Making an impact on the clean energy transition

ENERGY

HYDROGEN FROM RENEWABLES: GREEN BACK-UP POWER

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Powerful, efficient electrolysis

Using excess electricity from renewables to split water molecules via electrolysis, the resulting green hydrogen can be stored in fuel cells to supply power as needed. For green hydrogen to be used as efficient back-up energy-storage, electrolysis technology must become flexible enough to be coupled with renewables in real world-conditions, and costs need to be cut. To address these challenges, the FCH JU is focusing on developing more powerful and efficient electrolysers, and demonstrating industrial applications for the technology to open up new markets. HPEM2GAS, ELY4OFF, PRETZEL and NEPTUNE are among 30 co-funded projects aiming to improve electrolysis technology. Other initiatives, such as H2FUTURE, have demonstrated the increasing power of electrolysers, highlighting their suitability particularly for energy-intensive heavy industries, and HyUnder which worked on efficient hydrogen-storage solutions.

Clean energy storage

The European Commission's Energy Roadmap 2050's ambitious renewable energy targets could result in a 10-fold increase in demand for energy storage, with green hydrogen expected to play a key role. The FCH JU has put in place the building blocks to smooth the transition to renewables, showing that back-up power using green hydrogen is technically feasible and increasingly financially viable. Amid growing interest from industries, cities and regions, the point is now being reached where electrolysis is being adopted more widely as a clean energy-storage solution.

Green hydrogen, produced by harnessing surplus electricity from wind and solar sources, is an important back-up power solution. The FCH JU is playing a central role in making this clean energy-storage technology more efficient and cost-effective.

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KEY ACHIEVEMENTS

5 900 %
increase in power output of advanced, highly efficient, high pressure electrolysers from 2011 to 2016

1 000 %
forecast increase in demand for energy storage as a result of EU renewable energy targets

142 M EURO
FCH JU support for the development and demonstration of electrolysers

IMPACT

53
projects to improve electrolysers

30
projects developing electrolysis for energy applications

2.8 GW
electrolysers potential to be installed in Europe by 2025 with a market value of 4.2 b Euro

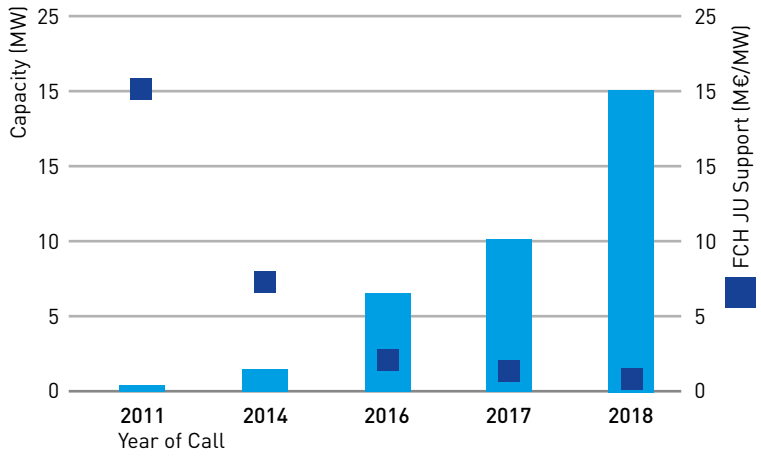
ENERGISING ADOPTION OF CLEAN ENERGY STORAGE

Developing more powerful and efficient electrolysers and demonstrating the potential applications of green hydrogen will encourage the adoption of the technology as an emission-free energy-storage solution.

DRIVING DEPLOYMENT THROUGH GREATER EFFICIENCY

To support wider deployment of green hydrogen as back-up energy storage, FCH JU projects use a unique public-private partnership structure enabling suppliers and end-users to work together, while promoting a long-term, strategic perspective on the sector. **The goal?** To increase sectoral interest and boost confidence in the technology by developing more powerful and more efficient electrolysers, alongside demonstrations of transport and industrial applications to open up new markets. **Key results?** A 5 900 % increase in the power output of advanced, dynamic electrolysers from 100 kW in the Don Quichote project in 2011 to 6 MW in H2FUTURE in 2016.

USING GREEN HYDROGEN FOR ENERGY STORAGE AND SECTOR COUPLING



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FUEL CELLS AND HYDROGEN JOINT UNDERTAKING

A partnership dedicated to clean energy and transport in Europe