Port and Harbor Decarbonization Plan for the Port of Yokohama (summary)

-121 public and private partnerships projects-

City of YOKOHAMA, Port and Harbor Bureau

March 2025

Contents

1. Overview of the City and Port of Yokohama

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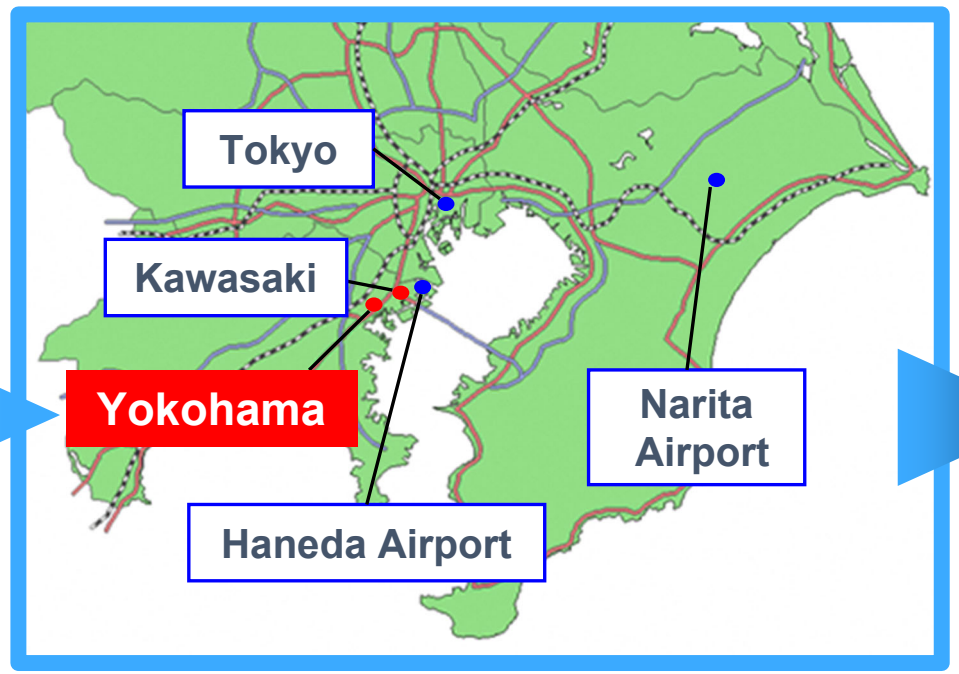
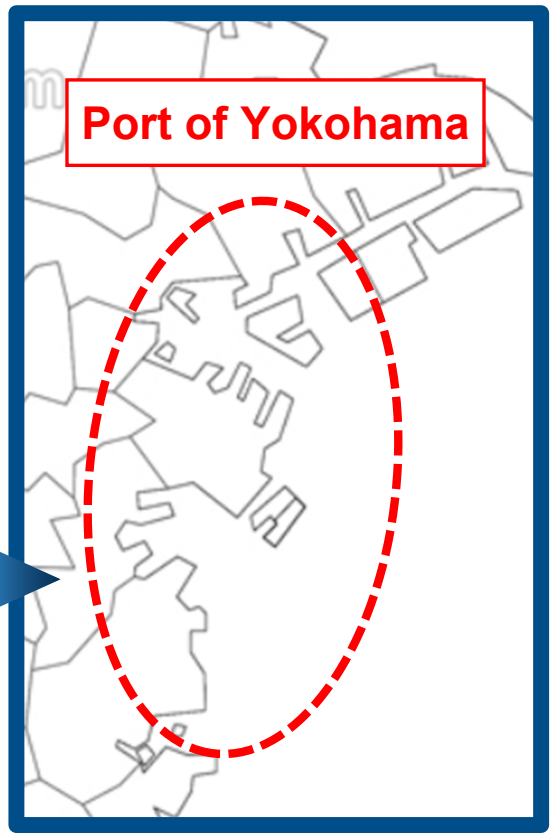
- International port city: port opened in 1859
- Second largest city in Japan
- Gross production: 97.6 billion USD (JPY150/USD)
- Population: 3.77 million
- 30 minutes from Tokyo Haneda Airport





1. Overview of the City and Port of Yokohama

Plan
P1

Mt. Fuji

The Port of Yokohama is an all-round player in the maritime industry. We have a variety of functions such as logistics, production and tourism. Yokohama is not only a big commercial port but also a big industrial port, so we have a good import and export balance.

1. Overview of the City and Port of Yokohama

Plan
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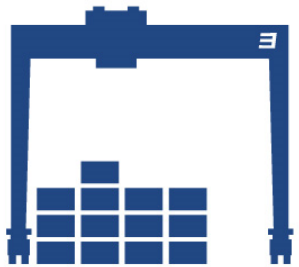
Total tons of freight in 2024: 101,187,174 tons
Total number of incoming vessels in 2024: 27,412 vessels

containers



46 million tons

3.1 million TEUs

roll-on/roll-off

15.7 million tons

720,000 vehicles

oceangoing vessels

8,602 vessels/year

liquid bulk

20.7 million tons

dry bulk

15.4 million tons

cruise ships

147 calls

coastal vessels

18,810 vessels/year

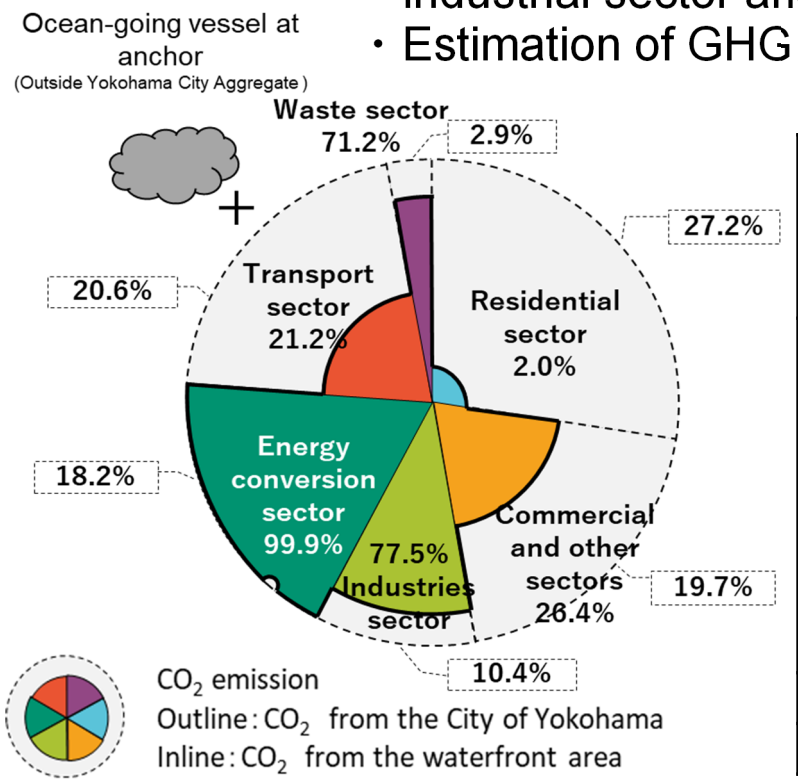
As of 2024

1. Overview of the City and Port of Yokohama

Plan P16-20

1-1. Carbon dioxide emissions from the Yokohama waterfront area

- It accounts for 39.5% of the total emissions from the entire city.
- Approx. 50% of emissions is accounted by the energy conversion sector, followed by the industrial sector and the business sector.
- Estimation of GHG emissions in compliance with Global Warming Law and international rules.



