PROJECT PARTICIPANTS OF REDHy

DLR Deutsches Zentrum für Luft- und Raumfahrt
Institut für Technische Thermodynamik

cnrs

INSTITUTO DE TECNOLOGÍA QUÍMICA

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Clean Hydrogen Partnership

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Facts and figures

Start date	1-1-2024
Duration	48 months
EU funding	€2,990,238.75

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7 partners in
5 European countries

Contact

Project coordinator
Tobias Morawietz
Tobias.Morawietz@dlr.de
DLR

Dissemination
Anna Molinari
a.molinari@uniresearch.com
Uniresearch

Fleur Pijper
f.pijper@uniresearch.com
Uniresearch

www.linkedin.com/company/redhy

REDHy

Redox-Mediated economic, critical raw material free, low capex and highly efficient green hydrogen production technology

Visit our website!

Objectives

Objective 1: Develop highly efficient and durable materials free of critical raw and fluorine free materials for the REDHy technology, especially the membranes, ionomeres, electrodes, redox mediators and heterogenous oxygen and hydrogen evaluation catalysts to allow the development of a short stack with manufacturing quality guided by Europe's circular-economy action plan for a cleaner and more competitive Europe.

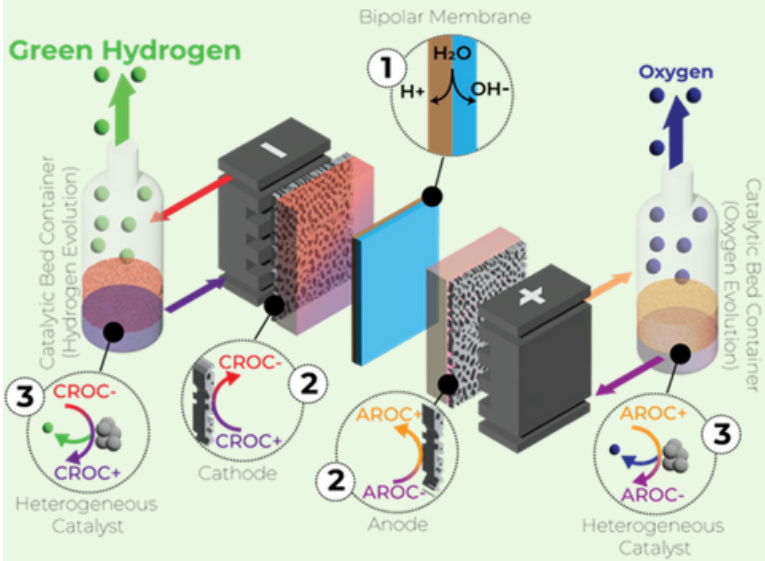
Objective 2: Validate the stack's efficiency and robustness to address dynamic situations frequently occurring when the electrical grid is fed by large proportion of renewable energy sources or if the system is directly interfaced with RES.

Objective 3: Eliminate the use of and the need for critical raw materials and fluorinated membranes and ionomers at stack level.

Objective 4: Demonstrate optimization strategies for the porous electrodes to enhance their mass transport characteristics and enhance energy efficiency.

REDHy ...

... is a 4-year project
... tackling the limitation of contemporary electrolyser technologies
... reimagining water electrolysis
... allow to surpass the drawbacks of state- of-the-art electrolyser
... become a pivotal technology in the hydrogen economy



Source: https://redhy.eu/project/

Aim of the project:

... develop a large area short stack with 5 cells
... active surface area of > 100 cm^2/cell
... nominal power of > 1.5 kW
... energy consumption of 48 kWh/kg H2
... energy efficiencies > 82 %
... nominal load of 1.5 A/cm^2
... degradation rate of 0.1 %/1000 h

Objective 5: Demonstrate a reduced energy consumption of at least 48 kWh/kg H_2 by implementing highly reversible, stable redox mediators with enhanced kinetics.

Objective 6: Demonstrate a drastic reduction in interface resistances across all cell components leading to energy efficiencies > 82 %.

Objective 7: Demonstrate the decoupling of oxygen and hydrogen production and enabling the REDHy system to operate at minimum 5 % of partial load operation (nominal load 1.5 A/cm^2) without exceeding 0.4 % of H_2 concentration in O_2.

Objective 8: Demonstrate that the REDHy technology is capable to perform efficient and direct seawater electrolysis.

Objective 9: Integrate the short stack in a prototype full system.

Objective 10: Demonstrate the operation of the REDHy electrolyzer at 1.5 A/cm^2 with electricity consumption of 48 kWh/kg H2 over at least 1200 hours of operation with a degradation of 0.1 %/1000 h.