project and its equipment at the Smart Cities 2023 (SCDC 2023) exhibition in Athens, Greece	Exhibition	June 16 th -17 th 2023	M32
AW_NPE_60	NTUA	"Results demonstrating the benefits of AccelWater's implementation" at the International Congress on Engineering and Food (ICEF14)	Conference	June 20 th -23 rd 2023	M32
AW_NPE_61	UoI	"Hidden water scarcity footprint of salmon aquaculture feed in Iceland" at Life Cycle Management LCM, Lille, France	Conference	September 6 th -8 th 2023	M35
AW_NPE_62	AGENSO	Presentation of the project's low-cost systems at the 87 th TIF HELEXPO, Thessaloniki, Greece	Exhibition	September 9 th -17 th 2023	M35

Code	Partner(s)	Event	Type of Event	Date	Month
AW_NPE_63	NTUA	"Decentralized wastewater management and resource recovery: experiences, challenges and opportunities" at 12th International Conference on Environmental Engineering and Management, Iasi, Romania	Conference	September 13 th -16 th 2023	M35
AW_NPE_64	MATIS	Nordic conference on the environmental impact of the fishing industry and the energy exchange in the sector	Conference	September 13 th 2023	M35
AW_NPE_65	MATIS	International Conference on Food and Biotechnology, Food & Bio Global Summit 2023, Denmark	Conference	September 26 th -27 th 2023	M35

In 17 of these 65 events, apart from disseminating the project and its results, networking activities took place.

Below is a list of these 17 events using the respective codes from Table 1.

- AW_NPE_02
- AW_NPE_05
- AW_NPE_06
- AW_NPE_17
- AW_NPE_18
- AW_NPE_27
- AW_NPE_31
- AW_NPE_36
- AW_NPE_40
- AW_NPE_45
- AW_NPE_46
- AW_NPE_47
- AW_NPE_49
- AW_NPE_51
- AW_NPE_54
- AW_NPE_58
- AW_NPE_59

Each of the aforementioned events will be described in the sections below.

2.1 Event AW_NPE_02

In October 9th 2020, a month before the project's official beginning, MATIS from Iceland participated in a conference held by the Northeast Iceland Development Fund (ssne.is). The conference was attended by the representatives from the Association of Municipalities, and MATIS had the opportunity to let them know about the project and its aims, while discussing potential adaptations of the project's results in the municipalities. The conference was a virtual one (due to the ongoing COVID-19 pandemic and the restrictive measures in effect) and was attended by approximately 60 people.

