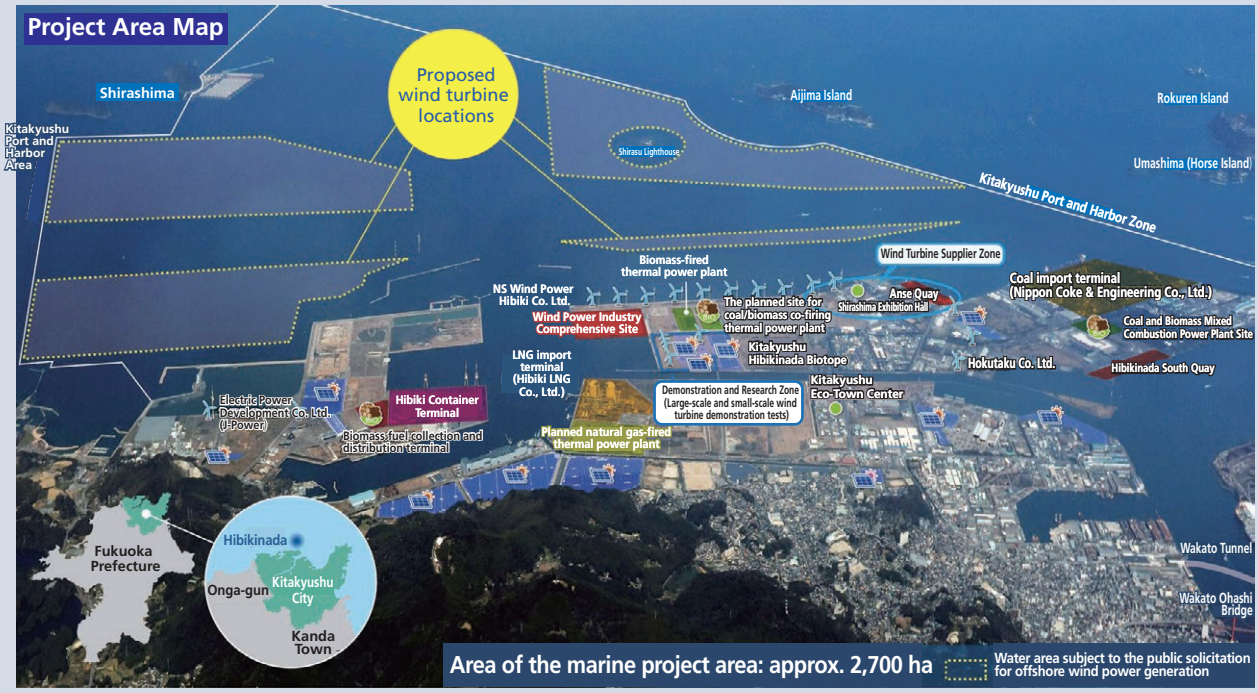
Offshore Wind Power Initiatives

Following the Signing of the EPCI*1 Contract for the Kitakyushu Hibikinada Offshore Wind Power Project (port area), the Construction has Begun

The Kitakyushu Hibikinada Offshore Wind Farm Construction Project is a large-scale offshore wind farm construction project to install 25 wind turbines (9.6 MW class) and generate approximately 220 MW of output on an approximately 2,700 ha site located in the port area of the Kitakyushu Hibikinada district. We signed an EPCI contract for marine construction and other work ((1) offshore civil engineering works such as foundation work for wind turbines, installation of wind turbines, cable laying, etc., (2) construction of O&M*2 base port), and started the construction in March 2023. (Project developer: Hibiki Wind Energy Co. Ltd.)

*1 Engineering, Procurement, Construction, Installation
*2 O&M: Operation & Maintenance



Project Outline (Source: Hibiki Wind Energy Co., Ltd. website)

(1) Wind turbine foundation and marine works
In charge of marine civil works, including foundations and installation of 25 bottom-fixed-type wind turbines
Contractor: Penta-Ocean Construction Co., Ltd. and Nippon Steel Engineering JV

(2) O&M base port construction
Establishment of a base port for the operation and maintenance of the wind farm
Contractor: Penta-Ocean Construction Co., Ltd. and Wakachiku Construction JV

CP-16001: Our second large offshore installation vessel (equipped with a 1,600t lifting capacity crane)

CP-5001: Multi-purpose self-propelled crane vessel

CP-8001: Japan's first offshore installation vessel (equipped with an 800t lifting capacity crane)

ZEB-certified construction office

A Japanese Offshore Wind Power Construction Leader

In Japan, aiming for the achievement of carbon neutrality by 2050, the Japanese government has set targets for the development of 10 GW of offshore wind power by 2030 and 30-45 GW by 2040. Offshore wind power is expected to increase its supply capacity as a major source of renewable energy, and in this context, the entire country is witnessing a surge in momentum for offshore wind construction.
In this business environment, we aim to become the "front runner in the offshore wind construction," and are actively working to establish a system to meet the growing demands for offshore wind power facilities.

