August 1, 2025
Fuji Electric Co., Ltd.
Mitsubishi Gas Chemical Co., Inc.

Fuji Electric and Mitsubishi Gas Chemical to Jointly Study of Hydrogen Fuel Cell System

Aim to create clean-energy system using hydrogen derived from methanol

Fuji Electric Co., Ltd. (FE; Head Office: Shinagawa-ku, Tokyo; CEO: Michihiro Kitazawa) and Mitsubishi Gas Chemical Company, Inc. (MGC; Head Office: Chiyoda-ku, Tokyo; President: Yoshinori Isahaya) announced today that they will jointly study the development and demonstration of a power generation system integrating fuel cells and hydrogen generators using methanol as feedstock. The initiative aims to leverage both companies' strengths to develop hydrogen fuel cells for a variety of facilities and regions

The study will evaluate the feasibility of commercializing a fuel cell system that uses hydrogen produced by the methanol-reforming process. The goal is to combine two companies' technologies and expertise to create a fuel cell system that efficiently and cost-effectively generates electricity using methanol-derived hydrogen. The current study targets to begin the demonstration by March 2027. The envisioned system will use green methanol produced with MGC's Carbopath™ environmental recycling* platform, making it possible to offset CO_2 generated during methanol reforming. The system is expected to serve as a clean energy source for backup power during outages at data centers, factories and other facilities or for power generation system to reduce peak loads. Through these initiatives, FE and MGC will proactively develop markets for practical applications of the system, aiming to deliver clean energy supplies to a variety of regions and facilities.

*Carbopath™ is an environmental recycling platform that generates materials and energy using methanol produced from CO_2 and waste as an alternative to conventional economic activities that consume fossil resources.

Hydrogen fuel cells are expected to contribute significantly to green transformation (GX) as a clean method of power generation that produces electricity through the chemical reaction of hydrogen and oxygen. However, current challenges include costs and commercial readiness of technologies for storing and transporting hydrogen. Methanol, a type of hydrogen carrier,[1] is well-suited for generating hydrogen on demand at the point of consumption. Methanol remains a liquid at room temperature and pressure, so it is easy to store and transport, and it can be used with existing infrastructure.

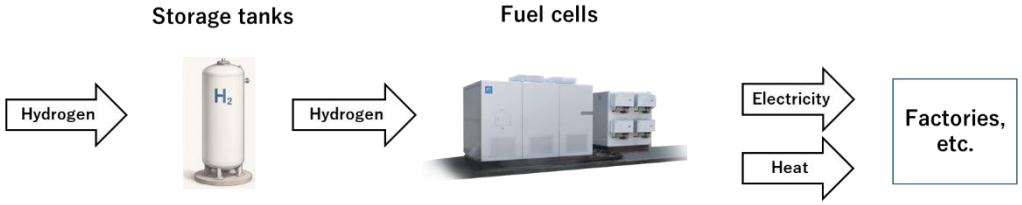
FE began developing industrial fuel cells in 1998. Since then, FE has delivered over 100 units in Japan and abroad, including government offices, hospitals and universities, and has more than 20 years of operational experience with its fuel cell systems. Leveraging its expertise in fuel cell manufacturing and power electronics technologies, FE is also developing a hydrogen fuel cell system that achieves low cost and high responsiveness by utilizing hydrogen fuel cell modules installed in Toyota Motor Corporation’s fuel cell vehicle, “MIRAI.”

MGC is a world-leading methanol manufacturer engaged in production, sales and application development. In recent years, MGC has been promoting Carbopath™ as an environmental recycling platform for producing energy and materials using methanol derived from CO_2 and biomass.[2] For more than 40 years, MGC has developed methanol-reforming technology to convert methanol into hydrogen.

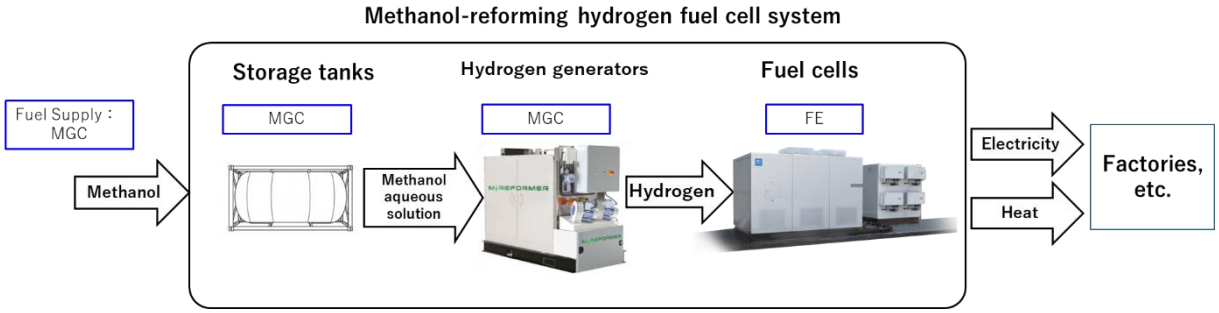
To accelerate the use of hydrogen produced through the methanol-reforming process, MGC is currently studying the demonstration of unit-type hydrogen generators in Japan through a strategic alliance [3] with Methanol Reformer S.L. and Element 1® Corp..

■Demonstration Scheme

【Conventional】



【Current Study】



Compared to pressurized hydrogen, which is typically distributed at 20 MPa in Japan, the same volume of liquid methanol can store and transport approximately six times more hydrogen molecules (calculated at 25 deg.C condition).

[1] Technologies and methods for converting hydrogen into other states or materials for storage and transportation

[2] Carbopath™ special website launch announcement (December 19, 2024)

[3] Mitsubishi Gas Chemical Company, Inc., Methanol Reformer S.L. and Element 1 Corp. announce strategic collaboration (February 4, 2025)

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About Fuji Electric (FE)

FE is committed to contributing to the creation of a responsible and sustainable society through innovation in the energy and environment business. Under its Environmental Vision 2050, which aims to achieve zero environmental impact, including decarbonization and transitioning to a circular economy, FE aims to contribute to the achievement of a decarbonized society, a recycling-oriented society, and a society that is in harmony with nature by expanding the use of FE's innovative clean energy technologies and energy-saving products, including hydrogen- and ammonia-based fuel cells, power supply systems for water electrolysis, and measuring instruments.

Please visit:

Hydrogen Fuel Cell System

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About Mitsubishi Gas Chemical (MGC)

MGC is an R&D-oriented chemical manufacturer that creates value to be shared with society. MGC is engaged in a wide range of businesses, from basic chemicals that support industry to functional chemicals that address user needs. Leveraging its proprietary catalyst-based methanol production technology cultivated over many years, MGC is promoting its Carbopath™, environmentally recycling platform, which converts CO_2, waste plastics and biomass into methanol for use in chemicals and fuels. MGC is committed to realizing a circular economy through methanol.

The information in this release, including product specifications, contact details and pricing, is current as of the date of announcement but is subject to change without notice.