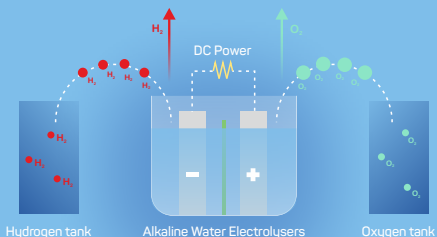


How to decarbonize our society?

Green Hydrogen

"Green Hydrogen" defines hydrogen produced from renewable energy. It represents a promising solution for decarbonizing our economy and society by allowing the storage and use of renewable energy.



How to produce green H₂?

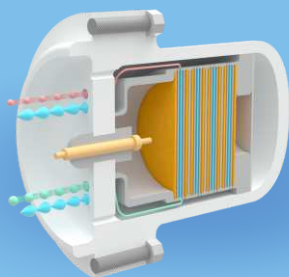
Water Electrolysis

Water electrolysis is an innovative solution for producing green H₂. It describes the process of splitting water into hydrogen and oxygen using electricity. This reaction takes place in a unit called electrolyser.

What is an Electrolyser?

Hydrogen Electrolysers

Three are the main components of electrolysers: anode, cathode and electrolyte. Electrolysers can operate in different ways depending on the electrolyte that separates cathode and anode.



The NEWELY consortium consists of 11 renowned R&D centers, 3 small & medium enterprises (SMEs), and 1 global player and world leader in the gases industry. Together the consortium covers every aspect of water electrolysis and green hydrogen production, paving the way to a sustainable future.



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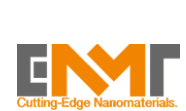
SMEs



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 and Technology (KIST)
 South Korea



University of Chemistry
 and Technology
 Prague (UCTP)
 Czech Republic



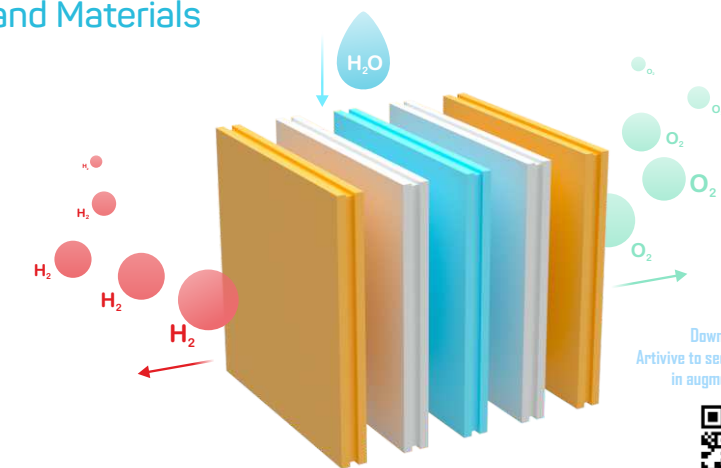
Westfälische Hochschule
 University of Applied
 Sciences (WHS)
 Germany



CEA French Alternative
 Energies and Atomic
 Energy Commission
 France



Next Generation Alkaline Membrane Water Electrolysers with Improved Components and Materials



Download the app
 Artivate to see the picture
 in augmented reality



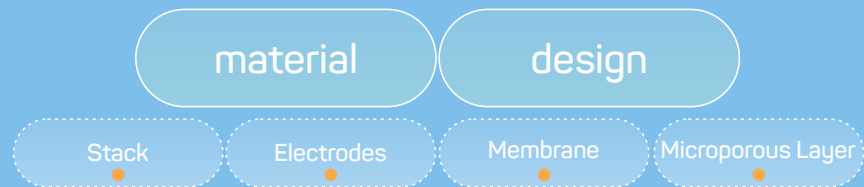
This project has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking under grant agreement No 875118. This Joint Undertaking receives support from the European Union's Horizon 2020 research and innovation programme and Hydrogen Europe and Hydrogen Europe Research



Research project TRL2 ->TRL4

NEWELY is a European project

that deals with the **development and testing of components** for the next generation of Anion Exchange Membrane Water Electrolysers (AEMWE).



The project focuses on material development and demonstration of new materials in a stack using relevant operating conditions and demonstrating long-term operation.

