

Advanced facility to develop production of carbon-free hydrogen inaugurated today

(03.09.2018) One of Europe's most advanced hydrogen facilities has today been inaugurated in Denmark. Led by Air Liquide, Hydrogenics, NEAS Energy, LBST and Hydrogen Valley/CEMTEC have partnered up behind one of Europe's largest hydrogen facilities for the production of what will be carbon-free hydrogen in the future.

The hydrogen is produced from water electrolysis, enabling the storage of renewable electricity from wind turbines. It helps balance the grid, which is essential for the stability in electricity systems. The hydrogen produced is used to supply industrial customers as well as the network of five hydrogen stations installed and operated by the Copenhagen Hydrogen Network (CHN), an Air Liquide subsidiary in Denmark.

Denmark is a pioneer in the integration of renewable energies into the national energy mix with more than 40% of the electricity produced on the territory coming from wind turbines.

The budget of the project totals € 15 million. The project has received € 8 million in funding from the Fuel Cells and Hydrogen 2 Joint Undertaking as well as € 2.6 million in funding from the Danish EUDP program.

Advancing key technologies

The project – named HyBalance – demonstrates the link between energy storage in the form of hydrogen and the deployment of hydrogen mobility solutions. The project will validate highly dynamic PEM (Proton Exchange Membrane) electrolysis technology and demonstrate this at a megawatt-scale (1.2 MW) in a real industrial environment, producing about 500 kg of hydrogen per day. The HyBalance setting is demonstrating the multiple applications of Power-to-Hydrogen technologies, including how carbon-free hydrogen can be used in multiple high value markets such as industry and clean transportation, and the project will help validate the business models for these applications.

- Hydrogen energy has a tremendous potential to support energy transition. Air Liquide is proud to be part of the HyBalance project. It also contributes to the Group's commitment to develop technological solutions towards lower greenhouse gas emissions in order to fight climate change, declares Francois Darchis, Senior Vice-President and member of Air Liquide Group Executive Committee, supervising Innovation.

The potential of using hydrogen in future energy systems

The EU has made a commitment to a forward-looking climate policy with energy security and independence and decarbonizing the economy as some of the prioritized dimensions. With the share of renewable energy growing in the energy mix, the need for storage and downstream use in fossil dependent sectors such as transportation has become a critical issue. Hydrogen is seen as one of the key enablers to solve these questions.

- *HyBalance is a historical project for the FCH JU, being the forerunner of our large electrolyser demonstration projects and the first to reach the Megawatt-scale. The project addresses two main objectives of the FCH JU: increasing the efficiency of green hydrogen production and demonstrating hydrogen's potential for energy storage and integration into the energy system. From the financial point of view, HyBalance will be assessing different income streams - selling the hydrogen and providing electricity grid services - in order to evaluate the business case of such innovative hydrogen energy systems. We are delighted to be able to support the HyBalance project through FCH JU funding, complemented by the Danish EUDP program, says Bart Biebuyck, CEO of Fuel Cells and Hydrogen 2 Joint Undertaking.*

Denmark has been chosen as the location

In 2012, Denmark framed one of the most ambitious energy strategies in Europe - a strategy which has been confirmed in 2018 by a new agreement that targets producing 100% of its electricity consumption from renewable sources in 2030, and becoming independent of fossil fuels in 2050 by substituting these with a mix of renewable energy sources.

These circumstances make Denmark an ideal site to demonstrate a Power-to-Hydrogen concept.

Partners in the HyBalance project



Air Liquide: World leader in gases, technologies and services for Industry and Health, Air Liquide is present in 80 countries with approximately 65,000 employees and serves more than 3.5 million customers and patients. Oxygen, nitrogen and hydrogen have been at the core of the company's activities since its creation in 1902. Air Liquide masters the entire hydrogen supply chain, from production and storage to distribution and uses for the end user. www.airliquide.com

Copenhagen Hydrogen Network (CHN): Refuelling station network operator and institution rolling out national hydrogen infrastructure in Denmark. CHN is a wholly-owned subsidiary of Air Liquide. www.airliquideadvancedbusiness.com/en/who-we-are/copenhagen-hydrogen-network-chn.html



Hydrogenics: Electrolyzer technology developer and global leader in advanced large scale PEM-electrolysis, having profound expertise in the design, provision and operation of hydrogen generation, fuel cell power modules and electrolyzers. www.hydrogenics.com



Neas Energy A/S: Balance Responsible Party and Danish electricity and natural gas trading company. Being an experienced energy company, Neas Energy will prepare for new electricity and natural gas markets from hydrogen technologies and their markets. Neas Energy has outstanding experience of current and future electricity markets and trading schemes, with Denmark being at the forefront in Europe when it comes to introducing renewable energies. www.neasenergy.com



Hydrogen Valley/CEMTEC: Danish business incubator acting as a driver of the hydrogen industry in Denmark and contributing to the project by drawing from the local energy market expertise.
hydrogenvalley.dk



Ludwig-Bölkow-Systemtechnik GmbH (LBST): Research institute and consultancy with more than thirty years of hydrogen and fuel cells expertise, contributing its knowledge on life-cycle analysis, performance reporting and business case analysis of Power-to-Gas systems for industry and politics. www.lbst.de

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