AT A GLANCE

TITLE:
MELoDIZER

CONSORTIUM:
18 partners

COORDINATOR:
Politecnico Di Torino

DURATION:
December 2022- November 2026

TOTAL BUDGET:
€ 8,290,517.48

EU CONTRIBUTION:
€ 7,007,470.74

MELODIZER
SUSTAINABLE MEMBRANE DISTILLATION FOR INDUSTRIAL WATER REUSE AND DECENTRALISED DESALINATION APPROACHING ZERO WASTE

Sustainable MEmbrane DIstillation for industrial water reuse and decentralized desalination approaching ZERo waste

MELoDIZER CONSORTIUM

1. Politecnico Di Torino (Italy)
2. Consiglio Nazionale Delle Ricerche (Italy)
3. Amapex Environement Slu (Spain)
4. Solarspring Gmbh (Germany)
5. Inotex Spol Sro (Czechia)
6. Deltamem Ag (Greece)
7. Athinaiiki Zythopiia Anonymos Etairia (Greece)
8. Wings Ict Solutions Information & Communication Technologies Ike (Greece)
9. Innovation In Research & Engineering Solutions (Belgium)
10. AquaBioTech Group Limited (Malta)
11. Bluetechtracker Limited (Ireland)
12. Centro De Investigaciones Energeticas, Medioambientales Y Tecnologicas-Ciemat (Spain)
13. Aalborg Universitet (Denmark)
14. Warrant Hub Spa (Italy)
15. POLYMEM (France)
16. enGits GmbH (Germany)
17. Fraunhofer Gesellschaft Zur Forderung Der Angewandten Forschung Ev (Germany)
18. Municipality Of Eilat (Israel)

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Horizon Europe 2021-2027

PROGRAMME:
HORIZON-CL4-2022-RESILIENCE-01

MELoDIZER PROJECT

MEloDIZER implements high performance membranes and modules in strategic applications of Membrane distillation (MD), hence providing the decisive step for the success of MD. These core components are fabricated with a focus on feasible wide uptake and on sustainability, substituting harmful materials and protocols with >80% of benign solvents and relying on green chemistry principles. Both flat-sheets and innovative hollow-fibres are produced, striking the optimum between productivity and energy efficiency, as well minimising fouling/wetting phenomena, also by applying novel sacrificial coatings while membranes are in situ. Optimised modules are developed with a focus on hydrodynamics and energy recovery improvement.

These activities are strongly supported by sustained modelling tasks, conducted at different scales to (i) control the relationship between membrane properties and performance, (ii) customise module geometry and (iii) increase system efficiency and automation. The membranes and modules are thus rationally installed as core components of four MD prototypes spanning three orders of magnitude of productivity. Two protypes (2-5m3/day, 0.5-2m3/day) are demonstrated in industrial facilities (textile, beverage, chemical industry) to reuse wastewater (70-90%), thus reducing water footprint and approaching zero waste, as well as to recover valuable nutrients as secondary raw materials from aquaculture wastewater.

Two prototypes (50-100lt/day; 10-20lt/day) are demonstrated as low-cost, ready-to-use, passive, autonomous, decentralised units, delivering drinking water from saline and challenging sources at community and family level. All prototypes are run with 90-100% sustainable energy from waste heat and/or solar energy, with careful designs that maximise membrane and system performance and system performance. Quantitative, robust evaluations of market entry and environmental benefits act as input data for each innovation activity in MEloDIZER and to promote exploitation.

Objectives of MELoDIZER

- Creation of next-generation membranes and modules obtained with green and readily scalable approaches.
- Rationally integrate the core innovative membrane and module components with energy and control systems that maximise their performance and enable the smart utilisation of renewable energy.
- Demonstrate the performance of the next-generation membrane components in the overall system for the reduction of industrial waste streams, the reuse of water, the extraction of resources, and for the production of drinking water by decentralised and diffuse human-scale Membrane Distillation (MD) units.
- Demonstrate the economic and environmental benefits associated with the implementation of the innovative membrane components and the resulting improved MD technology, also providing sustainable end-of-life management of membrane components and systems.

