

## Completion Ceremony Held for Methanation Demonstration Facility at Maishima Plant

May 17, 2024  
Osaka Gas Co., Ltd.

Osaka Gas Co., Ltd. (Representative Director and President: Masataka Fujiwara, hereinafter “Osaka Gas”), in cooperation with Osaka City and the Osaka Waste Management Authority, has been implementing a demonstration project since April 2022 to build a hydrogen supply chain that methanates<sup>\*1</sup> hydrogen from renewable energy sources (hereinafter “renewable energy”) and biogas produced by fermentation of kitchen waste and that subsequently transports the produced methane through pipes to be used in city gas-consuming appliances<sup>\*2</sup>. We are pleased to announce that a completion ceremony for a methanation demonstration facility was held today on the site of a waste incineration plant (hereinafter the “Maishima Plant”) in Konohana Ward, Osaka City, which is operated and managed by the Osaka Waste Management Authority.

This project aims to reduce carbon dioxide (hereinafter “CO<sub>2</sub>”) emissions by using e-methane<sup>\*3</sup> produced from renewable energy-derived hydrogen and unused local biomass, and to build a model for local production and consumption of energy.

The demonstration project will be carried out at the Maishima Plant until around July 2024. Subsequently, after the relocation and commissioning of the methanation demonstration facility, the project is scheduled to begin demonstration operation at the Osaka-Kansai Expo site in April 2025.



Exterior of the methanation demonstration facility



Completion ceremony

The Daigas Group, under the “Carbon Neutral Vision” announced in January 2021 and the “Energy Transition 2030” released in March 2023, remains committed to developing technologies and services that contribute to a carbon-free society and solving social issues, including climate change, in order to become a corporate group that helps customers both on the livelihood and business fronts toward their “further evolution.”

\*1: Methanation is a technology for synthesizing methane, the main component of city gas, from hydrogen and CO<sub>2</sub>.

\*2: Hydrogen Supply Chain Demonstration Project of Methanation Utilizing Renewable Hydrogen and Food Waste Biogas in Urban Areas (Released on April 27, 2022)

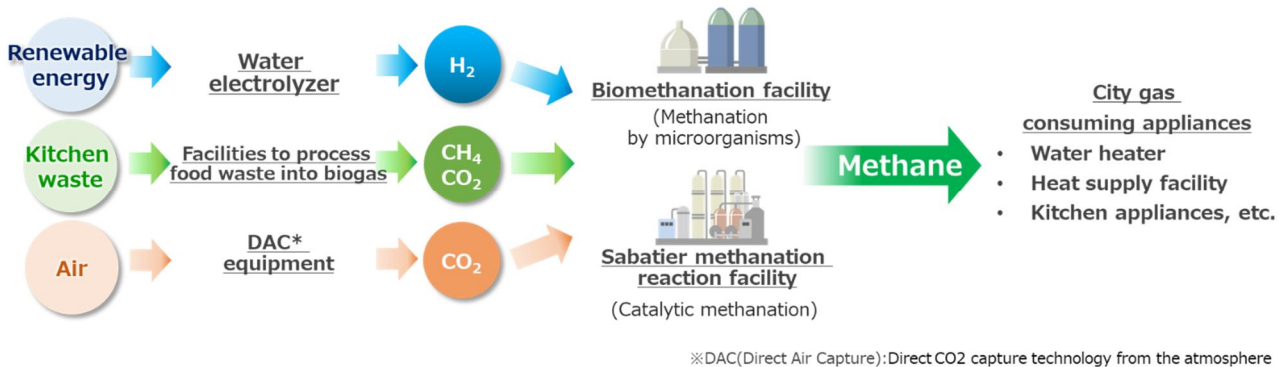
[https://www.osakagas.co.jp/en/whatsnew/\\_icsFiles/afieldfile/2022/06/07/220427\\_3.pdf](https://www.osakagas.co.jp/en/whatsnew/_icsFiles/afieldfile/2022/06/07/220427_3.pdf)

\*3: Synthetic methane synthesized from non-fossil energy-based hydrogen, specifically green hydrogen

