

August 29, 2023

Osaka Gas Co., Ltd.
ENEOS Corporation

Osaka Gas and ENEOS commence joint study for first large-scale domestic production of e-methane using green hydrogen in the Osaka Bay area

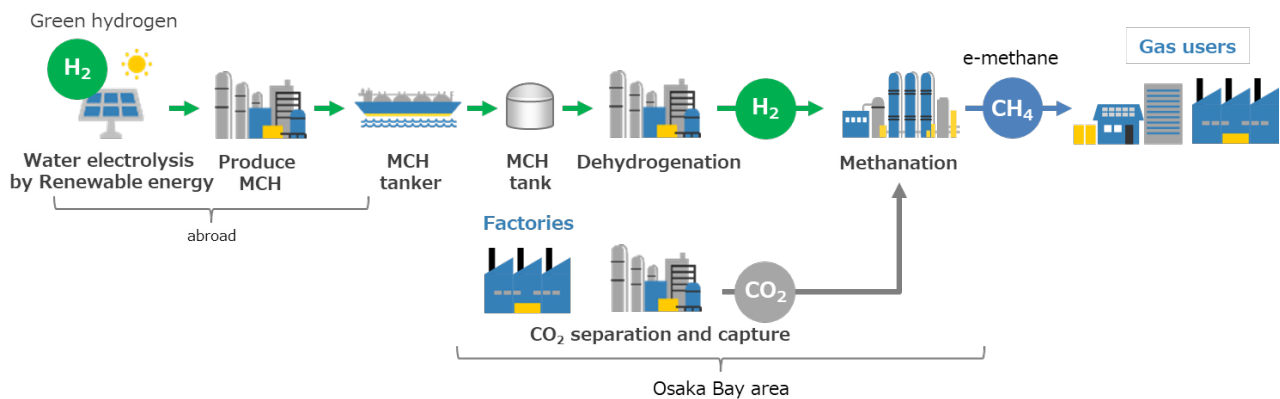
Osaka Gas Co., Ltd. (Representative Director and President: Masataka Fujiwara, hereinafter referred to as “Osaka Gas”) and ENEOS Corporation (Representative Director and President: Takeshi Saito, hereinafter referred to as “ENEOS”) have commenced a collaborative study for the first large-scale domestic production of e-methane^{*1} using green hydrogen^{*2} in the Osaka Bay area.

The scheme of this study consists of: (1) Conversion of overseas-produced green hydrogen into methylcyclohexane^{*3} (hereinafter referred to as “MCH”), an effective medium for the efficient storage and transportation of hydrogen; (2) Transportation of the MCH to Japan; and (3) Utilization of the MCH and domestically captured carbon dioxide (hereinafter referred to as “CO₂”) as the raw materials for the large-scale domestic production of e-methane. The objective is to establish manufacturing facilities with a capacity of 60 million m³/year (equivalent to 10,000 Nm³/h or the consumption of approximately 250,000 households) in the Osaka Bay area and to commence production by 2030.

With the progress of discussions on hydrogen utilization in various applications such as power generation and mobility, the conversion of hydrogen into e-methane will promote the proliferation of hydrogen and contribute to the realization of a hydrogen-based society. In addition, e-methane not only contributes to the decarbonization of city gas but also offers the advantage of utilizing the existing city gas infrastructure and appliances, which will allow for the smooth transition to carbon-neutral heat utilization across a wide range of consumer and industrial sectors while minimizing social costs. Furthermore, the establishment of domestic production facilities for e-methane will contribute to the recycling of CO₂ emitted from domestic industries and stable energy supply.

Towards the practical use of e-methane in society, Osaka Gas is working on various projects, including ongoing discussions with Mitsui Chemicals, Inc. regarding the utilization of domestically emitted CO₂.^{*4}

<Conceptual scheme of the e-methane production process in this study>



The Daigas Group, in its “Energy Transition 2030” strategy formulated in March 2023 with the goal of achieving carbon neutrality by 2050, has declared its intention to achieve 1% e-methane in the gas grid (60 million m³/year) by FY2030. In addition to domestic technology development and validation, the Group is also advancing multiple methanation studies in regions including North America, South America, Australia, the Middle East, and Southeast Asia.

ENEOS, in its long-term vision to 2040, has declared its intention to take on the challenge of realizing both “Stable Supply of Energy and Materials” and the “realization of a Carbon-Neutral Society.” Envisioning a society with substantial hydrogen consumption with the goal of achieving a decarbonized and recycling-oriented society, the company is actively engaged in building CO₂-free hydrogen supply chains, both domestically and internationally.

Through this study, Osaka Gas and ENEOS aim to establish large-scale domestic e-methane production facilities as a step toward the early realization of both carbon neutrality and stable energy supply.

<Comment from Mr. Tadashi Miyagawa, Representative Director and Executive Vice President of Osaka Gas Co., Ltd.>

Our group is committed to achieving carbon neutrality by 2050, and this study is one of the very important initiatives toward that goal. The possibility of realizing large-scale domestic e-methane production through the collaboration with ENEOS is of great significance. In the future, we will collaborate with other businesses in the Osaka Bay area to promote CO₂ recycling in the industrial sector, thereby contributing to the fulfillment of Japan's NDC^{*5} commitments. The Daigas Group not only aims to realize the scheme of this study but also to steadily advance other e-methane projects currently under consideration overseas. By doing so, the group aims to enhance the social significance of e-methane and contribute to the decarbonization of the gas industry as a whole.

<Comment from Mr. Tomohide Miyata, Representative Director and Executive Vice President of ENEOS Corporation>

ENEOS aims to halve CO₂ emissions per unit of energy supply by FY2040. To achieve this goal, it is crucial to explore the possibility of hydrogen utilization in various applications. Against this background, we are pleased to embark on a collaborative study with Osaka Gas to explore the large-scale domestic production of e-methane using green hydrogen. We are committed to realizing this

study and concurrently advancing our ongoing CO₂-free hydrogen projects overseas, thereby driving forward the energy transition.

*1 Synthetic methane synthesized from non-fossil energy-based hydrogen, namely green hydrogen, and CO₂

*2 Hydrogen generated using only energy from renewable sources, such as wind power and solar power

*3 A liquid at room temperature and atmospheric pressure with a volume 1/500 that of hydrogen gas. It is characterized by easy handling for storage and transportation.

*4 Please refer to the press release “Commencement of Joint Study on the Capture and Utilization of CO₂ Emissions from the Senboku Industrial Complex” published on May 31, 2023

(https://www.osakagas.co.jp/en/whatsnew/_icsFiles/afieldfile/2023/06/07/230531.pdf).

*5 NDC stands for “Nationally Determined Contributions,” which outline the greenhouse gas emissions reduction targets submitted by each country participating in the Paris Agreement to the United Nations. Japan has expressed its aim to achieve a reduction of 46% in greenhouse gas emissions by FY2030 (compared to FY2013 levels) with a commitment to ongoing efforts to achieve a 50% reduction as an ambitious target in line with its goal of achieving carbon neutrality by 2050.