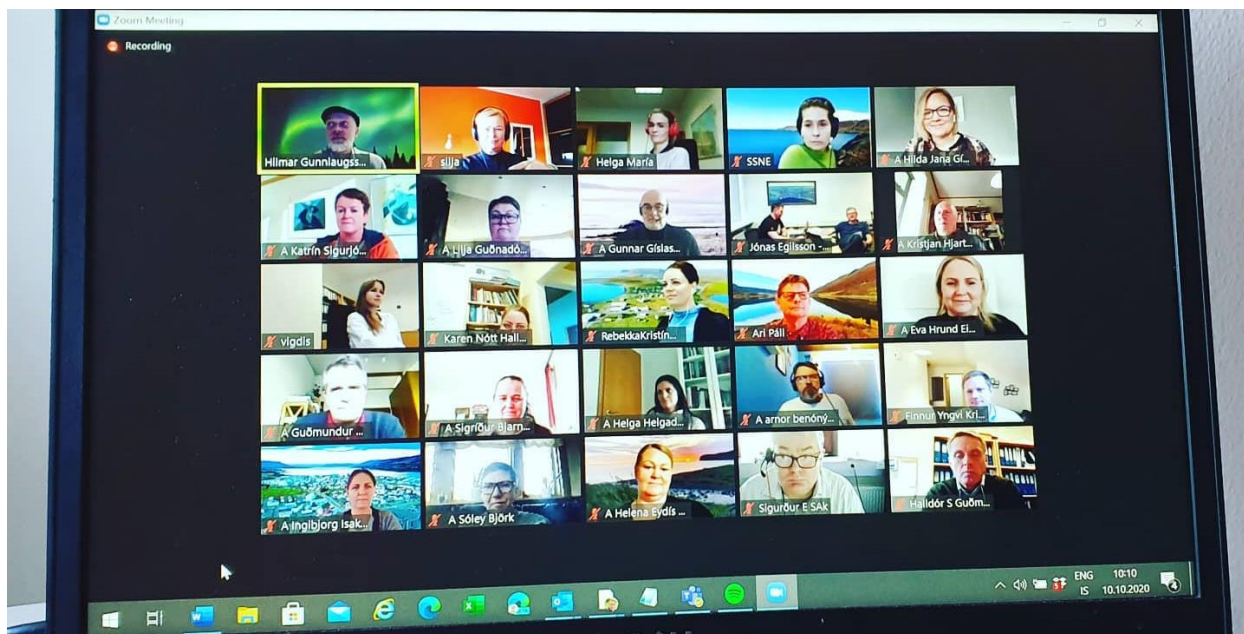


FIGURE 1: SSNE CONFERENCE

2.2 Event AW_NPE_05

In May 12th 2021, AGENSO participated in a virtual clustering event titled “Recycling of Industrial Water”. The virtual event was organized by HaDEA, the project’s agency. Participating in the event were five H2020 projects that were funded under the topic “CE-SPIRE-07-2020 Preserving fresh water: recycling industrial waters industry”. The main purpose of this event was for their PCs to acquaint with one another and find more about the objectives and structures of each project, as well as exchange good practices and ideas, thus building strong synergies.



EUROPEAN HEALTH AND DIGITAL EXECUTIVE
AGENCY (HADEA)
Digital, Industry and Space
Industry

CLUSTER EVENT ON RECYCLING OF INDUSTRIAL WATER 12 MAY 2021

DRAFT AGENDA

- 9:00 Welcome and introduction from HaDEA - Susana Xará, project adviser (5 min)
- 9:05 Introduction from Waste2Fresh - tbd, project coordinator (5 min)
- 9:10 Presentation of the topic – Susana Xará, Yolanda Alvarez Gallego & Dimos Paraskevas, project advisers (20 min)
- 9:30 Presentation of the projects, followed by a Q&A session for each
 - 9:30 Waste2Fresh - Serpil Cetin Edebalı, project coordinator (30 min)
 - 10:00 AccelWater - Zisis Tsiropoulos, project coordinator (30 min)

10:30 Coffee break (15 min)

10:45 AquaSPICE - Thomas Wintgens, project coordinator (30 min)

11:15 iWAYS - Luca Montorsi, project coordinator (30 min)

11:45 intelWATT - Andreas Sapalidis, project coordinator (30 min)

12:15 Q&A and discussions about possible synergies

12:45 Conclusion and future steps - Susana Xará, Project Adviser (max 15 min)

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FIGURE 2: DRAFT AGENDA FROM HADEA’S CLUSTERING EVENT

2.3 Event AW_NPE_06

On June 1st 2021, REZOS, a food processing company participating in the IS demonstrator (WP 3) had a bilateral meeting with the Greek Minister of Development and Investments, mr. Adonis Georgiadis.

During the meeting, the minister was presented with the project, its objectives and expected results, especially those dealing with water treatment and reuse. The minister gave his support on the project, especially after hearing about the expected impact in the Industrial Area of Patras (where the IS demonstrator would be built), as well as the city of Patras itself.

2.4 Event AW_NPE_17

On December 15th 2021, AGENSO participated in an online clustering event that was organized by Water Europe, which was open for the public. The main participants on the event included AccelWater and the other four projects funded under the topic "CE-SPIRE-07-2020 Preserving fresh water: recycling industrial waters industry" – namely Waste2Fresh, IntelWATT, AquaSPICE and iWAYS (see 2.2).



