

“PROMETEO” project launched with funding from European FCH JU

March 25, 2021

International consortium coordinated by Italy’s Energy Agency ENEA to develop innovative solid oxide electrolyser using concentrated solar power for a zero-emission industry

ENEA, the Italian National Agency for New Technologies, Energy and Sustainable Economic Development, will lead an interdisciplinary consortium of nine European partners to develop an innovative prototype for high-temperature solid oxide electrolysis (SOE) using renewable solar heat and power to produce green hydrogen in a continuous way. The project will use the solid oxide technology to build a 25 kWe prototype electrolyser capable of producing 15 kg of hydrogen per day. The prototype will be modular, with the potential to be replicated on the MWe industrial scale.

To overcome the intermittency of renewable solar energy, PROMETEO (Hydrogen **PRO**duction by **ME**ans of solar heat and power in high **TE**mperature solid **O**xide electrolyzers) will build an innovative system to manage the energy conversion and re-generation phases by minimising the withdrawal of electricity from the distribution grid and by optimising self-production from renewables when solar energy is not available. The project will use input from industrial end-users to fit the prototype’s performance with the requirements for hydrogen production in final applications. The final prototype will be characterized by improved efficiency, reliability and flexibility for meeting the energy demands of the energy and chemical industries.

ENEA will work in collaboration with the research institutes **Fondazione Bruno Kessler (Italy)**, **IMDEA Energy (Spain)** and **EPFL, the Swiss Federal Institute of Technology in Lausanne (Switzerland)** to model the prototype and its integration with renewable solar energy. The Italian-Swiss SME **SOLIDpower** will supply solid oxide electrolyzers and the thermo-regulation system. **Maire Tecnimont Group (Italy)** will be involved through two of its subsidiaries: the engineering, prototyping and start-up of the plant will be performed by **NextChem (Italy)**, the Group’s company dedicated to green chemistry and energy transition, while its innovation and licensing hub **Stamicarbon (the Netherlands)** will support the development of activities for the use of green hydrogen in chemical industries such as ammonia and fertilisers production. **Snam (Italy)** will contribute to fit PROMETEO for the injection of green

hydrogen into the gas grid. **Capital Energy (Spain)** will provide input for the use of PROMETEO in the chemical storage of renewable electricity.

By making the most efficient use of solar heat and power in green hydrogen production, PROMETEO aims to contribute to the penetration of Renewable Energy Sources in the European industrial sectors in line with the challenging goals set by the FCH JU.