AT A GLANCE

TYPE:
Research SME

LOCATION:
Mosta, MALTA G. C.

CAPABILITIES:
R&D / Consultancy / Engineering

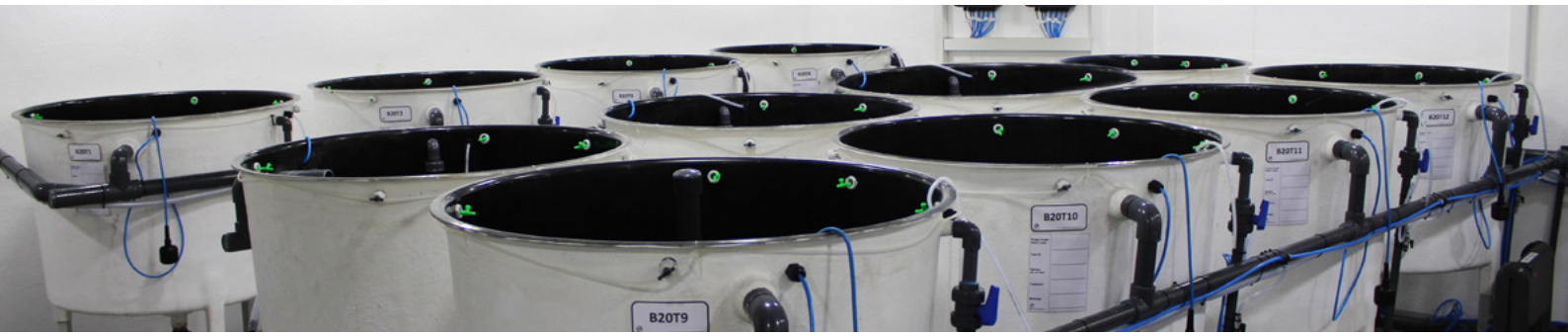
EXPERTISE:
Aquaculture / Marine Research
Blue Growth / Aquatic Environment

AquaBioTech Group

Who We Are

AquaBioTech Group is an international consulting, engineering and R&D company with over 20 years of experience in aquaculture, fisheries and other aquatic sciences. Located in the center of the Mediterranean on the island of Malta, although operating globally with clients and projects in over fifty-five countries.

The vast majority of the organisation's work is related to the marine or aquatic environment, encompassing aquaculture developments, market research/intelligence through project feasibility assessments, finance acquisition, project management, technology sourcing, technical support and training.

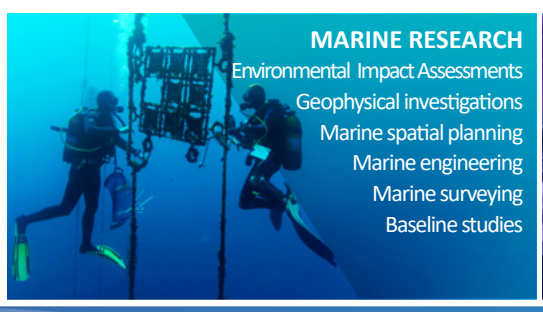


Our role in the MELoDIZER project

AquaBioTech Group's main tasks in the MELoDIZER project include:

- Participate in the valorization of waste streams and provide wastewater for use in demo sites to determine the possibility of nutrient recovery (targeting P & N).
- Participate in the training on the use of the prototype filtration system.
- Provide data for Life Cycle Assessment, Life Cycle Cost Analysis, techno-economic assessment, business cases, market opportunities and regulation assessment.
- Co-lead the training and capacity-building task.

Our Research Activities



AquaBioTech Group

Contact
+356 2258 4100
info@aquabt.com
www.aquabt.com
AquabioTech Group

Central Complex
Naggar Street
Targa Gap, Mosta
MST 1761
Malta G.C