<Project overview>

Project member	Project operator: Osaka Gas Co., Ltd.
Term	FY2022 to FY2025
Location	Inside the Maishima Plant of Osaka Waste Management Authority, Konohana-ku, Osaka City (FY2022 to FY2024) Inside the venue of the Expo 2025 Osaka, Kansai, Japan (FY2024 to FY2025)
Details of demonstration	<ul style="list-style-type: none"> <li>• Produce hydrogen by water electrolysis using renewable electricity and biogas by methane fermentation using kitchen waste</li> <li>• Produce e-methane by performing methanation using the produced hydrogen and biogas</li> <li>• Use the manufactured e-methane in city gas appliances</li> </ul>

<Reference image of building the hydrogen supply chain in this project>



This project has been implemented as a “Project to Construct and Demonstrate a Model for Reducing the Cost of Hydrogen Supply by Utilizing the Existing Infrastructure” adopted by the Ministry of the Environment\*4.

The demonstration project at the Maishima Plant will confirm that e-methane can be produced at a rate of 5 Nm<sup>3</sup>/h using biogas obtained from 1 ton/day of urban food waste and renewable energy-derived hydrogen through the process described in the following section, with the aim of achieving more effective use of biogas.

After this project, while scaling up the methanation facilities, we plan to introduce a system that produces synthetic methane from renewable energy-derived hydrogen and CO<sub>2</sub> in biogas derived from kitchen waste to incinerators and food processing plants mainly in the Kinki Region by 2030. By building a hydrogen supply chain that can utilize hydrogen derived from renewable energy as synthetic methane with existing city gas infrastructure and appliances without modification, we aim to realize low carbonization for heat demand, reduce additional social costs, improve energy security, and achieve social implementation at an early stage.

\*4: Adopted on March 30, 2022 as a project for the 4th year of Reiwa. The website below introduces the efforts, including this project, of government agencies to realize a hydrogen society.  
[https://www.env.go.jp/seisaku/list/ondanka\\_saisei/lowcarbon-h2-sc/en/demonstration-business/index.html](https://www.env.go.jp/seisaku/list/ondanka_saisei/lowcarbon-h2-sc/en/demonstration-business/index.html)

### <Demonstration process at Maishima Plant>

- ① We collect food waste from the supermarkets in Osaka City owned by Life Corporation to utilize it as the raw material for biogas.
- ② Biogas<sup>\*5</sup> is produced from food waste using the on-site biogasification system, D-Bio Methane, of Daigas Energy, a subsidiary of Osaka Gas.
- ③ Green hydrogen is produced by a water electrolyzer using the renewable power generation system owned by the Daigas Group.
- ④ Using Osaka Gas's biomethanation<sup>\*6</sup> technology, e-methane is produced from the CO<sub>2</sub> in the biogas and green hydrogen.
- ⑤ More e-methane is produced from the CO<sub>2</sub> in the biogas and green hydrogen using Hitachi Zosen Corporation's Sabatier methanation facility.
- ⑥ We will use the produced methane in gas cooking appliances and confirm whether stable methane production and utilization are possible.

\*5: Biogas is generated from biomass resources, such as sewage sludge and kitchen waste, and is generally composed of approximately 60% methane and approximately 40% CO<sub>2</sub>.

\*6: Microbial methanation technology

### <Demonstration at Expo 2025 Osaka, Kansai>

From around August 2024, the equipment will be relocated to the venue of Expo 2025 Osaka, Kansai, Japan. Subsequently, during the Expo, methane will be produced from hydrogen derived from renewable energy and biogas derived from kitchen waste generated at the venue. The produced methane will be used in heat supply equipment and gas stoves in the kitchen at the venue. This project is expected to contribute to the realization of the "Expo 2025 Green Vision"<sup>\*7</sup> set forth by the Japan Association for the 2025 World Exposition (hereinafter the "Expo Association").

Furthermore, during the Expo 2025 Osaka, Kansai, Japan, we are considering using CO<sub>2</sub> in the atmosphere as a raw material for methanation to increase the amount of methane production.

\*7: The Expo Association announced the ideal form of environmental energy, its direction, and specific technical fields that should be targeted at the Expo 2025 Osaka, Kansai, Japan, such as the implementation of carbon neutral measures at the Expo site and the introduction of energy optimization technology and hydrogen energy technology.

<https://www.expo2025.or.jp/en/news/news-20220427/>