Capital investment

POC plans to own three offshore installation vessels, including one under construction, in cooperation with other companies.

- **CP-8001 (Equipped with an 800t lifting capacity crane) (In operation since March 2019)**
  Shipowner: Penta-Ocean Construction Co. Ltd.
  We have accumulated experience in port construction, offshore wind turbine removal (Hibikinada, Kitakyushu), underwater geotechnical surveys, etc., and accumulated expertise in operating offshore installation vessel ahead of peer companies
- **CP-16001 (Equipped with a 1600t lifting capacity crane) (In operation since November 2023)**
  Shipowner: PKY Marine Co. Ltd.
  (Joint venture between POC, Kajima Corporation and Yorigami Maritime Construction)
- **Our third offshore installation vessel (Equipped with a 1600t lifting capacity crane) (Scheduled to start operation in 2027)**
  Upgrading a foreign-flagged offshore installation vessel to mount a 1600t lifting capacity crane and reflag it into a Japan-flagged vessel
  Shipowner: Japan Offshore Marine Co. Ltd.

Japan Offshore Marine Co. Ltd.
A Japan-based joint venture between Penta-Ocean Construction and DEME Offshore (Belgium) formed to collaborate on the construction of wind turbine foundations and installation of wind turbines for offshore wind power projects in Japan.
・Investment ratio: 51% for Penta-Ocean, 49% for DEME Offshore

JOM Japan Offshore Marine

- **Construction of offshore wind power work vessels (under consideration)**
  Construction of a cable laying vessel, a large foundation construction vessel (equipped with a 5,000t class crane), and a material carrier are under consideration.
- **Construction of new Muroran Factory**
  ・Fabricates temporary steel structures required for offshore wind power construction
  ・A "100% renewable energy factory" that uses renewable energy sources to power the entire factory

Alliances

- **Collaboration with DEME Offshore**
  DEME Offshore, with a leading track record, technology and know-how in the field of offshore wind power construction in Europe, and POC, with abundant experience and technical know-how in offshore civil engineering work under the severe metocean conditions in Japan, collaborated to overcome the severe construction conditions unique to Japan and to realize safe and reliable construction.
- **Collaboration with "K" Line Wind Service, Ltd. (KWS)**
  ・Operations such as conversion of foreign-flag offshore installation vessels that will be owned by our subsidiary JOM to Japan-flag vessels, as well as subsequent operations, maintenance, and management of crew members
  ・Utilization of KWS-owned offshore support vessels
  Utilization of "KAIKO" as a towing vessel for CP-8001, etc.
  Utilization of other vessels such as "AKATSUKI"
  ・Consideration of collaboration for SOV*3 , etc. necessary for maintenance after start of operation

*3 Service operation vessel

Completion of an offshore installation vessel "CP-16001".

CP-16001, a cutting-edge offshore installation vessel equipped with a 1,600t lifting crane, which was jointly constructed by Penta-Ocean Construction, Kajima Corporation and Yorigami Maritime Construction, has been completed.

She started operation in November 2023 in the construction of the Kitakyushu-Hibikinada offshore wind farm, and will contribute to the expansion of offshore wind power projects in general offshore areas of Japan, which are expected to be in full swing from 2027 onward.

<Specifications>
・Total length 123m, total width 45m, maximum capacity 100 persons
・Enables efficient construction of 15 MW-class wind turbines at sea.

Completed "CP-16001"

Efforts in Floating Offshore Wind Power Farms

In the name of the Japan Dredging and Reclamation Engineering Association, we engage in research and development in cooperation with related ministries, agencies, and private companies to promote the widespread use of floating offshore wind power facilities, including proposals of the work base construction to the government (offshore platforms) that will significantly increase the construction capacity of floating offshore wind power facility construction.

