

## Kawasaki Completes Installation of Liquefied Hydrogen Storage Tank on World's First Liquefied Hydrogen Carrier

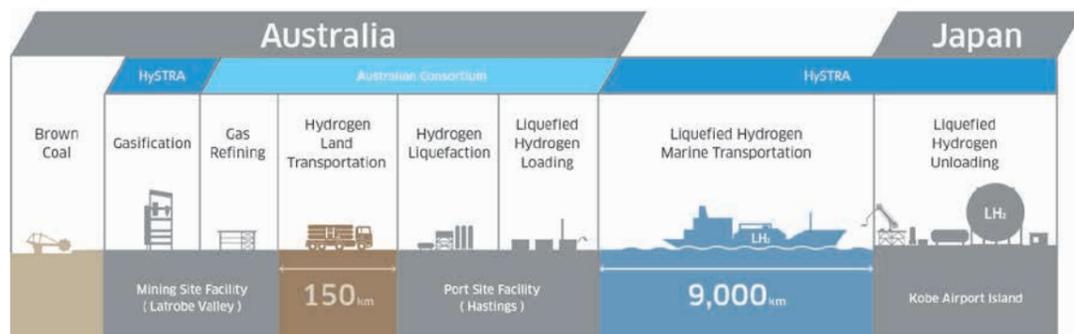
Kawasaki has installed a liquefied hydrogen storage tank for marine transport applications on the world's first liquefied hydrogen carrier, the *SUIISO FRONTIER*. Installation was carried out at the Harima Works on March 7. The company will complete piping installation and other outfitting operations for the vessel at the Kobe Works, with ship completion scheduled for October 2020. Once complete, the *SUIISO FRONTIER* will undergo operational testing in the coastal waters of Japan, then will be used for technology demonstration testing\* in Japanese FY 2020 aimed at the establishment of an international hydrogen energy supply chain in which liquefied hydrogen produced in Australia will be shipped to Japan.

This liquefied hydrogen storage tank was developed with the goal of providing a means of transporting liquefied hydrogen at 1/800 of its original gas-state volume, cooled to  $-253^{\circ}\text{C}$ , safely and in large quantities over long distances by sea. It features a double-shell structure with vacuum insulation between the overlapping inner and outer shell layers. Furthermore, the inner-tank supports are made of glass-fiber-reinforced plastic, which is also used in applications such as helicopter rotor blades, and boasts high strength along with properties enabling thermal conduction suppression. Kawasaki utilized its experience and knowledge in cryogenic equipment manufacturing,

accumulated through the building of equipment such as onshore-liquefied hydrogen storage tanks and liquefied natural gas (LNG) storage tanks, to achieve ultra-high thermal insulation performance.



Installation of liquefied hydrogen storage tank for marine transport applications



### Supply chain demonstration framework

\* Planned implementation as part of NEDO's Demonstration Project for Establishment of Mass Hydrogen Marine Transportation Supply Chain Derived from Unused Brown Coal.



Access Code:  
You can see a video demonstrating how the liquefied hydrogen storage tank was installed on the *SUIISO FRONTIER*.

## Kawasaki to participate in the United Nations Global Compact

Kawasaki has signed the United Nations Global Compact (UNGC) initiative, and was registered as a participating company on January 13. Kawasaki has also joined the Global Compact Network Japan, the compact's local network in Japan.

The UNGC is a voluntary initiative for companies and organizations to act as good members of society that will participate in creating a global framework for sustainable growth by taking responsible and creative leadership.

In conducting their business operations, UNGC signatory companies and organizations are required to support the initiative's ten principles in the four fields of human rights, labor, the environment, and anti-corruption.

Based on our Group Mission, "Kawasaki, working as one for the good of the planet," the Kawasaki Group is committed to providing solutions to social issues through active business actions.

With our signing of the UNGC, we commit ourselves to promoting the ten principles in the

four fields, and to continue our activities towards the realization of a sustainable society.



## Order Received from Taiheiyo Cement for Waste Heat Recovery Power Generation System using Newly Developed VEGA® Boiler

In January, Kawasaki received an order from Taiheiyo Cement Corporation (Taiheiyo) to supply a cement plant waste heat recovery power generation (WHRPG) system for their Saitama Plant. With an output of approximately 8 MW, the new



First VEGA boiler, installed at the Huaibei Zhongbei Cement plant in China

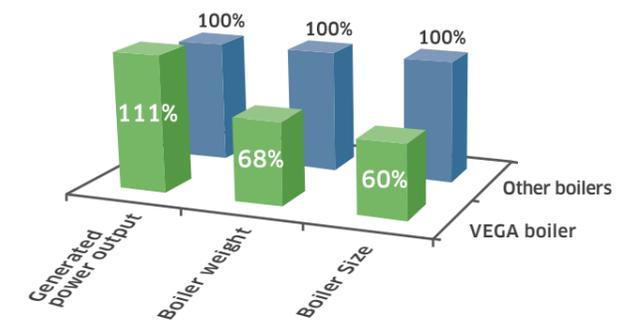
system is scheduled to start operation in September 2022.

This WHRPG system will recover waste heat during the calcining stage of the cement production process and use it for power generation and energy-saving measures of the cement plant. It consists of a waste heat recovery boiler, steam turbine generator, and other components. A newly developed VEGA boiler will be adopted for the first time in Japan as the heat recovery steam generator.

Since 1982, Kawasaki has served as a global leader in this product category, providing WHRPG systems to approximately 260 plants worldwide. Together these generate

about 2,800 MW of electric power and cut CO<sub>2</sub> emissions by about 12 million tons annually. Kawasaki provides a diverse range of products that save energy and reduce CO<sub>2</sub> emissions, and will continue active development and sales of such products, contributing to the prevention of global warming.

### Advantages of the VEGA Boiler



## Delivery of First Kawasaki FDGS for the PW1500G Regional Aircraft Jet Engine

In January, Kawasaki delivered a Fan Drive Gear System (FDGS) for the PW1500G jet engine, manufactured in its Akashi Works facility – the first FDGS ever produced by Kawasaki. This engine is installed on the Airbus A220 regional aircraft.

Kawasaki participates in the PW1500G and PW1900G Geared Turbofan™ engine

(GTF) programs for regional jet aircraft as a Risk & Revenue Sharing Partner with Pratt & Whitney (P&W). Kawasaki produces both the Fan Drive Gear System (FDGS) and the Compressor, which are critical components for the GTF. The GTF utilizes the FDGS to achieve a higher bypass ratio by changing the cycle speed between the turbine system and the fan module.

This first FDGS will be used for engine tests, and FDGS production for commercial engines will commence soon.

The PW1500G and PW1900G are both GTF engines. GTF engines feature a high bypass ratio with an advanced gear

system, delivering upwards of 16% fuel burn improvement, 75% noise reduction, and 50% lower NO<sub>x</sub> emissions as compared with traditional commercial aircraft engines.



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