FIGURE 3: WATER EUROPE EVENT AGENDA

The title for the event was "Integrated Water-Smart Strategies for Industrial Processes" and the aim was to gather the PCs of the aforementioned projects to discuss the achievements, the barriers, the synergies

and perspectives from their respective experiences from the projects, with the support of the POs of the HaDEA.



FIGURE 4: SCREENSHOT FROM THE WATER EUROPE EVENT

The participants in the event were 125.

2.5 Event AW_NPE_18

On December 17th 2021, AXIA, the WPL for WP 9 "Business Cases and Exploitation Strategy" attended a webinar titled Boosting EU Circular Economy transition through collaboration". The event was organised by the EIT Community initiative on Circular Economy and was held online.

The scope of this event was for the participants to find out more about EIT's work on the ground and hear stories of involved actors working with them to increase the uptake of circular innovative solutions. The event was divided in two sessions: the first one included an introduction to EIT Circular Economy Community, in addition to a presentation of the ECESP, while the second one was a more interactive one, during which AXIA discussed the AccelWater project and sought possible synergies with the participants.



FIGURE 5: BANNER FOR THE EIT EVENT

2.6 Event AW_NPE_27

In June 2nd 2022, in the city of Patras, Greece, a workshop entitled “Circular Economy Opportunities for Industries, Regions and Municipalities” was organised by the Greek partners of the AccelWater project, during the conference on Circular Economy and Industrial Coexistence in the framework of EU Green Week 2022. During the workshop, there were presentations regarding the research results and innovations of the project as well as the related strategies and opportunities given from EU towards Greek cities, regions and industries.

EU Green Week is an annual event supported by EU that gives the opportunity for discussion on European environmental policies with related stakeholders and policymakers. EU Green Week 2022 focused on the European Green Deal and the steps towards Europe’s resource efficiency and climate neutrality by 2050.

Circular Economy Opportunities for
the Greek Industries, Cities and Regions:

The AccelWater Solutions

SAVE THE DATE

Thursday, June 2nd 2022
Patras

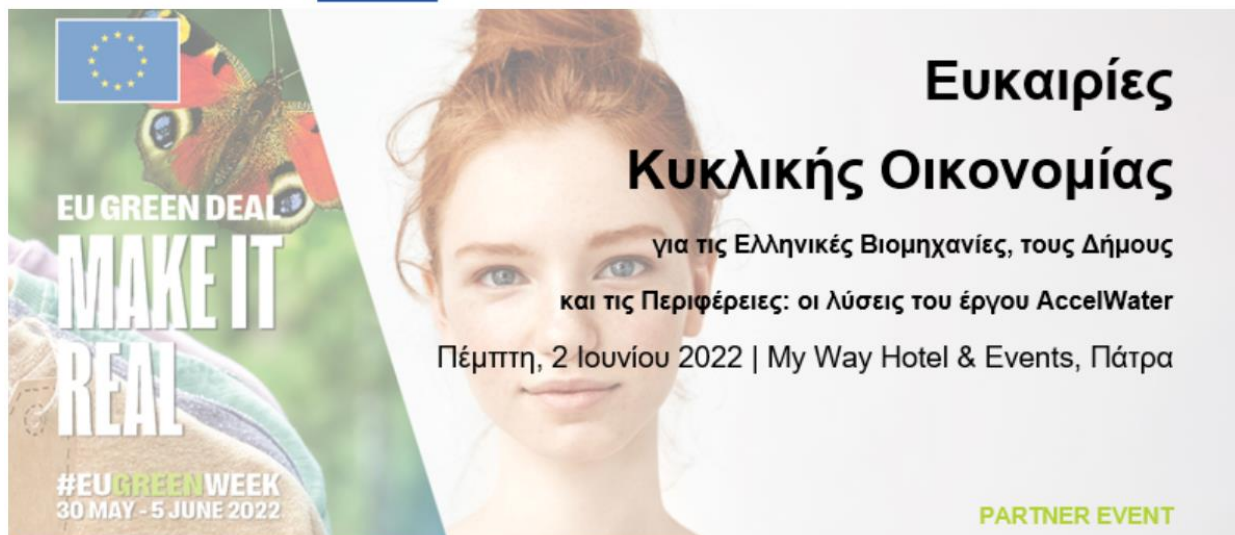
AccelWater



Accelerating Water Circularity in Food and Beverage Industrial Areas around Europe



