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## Joint Research on Fuel-Efficient Technology by Wind Power Using Sails

We are pleased to inform that we have started a joint research on fuel-efficient technology by wind power using sails with Namura Shipbuilding Co., Ltd.

Nowadays, environmental targets such as greenhouse gas (GHG) reduction are set in various countries around the world, and international shipping is required to reduce GHG from operating vessels, as set in GHG reduction targets by the International Maritime Organization (IMO).

<Features of this research>

- 1) The vessel will store the sails under the deck during cargo operation, or when the wind condition does not suit for sailing.
- 2) The vessel has a mechanism that allows the sails to laterally extend, in order to obtain the maximum propulsion force by wind power.
- 3) By setting multiple criteria for determining the shapes of sails and adopting multiple shapes of sails, it is possible to secure the visibility from the bridge as stipulated in the International Convention for the Safety of Life at Sea (SOLAS).

<Target ship type of this research> 183,000DWT Bulk Carrier Image of the overall sails

