

“Yokohama Blue Carbon Project”- the environmental activity utilizing marine resources



## LNG-fuelled tugboat joins the carbon offset program

Carbon credits will be created by using LNG as the fuel for the marine vessel.

City of Yokohama started “Yokohama Blue Carbon Project” in 2014, which was an original carbon offset program utilizing marine resources in Yokohama. Since then, Yokohama Blue Carbon Credits has been created by reduction of food mileage by local marine food and introduction of thermal energy by seawater heat pump.

As a new program, LNG-fuelled tugboat, more eco-friendly ship than diesel oil fuelled one, joins the Yokohama Blue Carbon Project and makes carbon credits. The credits offset CO<sub>2</sub> emissions from sports events and another activities in Yokohama.



LNG-fuelled tugboat during LNG bunkering at the Port of Yokohama

### ■ What is Yokohama Blue Carbon?

Blue Carbon is a carbon captured by ocean and coastal ecosystems.

“Yokohama Blue Carbon Project” doesn’t only contain Blue Carbon but also “Blue Resources”, which is utilizing marine biomass and marine energy, and promoting of sea-friendly society. It deals with climate change and improves an attraction of marine environment.

Specifically, “Yokohama Blue Carbon Offset Program” which utilizes Blue Carbon and Blue Resources was started.

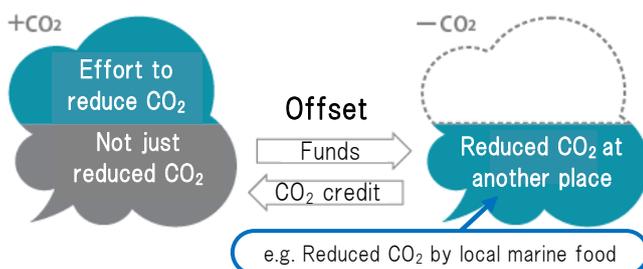


Image of the carbon offset program

### ■ Effects of CO<sub>2</sub> reduction by LNG-fuelled tugboat

The LNG-fuelled tugboat has Dual Fuel Engine so it can use diesel oil and LNG properly. It emits less CO<sub>2</sub> than conventional tugboats that use marine diesel oil.

LNG is used as a fuel for ordinary ship operation, but when work-load is dynamically changed during towing a ship, diesel oil assists the operation for a short time.

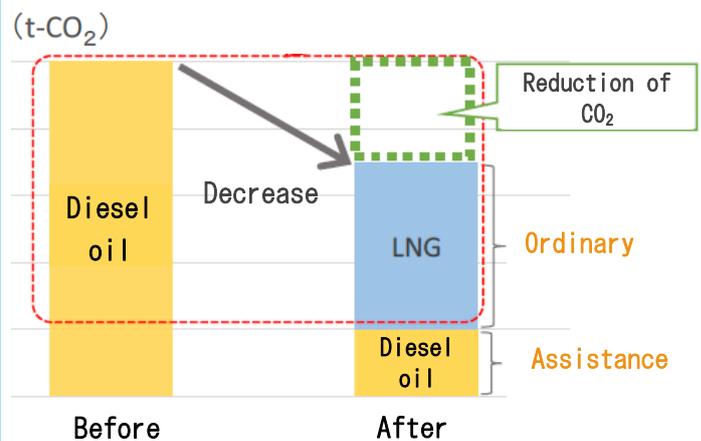


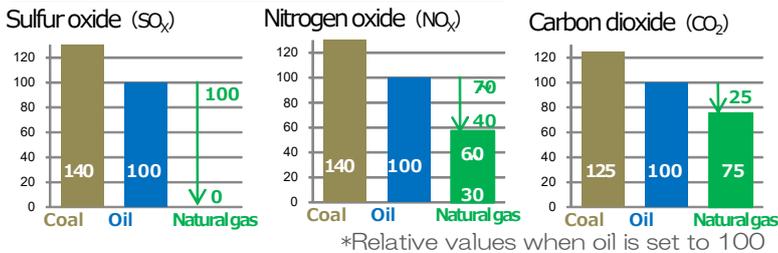
Image of an effect of CO<sub>2</sub> reduction

## ■ Utilizing of LNG as a ship fuel

### Environmental regulations

IMO (International Maritime Organization) has set a strong global limit for sulfur in fuel oil used on board ships from 2020. So it is expected that LNG-fuelled ships are increased because ship fuel is changed to LNG which is more eco-friendly fuel than diesel oils.

### Environmental advantages of natural gas



### Advantages of the Port of Yokohama as a LNG bunkering hub

City of Yokohama intends to build LNG bunkering hub in the Port of Yokohama in cooperating with the national government and private sectors. There are many advantages as a LNG bunkering hub in the Port of Yokohama as follows; (1) There are many existing LNG bases located next to the port. (2) The operation of a LNG-fuelled tugboat “*Sakigake*” is started in 2015, so know-how of LNG bunkering is accumulated. (3) The Port of Yokohama is located on the Pacific side and it serves as the first or last bunkering base in the Asian side of the Trans Pacific route.

## ■ Details of LNG-fuelled tugboat

- Owner: Nippon Yusen Kaisha (NYK LINE)
- Operator: Wing Maritime Service Corp.
- Name : *Sakigake*
- L.O.A. : 37.2m
- Breadth : 10.2m
- Gross Tonnage : 272 tons
- Port of Registry : Yokohama, Japan
- Engine : Dual Fuel Engine  
(both of diesel oil and LNG)



Japan's first LNG-fuelled ship  
“*船-Sakigake*”

**Yokohama Blue Carbon**

**“FutureCity”Yokohama**



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