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 958266



**Ευκαιρίες
Κυκλικής Οικονομίας**
για τις Ελληνικές Βιομηχανίες, τους Δήμους
και τις Περιφέρειες: οι λύσεις του έργου AccelWater
Πέμπτη, 2 Ιουνίου 2022 | My Way Hotel & Events, Πάτρα

**EU GREEN DEAL
MAKE IT
REAL**
#EUGREENWEEK
30 MAY - 5 JUNE 2022

PARTNER EVENT

FIGURE 6: INVITATION AND POSTER FROM THE EU GREEN WEEK EVENT



FIGURE 7: SELECTIONS FROM EU GREEN WEEK 2022 EVENT

2.7 Event AW_NPE_31

During the 1st International Conference on Sustainable Chemical and Environmental Engineering held in Rethymno, Crete, Greece between August 31st and September 4th 2022, interesting findings coming from AccelWater's project research were presented. The initial findings of the investigation into the biomethane potential tests conducted on dairy by-products were formally unveiled during the proceedings of session 7 "Anaerobic Digestion". The presentation, entitled "Anaerobic Co-digestion of Sewage Sludge and Acidic Cheese Whey", was a pivotal moment where the results of the research were shared and discussed in detail. This session provided a platform for sharing the outcomes of the study, shedding light on the promising aspects of anaerobic co-digestion and its application in the context of sewage sludge and acidic cheese whey, thereby contributing to a deeper understanding of sustainable waste management and resource recovery within the dairy industry. During the conference a discussion between scientists and engineers took place on topics related to chemical and environmental engineering and the incorporation of sustainability in those sectors. The conference accommodated both in-person attendance and virtual participation, ensuring accessibility and inclusivity around the globe. Furthermore, all the presentations, delivered in the form of scientific papers, were compiled and published within the official SUSTENG 2022 Conference Proceedings. This comprehensive publication had an anticipated reach of up to approximately 200 individuals, providing a wide dissemination of the valuable research and insights presented during the conference.



FIGURE 8: PRESENTATION OF THE ACCELWATER FINDINGS BY NTUA



1st International Conference on Sustainable Chemical and Environmental Engineering
31 Aug – 04 Sep 2022, Rethymno, Crete, Greece

Anaerobic Co-digestion of sewage sludge and acidic cheese whey

F. Gkoumas¹, Z. Gravanis², C. Noutsopoulos¹, D. Mamais¹ and S. Malamis²

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keywords: Anaerobic co-digestion; Agro-industrial waste; Acidic cheese whey; Biochar; BMP.

Introduction

Anaerobic Digestion (AD) is widely used in the valorization of waste because of its ability to produce biogas, which belongs to the biofuel category. However, mono -digestion has significant disadvantages, such as instability of the digestion process, limited availability of a particular feedstock, presence of heavy metals and low efficiency of biogas/methane production¹. Anaerobic co -digestion (AcoD) is the simultaneous AD of two or more substrates and is a potentially promising option to overcome mono-digestion's disadvantages and improve AD plants' economics through higher methane production. In particular, AcoD can enhance biogas production by 25% to 400% compared to the mono-digestion of the same substrates. Numerous studies have been focused on the co-digestion of sewage sludge (SS) with different types of wastes and in this context, cheese whey (CW) has been proposed as a suitable co-substrate². Given the above, this study aims to investigate the co-digestibility of SS and Acidic CW (ACW) by conducting AD batch experiments. In this sense, the biomethane potential (BMP) of ACW, SS, waste activated sludge (WAS) and mixtures was determined and compared with SS mono-digestion with three consecutive series of BMP tests. In addition, biochar, a known conductive material produced from the pyrolysis process, was supplemented in the bulk anaerobic liquid to evaluate its influence on the AD process³.

