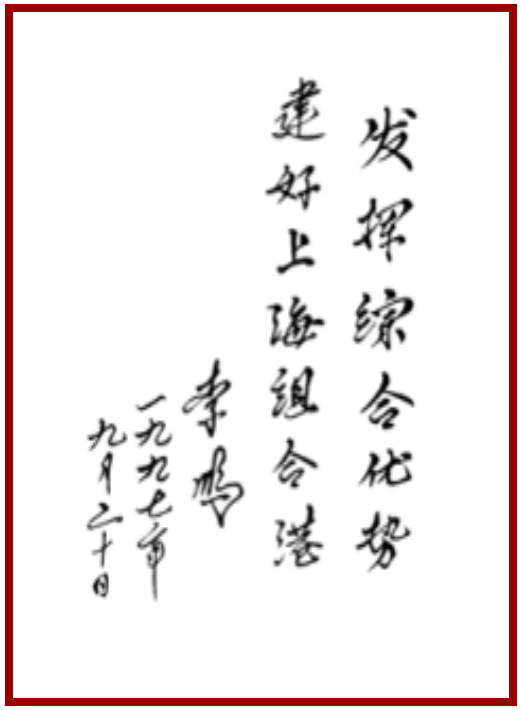
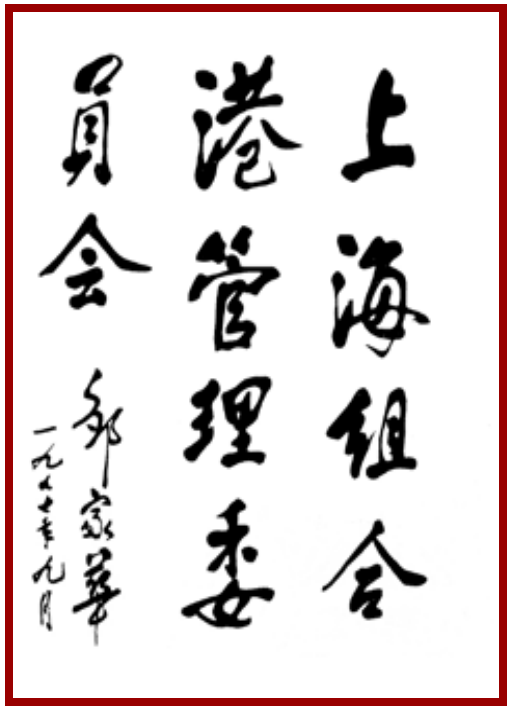
Commercial Operation Status of Full Electric Inland Waterway Vessels at Shanghai Port

COSCP
上海组合港管理委员会办公室
Commission Office of Shanghai Combined Port





- In 1997, the State Council made a major strategic decision to build the Shanghai International Shipping Center with Shanghai as the main body and Jiangsu and Zhejiang as the two wings. It was decided that the Ministry of Transport, Shanghai Municipality, Zhejiang Province, and Jiangsu Province would jointly establish the Shanghai Combined Port Management Committee.

Policies: The "Dual Carbon" strategic goals (carbon peak and carbonneutrality) and the Green and Low-Carbon Initiative for Transportation.

- In June 2022, the Ministry of Transport and three other ministries, in their implementation guidelines for the *Opinions of the CPC Central Committee and the State Council on Fully and Accurately Applying the New Development Philosophy and Doing a Good Job in Carbon Peaking and Carbon Neutrality*, explicitly proposed to **carry out pilot projects for fully electric vessels in an orderly manner** and to **promote the application of clean-energy ships**.
- In September 2022, the Ministry of Industry and Information Technology, the National Development and Reform Commission, the Ministry of Finance, the Ministry of Ecology and Environment, and the Ministry of Transport jointly issued the *Implementation Opinions on Accelerating the Green and Intelligent Development of Inland Waterway Vessels*, which clearly call for **accelerating the development of battery-powered ships.**

中共中央、国务院印发的

《关于完整准确全面贯彻新发展理念做好碳达峰碳中和工作的意见》

10月24日发布

提出五方面主要目标：

构建绿色低碳循环发展经济体系

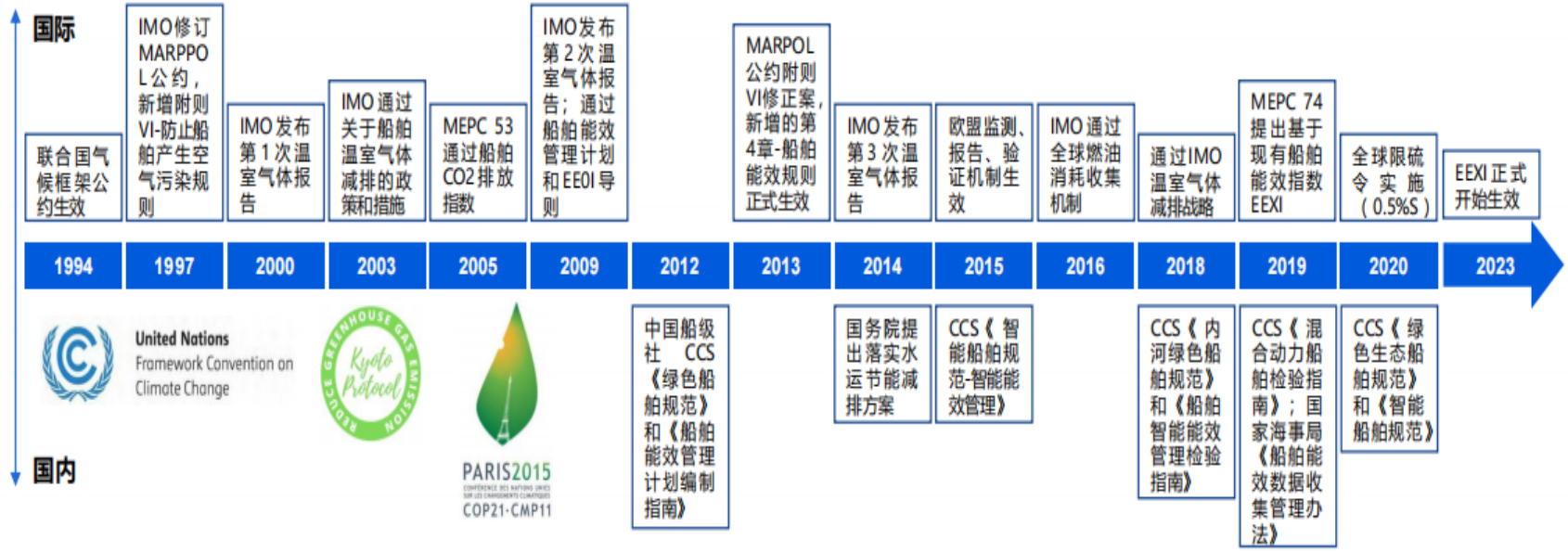
提升能源利用效率

提高非化石能源消费比重

降低二氧化碳排放水平

提升生态系统碳汇能力

图：历年来国际及国内与船舶领域节能减排相关的政策推进情况



- **As of now, there are 22 operational electric cargo ships in the Yangtze River Delta. Specifically, there are 2 in Shanghai (COSCO Green Water 01 and 02), 5 in Jiangsu Province (Jiangyuan Baihe, Jiangyuan Jinling, Yiangangji 001 and 002, Zhongtiandianyun 001), 13 in Zhejiang Province (Zhegang Neihe 001, 060, 080 and 10 ships in the Huzhou area), and 2 in Anhui Province (Ganghang Chuantu, Chuanchuan Yangtze River 001).**

700TEU

120TEU

64TEU

1,000 - tonnage bulk cargo

64TEU

96TEU

108TEU

3,000 - tonnage bulk cargo

- As of the end of 2024, there are approximately 150 electric ship charging facilities in the Yangtze River Delta, but most of them are electric passenger ship charging piles. There are a total of approximately 24 charging and battery swapping stations serving electric cargo ships, including 1 in Shanghai, 9 in Jiangsu (6 charging stations and 3 battery swapping stations), 9 in Zhejiang (all charging stations), and 5 in Anhui Province (3 charging stations and 2 battery swapping stations).

