

Launch of Demonstration Experiment for CO₂ Capture from Waste-to-Energy Plant Flue Gas for Use in Methanation

-- Joint Project by the City of Yokohama, Tokyo Gas, and MHI Group to Establish a CCU Chain Based on Regional Cooperation --

Tokyo, July 28, 2023 –The City of Yokohama and Tokyo Gas Co., Ltd. (Tokyo Gas), together with Mitsubishi Heavy Industries, Ltd. (MHI) and MHI Group company MHI Environmental & Chemical Engineering Co., Ltd. (MHIEC), are to launch a demonstration experiment of a CO₂ capture and utilization (CCU) process^{*1} in which CO₂ is separated and captured from the flue gas of a municipal waste-to-energy plant, and transported to a local methanation^{*2} demonstration facility operated by Tokyo Gas to be used as feedstock for methanation. This CCU demonstration experiment based on regional cooperation, conducted in Tsurumi-ku, Yokohama, is the first of its kind in Japan, which will aim to practically introduce e-methane^{*3} in addition to improve and expand CCU technology.

1. Overview

The City of Yokohama and Tokyo Gas together with MHI and MHIEC (MHI Group), based on an agreement^{*4} and memorandum of understanding^{*5} concluded in 2022, have been making preparations for the demonstration experiment.

Now that trial operations for all equipment have been completed, the partners will begin the demonstration experiment in which CO₂ is separated and captured from flue gas at the Tsurumi Plant using a system developed by MHI Group, and transported to the Tokyo Gas Yokohama Techno Station to be used for methanation. This CCU demonstration initiative, in which CO₂ that has been separated and captured from the flue gas of a waste-to-energy plant is transported to a different demand location for use in methanation, is the first of its kind in Japan.

In addition, the methanation facility used for this demonstration test operates with 100% renewable energy by utilizing electric power is generated at waste-to-energy plants in Yokohama.

Going forward, the partners aim to utilize CO₂ for purposes other than methanation facilities, as well as to explore measures for the visualization of the CO₂ value chain, such as the amount of CO₂ collected and the transport destination.