Materials and methods

The experiments were carried out with a compact BMP unit consisting of a heated bath maintaining a constant temperature at 35 ± 1 °C. The working volume of each bottle is 400 to 700 mL. The biogas produced passes through a scrubber of NaOH 2M solution to separate CH₄ from other gases. The volume of CH₄ is automatically measured and recorded in the BMP unit control panel. The substrate to inoculum ratio (SIR) was 1:2 in the first and second series and 1:1 in the third series. The duration of each series was 30 d and the tests were performed in duplicate, with inoculum-only reactors also selected in each series. The methodology followed was in accordance with Angelidaki et al. 2009⁴. SS, WAS and inoculum were obtained from the Psytalia Wastewater Treatment Plant (WWTP) and were blended before the characterization. The ACW was obtained from a dairy industry in Patra, Greece. The biochar was supplied by Novocorbo (Dörth, Germany).

Results and discussion

Table 1 summarizes the results of the three BMP series compared to the SS mono-digestion. The findings from the first BMP series show that the inclusion of WAS in the SS digestion has a small, yet notably positive effect (3%) on methane yield compared to SS mono-digestion. In the second BMP series, ACW as a co-substrate to the SS showed a slight increase (1%) in methane yield at a ratio (SS-ACW) of 80:20. However, the methane yield was 8% and 18% lower compared to SS mono-digestion with increased ACW compared to SS with a ratio of SS: ACW at 60:40 and 50:50, respectively. After completion of the 30-day digestion, alkalinity was not significantly reduced and pH was maintained in a desired range. Therefore, in the third series of BMP tests, the SIR was changed to 1:1 and higher SS: ACW ratios were applied. Furthermore, the reactor with SS: ACW at a 95:5 ratio was found to enhance the methane yield compared to SS mono-digestion. Co-digestion experiments of SS and ACW in continuous flow anaerobic reactors in another study revealed an increase in biogas production compared to SS mono-digestion, but a negative effect was observed on the biogas composition⁵. The lower methane content in the biogas yield could explain the reduced methane yield. In addition, the reactors with the same ratio of SS: ACW, which were enriched with biochar (5 g/L), showed a positive effect on methane yield, which was 7% and 4% higher than the SS mono-digestion and the non-



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amended with biochar reactors, respectively. Interestingly, the methane yield of the biochar enriched reactors with a ratio of SS: ACW at 95:5 was higher than the SS: ACW at a 95:5 ratio. Although biochar has been shown to improve the performance of AD in many ways⁶, further research is needed on the associated mechanisms and the effect of conductive materials on AD.

Table 1. Methane yield of the three BMP series compared to SS mono-digestion

BMP Tests mixtures used		Methane yield variation NmL CH ₄ g ⁻¹ VS _{sub}	
First Series	SS 80% - WAS 20%	354.6	3
SIR 1:2	SS 100%	343.1	0
	WAS 100%	110.8	-68
Second Series	SS 80% - ACW 20%	388.2	1
	SS 100%	383.9	0
	SS 60% - ACW 40%	353.6	-8
	SS 50% - ACW 50%	342.7	-18
Third Series	SS 95% - ACW 5% Biochar (5 g/L)	381.5	7
	SS 90% - ACW 10% Biochar (5 g/L)	373.7	5
	SS 95% - ACW 5%	366.8	3
	SS 100%	355.2	0

Conclusions

In this study, the effect of co-substrates on the performance of AD was investigated, with a particular interest in the co-digestion of SS and ACW and the determination of the most appropriate ratio of co-substrates. In addition, biochar's effect on AD was also investigated, although not to a great extent, with preliminary results showing that it has a favorable effect on AD's performance. In particular, methane yield of SS and ACW was increased compared to SS mono -digestion when the ratio SS: ACW was 80:20 and higher. Methane yield was further increased when the bulk anaerobic liquid was enriched with biochar. Finally, increasing SIR to 1:1 did not affect the performance of the AD process and the methane yield of the SS mono-digestion tests was relatively similar in terms of NmL CH₄ g⁻¹ VS_{sub} among the three BMP series.