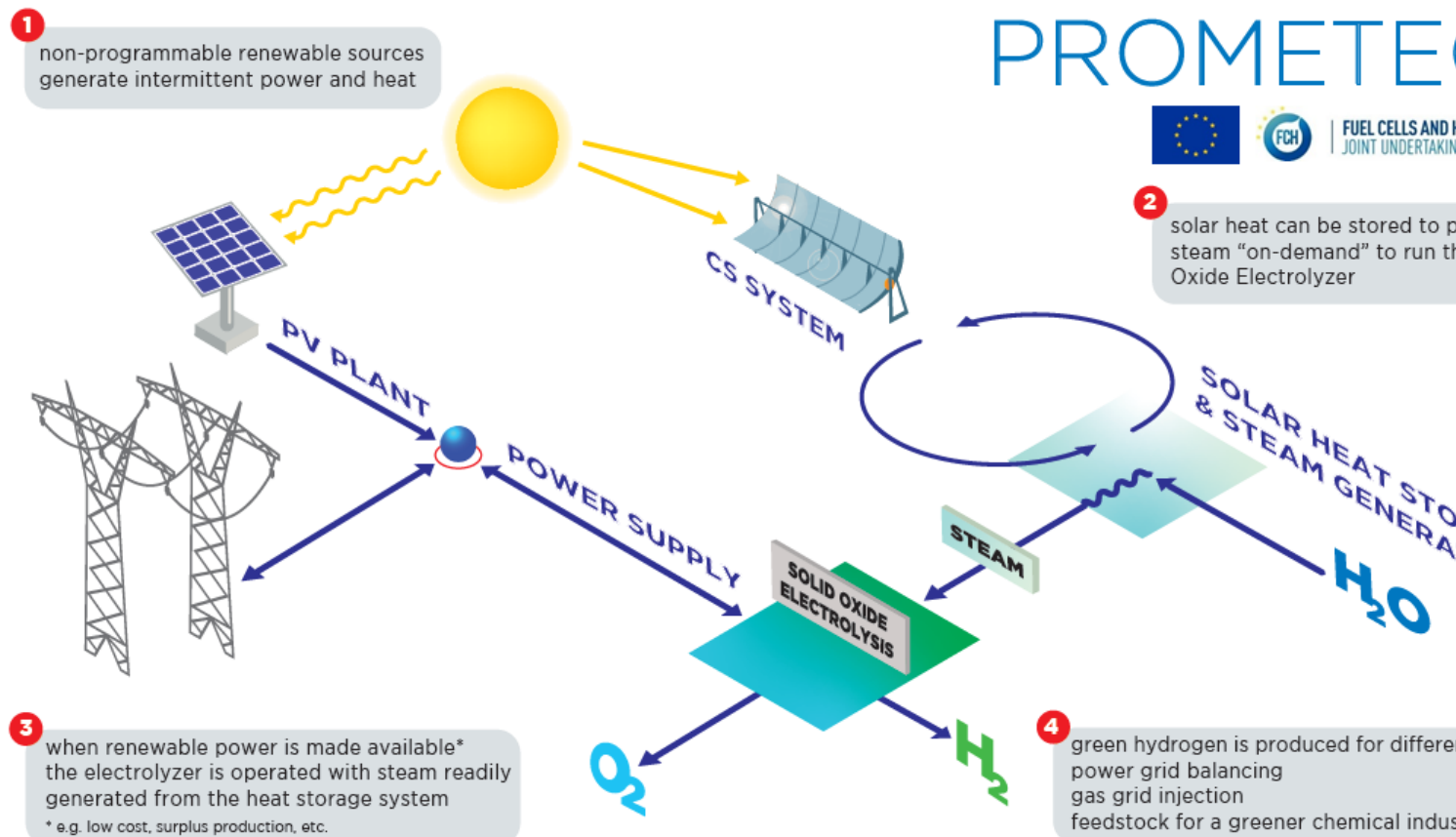
“This is a great challenge for us”, says **Giorgio Graditi**, Head of Department of Energy Technologies and Renewable Sources at **ENEA**. “PROMETEO will allow us to take an important step towards the production and use of green hydrogen in industry. We are starting from the most efficient way of producing hydrogen from water, namely by high-temperature electrolysis, to integrate it in the best possible way with renewable sources, in particular with solar energy and other intermittent sources. The aim of the project is to build a technology that can increase the penetration of renewable sources in various sectors of our economy. In order to do this, we have built a consortium made up of excellent European research centres and all the components of the supply chain, from basic component manufacturers to engineering and industrial end-users”.

“The first major challenge is to produce hydrogen with zero emissions on a large scale and at low costs to decarbonise the energy-intensive industry and heavy mobility”, states **Dina Lanzi, Head of Technological Development at Snam’s Hydrogen business unit**. “The project PROMETEO will help to develop and scale-up efficient production technologies thanks to high temperatures, reducing the costs of green hydrogen production and increasing its competitiveness. The second goal consists in integrating this technology into the energy infrastructure, coupling the gas and the electricity networks, to overcome the current and future challenges of the Italian and European energy system. We are happy to participate in this project by pooling our infrastructural and technological skills from a value chain perspective”.

Luigi Crema, Director of **FBK’s Sustainable Energy Centre**, comments: “The project PROMETEO represents an excellent opportunity for developing the European value chain in the green hydrogen sector. By working in close connection with the industry, PROMETEO will build an innovative prototype that can contribute to decarbonise the industrial sectors most involved in the clean energy transition such as the energy, chemical and in particular nitrogen fertiliser sectors. It is a great challenge that we will face with passion and commitment”.

Barbara Morico, Project Manager for **NextChem**, comments: “PROMETEO is a relevant project in the framework of NextChem and Maire Tecnimont Group’s green hydrogen initiatives, finalized to the development of a new process based on the high temperature solid oxide electrolysis technology. PROMETEO represents a relevant step for decarbonization, as it aims at improving the integration of water electrolysis with renewable power sources (solar thermal, photovoltaics, wind). NextChem, inside the Consortium, is in charge of transforming this proposal into a prototype for the demonstration of the technology, also contributing at the definition of the strategies for the scale-up on industrial base.”

PROMETEO



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