(As of FY2022)

category	Waterfront Area		Entire City Area		Waterfront Area／Entire City Area(%)
	amount (kt-CO2)	ratio (%)	amount (kt-CO2)	ratio (%)	
Emissions from land	6,227	97.4	16,042	99.0	38.8
Energy Conversion Sector	2,944	46.0	2,948	18.2	99.9
Industrial Sector	1,307	20.4	1,686	10.4	77.5
Business Sector	841	13.2	3,188	19.7	26.4
Transportation Sector	708	11.1	3,342	20.6	21.2
Waste Sector	337	5.3	474	2.9	71.2
Residential Sector	90	1.4	4,404	27.2	2.0
Ocean-going vessels at anchor	167	2.6	167	1.0	100.0
Total	**6,394**	**100.0**	**16,209**	**100.0**	**39.5**

1. Overview of the City and Port of Yokohama

Plan
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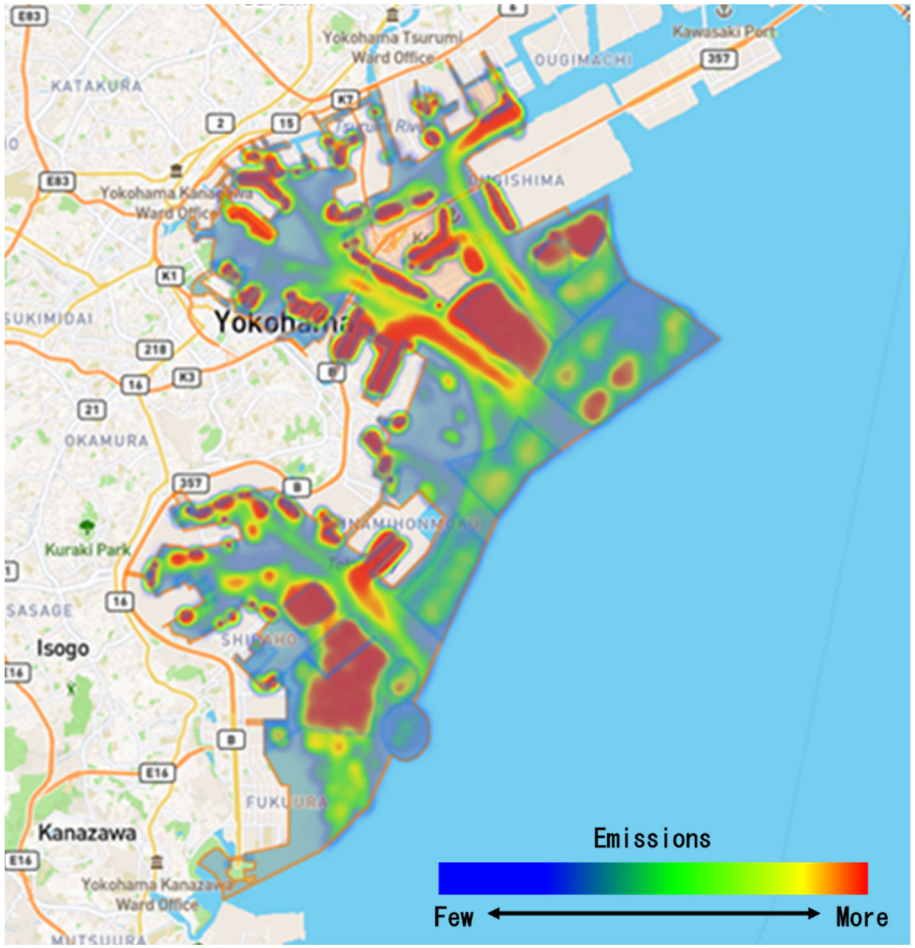
1-2. GHG emissions from vessels in the port area of the Port of Yokohama



- The Port of Yokohama is first in Japan to adopt RIGHTSHIP's Maritime Emissions Portal.
- We keeps track of greenhouse gas emissions and environmental pollutants from vessels operating in Yokohama port. We intend to further analyze the locations of GHG emissions.

Mode	CO_2 emissions(t)	CO_2 Equivalent(t)
At berth (alongside)	187,556	191,349
Anchored (anchorage)	48,838	49,540
Maneuvering	70,349	71,433
Total	306,743	312,341

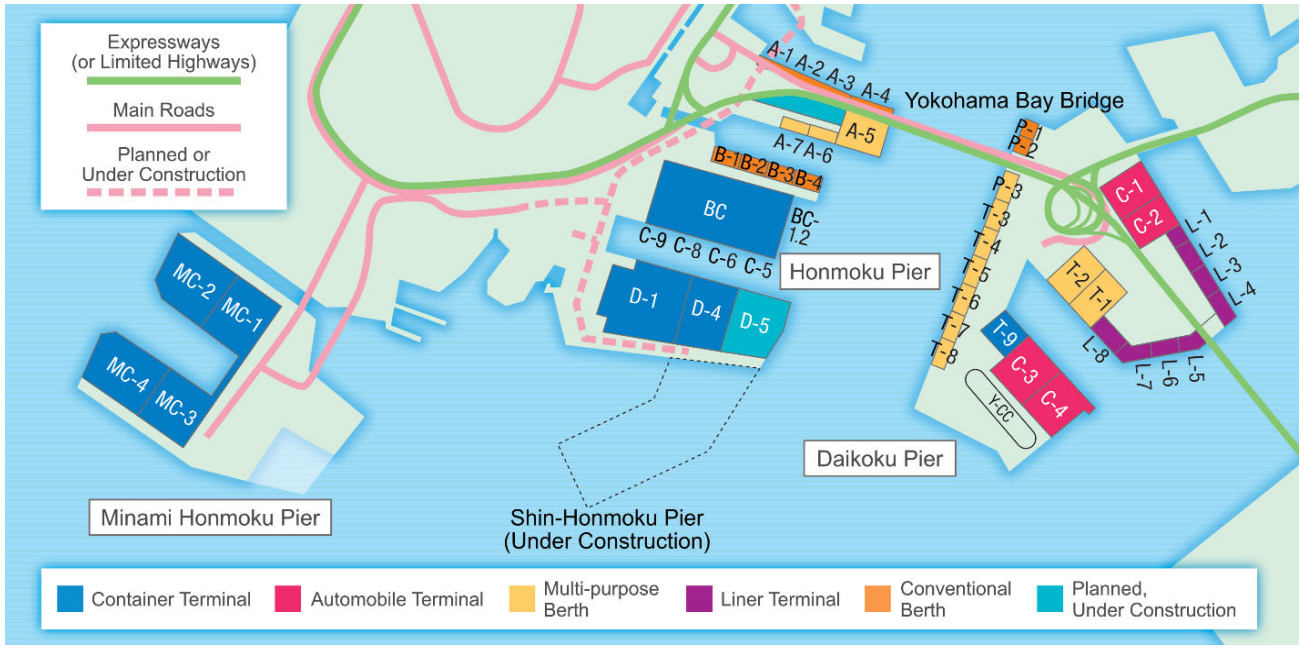
(As of 2024)

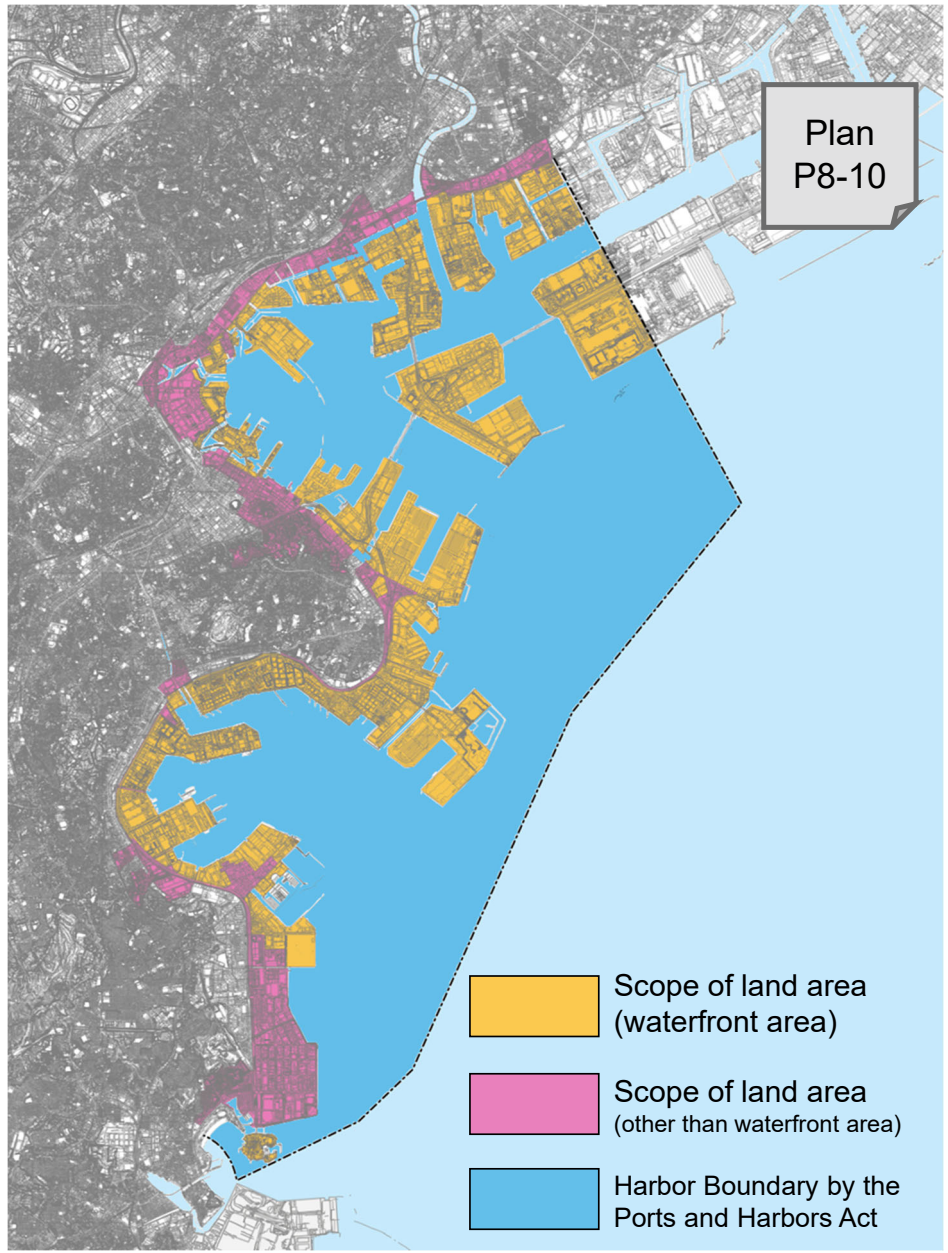
Name	Amount (t/year)
CO_2	308,147
N_2O	16
CH_4	53
SOx	891
NOx	3,523
PM2.5	123
PM10	134