ZEB Initiatives

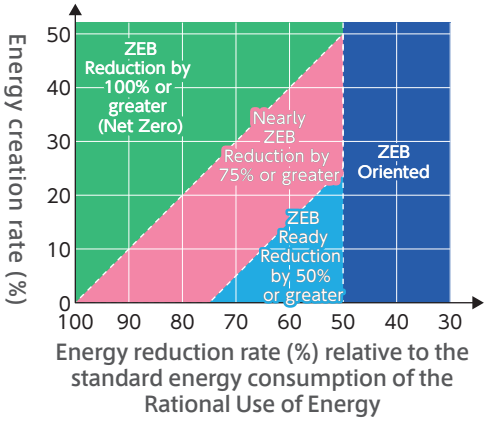
ZEB (Net Zero Energy Building) Track Records

POC's Institute of Technology continues to develop energy-saving technologies for Net Zero Energy Buildings (ZEB). Energy monitoring of buildings after the completion of construction with energy-saving technologies has confirmed that ZEB features have been achieved, proving its effectiveness.

POC's ZEB construction record

ZEB Rank	Project Name	Energy saving rate	Energy creation rate	Energy conservation rate
ZEB	Hisamitsu Pharmaceutical Museum (2019)	65%	38%	103%
Equivalent to ZEB Ready	Penta-Ocean Construction Institute of Technology Laboratory Building (2019)	72%	0%	72%
Equivalent to Nearly ZEB	Tokyo Metropolitan Archives Building (2020)	54%	37%	91%
Nearly ZEB	EXEO Group, Inc. South Kanto Branch (2021)	50%	25%	75%
ZEB	POC Muroran Factory (2022)	65%	360%	425%
ZEB	Kobe Sumiyoshi Cold Storage Warehouse, Japan Port Industry Co., Ltd. (2022)	66%	34%	100%

Definition of ZEB



(Based on materials compiled by the ZEB Roadmap Follow-up Committee in FY 3/19)

Hisamitsu Pharmaceutical Museum

EXEO Group, Inc. South Kanto Branch

Penta-Ocean Construction Institute of Technology Laboratory Building

New Muroran Factory (2022)

ZEB

The new Muroran factory was completed in 2022. With its ZEB-converted offices, all the facility including the factory is powered by renewable energy sources. In addition to the existing business of fabricating steel structures for bridges, etc., the new factory will play a more significant role as a fabricating hub for temporary steel structures for offshore wind power construction, which is expected to have high demand in the future.

At the new factory which runs on 100% renewable energy, we will accumulate knowledge on the use of hydrogen energy through the use of by-product hydrogen and the production and use of green hydrogen generated from solar power, and apply this knowledge to our businesses.


New Muroran Factory

Energy-saving technology applied to the offices of the new factory

High energy savings

Energy reduction rate:65%

- Improvement of thermal insulation through the use of resin sashes
- Reduction of lighting load through the use of light-collecting films
- Introduction of high-efficiency air-conditioning units tailored for cold climates, etc.
- Air conditioning control using motion sensors, etc.

Energy-creating equipment installed at the new factory

A large amount of power generation throughout the year

- Photovoltaic power generation system (670 kW output)
- Hydrogen fuel cells (30 kW output)

Use and demonstration of hydrogen energy

- Use of two types of hydrogen: green hydrogen and by-product hydrogen
  Green hydrogen: Hydrogen produced through a water electrolysis system using solar power generation electricity, stored in hydrogen storage alloys, and used in fuel cells to generate electricity
  By-product hydrogen: Hydrogen produced as a by-product at a plant in Hokkaido is stored in hydrogen tanks and used to generate electricity through fuel cells

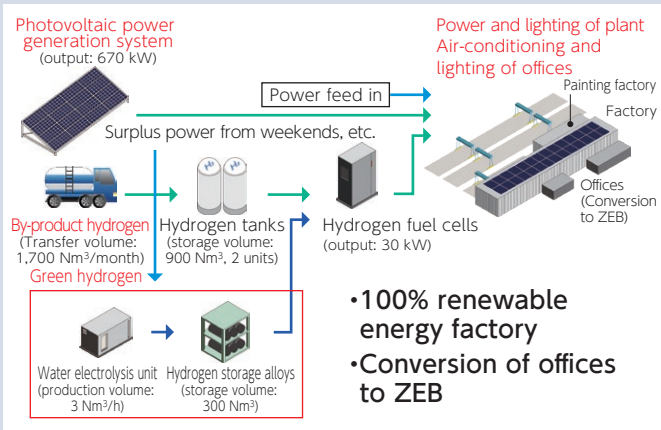


Diagram of energy use at the new factory

Roadmap to achieve carbon neutrality (CN)