Shanghai

No.	Location	Specification	Remarks
1	Yangshan Shengdong Terminal	Charging and battery swapping station	Provides battery swapping services for COSCO Green Water 01 and 02

Zhejiang

No.	Location	Specification	Remarks
1	Changxing Power Plant Wharf	450kW	Provides charging services for "Dongxing 100"
2	Changxing Jietong Wharf	500kW	
3	Balidian Qiancun	500kW	
4	Changxing Lushan Water Service Area	720kW×2	
5	Chengdong Water Service Area	500kW	
6	Hengtangqiao Water Service Area	800kW	

Jiangsu

No.	Location	Specification	Remarks
1	Suzhou Taicang Port Area	Charging and battery swapping station, 720kW×2	Provides charging and battery swapping services for the "Jiangyuan Lily" vessel
2	Nanjing Port Longtan Port Area	Charging and battery swapping station 500kW×8	Provides battery swapping services for COSCO Green Water 01 and 02
3	Nantong Port Tonghai Port Area	Charging station 500kW	
4	Yancheng Inland Port Area	180kW	Provides charging services for "Yancangji 001" and "Yancangji 002"
5	Dafeng Port Area	180kW×2	
6	Xuzhou Port Shundihe Port Area	500kW×2	Provides charging services for "Jiangyuan Jinling" and "Jiangyuan Qinhuai" vessels
7	Suqian Port Central Port Area	500kW×4	
8	Huaian New Port	500kW×2	
9	Yangzhou Yuanyang Wharf	500kW×2	

Anhui

No.	Location	Specification	Remarks
1	Xuancheng Huijin Wharf	400kW	Constructed by Chuanchuan Shipbuilding Engineering (Xuancheng) Co., Ltd.
2	Wuhu Southern Wharf	400kW	
3	Chaohu Diaoyu Wharf	400kW	
4	Chaohu Lida Wharf	400kW	
5	Hefei Majiadu Wharf	400kW	
7	Wuhu Port	Charging and battery swapping station, 720kW	Provides charging services for the "Ganghang Chuantu 01" vessel
8	Hefei Paihe Wharf		

Demonstration Route Selection

Comprehensive consideration:

- Cargo transportation in inland ports of the Yangtze River Delta;
- Basic conditions for container transportation in the Yangtze River Delta;
- Inter-provincial waterway freight transportation in the Yangtze River Delta.

Conclusion:

- Container transportation is concentrated in the inland waters of Shanghai, Southern Jiangsu, Northern Jiangsu, and Northern Zhejiang;
- A container transportation channel has been formed from Northern Zhejiang to Shanghai Port, Northern Zhejiang to Jiaxing Seaport, and Southern and Northern Jiangsu to Taicang Port and Shanghai Port;
- In terms of the number of ships, the Beijing-Hangzhou Canal is particularly prominent, and the combined transport scale of container transport from Northern Zhejiang and Southern Jiangsu to Shanghai Port and from Northern Zhejiang to Jiaxing Seaport is the largest.

Inter-provincial waterway freight transportation in the Yangtze River Delta

Serial number	Cross-provincial direction	Channel name	Freight volume (TEU, 10,000 tons)	Number of ships (10,000)
1	Shanghai ⇋ Jiangsu	Northern Jiangsu Canal	9000	18
		Southern Jiangsu Canal	2 million TEU	2
2	Shanghai ⇋ Zhejiang	Hujiashen Line	8000	21
		Hangzhen Line	8000	21
		Hangpingshen Line	4500	9.5
3	Shanghai ⇋ Anhui	Wushen Line	1500	5
4	Zhejiang ⇋ Jiangsu	Hanghuxi Line	6000	10
		Beijing-Hangzhou Canal	4000	23.5
		Changhushen Line	2800	12
		Zhajiasu Line	2000	8
		Dongzong Line	1500	5
5	Zhejiang ⇋ Anhui	Extension of Changhushen Line	5000	8
		Xin'an River ~ Fuchun River Channel	4500	6
6	Jiangsu ⇋ Anhui	Jianghuai Canal	8500	12
		Heyu Line Channel	7000	10
		Huaihe Main Line	7500	5

Electric passenger ships are booming and operating smoothly at Shanghai Port.

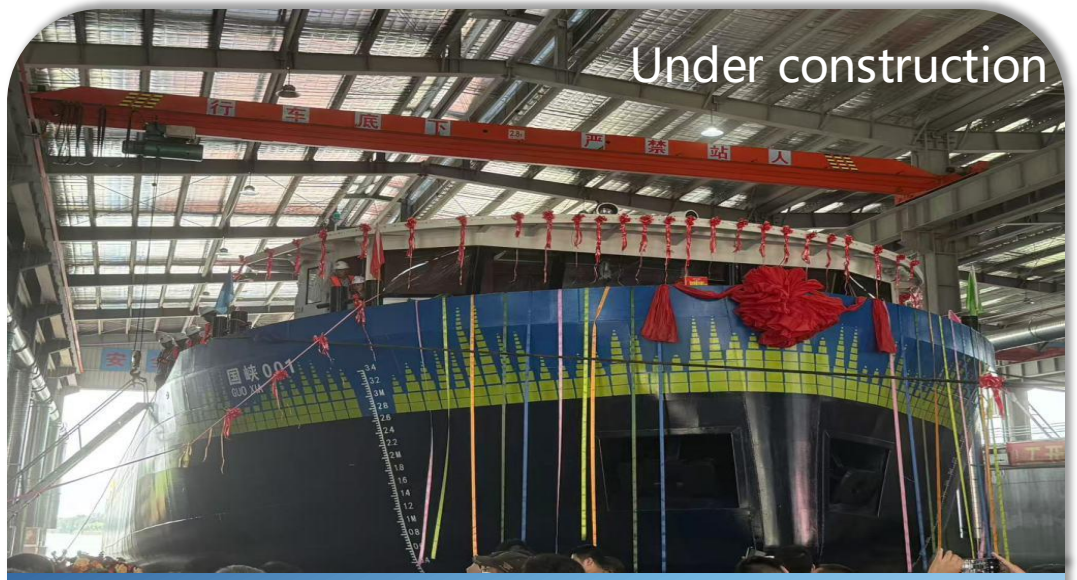
Passenger ship company	1 vehicle-passenger ferry (2022)	Changxing Island to Hengsha Island Ferry	1 charging station	165 passengers + 30 family cars
Pujiang Tourism Company	1 tour boat (2023)	Huangpu River Water Tourism	1 charging and battery swapping station	Capacity of 150 passengers
Suzhou River Tourism Company	18 small tour boats (2022-2023)	Suzhou River Sightseeing Tour	7 docks 54 charging piles	
Ferry Company	2 ferry boats (April 2025)	Jinling East Road Ferry to Dongchang Road Ferry	2 charging stations	

The steady rollout of electric cargo vessels has begun in Shanghai.

In operation

2 × 700 TEU river–sea electric container ships (Nanjing–Nantong–Shanghai Yangshan route); Yangshan terminal: 3 battery swap/charging units, total power 2,700 kW

Under construction



1 × 64 TEU multipurpose vessel (Huangpu–Dazhi, building materials) + 1 charging; station1 × 64 TEU container vessel (Zhejiang–Shanghai) + 1 charging station

Three Key Actions to Accelerate Electric Ship Development

01

Formulate support policies: subsidize electric vessels at 30% of the cost of their propulsion systems (40% for passenger vessels in operation), and provide an electricity subsidy for charging facilities of up to 0.4 CNY per kWh.

02

Implement the "Two New" policy: subsidies to phase out and renew old vessels, plus an online system for fully digital processing and automatic fund release.

03

Strengthen city–district coordination: work with key shipping clusters (Pudong, Lingang, Hongkou, etc.) and relevant departments to track enterprise needs, provide end-to-end services, and attract firms.

Next Steps: Focusing on Standards, Infrastructure, and Incentives for Electric Vessels.

国家标准

Formulate Technical Standards: Coordinate with the Yangtze River Delta to unify the interfaces and protocols of charging and battery swapping facilities

Promote Collaborative Legislation: Formulate the "Shanghai Electric Ship Safety Management Measures" to explore integrated legislation in the Yangtze River Delta

Publish Layout Report: Lead the three provinces and one city to formulate the "Research Report on the Layout of Charging and Battery Swapping Stations in the Yangtze River Delta"

Accelerate Site Construction: Shanghai will promote the completion of 2-3 charging and battery swapping stations from 2025 to 2027

Key Layout Areas: Dazhi River Wharf (to be completed within the year), Huangpu River Minhang Water Area (underway), Xuanqiao/Jishuigang Service Area, Waigaoqiao Port Area (to be promoted)


THANKS!