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FIGURE 9: SUSTENG2022 PROCEEDINGS EXCERPT

2.8 Event AW_NPE_36

On September 29th 2022, UVIC, the WPL for the meat processing demonstrator in WP 5, participated in the new edition of the Bioeconomy Congress of Catalonia (BIT), that was organized at the Congress Palace-La Llotja of Lleida, in the framework of the Saint Miquel Fair. This is the second edition of the BIT Congress, after the one organized in Vic last March, aiming at opening new spaces to learn about trends, innovations and business projects related to the bioeconomy. During the first day of the event, UVIC participated in a thematic session on knowledge as a driver of the bioeconomy, in which they presented the results of the European project AccelWater on the reuse of wastewater in the food industry through recovery and reuse technologies. The 400 attendees were members of technological centres, companies and Catalan administration officials interested in Bioeconomy, Innovation and Technology.



PROGRAMA

Lleida, 29 y 30 de septiembre
Palacio de Congresos - La Llotja de Lleida

12.00 a 14.00 h SESIÓN TEMÁTICA 2:
EL CONOCIMIENTO: MOTOR DE LA BIOECONOMÍA

Sala Maria Rúbies 1+2

Modera Xavier Flotats

- Mapa del ecosistema RDI catalán para el desarrollo de la bioeconomía**
A cargo de **Laura Arribas**
Responsable de Ecosistemas y Políticas de Innovación, Consultoría Tecnológica de Eurecat.
- Panel de proyectos RDI para la valorización de recursos líquidos**

Proyecto ACCELWATER: optimización del consumo de agua en la industria alimentaria mediante tecnologías de recuperación y reutilización.
A cargo de **Mabel Mora**
Responsable del Área de Tecnologías Ambientales y Bioeconomía Circular del centro BETA.

Proyecto NIMBUS: producción de biometano obtenido a partir de fangos de depuradora y su utilización como combustible sostenible para el transporte público.
A cargo de **Oscar Guerrero**
Investigador Predoctoral/ Profesor asociado de la UAB.

Proyecto SOLIEVA: recuperación de compuestos de interés y agua de las balsas de evaporación de la industria de la aceituna de mesa para su posterior valorización.
A cargo de **Sandra Meca**
Jefa de línea de residuos y economía circular en la Unidad de Residuos, Energía y Impacto ambiental de Eurecat.

Proyecto ENRICH: recuperación de nutrientes de las aguas residuales y su utilización como fertilizantes.
A cargo de **Carme Biel**
Investigadora del programa Protección Vegetal Sostenible del IRTA.
- Panel de proyectos RDI para la valorización de recursos sólidos**

Proyecto NUTRI2CYCLE: creación de modelos de negocio agrícola más eficientes y sostenibles para la recuperación y reciclaje de nutrientes en granja.
A cargo de **August Bonmatí**
Investigador en el programa de Sostenibilidad en Biosistemas del IRTA.

Proyecto 4BIOLIVE: producción de bioestimulantes, biofertilizantes, biopolímeros y bioenergía a partir de residuos y subproductos de la cadena del aceite.
A cargo de **Ivet Ferrer**
Catedrática de Tecnologías del Medio Ambiente de la UPC.

FIGURE 10: EXCERPT FROM THE BIT CONGRESS AGENDA



FIGURE 11: DISCUSSION AT THE BIT CONGRESS 2022

2.9 Event AW_NPE_40

On October 22nd 2022, UoI participated in a workshop titled “Sustainability in food research and innovation”, which was held during the Icelandic Food and Nutrition association MNÍ day. This annual meeting, brings together the most important specialists in food science and nutrition in Iceland both associated with academia, research, health institutes and industry. The activities UoI undertakes in the framework of the AccelWater project were presented at the event from an environmental impact and sustainability point of view. Approximately 100 attendants were at the meeting, which was held at the Hotel Natura in Reykjavík, Iceland.

