



June 27, 2023
ENEOS Corporation

Holding a Ceremony for Filling FCV with Australian Hydrogen Using Direct MCH®

ENEOS Corporation (President: Saito Takeshi; “ENEOS”) announces that it has held a ceremony to fill a fuel cell vehicle (FCV) with hydrogen manufactured*¹ using its proprietary low-cost “electrochemical synthesis of organic hydride” method*² (Direct MCH®*³) at ENEOS Yokohama Tsunashima Hydrogen Station (located in Yokohama City, Kanagawa Prefecture) on June 26, 2023.

ENEOS is conducting a manufacturing demonstration of methylcyclohexane*⁴ (MCH) ,a type of hydrogen carrier, at Brisbane, Queensland, Australia. In this ceremony, with the cooperation of Toyota Motor Corporation, a small fuel cell bus (Toyota’s fuel cell Coaster) was filled with hydrogen extracted at ENEOS’s Central Technical Research Laboratory from MCH that was transported from Australia to Japan. Guests were then invited to test ride the bus.

ENEOS is working to scale up electrolyzers using Direct MCH® technology in order to mass produce MCH derived from renewable energy (green MCH). As part of this effort, we are currently conducting a green MCH manufacturing demonstration*⁵ that combines a 150-kilowatt-scale medium-sized electrolyzer with a 250-kilowatt solar power system toward the development of a commercial-scale, larger-sized 5-megawatt-scale electrolyzer (with a hydrogen production capacity equivalent to 1,000 Nm³/h).

Under the ENEOS Group’s Long-Term Vision, we are taking on the challenge of achieving both “a stable supply of energy and materials” and “the realization of a carbon-neutral society.”

In anticipation of a hydrogen-oriented society toward decarbonized and recycling-based society, we will continue to further encourage the development of manufacturing technologies for an affordable and stable supply of green hydrogen in Australia, which has high potential for the manufacturing of CO₂-free hydrogen (green hydrogen). We will also promote initiatives for the use of MCH, which is expected to be cost competitive by enabling the use of existing infrastructure.

Photographs taken during the filling ceremony

<Group photograph>



“Holding a Ceremony for Filling FCV with Australian Hydrogen Using Direct MCH®”

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<Filling process 2>



<Group photograph>

Third person from left: Fujiyama Yuichiro, Senior Vice President, ENEOS Corporation

Fourth person from left: Yamanaka Takeharu, Mayor, Yokohama City

Fifth person from left: Miyata Tomohide, Representative Director and Executive Vice President, ENEOS Corporation

Sixth person from left: Adachi Tomohiko, Director, Hydrogen and Fuel Cells Strategy Office, Advanced Energy Systems and Structure Division, Energy Conservation and Renewable Energy Department, Agency for Natural Resources and Energy, Ministry of Economy, Trade and Industry (METI)

Seventh person from left: Ohira Eiji, Strategy Architect, Smart Community and Energy Systems Department, New Energy and Industrial Technology Development Organization (NEDO)

Eighth person from left: Tada Yuichi, Project Manager, Japan H2 Mobility, LLC

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- 1 METI's Director Adachi and ENEOS's Vice President Miyata
- 2 Yokohama City's Mayor Yamanaka and ENEOS's Vice President Miyata

*1 This demonstration was conducted as part of Green Innovation Fund Projects of Large-scale Hydrogen Supply Chain Establishment / Direct MCH electro-synthesis technology development commissioned by the New Energy and Industrial Technology Development Organization (NEDO).

News release dated August 26, 2021, [Four Demonstration Projects toward the Development of a CO₂-free Hydrogen Supply Chain selected as NEDO's Green Innovation Fund Project](#)

*2 Hydrogen produced via water electrolysis must be stored in a tank and reacted with toluene in order to convert it into MCH, a type of organic hydride (hydrogen carrier) useful for storage and transport. However, the electrochemical synthesis of organic hydride method uses water and toluene derived from renewable energy and other sources of electricity to produce MCH in a one-step reaction. This method is capable of reducing facility costs for MCH production by approximately 50% (calculated by ENEOS, for when the technology is at scale in the future).

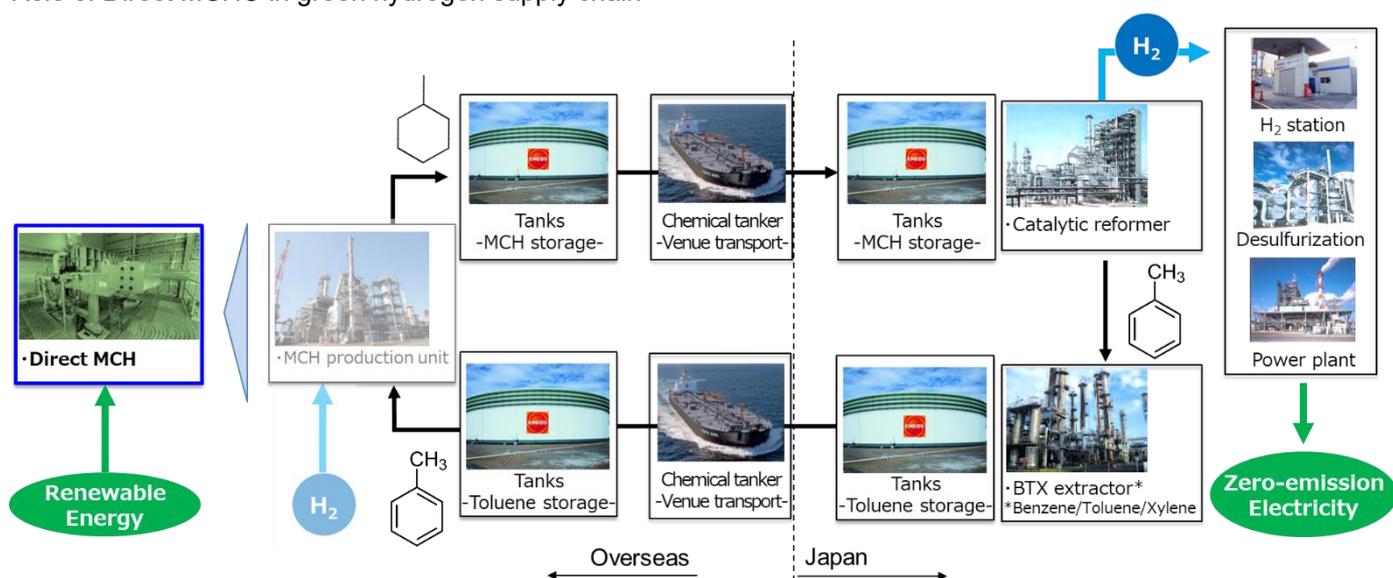
News release dated March 15, 2019, [Succeeded in the world's first technical verification to produce "CO₂-free hydrogen" at low cost](#)

*3 Direct MCH® is a registered trademark of ENEOS Corporation.

*4 Normal temperature, normal pressure liquid with a volume of 1/500th of hydrogen gas. It is characterized by ease of handling including storage and transport.

*5 News release dated January 30, 2023, [Australian Demonstration Plant Begins Operation toward the Development of a CO₂-free Hydrogen Supply Chain](#)

Role of Direct MCH® in green hydrogen supply chain



Direct MCH® development roadmap

