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Establishment of a State-of-the-Art Zero-Carbon Energy Demonstration Facility Using Ammonia and Hydrogen on the Gifu University Campus

Tokai National Higher Education and Research System Gifu University (President: Kazuhiro Yoshida), Resonac Corporation (President & CEO: Hidehito Takahashi), Mitsubishi Kakoki Kaisha, Ltd. (Representative Director/President & CEO: Toshikazu Tanaka), Tokyo Gas Co., Ltd. (Representative Corporate Executive Officer, President & CEO: Shinichi Sasayama), and MIURA Co., Ltd. (President & CEO: Tsuyoshi Yoneda) have established a **zero-carbon energy demonstration facility using ammonia and hydrogen** within the Gifu Renewable Energy System Research Center, Institute for Advanced Study, Gifu University.

This facility will begin operations in April 2026 as one of Japan's leading ammonia utilization demonstration platforms. Going forward, in addition to being a venue for the development of ammonia utilization technologies, it will be developed as a “co-creation platform for market creation,” with a view to full-scale commercialization.

[Overview]

This facility is one of Japan's leading ammonia utilization demonstration platforms, and has been established at Gifu University as the core of a “Distributed energy systems using ammonia and hydrogen” research and development theme, under the Strategic Innovation Promotion Program (SIP)^{*2} third-phase “Building a Smart Energy Management System”^{*3} led by the Council for Science, Technology and Innovation (CSTI)^{*1} under the Cabinet Office.

With the enactment of the Hydrogen Society Promotion Act^{*4} in 2024, ammonia has been positioned as an important energy source supporting the creation of a hydrogen society and is rapidly gaining attention as the “next growth market.” In addition to commercialization in the commercial electricity generation sector, expansion into the industrial, transport, and consumer sectors is accelerating.

This facility will move forward with demonstration of the following systems, which are linked directly to commercialization, with a view to social implementation from the fiscal year ending March 2029.

- 1) Distributed cogeneration system using ammonia and hydrogen (with integrated EMS) (Gifu University)
- 2) Ammonia reforming unit (Resonac, Mitsubishi Kakoki)
- 3) Zero-carbon industrial furnace (Tokyo Gas)
- 4) Zero-carbon boiler (Tokyo Gas, MIURA)
- 5) Zero-carbon 7 kW portable generator (for construction, disaster response, and event use) (Gifu University)

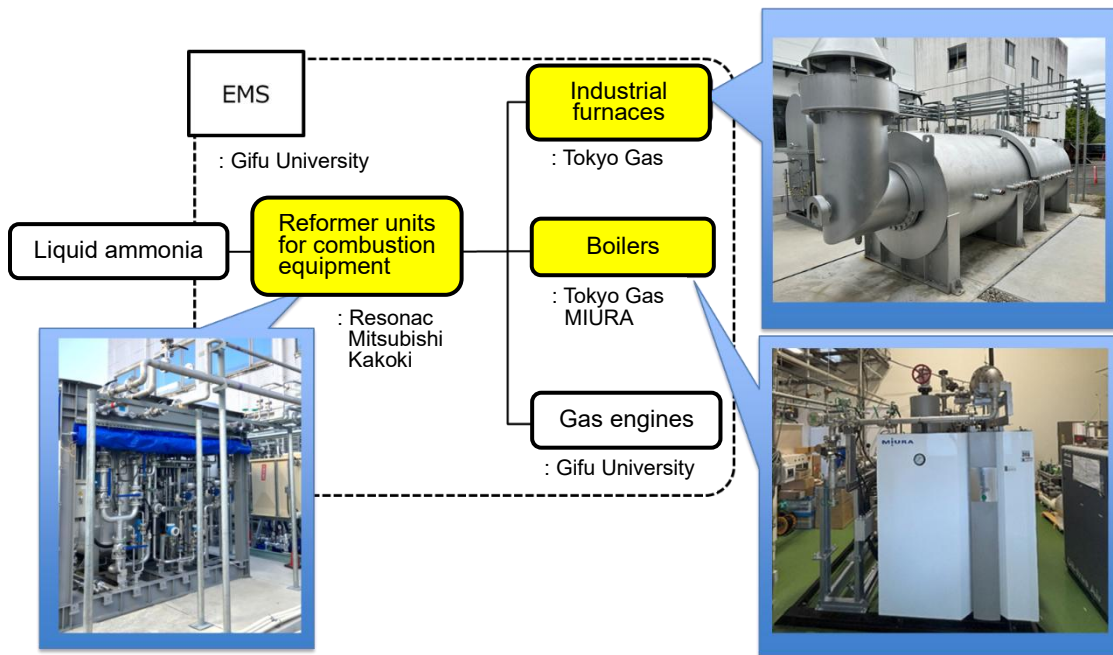
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Starting in 2026, demonstration testing at a practical scale will begin, in anticipation of use in hotels, factories, construction sites, and other similar facilities. Performance evaluations, safety design, and economic feasibility studies will be undertaken in parallel, and we will accelerate the transition to the social implementation phase.

[Features]

Notable features of this facility are the ability to safely supply ammonia gas at 200 Nm³/h as feedstock for reformers, and infrastructure that enables the mixing of reformed gas and ammonia gas. Demonstration environments at this scale are extremely rare in Japan, and this facility will enable companies from a wide range of industries—including combustion equipment manufacturers, generator manufacturers, furnace and boiler manufacturers, and material and catalyst companies—to rapidly conduct scale verification of their technologies. Going forward, we will use a matching fund scheme^{*5} to actively engage in collaborative research with companies, leveraging this facility to create a new industrial ecosystem. The ammonia used in these demonstrations is low-carbon and environmentally friendly, and is produced by Resonac through gasification-based chemical recycling, with used plastic as part of its feedstock.

This facility will be developed beyond a venue for the development of ammonia utilization technologies into a “co-creation platform for market creation,” with a view to commercialization, and will contribute to the realization of a decarbonized society and the creation of new energy markets.



*1: The CSTI is one of the “councils of important policies.” Under the leadership of the Prime Minister and the Minister of State for Science and Technology Policy, it is mandated to plan, formulate, and comprehensively coordinate comprehensive and fundamental science, technology, and innovation policies from a position above individual ministries.

*2: SIP is a program promoted by CSTI that, through a back-casting approach toward realizing Society 5.0, identifies priority issues essential for addressing societal challenges and enhancing Japan’s economic and industrial competitiveness. It promotes integrated research and development—from basic research through to social implementation—and advances cross-disciplinary research and development through inter-ministerial collaboration, as well as industry–academia–government collaboration to support the social implementation of its outcomes.

*3: Appointment of the research and development project leader for the Strategic Innovation Promotion Program (SIP) third-phase “Building a Smart Energy Management” (Announced by the Japan Science and Technology Agency (JST) on June 30, 2023)

*4: The Hydrogen Society Promotion Act (Official name: Act on Promotion of Supply and Utilization of Low-Carbon Hydrogen and its Derivatives for Smooth Transition to a Decarbonized, Growth-Oriented Economic Structure) is a law enacted in October 2024 to promote the supply and use of low-carbon energy, such as hydrogen and ammonia, with a view to achieving carbon neutrality by 2050.

*5. When companies and universities engage in collaborative research, the government and universities provide support equivalent to

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the research expenses borne by the companies, promoting the commercialization of research results.

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