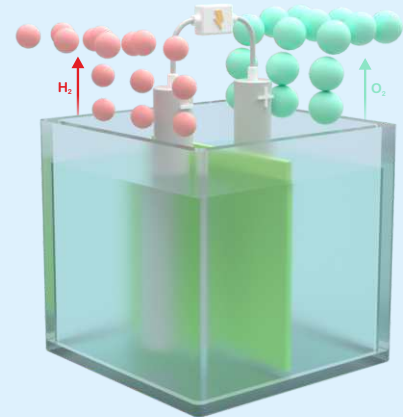
With the innovations on the membrane, electrodes and stack design, the NEWELY prototype will become the most efficient and cost-competitive AEMWE by 2023.

NEWELY will be an important breakthrough that will enable the adoption of green hydrogen energy storage solutions in Europe and in the rest of the world for turning to more sustainable energy systems.

method **1** liquid separator AWE

Alkaline water electrolyzers (AWE)

Alkaline Water Electrolyzers (AWE) produce H₂ by splitting water with two electrodes operating in a liquid alkaline electrolyte solution.



FEATURES

AWE is a mature technology with high durability and low costs for H₂ production.

LIMITS

It has a large footprint, it is incompatible with intermittent power supply from renewables and it requires additional compression that makes it inadequate for producing green hydrogen from renewable energy at large scale.

method **2** solid separator PEMWE

Polymer Electrolyte Membrane Water Electrolyzers (PEMWE)

Polymer Electrolyte Membrane Water Electrolyzers (PEMWE) use a solid polymer electrolyte to conduct protons and to separate water from oxygen. All the components are solid.



FEATURES

PEMWE has a compact design, it is compatible with intermittent power supply from renewables, it doesn't need H₂ compression and it produces pure H₂.

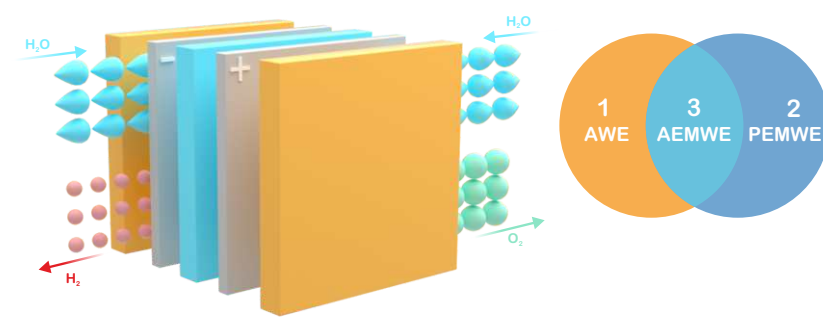
LIMITS

PEMWE is expensive due to dependence on iridium and platinum (critical raw materials, CRM) that pose a serious threat for up-scaling.

method **3** solid separator AEMWE

Anion Exchange Membrane Water Electrolyzers (AEMWE)

Anion Exchange Membrane Water Electrolyzers (AEMWE) combine the benefits of AWE and PEMWE. AEMWE uses an alkaline solid polymeric membrane for producing H₂.



FEATURES

AEMWE has low costs, is compatible with intermittent power supply from renewables, doesn't need compression of H₂ and produces pure H₂ thanks to a compact design.

LIMITS

AEMWE's performance indicators do not reach commercial requirements and are lacking competitiveness in terms of efficiency, costs and durability.

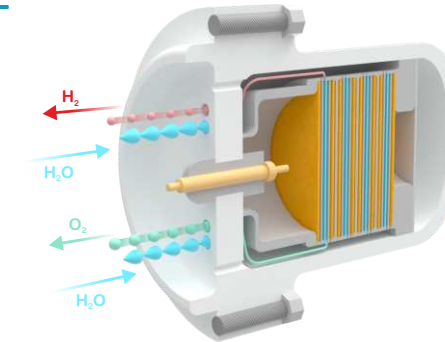


NEWELY aims at developing a new prototype of Anion Exchange Membrane Water Electrolyser characterized by high-performance, CRM-free catalysts, neutral conditions, cost-effectiveness and durability.

NEWELY PROTOTYPE

The 2 kW 5-cell AEMWE stack prototype

is based on hydraulic compression with novel components characterised by superior performance and stability. It is fed with **pure water** feedstock at a temperature of at least 45 °C and it keeps this performance for **2.000 hours**.



The advantages of NEWELY are:

- Compact design
- Low cost of materials
- Low environmental impact
- Higher stability of materials
- Higher performance
- Long life time