

MULTIPLHY - GREEN HYDROGEN FOR RENEWABLE PRODUCTS REFINERY IN ROTTERDAM

Rotterdam, March 11, 2020 CEA, Neste, Paul Wurth, ENGIE and Sunfire announce a project-partnership to build and operate the world's first multi-megawatt scale high-temperature electrolyser for highly efficient hydrogen production.

The MULTIPLHY project – “Multi-megawatt high-temperature electrolyser to generate green hydrogen for the production of high-quality biofuels” has recently been launched at Neste's renewable products refinery in Rotterdam. The project involves renewable products specialist Neste, world's leading provider of renewable diesel and renewable jet fuel, and as key technology partners the French research organisation CEA, plant builder Paul Wurth, the energy utility ENGIE and the cleantech company Sunfire. The consortium will install, integrate and operate the world's first high-temperature electrolyser (HTE) system in multi-megawatt-scale. The project consortium led by CEA, as project coordinator, is part of the EU Horizon 2020 FCH2-JU program with an overall funding of EUR 6.9 million.



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MULTIPLHY marks the first demonstration of an HTE in an industrial refining process with a nominal power input of 2.6 MW and a hydrogen production capacity of 60 kg/h reaching an electrical efficiency of up to 85% $_{AC}$ to LHV H_2 .

“This project shows the great progress being made in bringing our green hydrogen production technologies to the next level and paving the readiness for a further scale up to 100 MW” said Sunfire Managing Director Nils Aldag.

“Neste is a global forerunner in renewable fuels with the ambition to become a global leader in renewable and circular solutions. Demonstrating green hydrogen production at our Rotterdam refinery enables us to drive the development of new sustainable technologies aiming at decreasing the carbon footprint of our customers” said Lars Peter Lindfors, Senior Vice President, Innovation, Neste.

“ENGIE is delighted to be part of MULTIPLHY to decarbonize Neste's bio refinery. This is the world's first multi-megawatt high-temperature electrolysis project to produce hydrogen. We will contribute our expertise and increase our knowledge to extend ENGIE's renewable

hydrogen-based solutions, and enable our customers' zero-carbon journey," said Michèle Azalbert, Chief Executive Officer of ENGIE's Hydrogen Business Unit.

For Georges Rassel, CEO of Paul Wurth, "our involvement in the MULTIPLHY project is an important part of our strategy for the transformation of the industry towards Zero Carbon Emissions, especially as H₂ is considered THE reducing agent of the future in the world of ironmaking."

By the end of 2024, the electrolyser is expected to have been in operation for 16,000 hours or more, producing a total of around 960 tonnes of green hydrogen while avoiding approximately 8,000 tonnes of GHG emissions. The project supports the most promising Carbon Direct Avoidance (CDA) approach by substituting "grey" hydrogen currently generated via steam-methane reforming (SMR) by certified green hydrogen.

About Sunfire

Sunfire GmbH, founded in 2010, develops and produces high-temperature electrolysers (SOEC) and high-temperature fuel cells based on solid oxide cell technology (SOFC). The company employs more than 170 people and is the world market leader for commercial SOEC. High-temperature electrolysis generates valuable hydrogen from steam powered by renewable electricity. The use of steam instead of liquid water for electrolysis significantly increases the efficiency of the process and is specifically well suited for industrial application where process heat is available. The technology holds promise to make the entire transport sector and many industrial processes, which today depend on oil, gas or coal, sustainable and CO₂-neutral. Further information at www.sunfire.de/en

About Neste

Neste (NESTE, Nasdaq Helsinki) creates sustainable solutions for transport, business, and consumer needs. Our wide range of renewable products enable our customers to reduce climate emissions. We are the world's largest producer of renewable diesel refined from waste and residues, introducing renewable solutions also to the aviation and plastics industries. We are also a technologically advanced refiner of high-quality oil products. We want to be a reliable partner with widely valued expertise, research, and sustainable operations. In 2019, Neste's revenue stood at EUR 15.8 billion. In 2020, Neste placed 3rd on the Global 100 list of the most sustainable companies in the world. Read more: www.neste.com

About Engie

ENGIE Group is a global reference in low-carbon energy and services. In response to the urgency of climate change, our ambition is to become the world leader in the zero-carbon transition "as a service" for our customers, in particular global companies and local authorities. We rely on our key activities (renewable energy, gas, services) to offer competitive turnkey solutions. With our 170,000 employees, our customers, partners and stakeholders, we are a community of Imaginative Builders, committed every day to more harmonious progress. Turnover in 2019: EUR 60.1 billion. The Group is listed on the Paris and Brussels stock exchanges (ENGI) and is represented in the main financial indices (CAC 40, DJ Euro Stoxx 50, Euronext 100, FTSE Eurotop 100, MSCI Europe) and non-financial indices (DJSI World, DJSI Europe and Euronext Vigeo Eiris - World 120, Eurozone 120, Europe 120, France 20, CAC 40 Governance). Press contact tel.: +33 (0)1 44 22 24 35; email: engiepress@engie.com

About Paul Wurth

Headquartered in Luxembourg, the Paul Wurth Group can look back on 150 years of excellence, during which the firm has developed into an international engineering company and an established technology provider for the global ironmaking industry. Paul Wurth is a leading market player for the design and construction of complete blast furnace and coke oven plants. Direct reduction plants, environmental protection solutions and recycling technologies complete Paul Wurth's product portfolio. Presently, the company is focusing on the development of innovative solutions for leading the transformation of the steel industry towards carbon-free steel production. With more than 1500 employees, Paul Wurth is active worldwide, operating entities and affiliated companies in the main iron and steelmaking regions of the world. Paul Wurth is a member of SMS group. Further information at www.paulwurth.com

About CEA

The CEA is a French public research organization, working in four main areas: energy transition (nuclear and renewable), digital transformation for industry, future health technologies, defense and security. Based on an excellent fundamental research, the CEA participates in the organization of cooperation projects with a wide range of academic and industrial partners. It also carries out sovereign missions, entrusted by the French State. The CEA is the only French research organization in the Top 100 of the innovation players in the world, according to the Clarivate ranking (2018) and the leading research organization filing patents in France and Europe.

With its 20,000 employees and its research centers with impressive infrastructures, the CEA is a major player in European research and is strengthening its international presence where it supports the deployment of French innovative companies.

Its Institute CEA-Liten, employing 1000 people is fully dedicated to the activities on new technologies for renewable energy and energy efficiency. It is involved in various national and EU research and demonstration projects related to high temperature electrolysers and/or fuel cells (SOEC/SOFC) and their integration on the electric system in presence of large renewable energy sources.

Further information at www.liten.cea.fr

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