2. Scope, terms and goals

2-1. Scope of the Plan

- The scope of this plan is shown in the figure on the right.
- Part of the six waterfront wards of Yokohama City (set by town and street) and the sea area separated by the port boundary according to the Port and Harbor Law.
- The figure below shows the main public terminals.





2. Scope, terms and goals

2-2. Terms and goals of the Plan

- In base year (FY2013), GHG emissions from the Yokohama waterfront area are approx. 9.09 million tons.
- To aim 4.8 million t-CO2/year in FY2030 (reduced by 47% from FY2013)
- To aim 2.4 million t-CO2/year in FY2040 (reduced by 74% from FY2013)
- Aim for Net zero emissions in FY2050.

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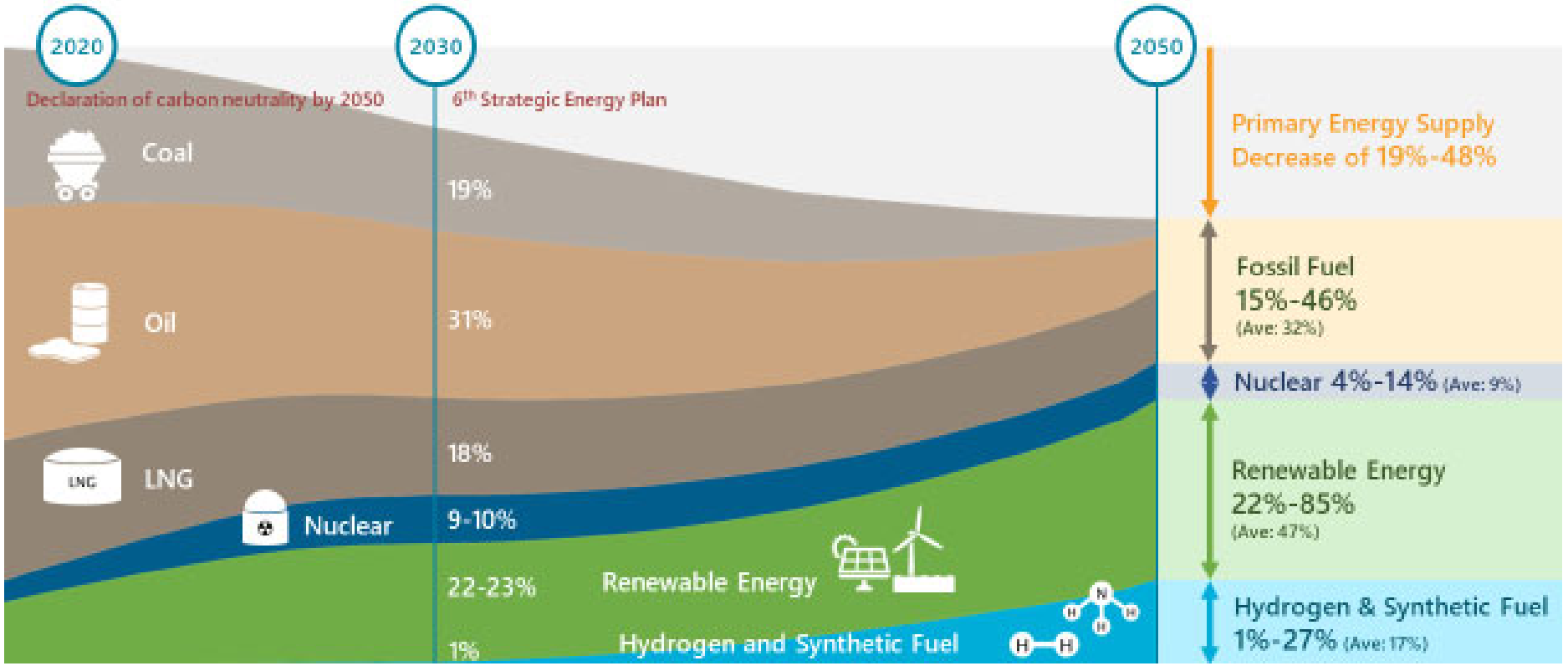
KPI	Target values		
	Short-to-medium term (FY2030)	Medium term (FY2040)	Long term (FY2050)
① Carbon dioxide emissions from the Yokohama waterfront area	4.8 million t-CO2/year (reduced by 47% from FY2013)	2.4 million t-CO2/year (reduced by 74% from FY2013)	Net Zero t-CO2/year
② Preservation, reproduction and creation of blue infrastructure (CO2 absorption)	Approx.150 t-CO2/year	Approx. 200 t-CO2/year	Approx. 250 t-CO2/year

2. Scope, terms and goals

2-3. Our original Estimated Forecast of Primary Energy Supply Outlook in 2050

We examined the original primary energy supply outlook for 2050 by utilizing several scenarios published by several research institutes and consulting firms, because the national government does not present.



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3. Basic policy

①Policies for decarbonization of the waterfront area

This initiative, led by companies located in the Yokohama waterfront area, will promote energy conversion using hydrogen and hydrogen derivatives (methanol, ammonia, synthetic methane, etc.), introduction of renewable energy, introduction of energy-saving facilities, and development of new technologies.

②Policy for decarbonization initiatives at the terminals

As a strategic international container port, this is an initiative to promote decarbonization at public terminals such as container terminals and to become a port of choice.

③Policy for efforts for the creation of an abundant ocean

Promote the use of blue carbon ecosystems, including the formation of seaweed beds and shallow water.

