Making an impact on the clean energy transition

ENERGY

FAREWELL TO FOSSILS

© FCH JU project REMOTE

The missing piece

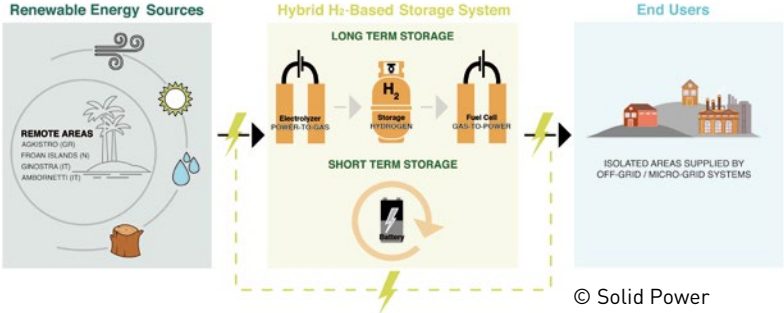
Many remote regions cannot be adequately integrated into a larger energy grid and must use alternative systems for energy storage and distribution. This means that those using renewables often rely on fossil-fuel generators to balance supply and demand. Producing hydrogen is a cleaner alternative for storing excess energy.

Two major projects are exploring and demonstrating this route. In a remote region of Norway, the FCH JU-funded Haeolus project is creating a new-generation electrolyser for installation inside the fence of a wind farm experiencing grid bottlenecks. With demonstrations in four isolated micro-grid or off-grid sites, the REMOTE project will showcase the technical and economic feasibility of using FCH energy storage solutions to create completely sustainable energy systems.

The deployment of intermittent energy sources, like wind and solar, requires a system for balancing supply and demand. For regions that are not part of a larger energy system, this can be particularly problematic. The FCH JU is demonstrating how flexible hydrogen technologies can offer an environmentally friendly solution.

Microcosm

With the potential to compensate for fluctuations in renewable sources, FCH technologies could enable the EU-wide replacement of fossil fuels. To advocate for this, the FCH JU is not only showing how these technologies can revolutionise energy systems in remote regions, but publicly presenting the business case for electrolysers in wind farms as a means to avoid electricity distribution fees. The Haeolus project is exploring a number of operating strategies and creating a business case for hydrogen production that can be replicated in remote wind farms across the world.



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LIGHTHOUSES BURN BRIGHT

The use of renewable energy resources presents specific challenges for remote regions, but the solutions can be applied across Europe.

SHOWCASING SOLUTIONS

By resolving energy-storage challenges in remote regions, the FCH JU is demonstrating key tools for stabilising the energy grid. **The goal?** Bringing together FCH product manufacturers, both small and large, with renewable energy suppliers, energy storage providers, researchers and regional authorities, to show that sustainable energy systems can be developed. **Key results?** Demonstrating the use of hydrogen to create entirely sustainable energy systems based on renewables.

KEY ACHIEVEMENTS

HAEOLUS

2.5 MW
polymer electrolyte membrane (PEM) electrolyser, with a unique single cell stack, to be developed and deployed

52 kWh per kg H_2
energy consumption in line with FCH JU KPIs for 2020

2 SECONDS
for hot start-up, enabling effective grid balancing inside a wind park fence

REMOTE

4 REMOTE LOCATIONS
Ginostra, southern Italy; Agkistro, Greece; Ambornetti, northern Italy; Froan Island, Norway

4 DIFFERENT RENEWABLE ENERGY SOURCES
solar PV, biomass CHP, hydroelectric, wind

50 – 100 kW SCALE
4 proof-of-concept power-to-power solutions

4 USAGE CASES
electrical power to communities, electrical power to industry, battery electrical storage, power to heat

IMPACT

3 CONTROL SYSTEMS DEVELOPED
to address the challenges of the 3 main modes of operation identified by the International Energy Agency: electricity storage; mini-grid; fuel production

REMOTE

TOTAL 584 MWh ANNUAL ENERGY DEMAND ACROSS 4 SITES
met entirely using renewable energy with the help of hydrogen storage

65 000 LITRES PER YEAR FUEL SAVINGS
on the island village of Ginostra in southern Italy

100 % ENERGY AUTONOMOUS AGRIFOOD PROCESSING UNIT
independent from the grid using the hydro plant and a hydrogen-based storage system in Agkistro, Greece

100 % RENEWABLE POWER GENERATION
provided for the mountain community of Ambornetti in northern Italy

> 98 %
power availability when wind energy is combined with hydrogen storage on the island of Froan, Norway