T&E - PORTS ELECTRIFICATION WORKSHOP
CONNECT TO THE SUSTAINABLE PORT

RYAN CORNELISSE · PROGRAM MANAGER

PORT OF ROTTERDAM

At a glance, general info

42 KM
PORT AREA

12,500 HA
TOTAL AREA

8,000 HA
LAND AREA

4,500 HA
WATER AREA

75 FT (= 24 M)
MAX DEPTH

€29.6 BILLION
ADDED VALUE
2.9% OF DUTCH GDP

91,000
INLAND VESSELS PER YEAR

28,000
SEA-GOING VESSELS PER YEAR

AWARDED BEST PORT INFRASTRUCTURE

FRONTRUNNER IN SUSTAINABILITY

11TH PORT IN THE WORLD: 436 MILLION TONNES OF FREIGHT THROUGHPUT

LARGEST EUROPEAN PORT

CA. 192,000
DIRECT & INDIRECT JOBS

ENERGY TRANSITION: ACTIVITIES IN 4 PILLARS

PILLAR 1
EFFICIENCY & INFRASTRUCTURE

PILLAR 2
NEW ENERGY SYSTEM

PILLAR 3
A NEW RAW MATERIALS AND FUEL SYSTEM

PILLAR 4
SUSTAINABLE TRANSPORT
(-20% in 2030)

-55% CO_2 in 2030
(compared to 1990)

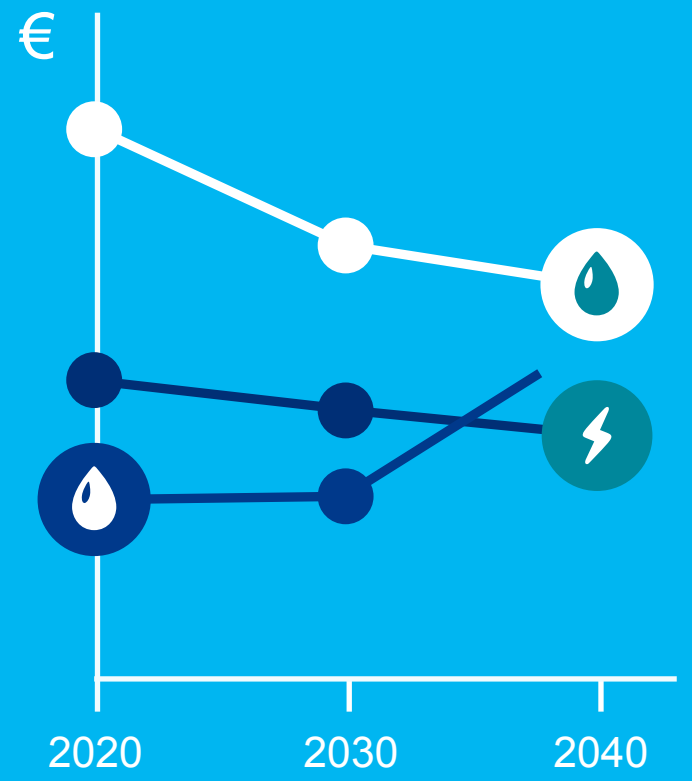
CO_2 NEUTRAL in 2050

Scope 3 – shipping emissions
-20% CO_2 IN 2030

Substantial role for shore power

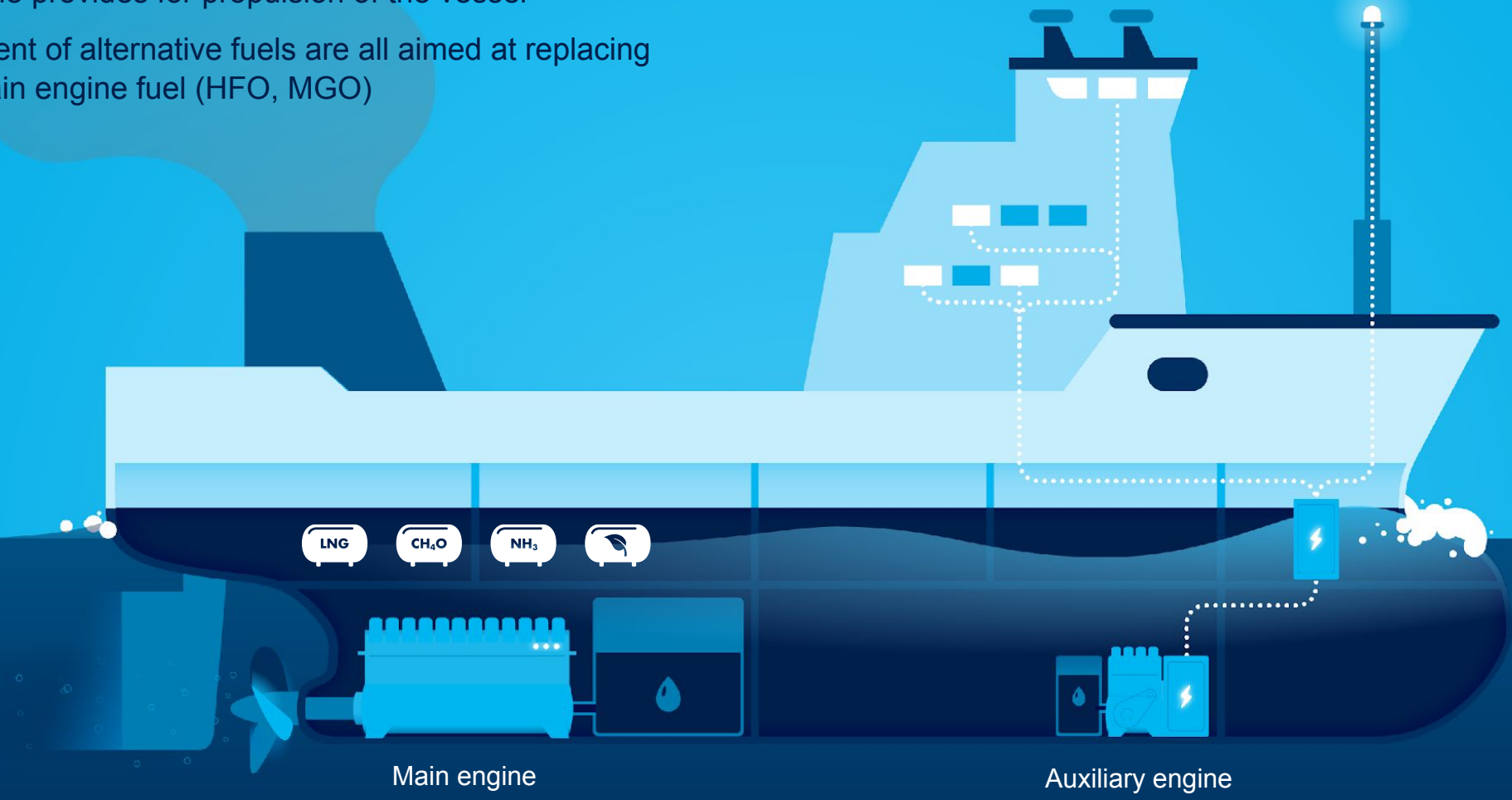
WHY SHORE POWER

- Internationally, shipping is becoming more sustainable.
- Regulations for 2030 and onwards.
- Cleanest form of energy for berthed ships.
- Eliminates local emissions: CO_2, FPM, N_2, methane and noise.
- Reduces total emissions of CO_2 drastiscally.
- Proven technology in USA, Nordics, a.o.
- Lower costs compared to alternative fuels.