2.10 Event AW_NPE_45

On November 25th 2022, there was an official presentation of the meat processing pilot plant in the MAFRICA facilities. The event was divided into two parts: a first session of discussions among representatives and then a visit to show and present the technologies in place. Present were representatives from Catalan Waste Agency (ACR), Catalan Water Agency (ACA), as well as high-level officials from the three Spanish partners and other stakeholders, a total of 40 attendees. In their respective statements, all attendees transmitted the importance of implementing this type of projects to the industry. It has to be mentioned that this particular activity generated a lot of interest in mass media (newspapers and TV newscasts).



FIGURE 12: IMAGES FROM THE OFFICIAL PILOT PRESENTATION

2.11 Event AW_NPE_46

On November 29th 2022, UVIC was interviewed in a radio show called "Territori 17" at the El 9FM radio station of Catalonia, explaining the AccelWater project and emphasizing on its impact in the Catalonia region.

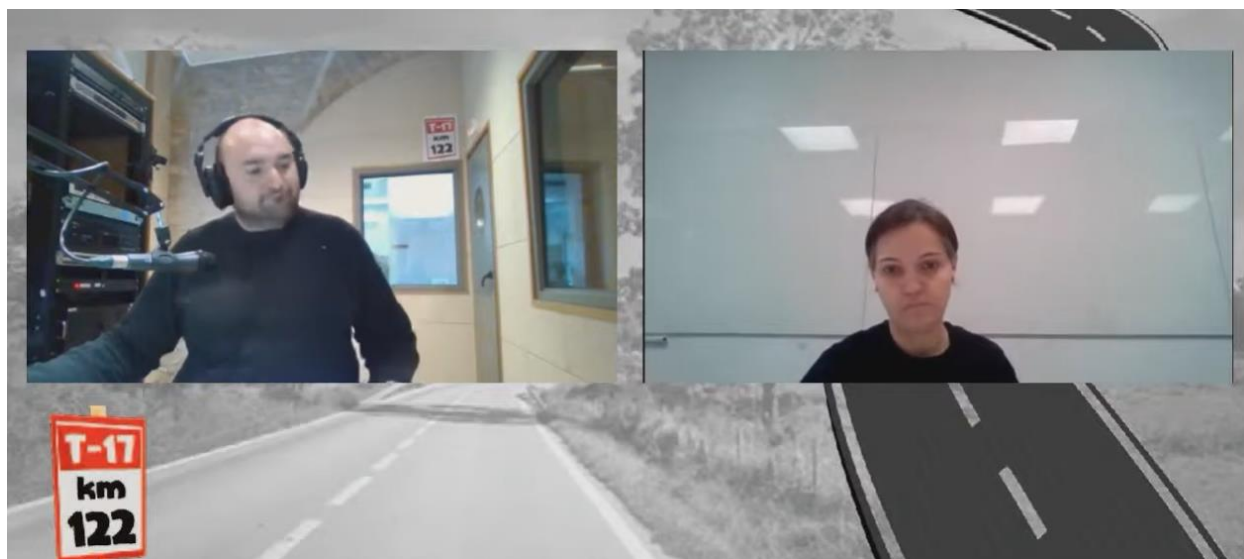


FIGURE 13: UVIC AT "TERRITORI 17" SHOW IN EL 9FM RADIO STATION

2.12 Event AW_NPE_47

Representatives from all Spanish partners gave interviews for a TV report on water reclaiming initiatives, especially in regards to the AccelWater project. The report was broadcast on December 9th 2022 in the TV3 channel (the Catalan Public TV channel) during its main newscast. The newscast's audience has been measured in over 1.000.000 in the greater area of Catalonia.



