

“e5 Tug” – electric tug powered by battery and hydrogen fuel cell



Tokyo Kisen Co., Ltd. and e5 Lab Inc. have jointly developed the new concept design of “e5 Tug,” electric propulsion harbor tugboat powered by large-capacity battery and a hydrogen fuel cell.

The e5 Tug is a harbor tug fully electrified and designed to minimize environmental footprint.

The e5 Tug is equipped with a propulsion system running on “e5 powertrain platform”, devised and planned by e5 Lab, which utilizes a large-capacity battery system as a main power source and a hydrogen fuel cell and generator as the auxiliary power source.

This electric propulsion system will ensure sufficient bollard pull and continuous cruising time necessary for harbor tugboat which requires a large-capacity power to function. Furthermore, CO₂ emission is minimized by incorporating fuel cell.

This joint project is drawing upon knowledge and experience of Tokyo Kisen as a tugboat operator and e5 Lab is undertaking concept planning / development, design, and project management.

We will proceed with the project by seeking advice from the Ministry of Land, Infrastructure, Transport and Tourism, ClassNK, and others for the regulatory compliance. After the final investment decision we aim to launch the tug for commercial operations at Yokohama Port and Kawasaki Port in 2022.

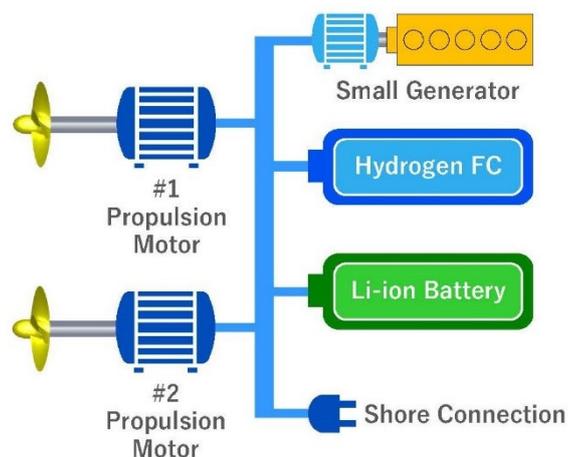
【e5 Tug outline】

Type of vessel	Harbor tugboat
Operating area	Yokohama Port / Kawasaki Port
Propulsion	2 x 1500kW azimuth thruster
Towing power	50 tons
Service speed	14 knots

【Main features of e5 Tug】

Environmental performance	It reduces CO2 emissions in all operational phases such as push / pull, transit and standby (it can also be reduced on the basis of Well-to-Propeller measure).
Contribution at the time of disasters	It has a function of power supply from ship to shore in the event of a disaster and can be used as an emergency power source.
Future scalability	Fully electrified powertrains can adopt the most suitable energy sources (lithium-ion battery, hydrogen fuel cell, all-solid-state battery, LNG generators, etc.) in accordance with technological progress. In the future, it will be possible to achieve zero emissions on Well-to-Propeller basis in combination with renewable energy.

【Li-ion Battery + Hydrogen FC pure electric power train for e5 Tug】



【Outline of each company】

Tokyo Kisen Co., Ltd. (Head office: Yokohama) is a major tugboat company in Japan with its mission of supporting maritime safety. Since the founding in 1947, the company has been consistently engaged in the operations of assisting navigational safety of ships throughout Tokyo Bay, the center of Japanese marine transportation, and one of the busiest sea traffic areas in the world.

Tokyo Kisen is operating harbor tugs, escort tugs, pilot boats and CTVs for offshore wind farms. In addition, its group companies operate transfer boats, water busses, harbor cruise ships and car ferries. In 2013, the company launched a (non-battery type) hybrid tug.

Website: www.tokyokisen.co.jp

e5 Lab Inc. (Head office: Tokyo) is a shipping solution provider based on the electrification and digitization of ships. With the mission of “Sustainable domestic shipping, which is the lifeline of Japan”, we will create new added value by combining the latest technology and ideas, and solve the problems of domestic shipping, thereby ensuring safe navigation of ships. We aim to contribute to society by protecting the global environment. Currently, we are proceeding with a project aimed at completing an electric propulsion Tanker “EV Tanker” of Asahi Tanker Co., Ltd. in 2021.

Five values provided by e5 Lab: electrification, environment, efficiency, economics, evolution

Website: <http://e5ship.com>

e5 project promotion video:

<https://youtu.be/6sJzCbRFWw>

【Contact】

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