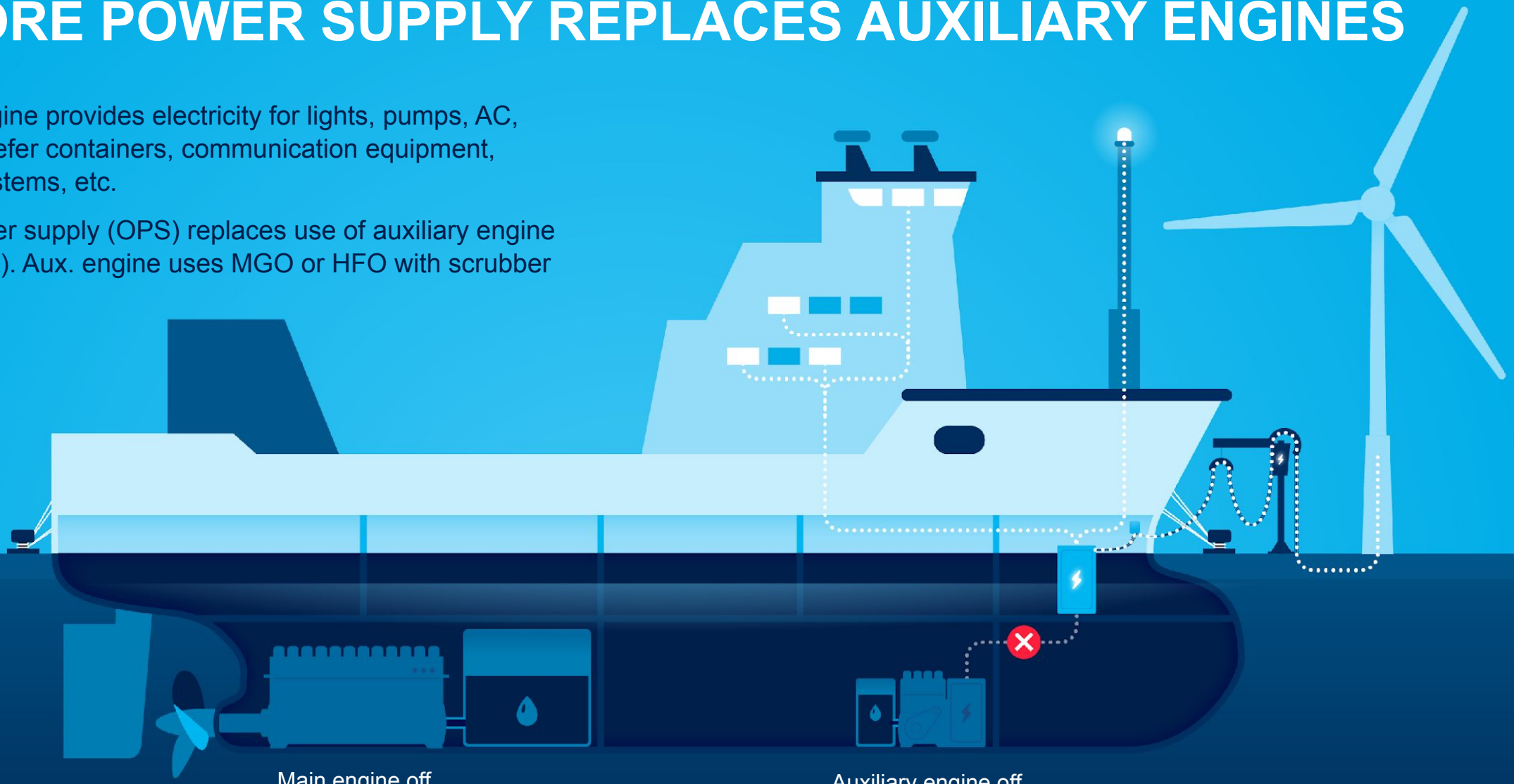
ALTERNATIVE FUELS DEVELOPED FOR THE MAIN ENGINE

- Main engine provides for propulsion of the vessel
- Development of alternative fuels are all aimed at replacing current main engine fuel (HFO, MGO)



ONSHORE POWER SUPPLY REPLACES AUXILIARY ENGINES

- OPS/Aux. engine provides electricity for lights, pumps, AC, ventilation, reefer containers, communication equipment, navigation systems, etc.
- Onshore power supply (OPS) replaces use of auxiliary engine (generator set). Aux. engine uses MGO or HFO with scrubber



Main engine off

Auxiliary engine off

DIFFERENT SHORE POWER APPROACHES IN ROTTERDAM. OWN ASSETS VERSUS CLIENT ASSETS

PoR has decided that building and operation of shore power on terminals is the responsibility of terminal operators. Hence, there are three different approaches to shore power projects:

Port of Rotterdam

- PoR owns and operates the shore power installations
- Examples: public waiting berths, inland waterway berths, tug boat berths.

RSP
engines off, shore power on

- RSP is a joint venture between PoR and Eneco (renewable energy company)
- Terminal clients hire RSP to build, own and operate the shore power installation
- Examples: Heerema, DFDS Vlaardingen, Boskalis

www.rotterdamshorepower.com

- Clients build, own and operate shore power installation
- Examples: Cruise terminal, RST, ROG, Royal Roos

SHORE POWER DEVELOPMENTS SO FAR

BEFORE 2020

99 SHORE POWER UNITS for inland shipping public berths	**SHORE POWER UNIT** seagoing vessels – private berth
> 5 MW of installed capacity	**1 PILOT** for mobile shore power without grid connection
€ 8 MILLION in investments and subsidies	**4 STUDIES** conducted for shore power at terminals

2020 - 2025

6 SHORE POWER UNITS Seagoing vessels – private berths	**> 43 MW** of installed capacity	**> 15 LOCATIONS** under investigation
18 QUICKSCANS conducted for shore power at terminals	**> € 235 MILLION** in subsidies and interest free loans	**> € 20 MILLION** in investments by PoR and RSP
4 STUDIES for the roll-out of shore power at terminals	**STARTED RSP** joint venture RSP by PoR and Eneco	**1 PILOT** for mobile shore power without grid connection

SHORE POWER STRATEGY 2025 - 2035

Ambition: Zero emissions at berth in 2050, shore power as essential instrument

1. Expansion & improvement at Public use berths

Inland Shipping	2027
Seagoing vessels	2035
Tugboats	2030

2. Preparing the port for EU shore power obligation

Containers	2030
Passenger	2030
Cruise	2025

3. Scaling shore power with impact

RoRo	2035	Break-bulk	>2035
Offshore	2035	Liquid bulk	>2035
Shipyards	2035	Dry bulk	>2035

WHAT IS REQUIRED TO SCALE-UP?

GRID EXPANSION

TECHNICAL STANDARDS

NET ZERO FRAMEWORK

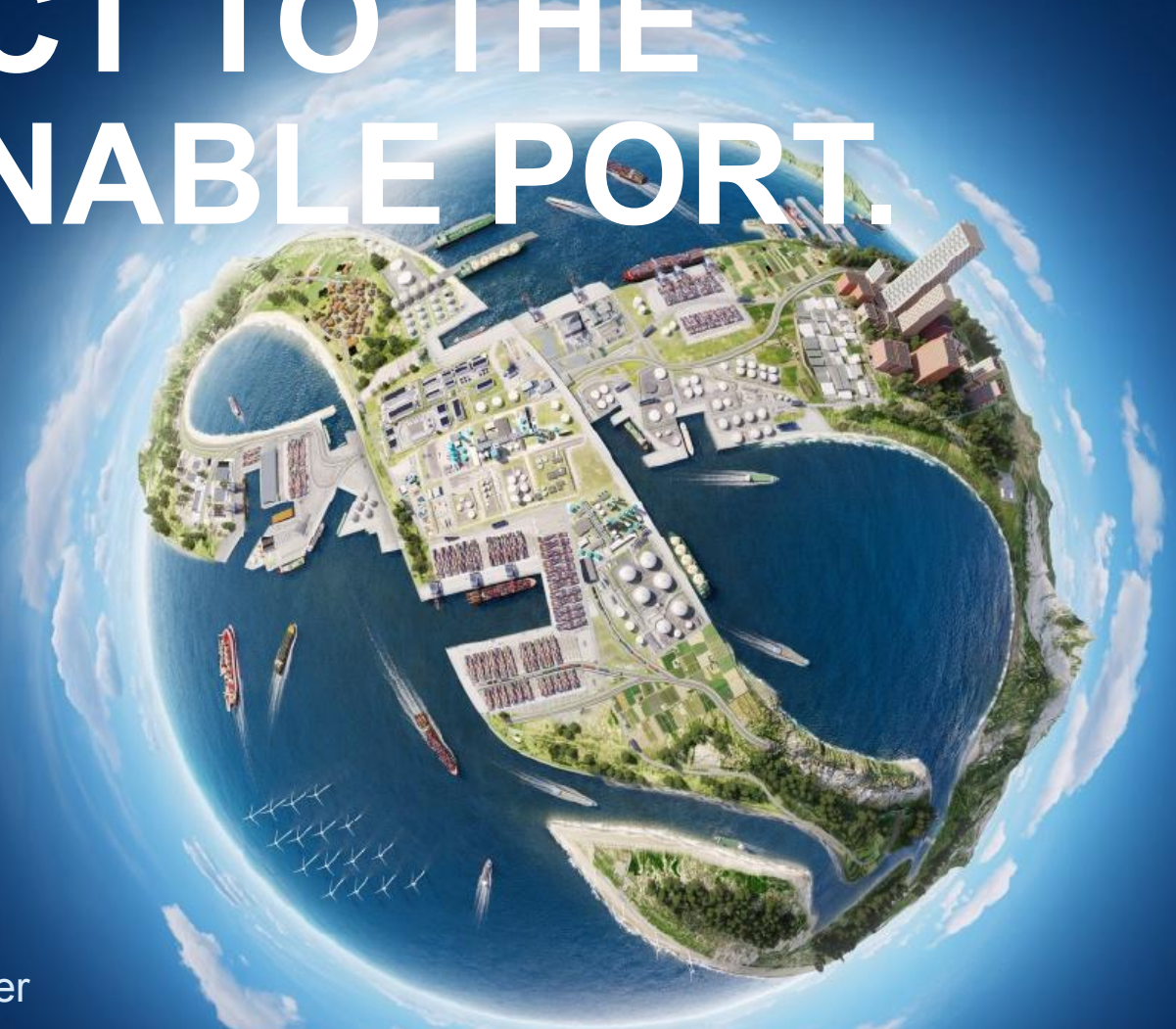
ADDITIONAL FUNDS

ENERGY PROFILE DATA

BROADEN EU LEGISLATION

Port of Rotterdam

SHORE POWER. CONNECT TO THE SUSTAINABLE PORT.