2. Opening ceremony



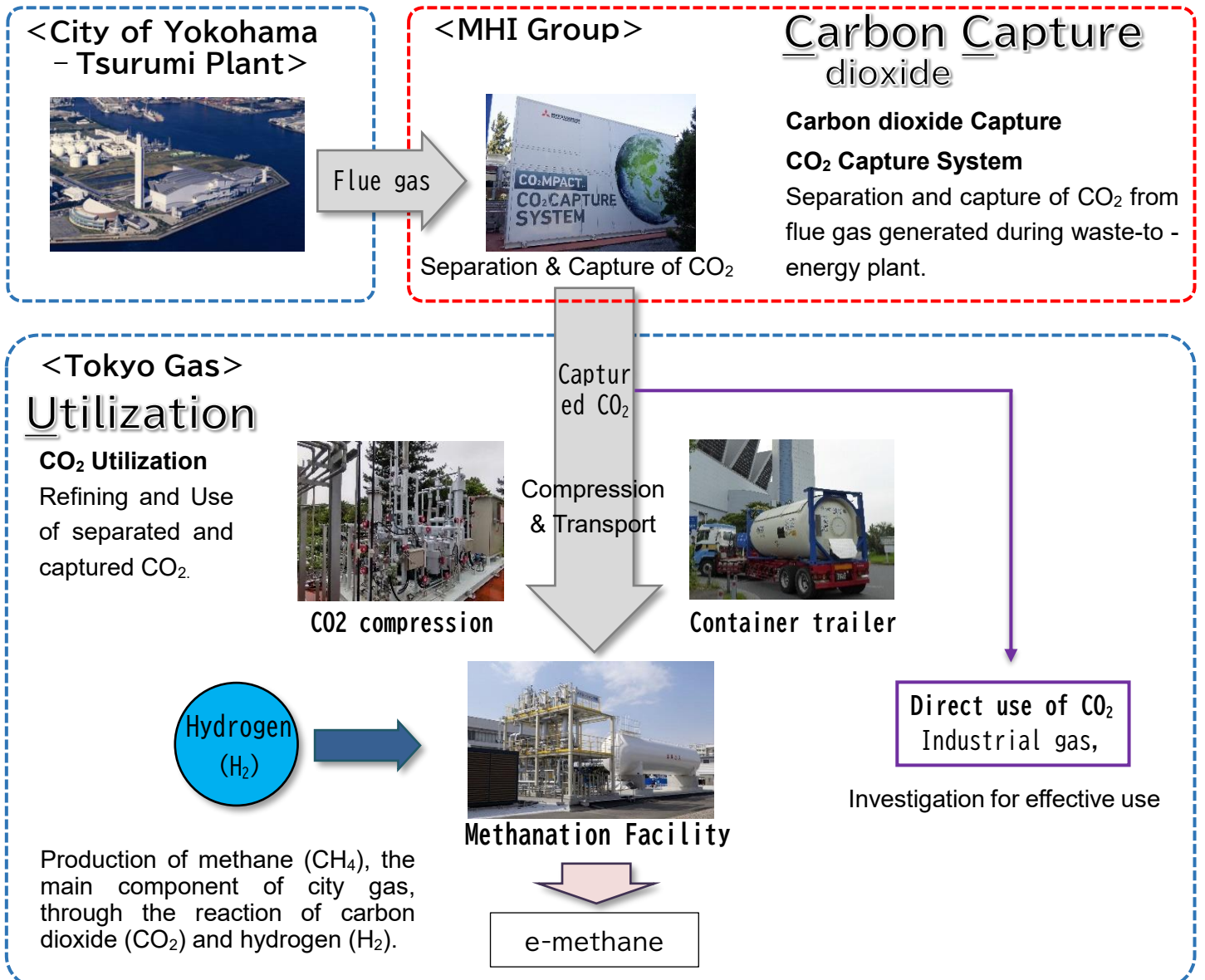
Ribbon-cutting ceremony



CO₂ nozzle connection

Takayuki Hishinuma President and CEO of MHIEC, Shinichi Sasayama President of Tokyo Gas, Takeharu Yamanaka Mayor of the City of Yokohama, & Seiji Izumisawa President and CEO of MHI

3. Image of the demonstration test



4. Suehiro Decarbonization Model District

Suehiro-cho (Tsurumi-ku, Yokohama), where the Tsurumi Waste-to-Energy Plant and Tokyo Gas Yokohama Techno Station are located, is home to a concentration of various production functions and R&D facilities. Establishing a model district for decarbonization in coastal areas will be aimed to build a model for local production and consumption of hydrogen and e-methane produced through methanation.

Further, the City of Yokohama and Tokyo Gas, based on an agreement executed in January 2022, are also pursuing verification of methanation using recycled water and digestion gas (biogas generated in the process of treating sewage sludge) from the Northern Sewage Treatment Facility (Environmental Planning Bureau).

Notes

- *1: Carbon capture and utilization (CCU) is the process of capturing carbon dioxide (CO₂) to be used for a specific purpose.
 - *2: Methanation is a technology to produce methane (CH₄), the main component of city gas, through the reaction of carbon dioxide (CO₂) and hydrogen (H₂).
 - *3: E-methane is synthetic methane (CH₄) produced from non-fossil energy sources such as green hydrogen.
 - *4: [“Yokohama and Tokyo Gas Sign Partnership Agreement for Methanation Demonstration Test”](#) (January 18, 2022) (Japanese)
 - *5: [“Yokohama Begins Demonstration Testing for the Separation, Capture, and Utilization of Carbon Dioxide from Exhaust Gas of Waste Incineration Plants – Joint Project with MHI Group and Tokyo Gas”](#) (February 24, 2022) (Japanese)
- MHI Press Release(March 17, 2022)<https://www.mhi.com/news/220317.html>