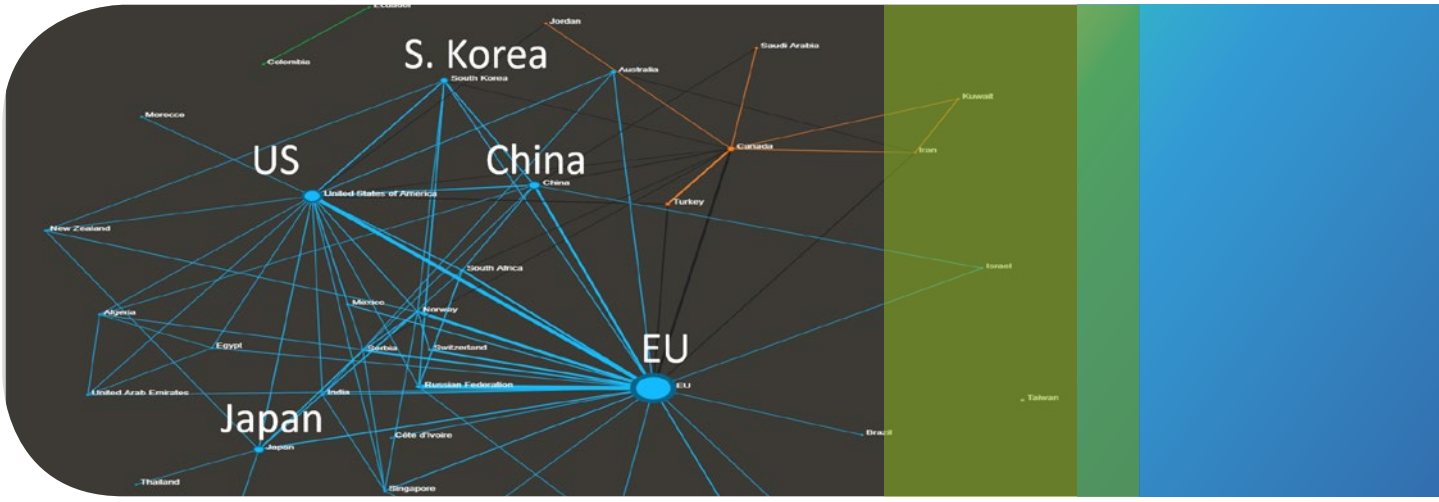
Making an impact on the clean energy transition

ENERGY

A GAME CHANGER IN EUROPE'S RENEWABLE LEAD



An electrifying future

Electrolyser technologies are key to the production of green hydrogen, paving the way for the greening of industry, transport and heating sectors through the increased penetration of renewable energy. Electrolysers are commercially available today, however the development of more efficient, more dynamic and cheaper electrolysers like proton exchange membrane (PEM) electrolysers or Solid Oxide (SO) electrolysers remains a challenge.

The FCH JU is taking a two-pronged approach to promoting break-through solutions in PEM and SO electrolysis technology. It is supporting the development and demonstration of the largest innovative electrolysers worldwide while focusing on reducing costs and boosting performance. FCH JU-funded research projects – like NEPTUNE, PRETZEL, GAMER and REFLEX – are now driving Europe's global leadership in the field.

Electrolysers generate renewable hydrogen through a process whereby renewable electricity splits water into hydrogen and oxygen, to the benefit of the environment and fighting climate change. The FCH JU is supporting the development of cutting-edge research projects in the field, turning Europe into a global leader in the field of renewable energy technologies

