

## **Synhelion receives support from Innosuisse to further develop solar storage technology**

Lugano, Switzerland, 6 July 2021

*Synhelion and Empa are conducting a joint research project, co-funded by the Swiss Innovation Agency Innosuisse, to further develop a high-temperature energy storage solution that is a key component in the production of climate-friendly solar fuels. The project will enable the cost-effective and scalable storage of high-temperature solar heat at over 1'000 °C for the first time. The storage technology is expected to be used in Synhelion's first industrial-scale solar fuel production facility, which will be built in 2022.*

Synhelion produces sustainable fuels such as gasoline, diesel, and kerosene that are compatible with conventional internal combustion engines and jet engines. The ETH Zurich spin-off has developed a solar thermochemical process based on process heat generated from concentrated sunlight to produce these synthetic fuels. To enable the chemical reactors for solar fuel production to operate around the clock, a cost-effective, high-temperature thermal energy storage (TES) is needed. This solution stores part of the solar energy to be used during the night and cloudy periods, enabling continuous operation of the reactors, thereby significantly increasing plant capacity and drastically reducing capital expenditure.

Currently, there is no TES on the market that is compatible with the high temperatures, cycle times, and heat transfer fluid of Synhelion's technology. For this reason, Synhelion is further developing the solid heat storage technology, enabling the storage of high-temperature solar heat of over 1'000 °C in a cost-effective and scalable manner for the first time. As part of the research project with Empa, which is being co-funded by Innosuisse, storage and insulation capabilities will be optimized in terms of material costs, high specific heat capacity, and service life. Additionally, a design for the world's first industrial-scale solar fuel plant, to be built by Synhelion in 2022, is being developed.

Dr. Lukas Geissbühler, Head Thermal Systems at Synhelion, commented: "Thermal energy storage is much cheaper and more environmentally friendly than battery storage. The further development of our TES solution is crucial for the cost-effective and continuous production of synthetic fuels. With our solar fuels, we can make an important contribution to combating the climate crisis."

Professor Dr. Thomas Graule, Head of the Laboratory for High Performance Ceramics at Empa, added: "This research project builds on numerous Swiss cleantech innovations of recent years. Our expertise in developing and using technical ceramics under extreme temperature and corrosion conditions is creating added value for Swiss industry. Affordable and technologically advanced TES materials will be developed and characterized by Dr. Gurdial Blugan and his Ceramic Composites team in partnership with Synhelion."



### **About Synhelion**

Synhelion is a global pioneer in the field of sustainable solar fuels. The clean energy company evolved from the Swiss Federal Institute of Technology (ETH Zurich) in 2016. The solutions of Synhelion leverage high-temperature solar heat to radically decarbonize industrial processes and turn CO<sub>2</sub> into fuel. Synhelion strives to provide the world with cutting-edge technology to solve the climate crisis and already works with international partners such as Eni, CEMEX, Lufthansa Group, Wood, and Zurich Airport. For more information, please visit:

[www.synhelion.com](http://www.synhelion.com)

### **About Empa**

As an interdisciplinary research institute of the ETH Domain, Empa, the Swiss Federal Laboratories for Materials Science and Technology, conducts cutting-edge research in materials science and technology. Empa's R&D activities focus on innovative solutions for the most pressing challenges faced by industry and society. As a result, Empa is capable of providing its partners with customized solutions that enhance their innovative edge and international competitiveness. Empa's Laboratory for High Performance Ceramics investigates and develops new applications for ceramic materials in fields such as sensor technology, energy applications, and catalysis. For more information, please visit: [www.empa.ch](http://www.empa.ch)

### **About Innosuisse**

Innosuisse is the Swiss Innovation Agency. Its mission is to promote science-based innovation in the interest of the economy and society in Switzerland. The core of Innosuisse funding is to support innovation projects from organizations such as companies and start-ups that are developing new services and products together with universities and research institutions. For more information, please visit: [www.innosuisse.ch](http://www.innosuisse.ch)

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### **Images**

<https://www.dropbox.com/sh/hm9wrsa74gcawjq/AADO1daLCfpGxOxxfOaSlpQ4a?dl=0>