Ryan Cornelisse
Program Manager Shore Power

Port of Rotterdam

CITY OF YOKOHAMA

Port of Yokohama
Port Electrification Initiatives

OGIWARA Koji,
Director of Policy Coordination Division,
Port and Harbor Bureau, City of Yokohama, Japan
November 26, 2025

明日をひらく都市
OPEN X PIONEER

Table of contents

Ⅰ. Outline of the Port of Yokohama

Ⅱ. Power Supply Status at Yokohama Port

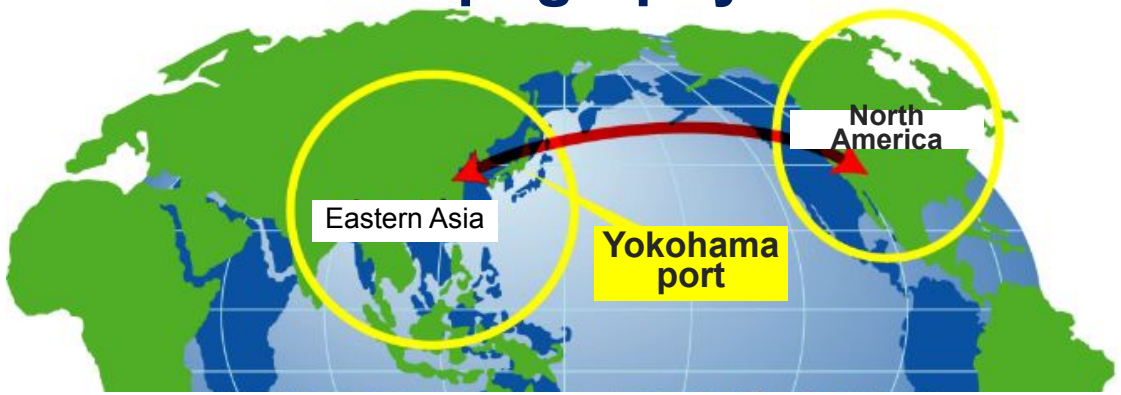
Ⅲ. Challenges and Initiatives

Ⅳ. For the future

明日をひらく都市
OPEN × PIONEER
YOKOHAMA

Ⅰ -1 Outline of the Port of Yokohama

■Location & Topography



The first/last port on the North American and Pacific routes

- ✔ The Port of Yokohama is located on Tokyo Bay and at the eastern end of the Asian region, a location that can be the first/last port on the North American and Pacific routes.
- ✔ Close to the mouth of Tokyo Bay.
- ✔ Naturally blessed with the most favorable conditions such as water depth. Cargo handling is rarely affected by natural conditions such as wind and tidal current/variation. No need for periodic dredging due to lack of river inflow.