Plan
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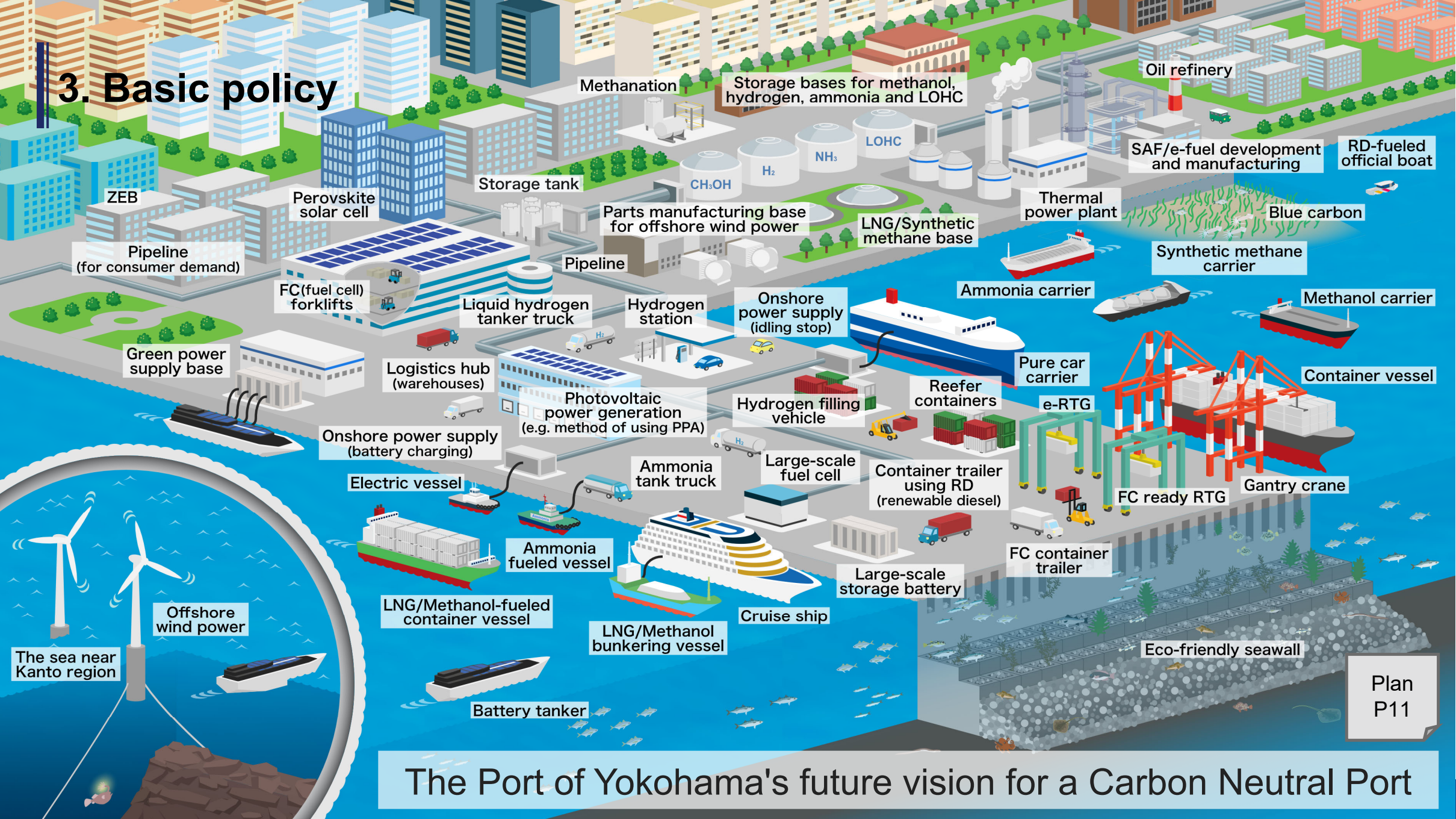
3. Basic policy



The Port of Yokohama's future vision for a Carbon Neutral Port

4. Yokohama Port CNP Council

The Council and other bodies will meet regularly to discuss how to promote this plan and to confirm and evaluate its progress.

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Yokohama Port CNP Council			
Companies and Organizations	AGC, docomo business, ENEOS, TOAGOSEI, idemitsu, TOSHIBA, MIZUHO, jera, TOKYO GAS, Ocean Power Grid, J-POWER, NISSHIN Oillio, HITACHI Inspire the Next, Ohgishima Power, NISSAN MOTOR CORPORATION, MITSUI E&S, IHI, NYK LINE, JFE Holdings, Inc., JFE Steel Corporation, JFE Engineering Corporation, MITSUBISHI HEAVY INDUSTRIES, MITSUBISHI GAS CHEMICAL, MUFG, YKIP		
Academic Experts	Dr.Takeo Kikkawa, President, International University of Japan [chair] Dr.Akihisa Kuriyama, Research Manager, Institute for Global Environmental Strategies		
Administrative Agencies	MLIT Ministry of Land, Infrastructure, Transport and Tourism	Office	Port and Harbor Bureau, City of Yokohama

4. Yokohama Port CNP Council

“Plan to lead the ports in Japan”

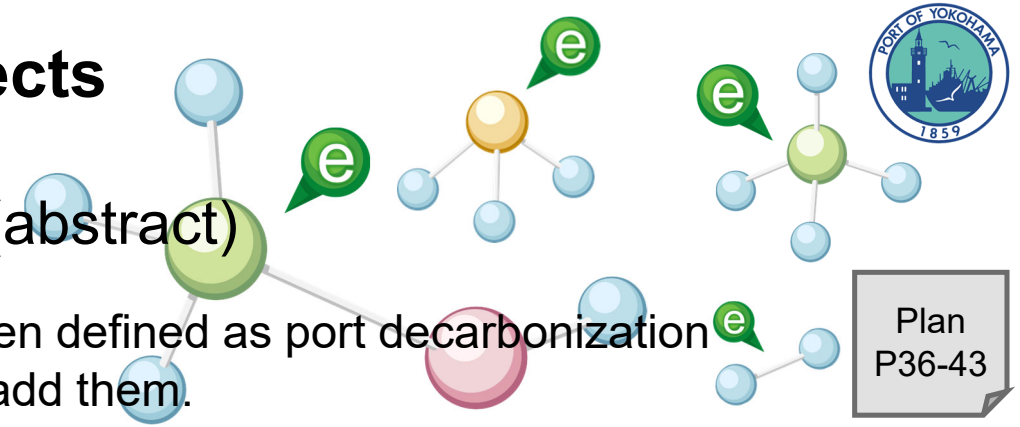
The Plan, which was recently formulated by the City of Yokohama, is leading the way in carbon neutral port projects that the government is promoting throughout Japan. There are several reasons for this.
The first is using green methanol to decarbonize container ship fuel, an initiative rarely seen in other ports.
The second is launching the Port of Yokohama Sustainable Finance Framework, which will target not only large corporations but also small and medium-sized enterprises (SMEs) for financial assistance.
The third is the fact that the Port of Yokohama waterfront area is envisioned to serve as a receiving site for power generated by floating offshore wind turbines that are planned to be constructed far offshore in Tokyo Bay.
These are all unique features that can only be found in the “Yokohama Port Plan”.
I hope that this plan, along with other measures, will be steadily implemented in society.（March 25, 2025）

Ph.D. Kikkawa, the Chairperson of Yokohama Port CNP Council

（President, International University of Japan;
Professor Emeritus, University of Tokyo and Hitotsubashi University）

5. Port decarbonization promotion projects

5-1. Efforts to decarbonize the waterfront area (abstract)



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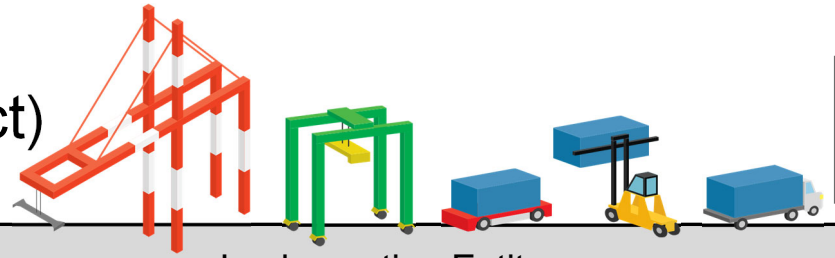
As of March 2025, **121 projects of 42 entities** have been defined as port decarbonization promotion projects. When there are new proposals, we will add them.

Initiatives	Implementing Entity
Decarbonization of building (multiple initiatives)	NTT Communications, Hitachi, MUFG Bank, etc.
Utilization of unused energy	TOA GOSEI
Solar Power Generation, Offshore Wind Power Generation	IHI, Toshiba Energy System & Solutions
Use of decarbonized electricity and fuels (CO2-free electricity, etc.)	AGC, Tokyo Gas, JFE Engineering, MUFG Bank
Updating generators and using, hydrogen and ammonia	The Nissin Oillio Group, etc.
Next Generation Fuel Bunkering	Mitsubishi Gas Chemical, Idemitsu Kosan
Synthetic methane supply	Tokyo Gas
Hydrogen use in LNG- and coal-fired generation	JERA, Electric Power Development(J-POWER)
Development and demonstration of various technologies	ENEOS, JFE Holdings, Ocean Power Grid, etc.