Roadmap to achieve carbon neutrality (CN) by 2050 (Scope 1 and Scope 2)

Low carbonization Short-term initiatives

Fuel efficiency improvement (Scope 1)
- Engine-idle reduction, energy saving education, and ensuring proper maintenance of vessels and machinery
- Promotion of the on-site use of K-S1 and other fuel efficiency improvement additives

Improvement of construction efficiency (Scope 1)
- Improving construction efficiency through the use of ICT technology for land-based construction machinery and work vessels, and promoting more efficient energy use in work vessel equipment.
- Tracking the market trend of electrified land-based construction machinery – Promoting their on-site use
- Conducting studies for the electrification of cranes and winches on work vessels and utilization of large rechargeable batteries and fuel cells.

New Energy (Scope 1)
- Tracking technological trends, such as engine development, for the introduction of new energy sources
- Review of contribution to the Carbon Neutral Port (CNP) as an import and storage hub for new energy sources

Energy Conservation and Energy Creation (Scope 2)
- Promotion of ZEB conversion of construction offices, etc.

2030

Reduction target for 2030: -50% (compared to FY 3/20)

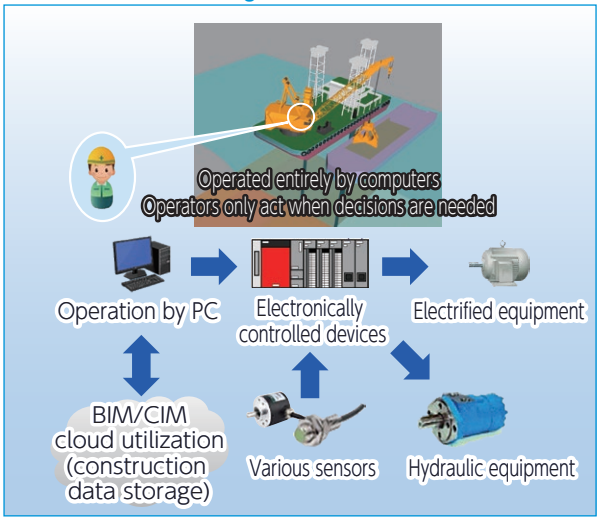
Low carbonization to decarbonization Mid-term initiatives

Fuel efficiency improvement (Scope 1)
- Study to adopt dual fuel engines, etc. (from research and development to on-site implementation)

Improvement of construction efficiency (Scope 1)
- Exploring automatic and autonomous operations by electrification of work vessels [Figure A]
  (from program development to on-site implementation)

New Energy (Scope 1)
- Utilization of alternative fuels such as BDF (Biodiesel Fuel) and GTL (Gas to Liquids)
- Onshore power supply (work vessels)
- Utilization of by-product hydrogen and ammonia, trial use of green hydrogen

[Figure A] Concept of automatic and autonomous operation of cranes through electrification and electronic control

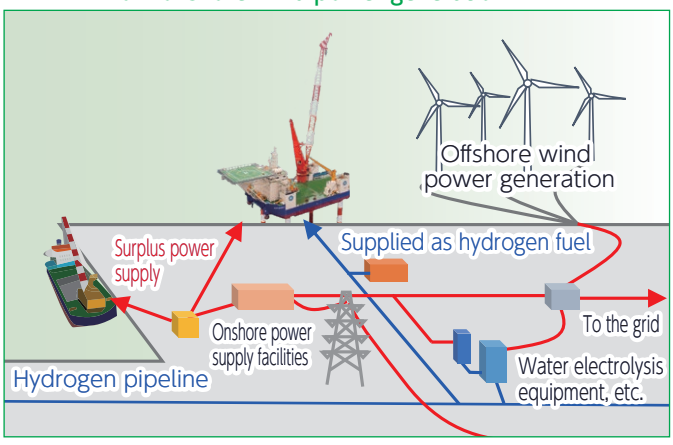


Decarbonization Long-term initiatives

New Energy (Scope 1)
- Introduction of work vessels and land-based construction machinery which run on new energy
- Utilization of green hydrogen and ammonia
- Utilization of surplus electricity from offshore wind power generation [Figure B]
  (onshore power supply and green hydrogen utilization)

2050

[Figure B] Conceptual image of utilization of surplus power from offshore wind power generation



Aim to achieve carbon neutrality by 2050