I -2 Outline of the Port of Yokohama

Total tons of freight in 2024: 101,187,174 tons

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

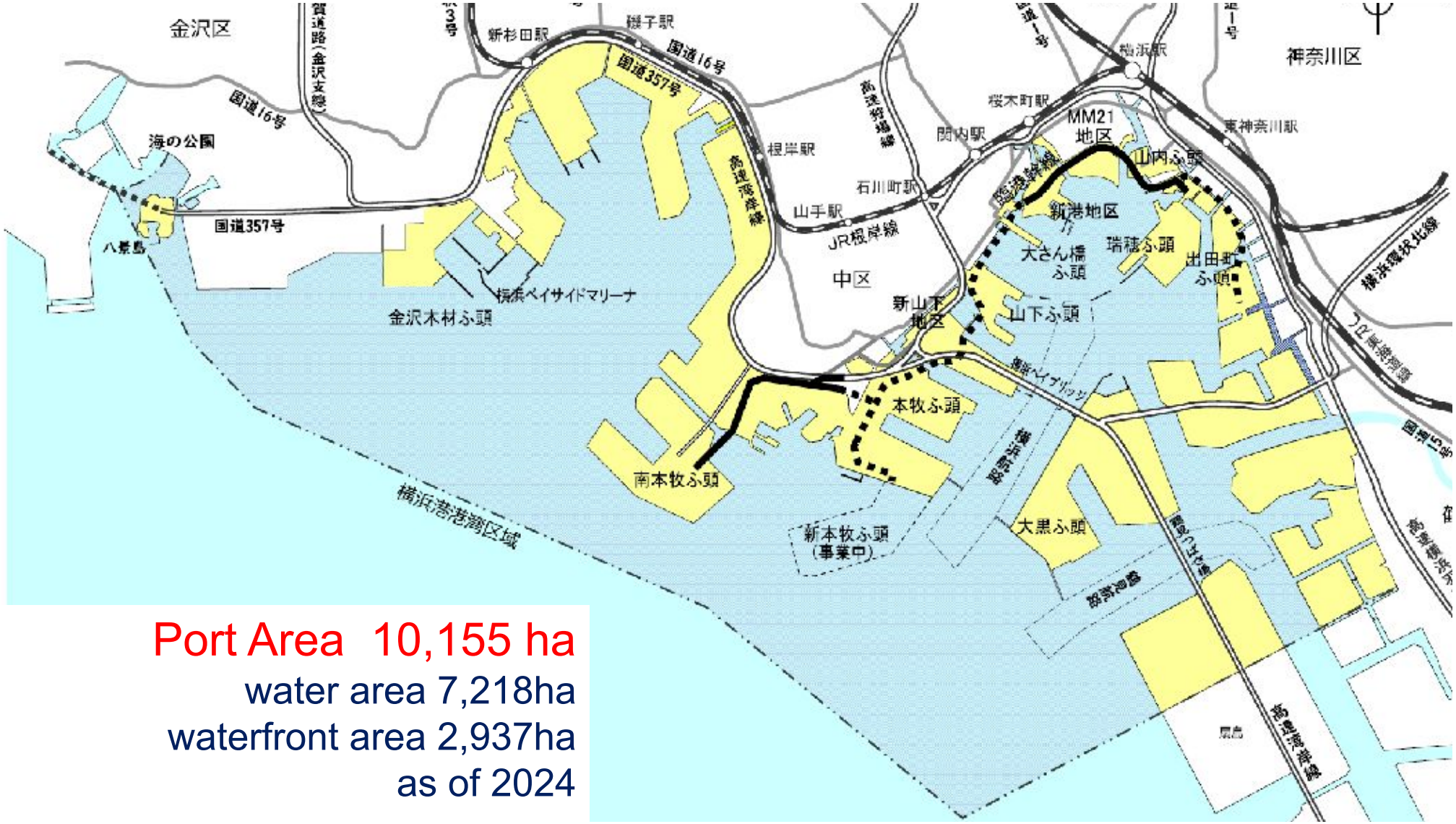
147 calls

coastal vessels

18,810 vessels/year

As of 2024

Ⅰ-3 Overview of the Port of Yokohama



Port Area 10,155 ha
water area 7,218ha
waterfront area 2,937ha
as of 2024

Ⅰ-4 Overview of the Port of Yokohama

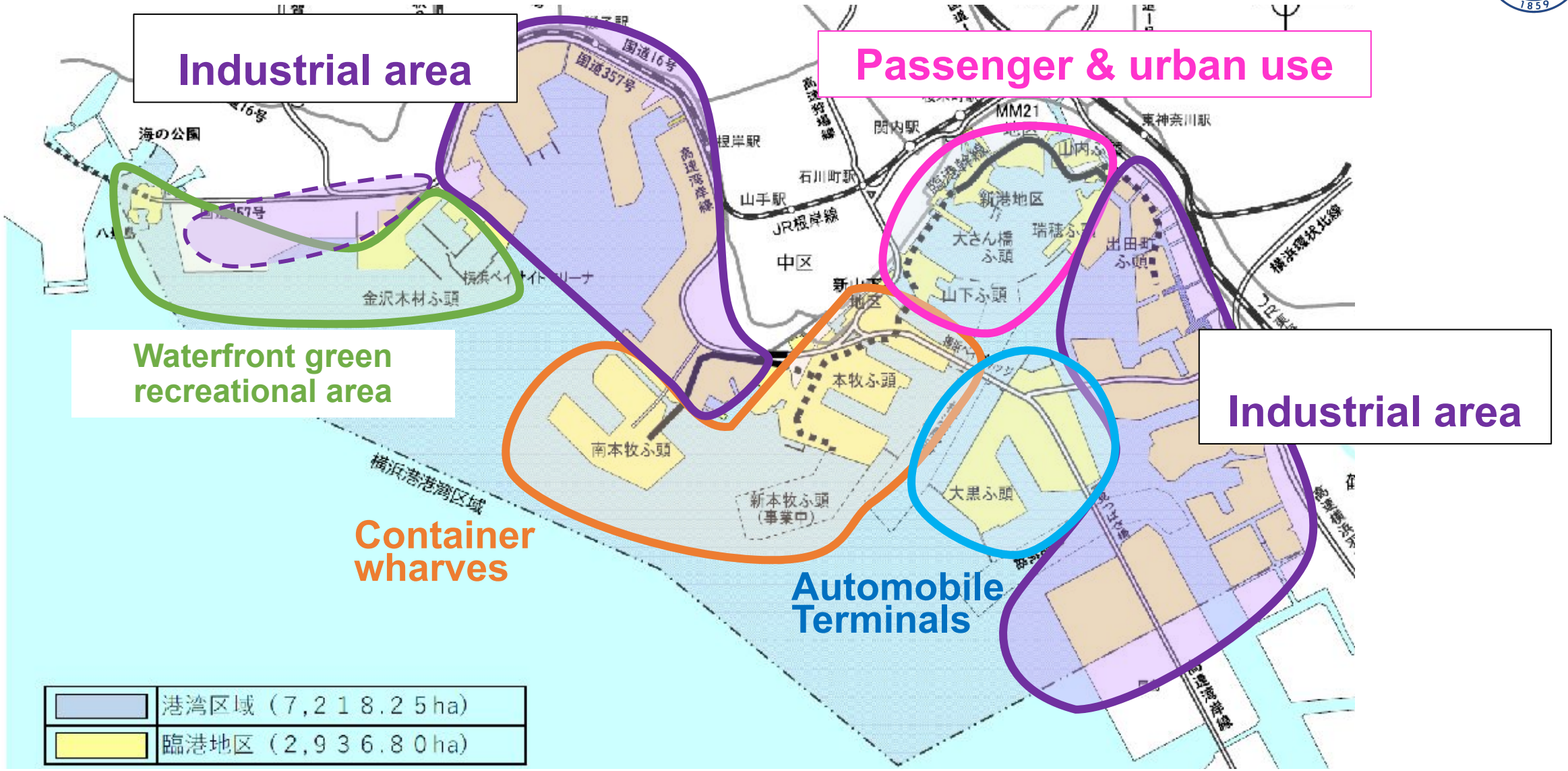


Table of contents

Ⅰ. Outline of the Port of Yokohama

Ⅱ. Power Supply Status at Yokohama Port

Ⅲ. Challenges and Initiatives

Ⅳ. For the future

明日をひらく都市
OPEN × PIONEER
YOKOHAMA

Ⅱ -1 Power Supply Status at Yokohama Port

Table of contents

Ⅰ. Outline of the Port of Yokohama

Ⅱ. Power Supply Status at Yokohama Port

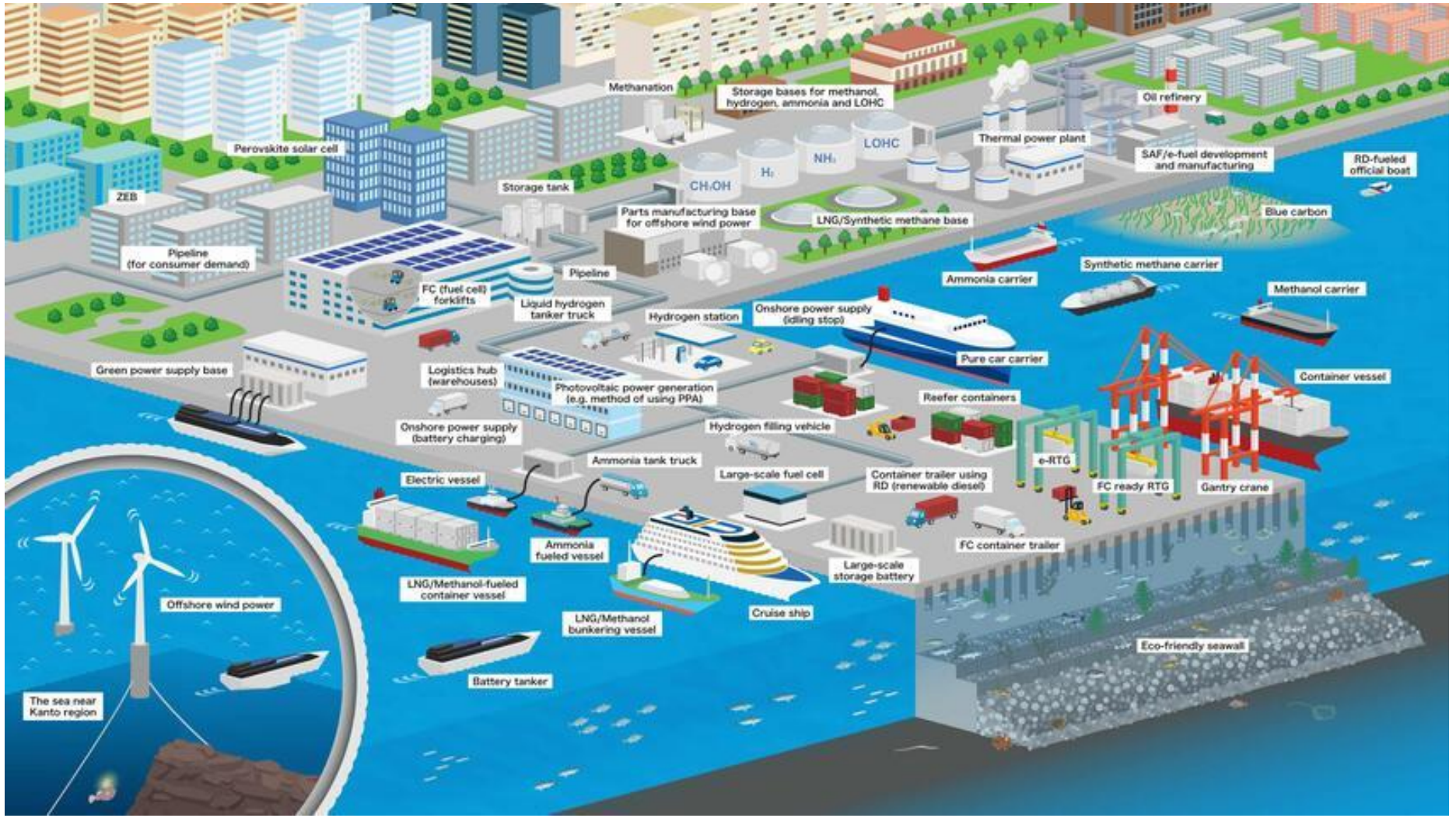
Ⅲ. Challenges and Initiatives

Ⅳ. For the future

明日をひらく都市
OPEN × PIONEER
YOKOHAMA

Ⅲ Challenges and Initiatives

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



Ⅲ Challenges and Initiatives

Port electrification generally involves the following components:

(1) Electrification of vessel-related equipment

(e.g., shore power for vessels, electric tugboats, etc.)

(2) Electrification of cargo handling equipment

(e.g., Rubber-Tired Gantry cranes (RTGs), forklifts, reach stackers, etc.)

(3) Electrification of cargo transport vehicles

(e.g., electric trucks and trailers, etc.)