5. Port decarbonization promotion projects

5-2. Efforts to decarbonize the terminals (abstract)



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Initiatives	Implementing Entity
Energy-saving lighting equipment (LEDs, etc.)	Yokohama Kawasaki International Port Corporation, Yokohama Port Corporation, the City of Yokohama, etc.
Solar power generation, use of decarbonized electricity and fuels	Yokohama Kawasaki International Port Corporation, Yokohama Port Corporation, the City of Yokohama, etc.
Introduction of decarbonized cargo handling equipment	CMACGM Japan, APM Terminals Japan, Mitsui E&S, Yokohama Kawasaki International Port Corporation etc.
Next generation fuel Bunkering	the City of Yokohama, etc.
Decarbonization of vessels	NYK Line, Daito Corporation, the City of Yokohama
Installation of onshore power supply facilities	Yokohama Kawasaki International Port Corporation, the City of Yokohama etc.
Incentives for environmentally friendly vessels	the City of Yokohama

5. Port decarbonization promotion projects

5-3. Efforts to create an abundant ocean

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Initiatives	Implementing Entity
Preservation, reproduction and creation of blue infrastructure such as Seawalls, wave dissipating blocks, shallow areas, etc	the City of Yokohama, etc.

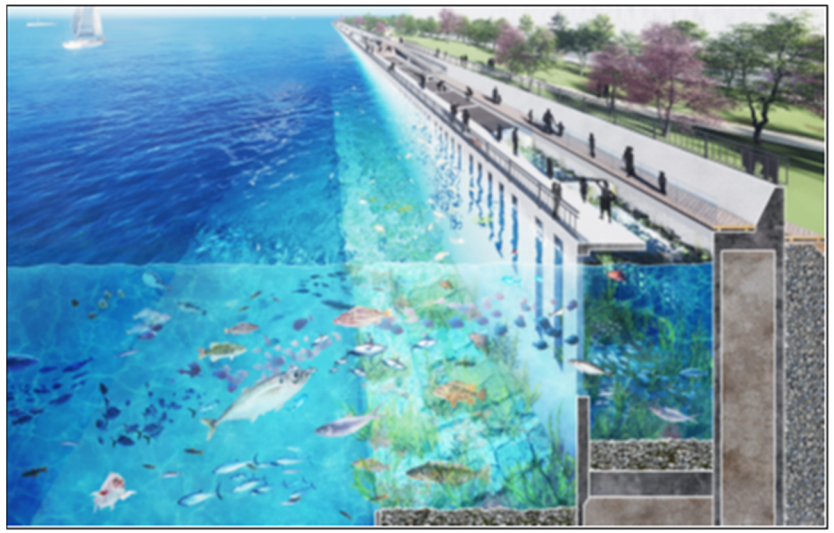
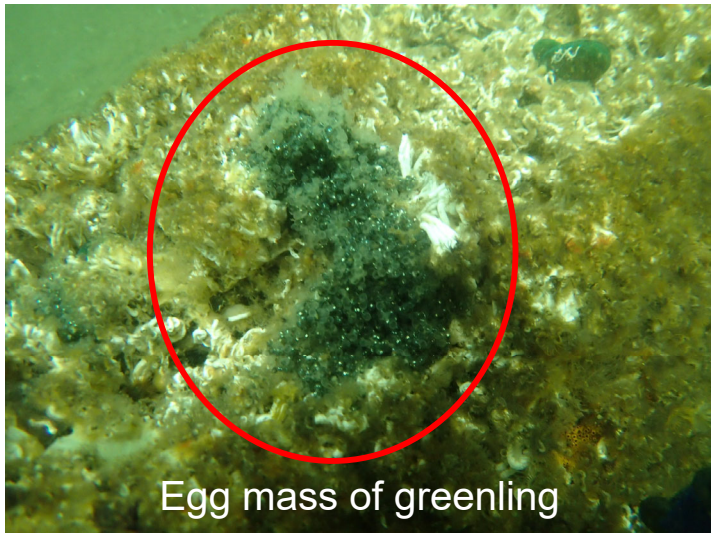
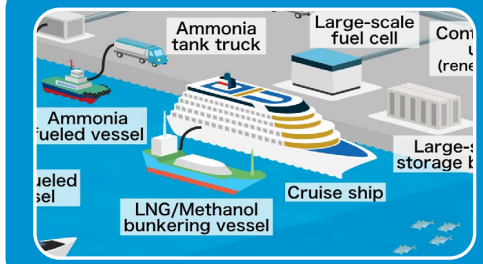


Image of a Eco-friendly seawall



The spawning of greenling (Hexagrammos otakii) was confirmed on an artificial structure placed on a seawall for the first time in Japan.

6. Three core pillars of our initiatives



6-1. Next generation energy ships and bunker service

We construct a supply system for methanol, ammonia, LNG, and other fuels is underway to accommodate a variety of next-generation marine fuels expected to be used in international shipping.

EXTERNAL REVIEW-VERIFICATION
DNV
Second Party Opinion

6-2. Sustainable Finance Framework

We launched the Port of Yokohama Sustainable Finance Framework based on international standards. The framework will target not only large corporations but also small and medium-sized enterprises (SMEs).

6-3. Research how to supply green power from offshore wind power generation to the waterfront area of Yokohama

We clarified the concept that Yokohama waterfront area is envisioned to be a hub for receiving electricity from floating offshore wind power generation facilities that are expected to be constructed in Japan’s EEZ area in the future.

6. Three core pillars of our initiatives

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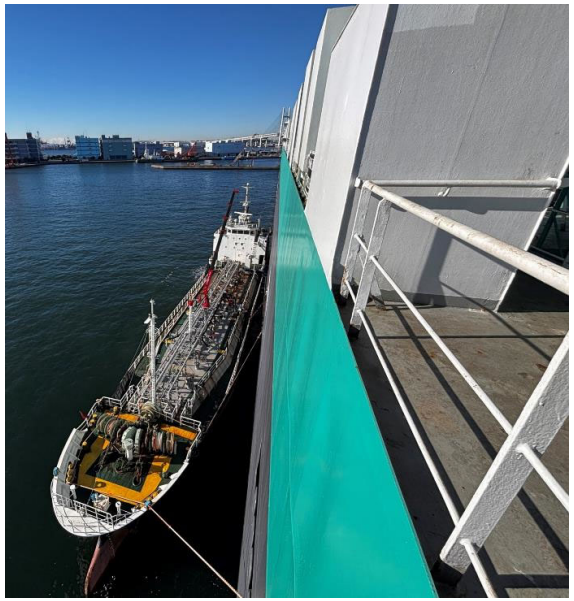
6-1. Next generation energy ships and bunker service