Innovating hydrogen

Europe is already a world leader in low temperature PEM and high temperature SO electrolysis, aiming to develop green hydrogen as a key energy carrier for the implementation of renewables in the EU's energy transition. Europe has published twice as many publications and patents on PEM electrolysis as the United States. Likewise, EU patent and publication leads are also significant in the field of solid oxide electrolysis development, a process in which an electrochemical device generates hydrogen utilising waste heat, thus achieving even higher efficiencies. Alongside research into innovative renewable energy storage solutions, the FCH JU is moving Europe into pole position in electrolyser technologies.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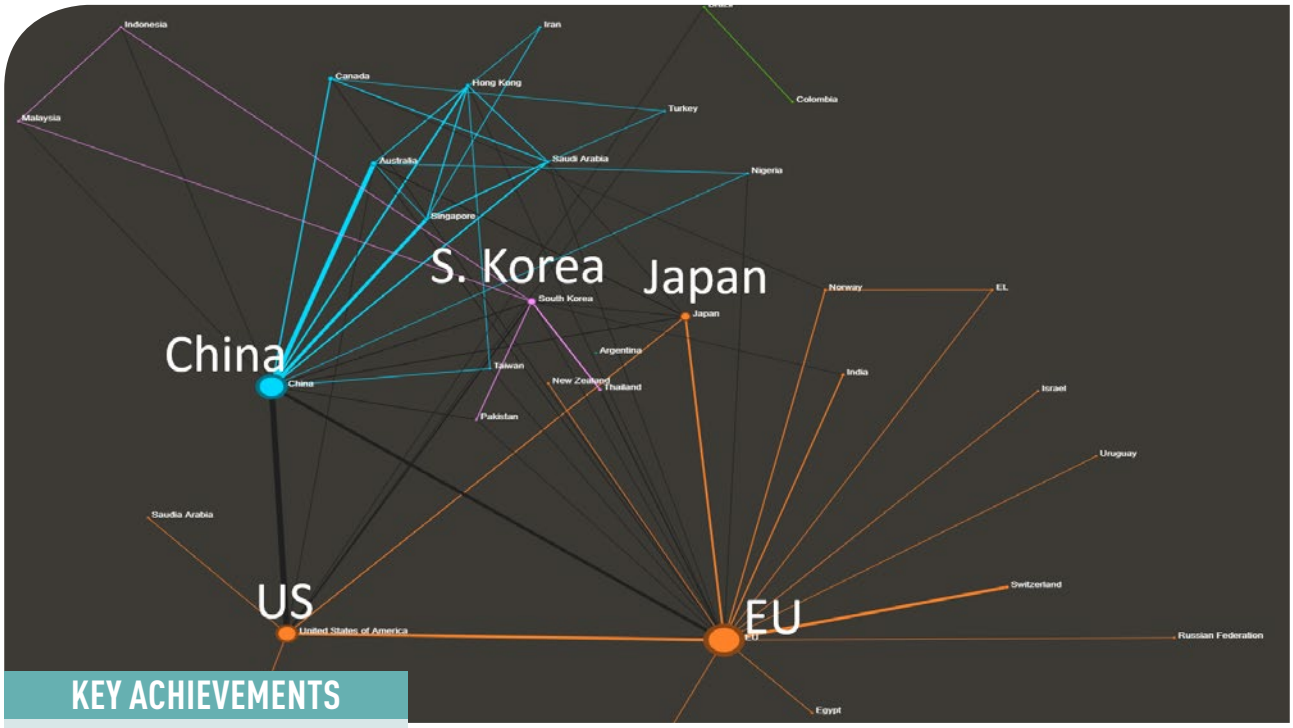

KEY ACHIEVEMENTS

UP TO 8 A/CM2
electrolyser current density targeted in projects

AT LEAST 11 000 HOURS
total duration of electrolyser operation across the various research projects

LESS THAN 50 kWh PER kg HYDROGEN
energy requirement target in NEPTUNE

IMPACT

823
PEM electrolysis publications and patents in EU 2004-2017

508
solid oxide electrolysis publications and patents in EU 2004-2017

AFFORDABLE, EFFICIENT AND RELIABLE

In light of the growing potential for renewable energy to combat climate change, electrolyser technologies must become more affordable, efficient and reliable before they can be rolled out on a large commercial scale.

PUSHING LIMITS

FCH JU-supported projects are seeking to go beyond the current mix of state-of-the-art technologies for the commercial production of clean energy from electrolysers. By tackling issues currently limiting the full potential of electrolysers, the research is making a significant contribution to the EU's transition to a low-carbon economy. **The goal?** To ensure Europe continues to lead the world when it comes to innovative electrolysers and pushing the technology beyond what is currently possible. **Key results?** The plan is to further increase capacity, safety and performance and drive down the cost of electrolysers.

FIND OUT MORE

NEPTUNE http://www.neptune-pem.eu/
Will develop a self-pressurising 100 bar PEM electrolyser system of 48-115 kW

PRETZEL: http://pretzel-electrolyzer.eu/
Will develop a PEM electrolyser cell concept capable of 100 bar, with a system of 25 kW

GAMER https://www.sintef.no/projectweb/gamer/
Will develop a tubular proton ceramic electrolyser at 30 bar, with a system of 10kW

REFLEX http://www.reflex-energy.eu/

www.fch.europa.eu/page/fch-ju-projects

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FUEL CELLS AND HYDROGEN
JOINT UNDERTAKING

A partnership dedicated to clean energy and transport in Europe