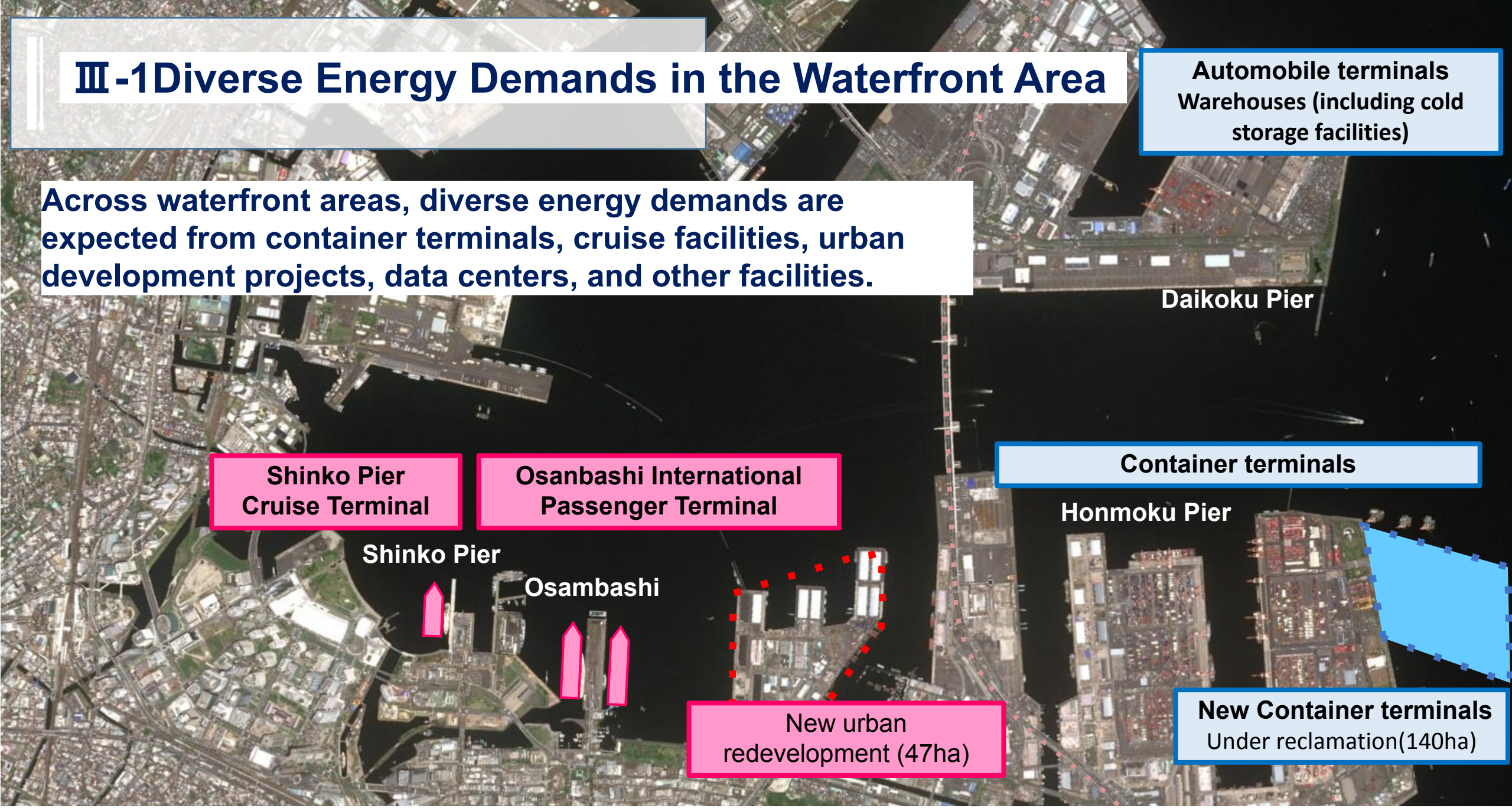
(4) Electrification of landside facilities

(e.g., cold storage warehouses, etc.)

+ Green Energy (Including Renewable Sources)

Ⅲ-1Diverse Energy Demands in the Waterfront Area

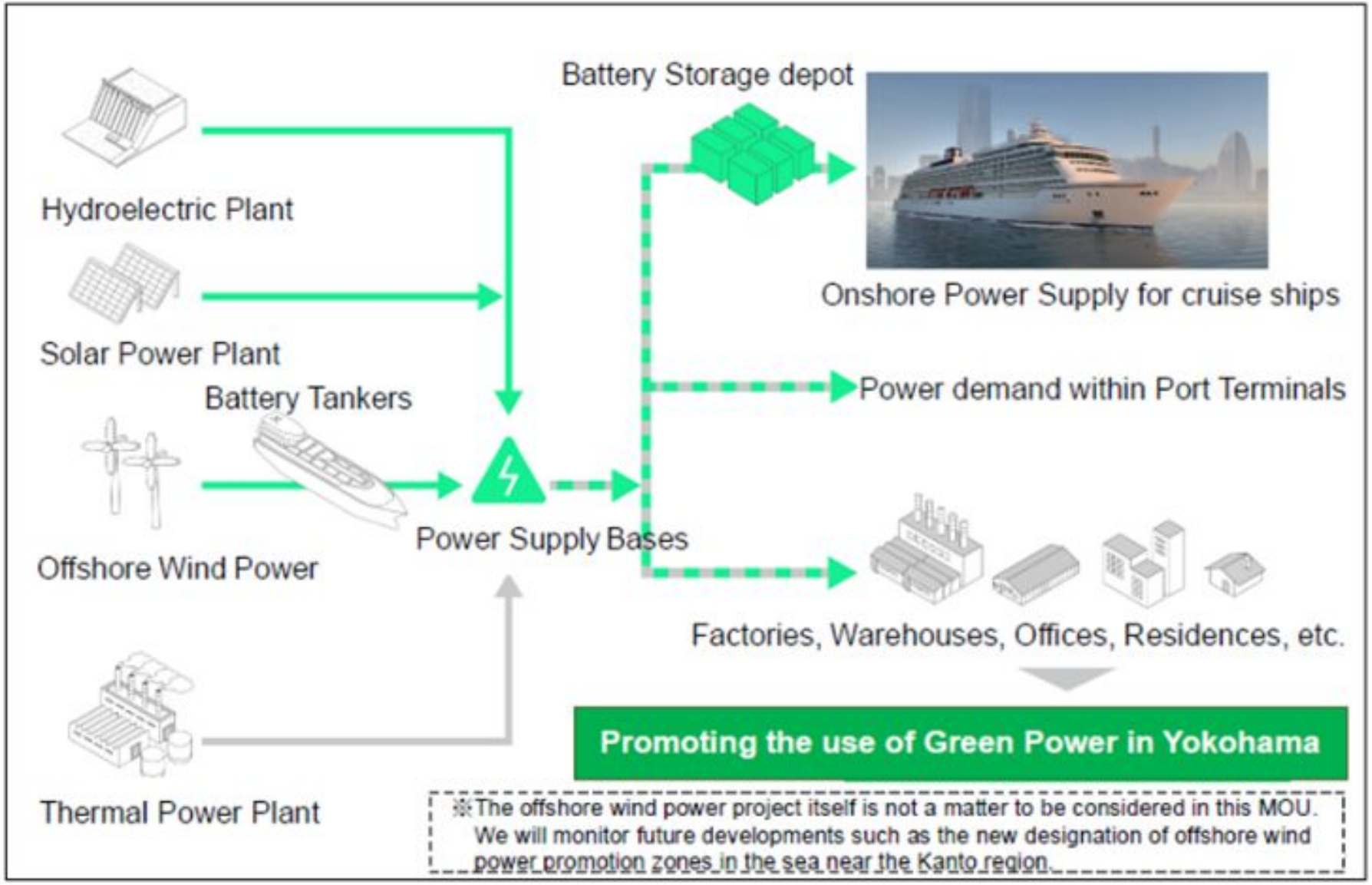
Across waterfront areas, diverse energy demands are expected from container terminals, cruise facilities, urban development projects, data centers, and other facilities.



Ⅲ-2 Cruise Terminal

Osambashi International Passenger Terminal

Ⅲ-3 Image of the Electric Power Network Concept



Ⅲ-4 Challenges in Implementing Onshore Power Supply (OPS)

(1) Limited grid power supply

(2) Long lead time for grid installation

(3) Cable installation challenges on existing berths

(4) Uncertain electricity pricing structure

Ⅲ-4 Initiatives to Address Challenges in Implementing OPS

(1) Limited grid power supply

(2) Long lead time for grid installation

⇒We have signed an MOU with a power grid company.

⇒ We work together to boost grid capacity and shorten lead times.