Methanol	**Bio**	**Ammonia**
All Electric	**LNG**	

6. Three core pillars of our initiatives

6-2. Sustainable Finance Framework

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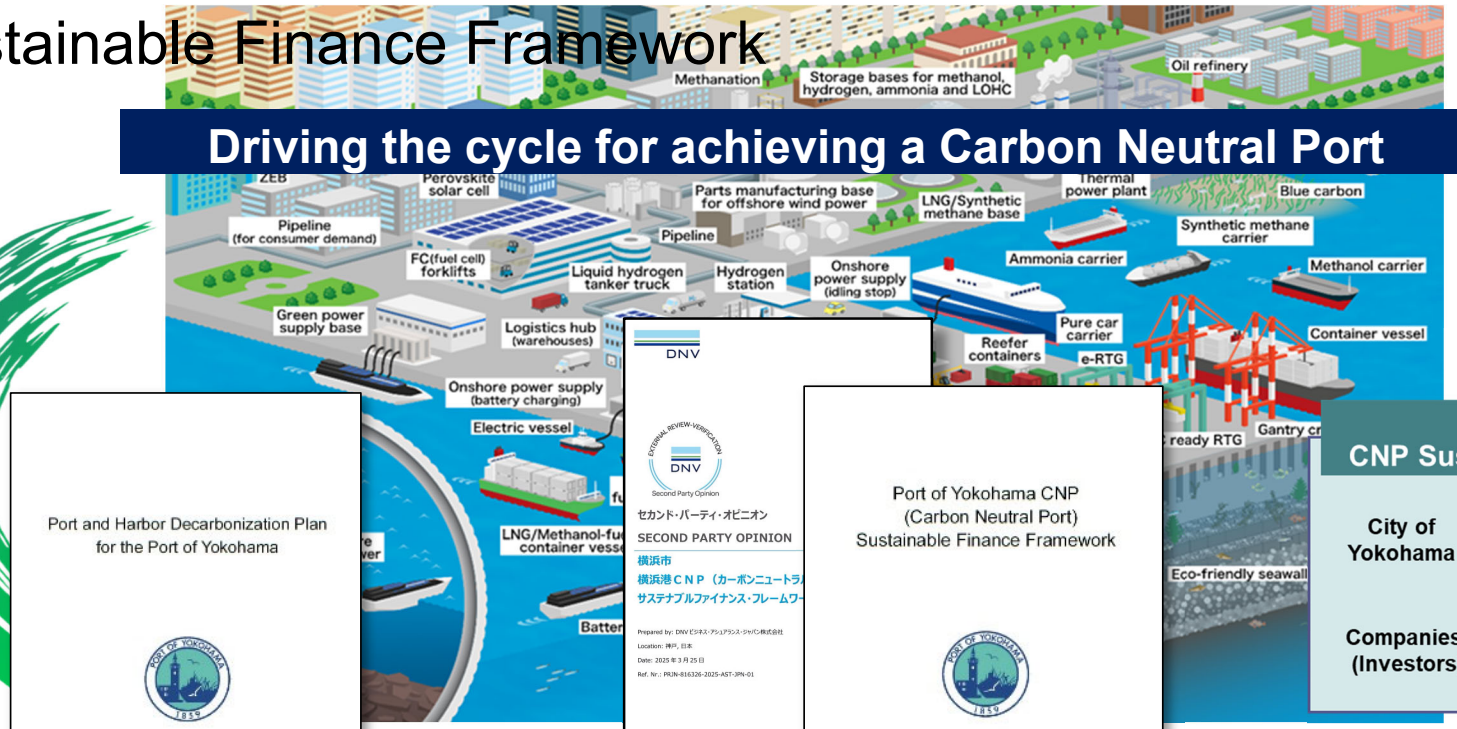
Driving the cycle for achieving a Carbon Neutral Port



Port and Harbor Decarbonization Plan for the Port of Yokohama

March 2025
City of Yokohama
(Port Management Body of the Port of Yokohama)

DNV

DNV
Second Party Opinion
セカンド・パーティ・オピニオン
SECOND PARTY OPINION
横浜市
横浜港ＣＮＰ（カーボンニュートラ
サステナブルファイナンス・フレームワー

Port of Yokohama CNP
(Carbon Neutral Port)
Sustainable Finance Framework

March 2025
City of Yokohama
(Port Management Body of the Port of Yokohama)

①A project is added to the Decarbonization Plan

②Utilize Sustainable FW made by the City of Yokohama

③Access to sustainable financing

6. Three core pillars of our initiatives

Plan
P55-56

6-2. Sustainable Finance Framework

Daito Corporation signs first financing agreement utilizing “the Port of Yokohama CNP Sustainable Finance Framework”. This is the first contract to utilize the framework and the first case in Japan where a private company utilizes such a framework developed by a local government.

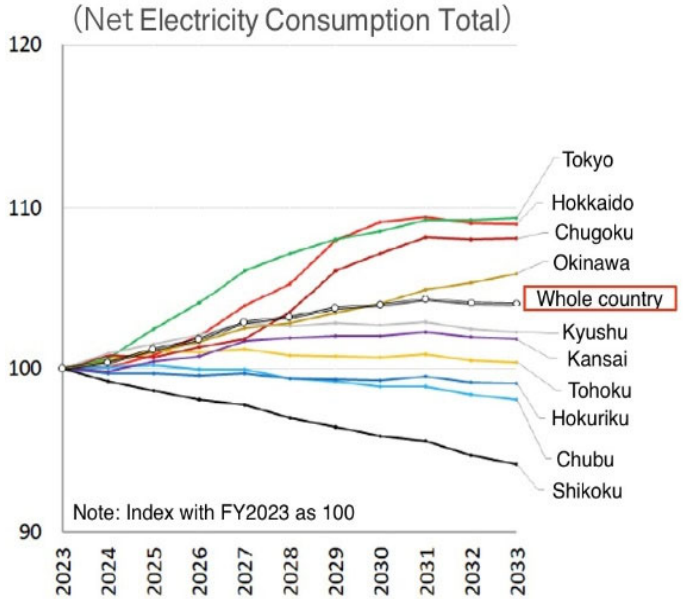
Summary of Loan Agreement for Green Loan	
Borrower	Daito Corporation
Lender	Mizuho Bank
Contract amount	950 million yen
Date of Contract	March 25, 2025
Use of funds	Electric tugboat construction fund

6. Three core pillars of our initiatives

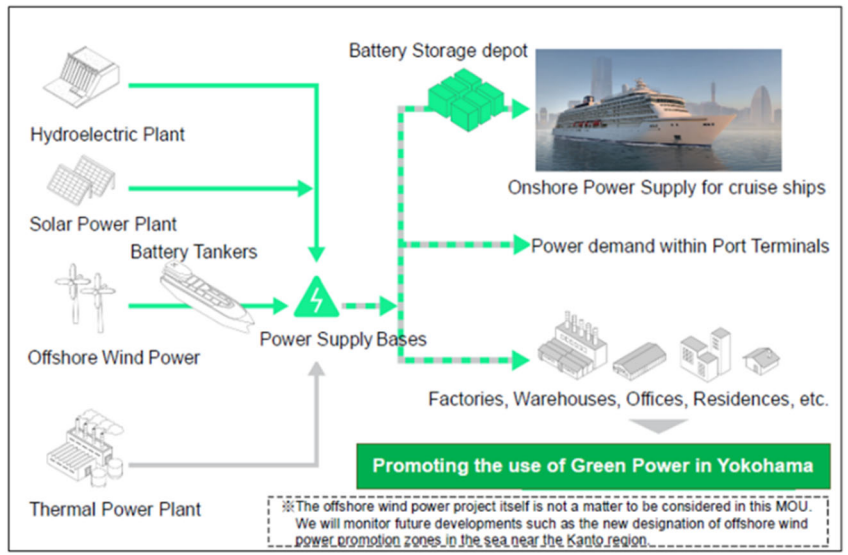
6-3. Research how to supply green power from offshore wind power generation to the waterfront area of Yokohama

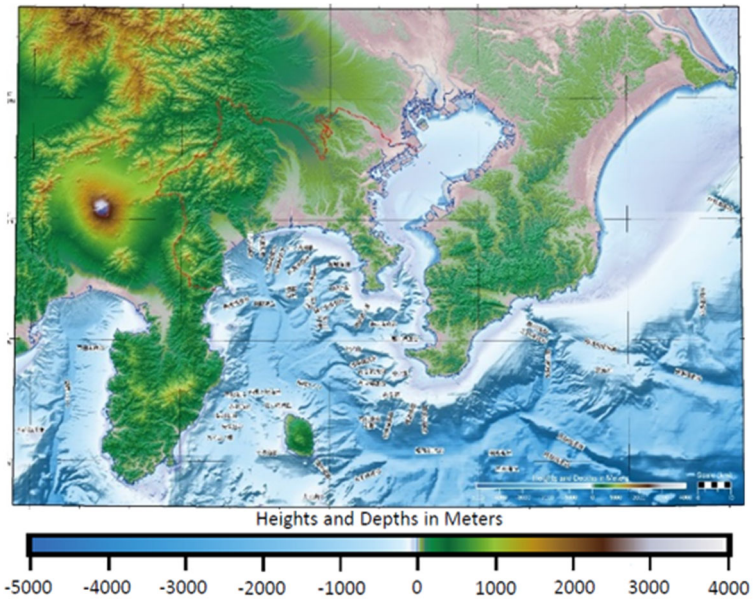
Plan P57-59

・Forecast of future electricity



・Expectations for Battery Tankers and Floating Offshore Wind Power





Hokkaido has the highest rate of increase, but Tokyo has by far the largest increase (OCCTO FY2025 estimated demand)

While the Japanese government is considering a system that will allow offshore wind power generation to be deployed in the exclusive economic zone (EEZ), it is said that it is difficult to lay submarine cables because Japan's waters are deep.

