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Clean Hydrogen Partnership

Co-funded by the European Union

About SWEETHY

SWEETHY is a 4-year project co-funded by the European Union, focused on creating a new and advanced electrolysis system. The goal is to produce 20 g_{H2}/h using renewable energy and seawater, without prior purification steps.

SWEETHY in figures

- Duration: 48 months
- Start date: March 2025
- EU Funding: 3.999.768 €
- Partners: 9 from 7 different countries

Contact

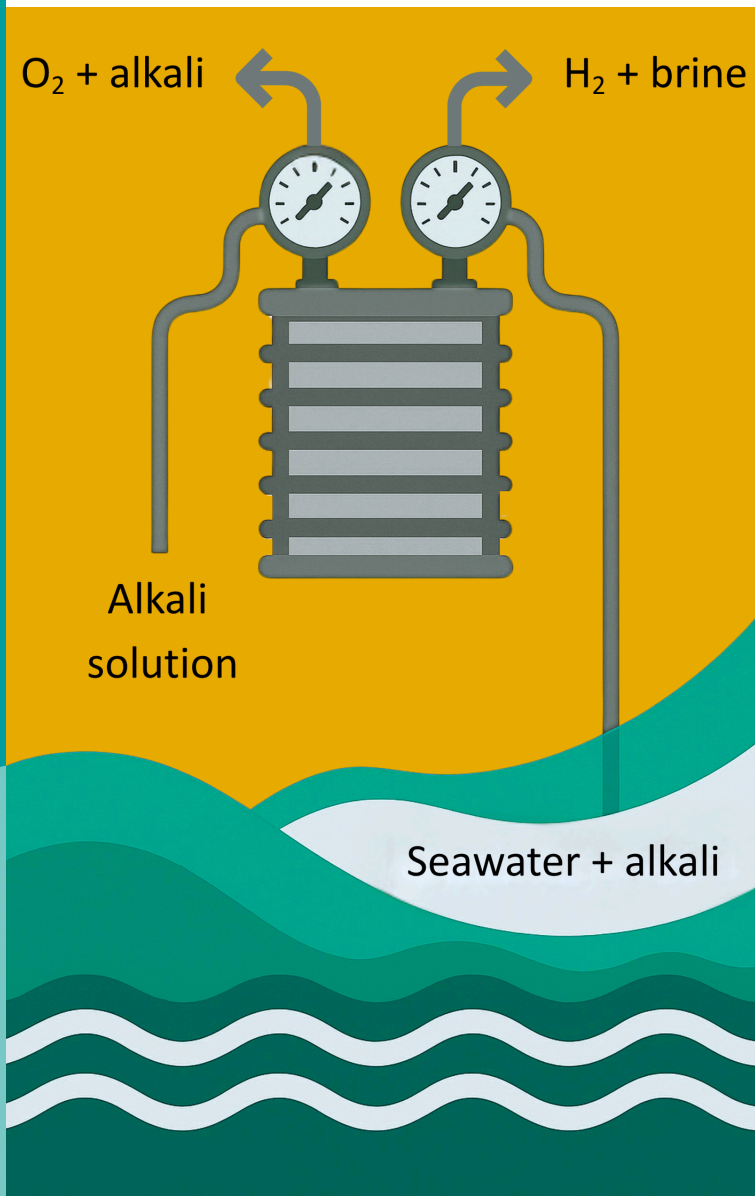
Coordination:
Olesia Danyliv (RISE, olesia.danyliv@ri.se)
Live Mölmen (RISE, live.molmen@ri.se)

Dissemination:
Martina Cotti (UNR, m.cotti@uniresearch.com)

www.linkedin.com/company/sweethy/

www.sweethy.eu

SWEETHY



Europe's Cutting-Edge Direct Seawater Electrolysis Platform

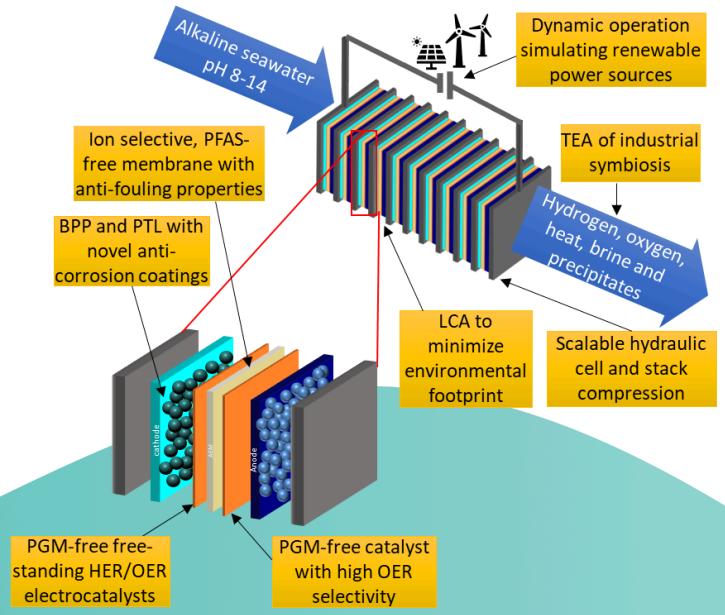
SWEETHY leverages the innovative AEMWE (anion exchange membrane water electrolysis) technology for which it will develop new and cost-effective materials, capable of withstanding highly corrosive saline conditions. The developed electrolyser stack will ultimately secure > 2000 h of operation under a 1%/100 h degradation rate.

Objectives

1. Development of corrosion resistant components for AEMWE electrolyser
2. Development and testing of short scalable 0.5 kW stack with direct sea water feed
3. Research market opportunities for utilization of electrolyser by-products (salts)
4. Minimize environmental impact of electrolyser

Concept

The project approaches the challenges of sea water electrolysis from three perspectives: **The material development, The sustainability analysis and The electrolyser configuration.** Materials for each electrolyser component will be screened with the goal to improve their corrosion resistance in saline conditions. Sustainability and economical principles will integrate and guide the screening, in order to identify the most crucial trade-offs between cost, efficiency and durability. Finally, SWEETHY's materials will be integrated in a modular and scalable electrolyser configuration, fed by sea water and operating under dynamic conditions, typical of renewable energy sources.



Approach

The key innovations include:

Material Development

- Electrocatalysts: PGM (platinum group metals)-free Ti/Ni alloys via 3D nanoparticle supports and electrodeposited foams/nanowires for high durability in saline/alkaline media.
- Membranes: Modified AionFLX™ with anti-fouling layers, zwitterionic additives, nanofillers, and sustainable materials.
- Polar plates & PTL (porous transport layer): Ti-based anti-corrosion coatings (plasma/electrodeposition) for extended durability.

Sustainability Analysis

- Interaction electrolyser with environment
- Sustainability guide for material development
- Integration electrolyser with industry and energy system
- Health, jobs, local value creation
- Guides eco-design and industrial integration.

Electrolyser Configuration

- Modular 10-cell AEMWE stack
- 20 g_{H2}/h at 20 bar for 2000 hours
- Handles intermittent energy input
- Feed of seawater + KOH
- Explores Mg recovery from brine