(3) Cable installation challenges on existing berths

⇒ Excavation is physically impossible due to structural constraints.

⇒ Exploring alternative installation methods.

(4) Uncertain electricity pricing structure

⇒ Reduce peak power demand using large-scale batteries.

⇒ Requesting the Ministry of Land, Infrastructure, and Transport (MLIT) to

Table of contents

Ⅰ. Outline of the Port of Yokohama

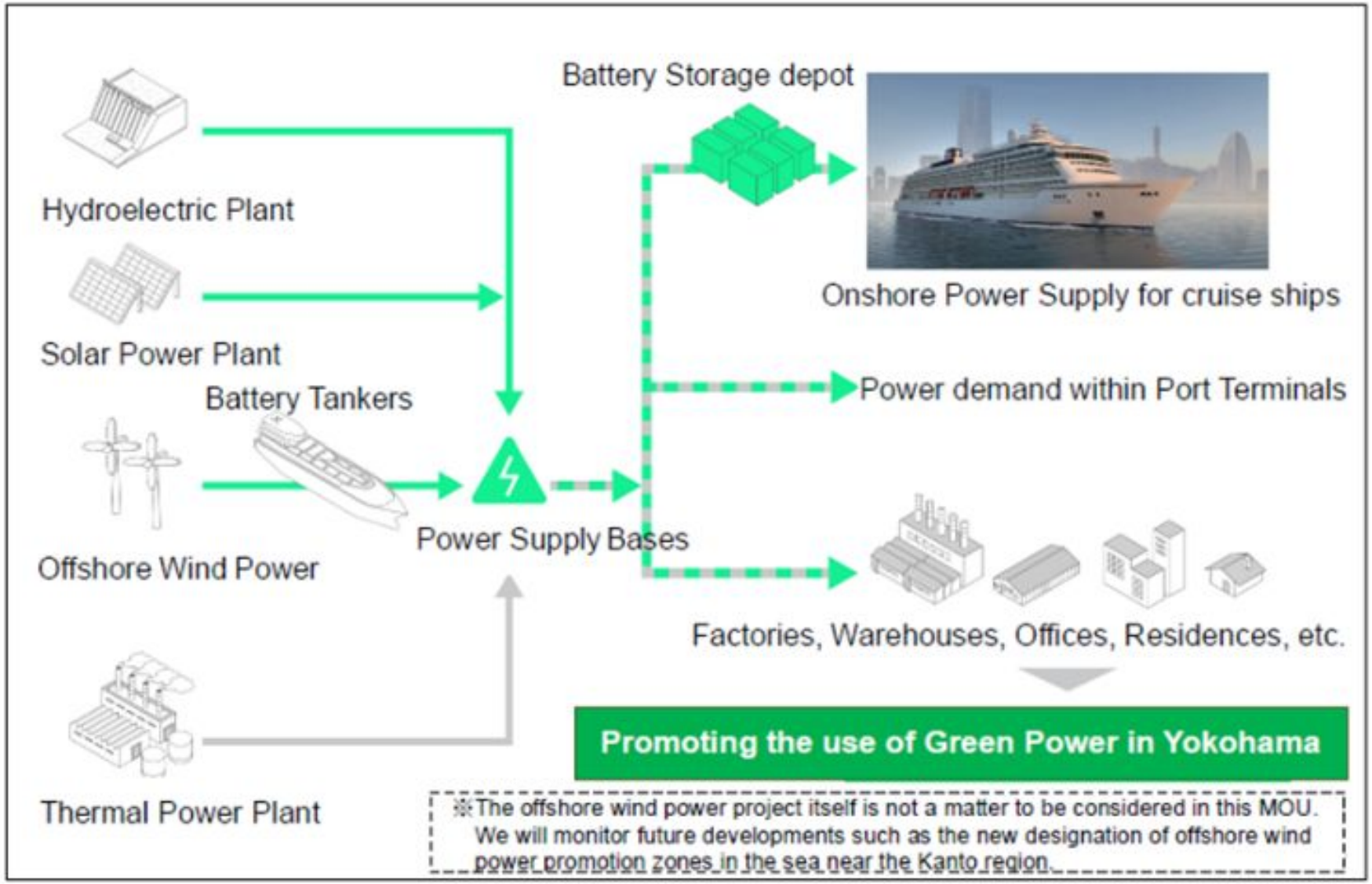
Ⅱ. The status of power supply at the port of Yokohama

Ⅲ. Challenges and Initiatives

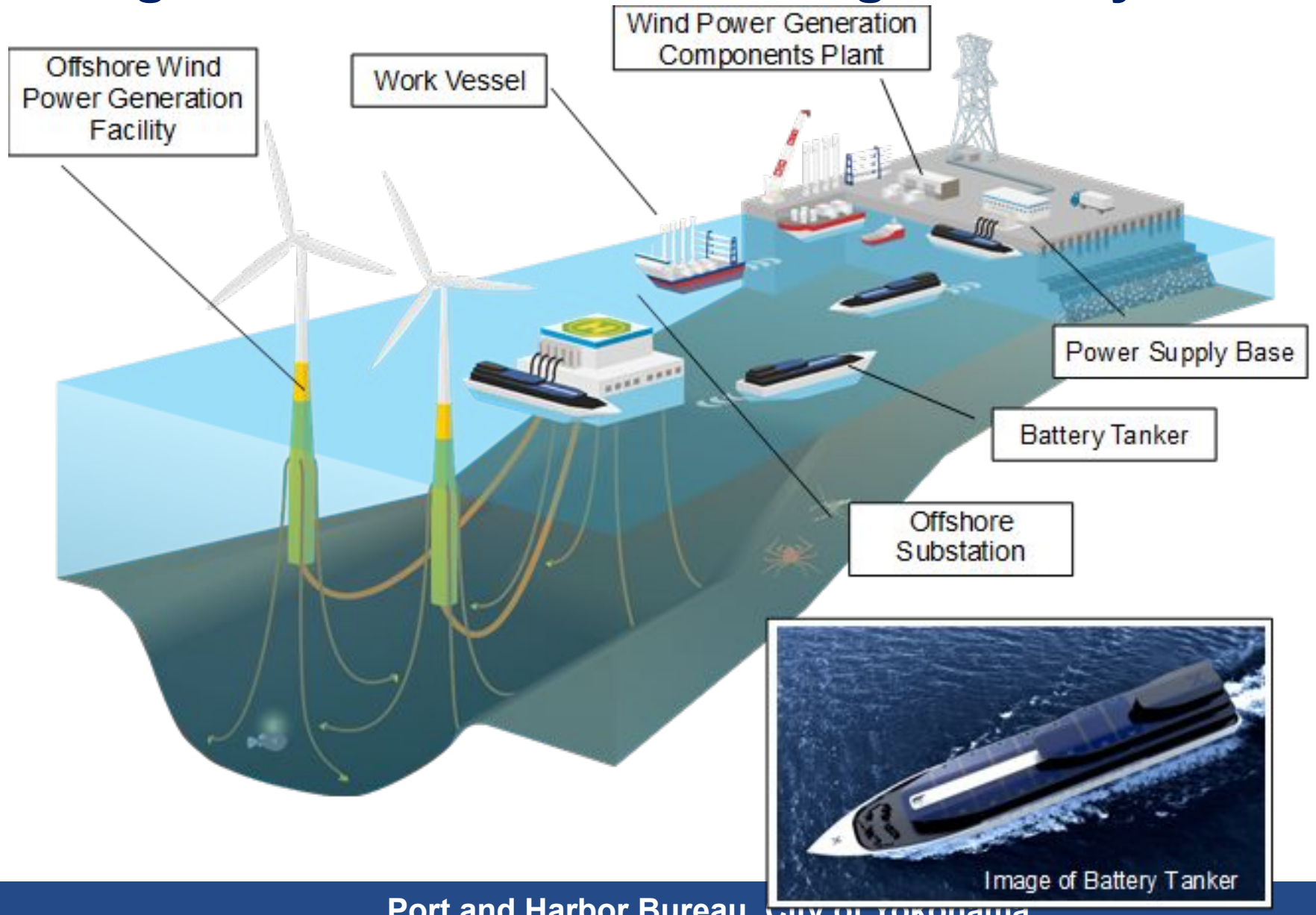
Ⅳ. For the future

明日をひらく都市
OPEN X PIONEER
YOKOHAMA

Ⅳ-1 Image of the Electric Power Network Concept



Ⅳ-2 Floating Offshore Wind Farm Using a Battery Tanker




Thank you