Press release

University of Florida and Synhelion to scale up solar hydrogen energy solution

Gainesville, Florida, USA and Zurich, Switzerland, June 21, 2023

Synhelion and its partner, University of Florida, announced today that their joint project has been awarded US$ 2.7 million from the U.S. Department of Energy Solar Energy Technologies Office (SETO). The project aims to accelerate the large-scale development and deployment of concentrating solar thermal power (CSP) technology to produce green hydrogen for industrial decarbonization and electric power generation and storage.

Green hydrogen is an important energy vector for the transition to a renewable energy infrastructure. But today, most of the world's hydrogen is produced from natural gas, a process that, while cheap, does not address the energy and climate concerns of the United States and the world.

The project aims to enable large-scale production of green hydrogen from solar energy by leveraging concentrating solar power (CSP) infrastructure and solar heat to split water (H_2O) into hydrogen (H_2) and oxygen (O_2). Synhelion's breakthrough technology delivers high-temperature solar process heat beyond 1'500°C, enabling the decarbonization of industrial processes and the production of sustainable fuels. For this project, Synhelion and University of Florida (UF) will jointly develop a solar reactor powered by high-temperature solar thermal energy to produce hydrogen gas from water and sunlight. The hydrogen produced can then be stored, transported, and utilized on demand, for example in transportation sectors that are focused on decarbonizing their industries.

The production costs of green hydrogen – i.e. hydrogen from renewable resources as opposed to fossil sources, such as natural gas – remain a major barrier to wide-scale adoption in the transportation sector. The project team will work to improve the efficiency and cost of solar thermochemical hydrogen production by taking advantage of new redox materials. Redox materials are reactive materials that enable the chemical reactions in the reactor.

"By leveraging Synhelion's technological expertise, we are able to integrate new materials into solar thermal processes, which have the potential to lower hydrogen production costs," said project Principle Investigator Jonathan Scheffe, Ph.D., associate professor in the Department of Mechanical and Aerospace Engineering of the Herbert Wertheim College of Engineering at UF.

Gianluca Ambrosetti, Co-CEO and Co-Founder of Synhelion, added: "The U.S. Department of Energy's funding of this project underscores the relevance of our technology and the need for sustainable energy solutions. Together with the University of Florida, we are committed to replacing fossil energy sources with renewable alternatives as quickly as possible."

The joint project of University of Florida and Synhelion was awarded as part of the SETO's Fiscal Year 2022 CSP Research, Development, and Demonstration funding program, an effort to lower the cost of CSP technologies and create new market opportunities for the industry, with the goal of enabling substantial deployment of CSP to decarbonize the electricity grid and energy system. It is one of several projects that will enable concentrating solar-thermal technologies with thermal energy storage to be integrated with high-temperature industrial processes to produce economically important products, like cement, fuels, and other chemicals.

"With the financial resources provided by the U.S. Department of Energy Solar Energy Technologies Office, the academic expertise of the University of Florida, and the industrial experience of Synhelion, our team is well-poised to advance the state-of-the-art in this crucial sector and decrease the costs of solar-derived H_2," Dr. Scheffe said.

About the University of Florida

The University of Florida attracts the best and brightest students, staff and faculty, places them together and connects them with world-class resources to spark extraordinary discoveries and innovations. UF's momentum is reflected in the university's designation as a top-five public university by U.S. News & World Report. Artificial intelligence is a centerpiece at UF, spanning all disciplines so that every student has the opportunity to acquire competence and expertise in AI. The University of Florida is a place where limitless potential meets boundless opportunity through teaching, research, scholarship and service to the state, the nation and the world.

About Synhelion

Synhelion is a global pioneer in the field of carbon-neutral solar fuels. The clean energy company evolved from the Swiss Federal Institute of Technology (ETH Zurich) in 2016 to decarbonize the transportation sector. Synhelion is currently building the world's first industrial facility for the production of solar fuel in Jülich, Germany. The first commercial production facility is planned for commissioning in Spain by 2025. Synhelion is the first company to sustainably generate process heat beyond 1'500°C with concentrated solar radiation. This makes it possible to drive industrial processes such as fuel production and cement manufacturing with solar heat for the first time. The company provides the world with cutting-edge technology to combat climate change and works with international partners such as Eni, CEMEX, Lufthansa Group, Swiss International Air Lines, SMS group, Wood, AMAG Group, and Zurich Airport.

For more information, please visit: www.synhelion.com

About the Solar Energy Technologies Office

The U.S. Department of Energy Solar Energy Technologies Office supports research and development across the solar energy spectrum to drive innovation, lower costs, and support an equitable transition to a decarbonized economy.

Learn more at www.energy.gov/solar-office.

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