6. Three core pillars of our initiatives

6-3. Research how to supply green power from offshore wind power generation to the waterfront area of Yokohama

Plan P57-59

- In January 2025, the City of Yokohama signed a MOU with TEPCO Power Grid, Inc., Ocean Power Grid, Inc, TODA CORPORATION, and MUFG Bank, Ltd.
- Finding ways to supply green power through offshore wind power generated in the Yokohama waterfront as well as the regional co-creation of industries related to offshore wind power generation projects.
- The Seventh Basic Energy Plan offers a path to maximize the introduction of renewable energy as a main source of power.
- Promotion of the use of floating offshore wind power and battery tankers in waters deeper than 300 meters.

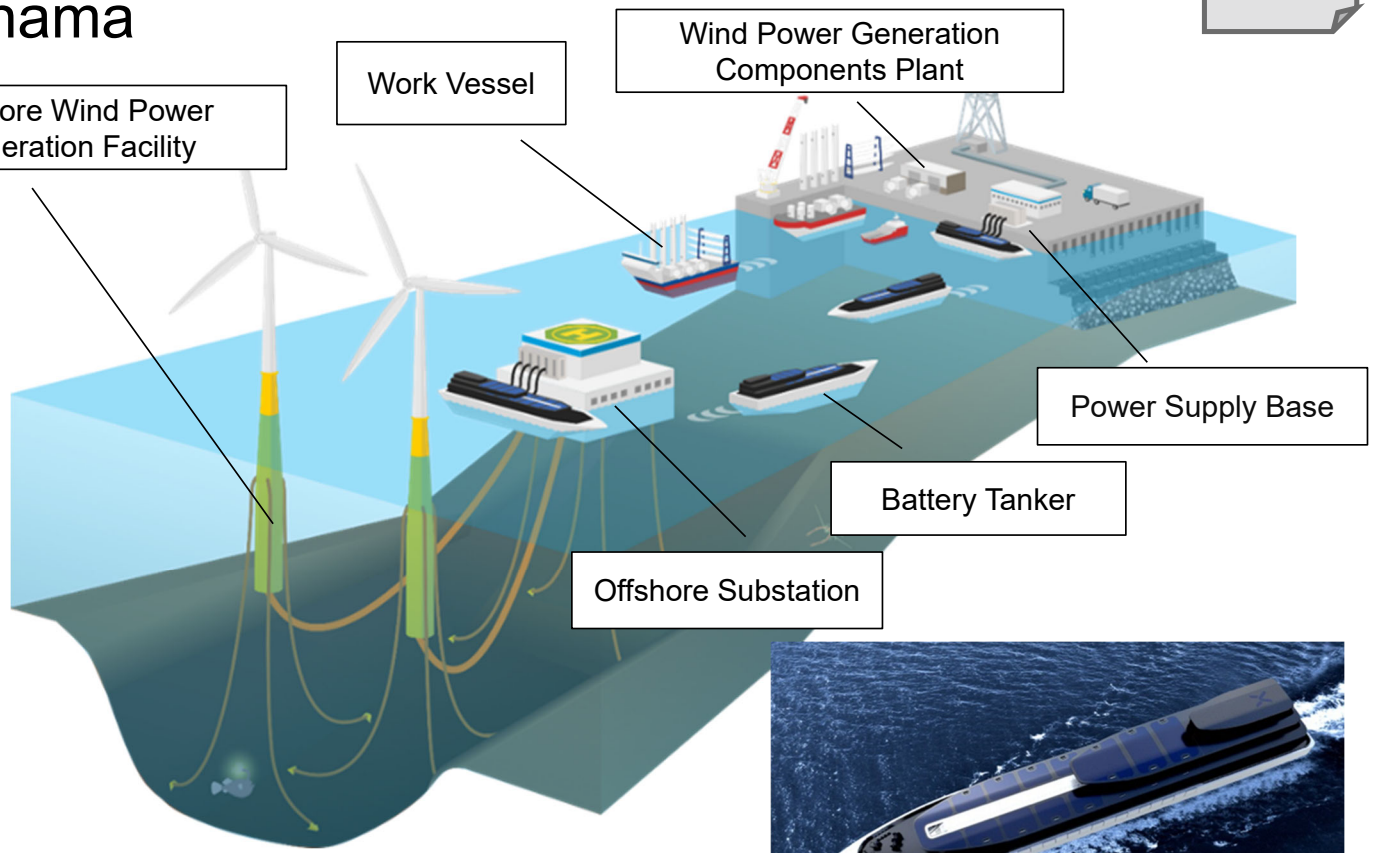


Image of Battery Tanker

6. Three core pillars of our initiatives

6-3. Research how to supply green power from offshore wind power generation to the waterfront area of Yokohama

Plan
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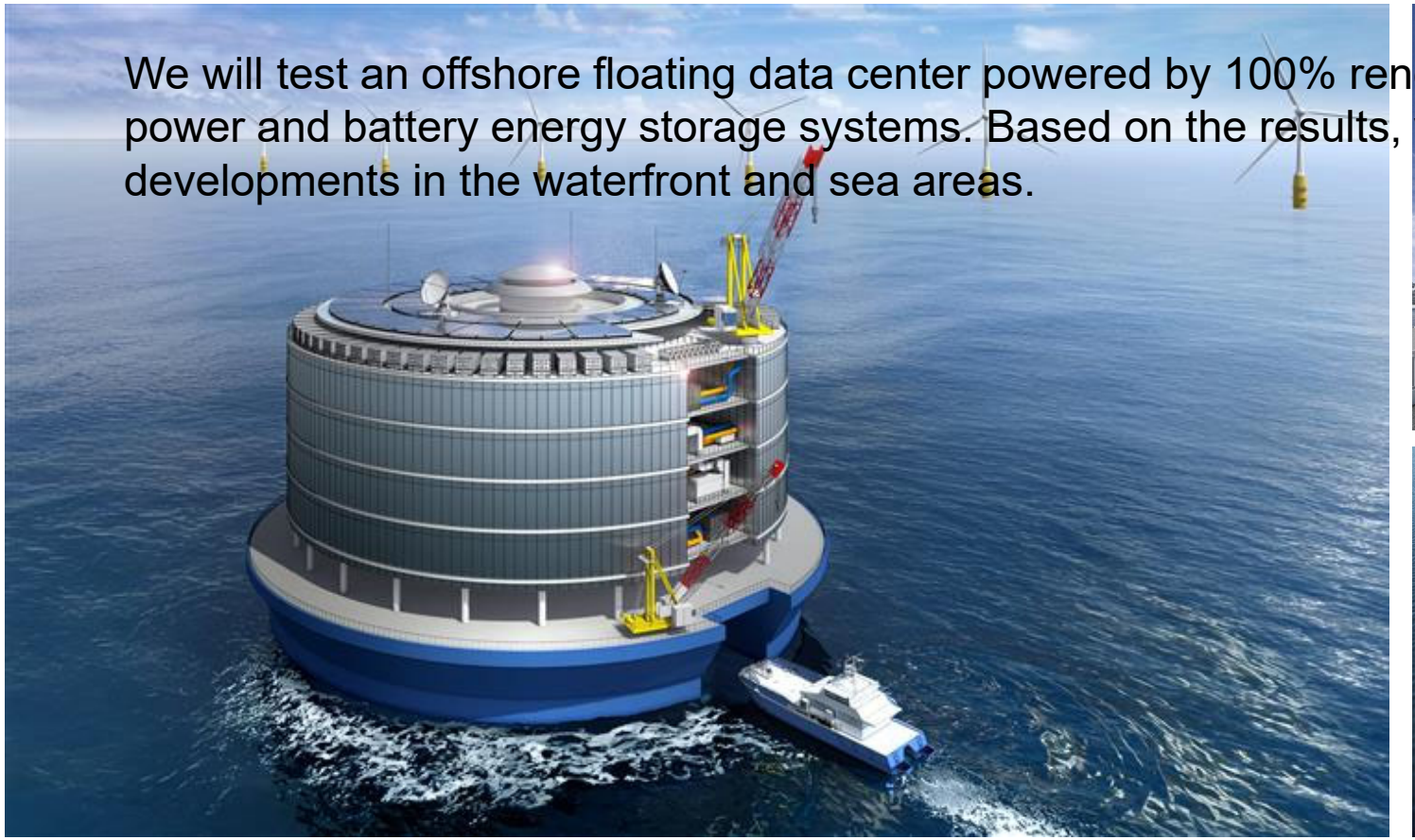
We will test an offshore floating data center powered by 100% renewable energy generated by solar power and battery energy storage systems. Based on the results, we will explore further developments in the waterfront and sea areas.



