



**ENEOS**

May 22, 2023

ENEOS Corporation

## A next-generation energy exhibition at the G7 Hiroshima Summit

ENEOS Corporation (President: Saito Takeshi) is pleased to inform you about our participation at an exhibition, from May 18 (Thu) to May 21 (Sun), in connection with the G7 Hiroshima Summit\*<sup>1</sup> (Hiroshima City, Hiroshima Prefecture), showcasing our work in the development of synthetic fuel production process\*<sup>2</sup>, the development of CO<sub>2</sub>-free hydrogen production technology, and the creation of CO<sub>2</sub>-free hydrogen supply chains.

<The synthetic fuels display>



The ENEOS Group's long-term vision is to fulfill our present responsibility—providing a stable supply of energy and materials—and continue to fulfill this responsibility in the future through the transition, in order to achieve both a stable supply of energy and materials and the realization of a carbon-neutral society, and is committed to next-generation energy businesses such as synthetic fuels and hydrogen.

Since synthetic fuels are produced from hydrogen derived from renewable energy (hereinafter, “CO<sub>2</sub>-free hydrogen”) and CO<sub>2</sub> as raw materials, they are carbon-neutral fuels that can reduce CO<sub>2</sub> emissions throughout the entire product life cycle, from raw material production to product use. Synthetic fuels, which are liquid fuels, are expected to be used in areas where electrification and hydrogen utilization are difficult, in addition to being able to leverage existing infrastructure. By developing synthetic fuel, we can contribute to carbon neutrality in a wide range of industries such as automobiles, aircraft, and ships. In addition, electricity derived from renewable energy, which is difficult to store due to its variable output, can be stored as liquid fuels, making a significant contribution to the stable supply of energy,

and it can also be stored for a long period of time, providing significant resilience in terms of disaster.

ENEOS is also working on creating supply chains and developing technologies for CO<sub>2</sub>-free hydrogen.

In anticipation of a hydrogen-oriented society, we are looking into collaborating with local companies in Australia, the Middle East, and Asia, where there is high potential for low-cost hydrogen production<sup>\*3</sup>, thereby exploring approaches to large-scale supply of hydrogen. In particular, when storing and transporting hydrogen, we intend to use methylcyclohexane (hereinafter, "MCH"), one of the organic hydrides (hydrogen carriers), which we expect to be cost competitive because it can utilize the existing infrastructure of the oil industry.

In addition, we aim to commercialize the technology of the low-cost "electrochemical synthesis of organic hydride" method (Direct MCH<sup>®</sup>)<sup>\*4</sup> that can cut costs in production of MCH derived from renewable energy, which we have independently researched and developed. We are working to increase the size of MCH production equipment (electrolyzers) using Direct MCH<sup>®</sup> technology. In order to develop a large-scale electrolyzer of 5 megawatt-scale (hydrogen production capacity equivalent to 1,000 Nm<sup>3</sup>/h), which is at a commercial scale, we are currently testing green MCH production by combining a 150 -kilowatt-scale medium-sized electrolyzer with a 250 -kilowatt solar power generation facility in Australia.<sup>\*5</sup>

<Image of the CO<sub>2</sub>-free hydrogen production plant >



Image: Wind power 21km x 21km, solar power 7km x 7km, Direct MCH<sup>®</sup> electrolyzer 700m x 400m, Toluene/MCH tank 300m x 400m

ENEOS Corporation is developing this technology to realize a carbon-neutral society as we engage in next-generation energy businesses.

Furthermore, during the "ENEOS Super Taikyu Series 2023 Round 2" to be held at Fuji Speedway

(Sunto District, Shizuoka Prefecture) on May 26 (Fri)-28 (Sun), we will also conduct a demonstration of automobile driving with synthetic fuel at the adjacent TOYOTA Safety Education Center “mobilitas” on May 28 (Sun).

- \*1 News release dated April 27, 2023 by the Japan Automobile Manufacturers Association ["JAMA Demonstrates Japan's Diverse Approaches to Achieving Carbon Neutrality at G7 Hiroshima Summit Side Event"](#)  
Hydrogen display at the International Media Center (IMC, Hiroshima Prefectural Sports Center).
- \*2 News release dated April 19, 2022 ["Development of Production process for Synthetic Fuels Using CO2 Selected as Green Innovation Fund Project"](#)
- \*3 Announcement of potential collaboration with local companies in Australia, the Middle East, and Asia  
News release dated August 2, 2021 ["ENEOS Begins Joint Study with Neoen for Development of a Japan-Australia CO2-free Hydrogen Supply Chain in South Australia"](#)  
News release dated August 23, 2021 ["ENEOS Begins Joint Study with Origin for Development of a Japan-Australia CO2-free Hydrogen Supply Chain in Queensland"](#)  
News release dated March, 25, 2021 ["ENEOS signs MoU with Aramco for blue hydrogen and blue ammonia collaboration"](#)  
News release dated June 7, 2022 ["Joint Study Agreement formed to evaluate development of clean hydrogen supply chain between UAE and Japan"](#)  
News release dated October 23, 2020 ["Signing of Memorandum of Understanding with SEDC Energy Sdn Bhd and Sumitomo Corporation to Consider Collaboration on Hydrogen Project"](#)
- \*4 In order to convert hydrogen into MCH, a type of organic hydride (hydrogen carrier) suitable for storage and transportation, hydrogen generated by water electrolysis must be stored temporarily in a tank and caused to chemically react with toluene. The organic hydride electrolytic synthesis method is a one-step method for making MCH from renewable and other energy by using water and toluene.  
Direct MCH® is a registered trademark of the ENEOS Corporation.  
Announced on March 15, 2019  
["Successful Demonstration of World-First Technology to Produce CO2-Free Hydrogen at Low Cost"](#)
- \*5 News release dated January 30, 2023  
["Australian Demonstration Plant Begins Operation toward the Development of a CO2-free Hydrogen Supply Chain"](#)

<Reference: Synthetic fuel production process>