FIGURE 14: SPANISH ACCELWATER PARTNERS AT TV3

2.13 Event AW_NPE_49

On January 23rd 2023, UoI participated at the “Food production and the environment” conference, organized by the Icelandic Medical Association. UoI’s activities on LCA and water scarcity impacts (AWARE) from the AccelWater project, were presented amongst other projects currently running at the Faculty of Food Science and Nutrition, where environmental impacts of food production and nutrition are considered. The presentation was a part of a special session on Environmental issues for health. The conference was held in Harpa, music and conference hall in Reykjavík, Iceland, for an audience of approximately 200 people, mostly from the Icelandic Medical Association and from Environmental governance institutes in Iceland (The Icelandic Environmental Association – Landvernd, The Environment Agency – Umhverfisstofnun, etc.).



FIGURE 15: STILLS FROM THE ICELANDIC MEDICAL ASSOCIATION CONFERENCE

2.14 Event AW_NPE_51

Between March 9th and 12th 2023, the 13th Panhellenic Exhibition for Agriculture and Livestock, AgroThessaly took place at the Neapolis Covered Market in Larissa, Greece. During the exhibition, there was a meeting entitled “Water management projects, Agriculture, Environment” where the project AccelWater and its results were presented. There was an interesting discussion where strong concerns regarding the water supply in the coming years came to the floor. AccelWater project was presented as a successful example of circular economy and proper water management with the use of IoT technologies.



FIGURE 16: AGENSO CEO AT THE AGROTHESSALY PANEL

2.15 Event AW_NPE_54

On March 31st 2023, UVIC once again participated in the 2nd edition of the Bioeconomy congress in VIC. The congress was attended by more than 300 attendees belonging to technological centres, companies and Catalan administration officials interested in Bioeconomy, Innovation and Technology. AccelWater was presented by UVIC in a session titled "Applied research advances in biogas production".



FIGURE 17: UVIC PRESENTATION AT THE 2ND BIT CONGRESS



FIGURE 18: AGENDA FROM THE 2ND BIT CONGRESS

2.16 Event AW_NPE_58

Between June 7th and 9th 2023 the Sanitary Engineering Laboratory of the National Technical University of Athens and the Hellenic Water Association organised the Water Innovation and Circularity Conference (WICC), in Athens, Greece. During the conference a workshop took place where AccelWater project and its results were presented. The conference focused on subjects related to nature-based solutions for water, wastewater management, environmental policies and assessment tools for circularity.



FIGURE 19: ACCELWATER PRESENTATION AT WICC 2023

2.17 Event AW_NPE_59

On April 16th and 17th 2023, the 1st Annual "Smart Cities" Exhibition took place at Zappeio Megaro in Athens, Greece. At the exhibition, AGENSO, which is the coordinator of AccelWater project, presented the project, its results and the equipment used at the demo sites. During the exhibition, a variety of companies in Smart Cities industry as well as representatives of Greek Municipalities and Regions visited AGENSO's stand and had the opportunity to discuss on subjects related to circular economy and how IoT technologies can help the shift towards sustainable development. The exhibition and the events held both

in physical and digital form. In the context of the Exhibition, AGENSO was awarded for the development of IoT systems that support the circularity on AccelWater demo sites.



FIGURE 20: AGENSO TEAM AT SMART CITIES EXHIBITION

3 Conclusions

While drafting this deliverable, the 65 non-project events where the AccelWater project was disseminated (see D10.8 for more details) were analysed to reach the result that 17 of them were the ones that helped the project towards promoting water-smart society and economy.

If one could distinguish amongst them, the most important would be:

- the meeting with the Greek Minister of Development and Investments
- the meetings with the Catalan authorities
- the event that was organized in the framework of the EU Green Week from the Greek partners
- the presentation of the project and its results in mass media (radio and television) in Spain
- the Smart Cities exhibition and the award for the AccelWater IoT systems that promote circularity in industry

It is certain that in the coming months and until the end of the project, many more such events will take place, since there will be more tangible project results to show.