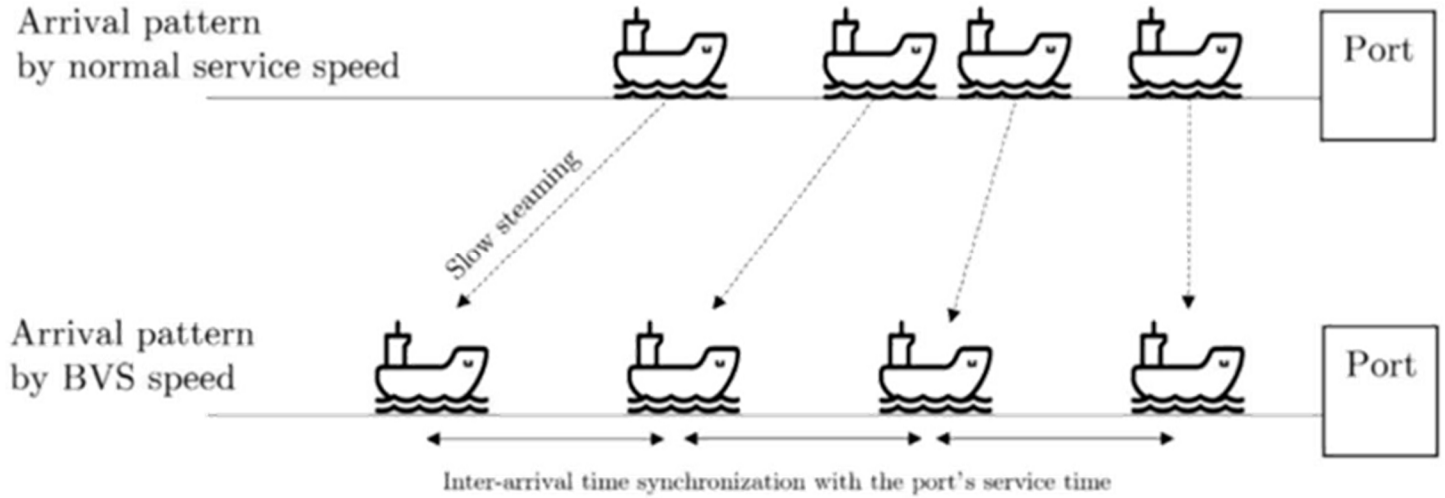
7. International partnership and local community cooperation

7-1. Participation in the Blue Visby Consortium (https://bluevisby.com/)

Plan P17

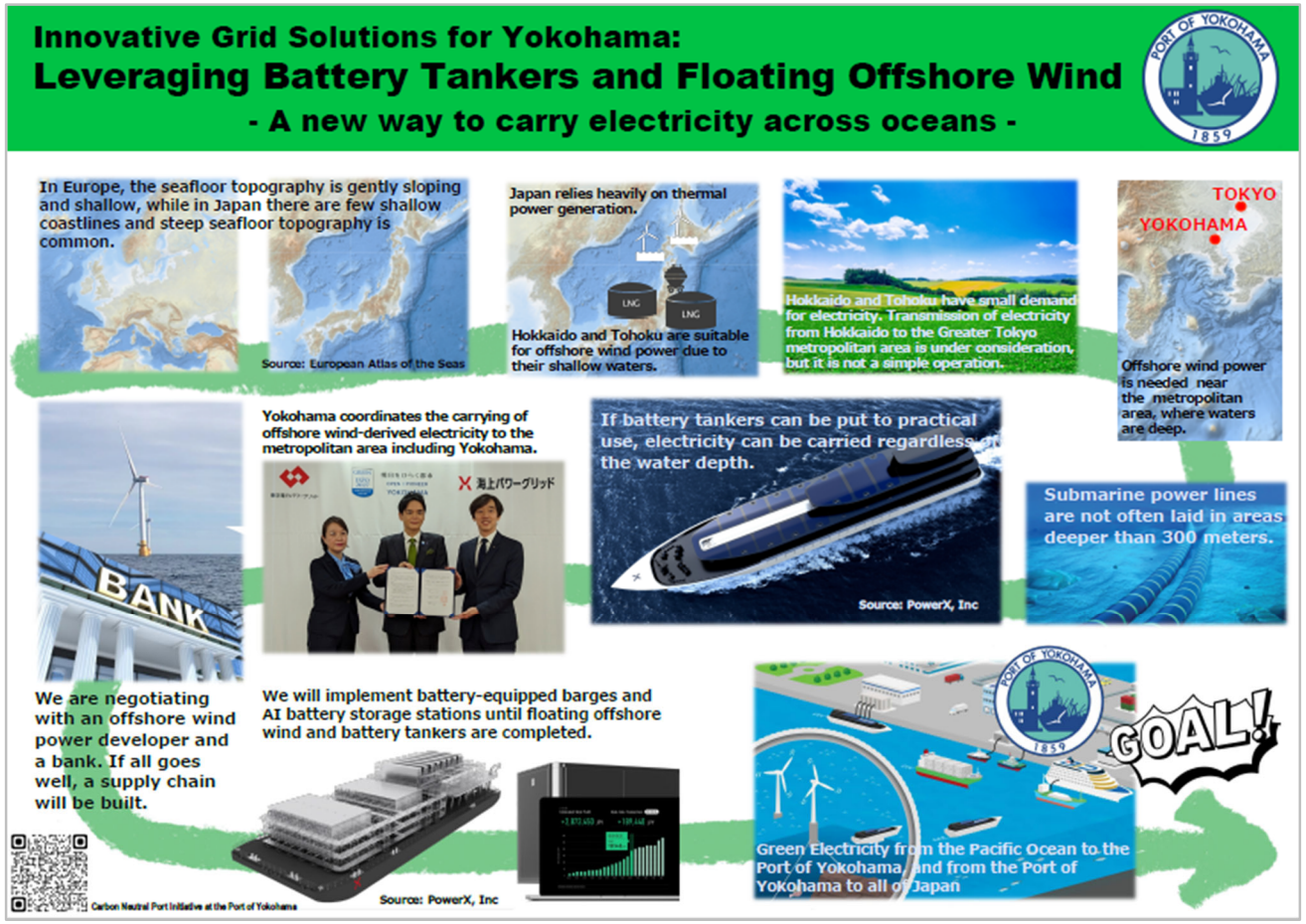
Yokohama has become the first port in Japan to join the Blue Visby Consortium, which aims to reduce greenhouse gas emissions from ships by using digital technology to optimize vessel navigation. In the shipping industry, it is customary to “Sail Fast, then Wait,” referring to the practice of reaching the destination quickly and waiting nearby, resulting in more greenhouse gas emissions. According to the Consortium's analysis and empirical studies, if a fleet of vessels jointly adjust their sailing speed and arrival time, it is possible to reduce greenhouse gas emissions by 15% or more.

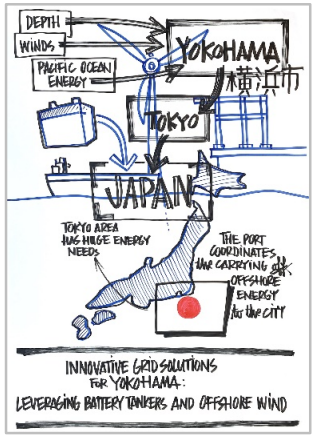
BLUE VISBY SOLUTION



7. International partnership and local community cooperation

7-2. Collaboration with international NGOs such as C40 and Pacific Environment, etc.





7. International partnership and local community cooperation

7-3. Working with the citizens of Yokohama

Event to introduce children to the “Sea Work”

Activities to plant eelgrass with citizens

Carbon-Neutral Port Initiatives of Port of Yokohama

Japanese

English

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Mail：kw-seisaku@city.yokohama.lg.jp