Kawasaki Commences Sales of a High-Efficiency Hydrogen Liquefier

From June, Kawasaki started selling a new hydrogen liquefier, the first one developed with made-in-Japan technologies, and offering industry-leading liquefaction efficiency.

Hydrogen is a clean energy that does not generate greenhouse gases when used as a fuel for power generation or fuel cell vehicles (FCVs), the use of which is expected to reach about 300,000 tons per year*1 by 2030. Focusing on the properties of hydrogen, which can be compressed to 1/800 in volume by liquefying at minus 253°C, Kawasaki has been engaged in research and development of liquefaction technology.

This hydrogen liquefier has demonstrated its performance and reliability through continuous demonstration operation for over 3,000 hours, and various functional tests.

The main features are as follows;

- Capable of producing five tons of liquefied hydrogen per day (equivalent to fuel for 1,000 FCVs).
- Industry-leading liquefaction efficiency*2, the key factors of which are a heat exchange cycle and a liquefaction process developed by Kawasaki, utilizing technology cultivated in our development of high-speed rotating machines such as gas turbines for power generation and jet engines for aircraft.
- Production of high-purity hydrogen (99.999%*3) and realization of easy maintenance, due to the elimination of impurities in the hydrogen liquefaction process.
- Compact layout due to the vertical structure of the liquefier (earthquake-resistant design).
- Prompt start of liquefaction within 24 hours*4 after plant start-up.

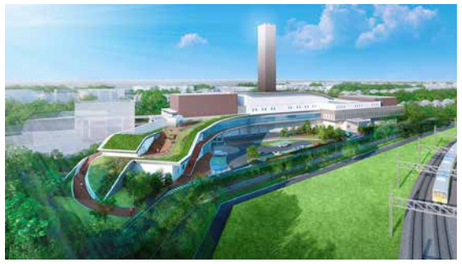
*1 2017 Renewable Energy/Hydrogen Energy Ministerial Meeting on "Hydrogen Basic Strategy"
*2 Kawasaki proprietary research
*3 This does not require a high-purification process and can be used in a fuel cell just by vaporizing it.
*4 Depending on the actual conditions, it may take more than 24 hours.

Kawasaki Awarded Contract for New Waste Treatment Facility

Kawasaki has been awarded a contract by the Kodaira, Murayama, Yamato Hygiene Association (Tokyo) for the New Waste Treatment Facility Construction and Operation Project (tentative name). This will be a design-build-operate (DBO) project in which Kawasaki will demolish and remove existing facilities, design and build new waste incineration and processing facilities, operate the new incineration facilities for 20 years and 6 months, and operate the non-combustible and bulky waste processing facilities for 24 years.

During this scrap-and-build project planned for execution in phases, Kawasaki will demolish two waste incineration facilities and a bulky waste processing facility situated in a very limited space adjacent to a quiet residential neighborhood, then proceed to build the new waste incineration facilities. All demolition and building work will be completed by the end of FY 2027.

The new waste incineration facilities will be capable of treating 236 tons of waste per day using two incinerators, each with a capacity of 118 tons every 24 hours. Incineration facilities will come equipped with leading-edge Smart-ACC®* technology and use Kawasaki's proprietary parallel-flow incinerator configuration. Each of the incinerators will combine high-temperature, high-pressure boilers and extraction condensing steam turbines for high-efficiency electric power generation that supplies all the electricity the facility needs. In addition, surplus power will be sold in quantities sufficient to supply approximately 8,100 general households annually.



Simulated image of completed facilities

The facilities will feature an architectural design that harmonizes with nearby sites, such as the Tamagawa Josui Scenic Road and Nobidome Canal Historical and Environmental Preservation Area, and will provide spaces for relaxation and interpersonal exchanges that can be visited by the public. In these ways, Kawasaki hopes to achieve familiarity and acceptance among locals for the new facilities, and replace the negative image fostered by conventional waste treatment facilities, while creating an open waste treatment center that contributes to the area as a hub for regional exchanges, disaster-prevention efforts and environmental education.

* Smart-ACC: Smart Automatic Combustion Control. Proprietary, sophisticated combustion control technology by Kawasaki, designed to achieve more efficient and reliable power generation than conventional waste treatment facilities. Enables adjustment of power output at a scale roughly double that of conventional systems (over the same time period), facilitating response more closely tailored to power supply demand.

Kawasaki Receives 2020 MEXT Commendation for Science and Technology

Kawasaki engineers have been awarded the Prize for the 2020 Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology (MEXT), in recognition of the company's successful development of a high-power, high-fuel-efficiency supercharged engine for large motorcycles.

Kawasaki's development of a supercharged engine for large motorcycles was achieved by bringing together various in-house technologies from areas including gas turbines and gas engines. The supercharger and engine were developed simultaneously. Kawasaki has received much praise for the resulting motorcycle engine, which fulfills essential requirements with its light weight, compact design, and agile response, while delivering high power and high fuel efficiency. The engine is currently being used in the Ninja H2R, Ninja H2, Ninja H2 SX and Z H2.

Satoaki Ichi made a short comment on behalf of Kawasaki: "It is a true honor to be selected for this commendation. I consider this a recognition of the hard work of everyone involved in the development project. Following this commendation, we will continue to refine our technologies while pursuing further development of motorcycles that meet the increasingly diverse needs of customers, and contribute to a better future for our global environment."

Ninja H2R/Ninja H2 (supercharged engine models)

Ninja H2 SX/Z H2 (supercharged engine models)

Supercharged engine for large motorcycles (Ninja H2R)

Commendation Overview

Prize name: 2020 Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology (Award for Science and Technology, Development Category).
Achievement: Development of a high-power, high-fuel-efficiency supercharged engine for large motorcycles.
Recipients: the following five employees:

1. Research & Development Division, Motorcycle & Engine Company
   Satoaki Ichi (Manager, Section 1, Innovation Department)
   Hiroyuki Watanabe (Manager, Section 2, Design Department 1)
   Kazuki Arima (Senior Staff Officer, Section 1, Testing Department 1)
2. Technical Institute, Corporate Technology Division, Head Office
   Masahito Saito (Manager, Section 1, Thermal Systems Research Department)
   Kazuo Tanaka (Manager, Section 3 Thermal Systems Research Department)

Successful Test Flight of a Large Hybrid Drone

In May, a large hybrid drone being developed by Kawasaki has successfully hovered.

The test model measures about 7 m long, 5 m wide and 2 m tall, and the purpose is to test the technical possibility of a payload capacity over 200 kg with a cruising range over 100 km, and further, to evaluate the product marketability as a "flying pickup truck." Three of our high-performance Ninja ZX-10R motorcycle engines are used to generate electricity for the eight electric motors with propellers.

Unlike regular drones that rely on battery power alone, this large hybrid drone uses power generated by gasoline engines, enabling it to maintain high power output for a long time. Transportation of goods over short to medium distances via helicopter tends to be expensive, so this large drone is positioned as a low-cost aerial goods-transportation solution, filling the gap between helicopters and small drones.

From concept development to design and production, the test model was completed by the Motorcycle & Engine Company, with the cooperation of the Aerospace Systems Company and the Technology Development HQ, with the aim of confirming the feasibility of the hybrid system.

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