

An aerial photograph of Kobe, Japan, showing the city, the harbor, and the port facilities. The text is overlaid on the image.

# **How to Decarbonize Kobe Port: The Path to a Carbon-Neutral Port (CNP)**

**Kobe Port and Harbor Bureau**

**July 9, 2024**

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# 1. Kobe Port Overview

**BE KOBE**



**Japan**

**Kobe**

## ■ Container Cargo Handling

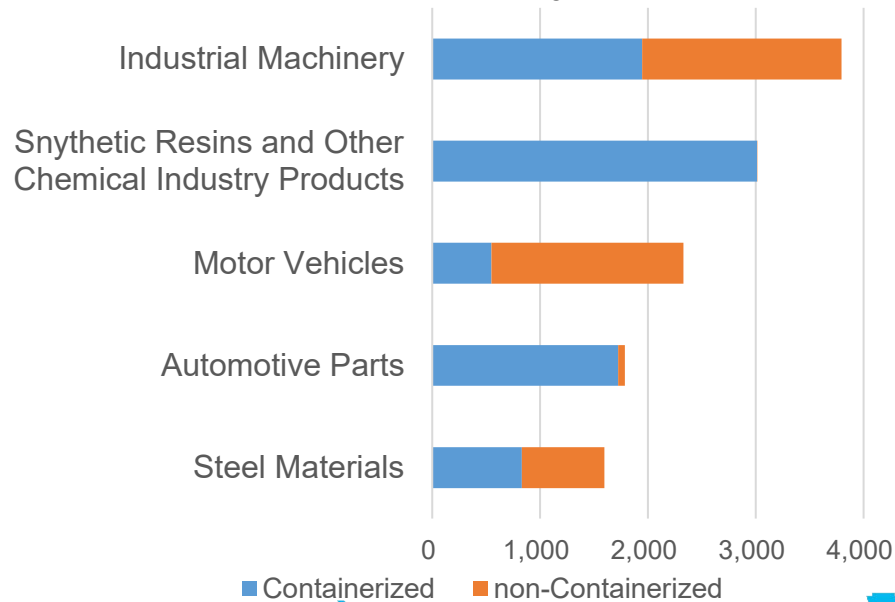
	2019	2020	2021	2022
<b>Total</b>	<b>2,872</b>	<b>2,647</b>	<b>2,824</b>	<b>2,891</b>
Foreign Volume	2,188	2,040	2,145	2,253
Export	1,179	1,082	1,148	1,207
Import	1,009	959	997	1,047
Domestic Volume	684	607	679	637

(Units: 1,000TEU)

## ■ Main Export Items

(Units: 1,000t)

\*average tons from 2018 to 2022

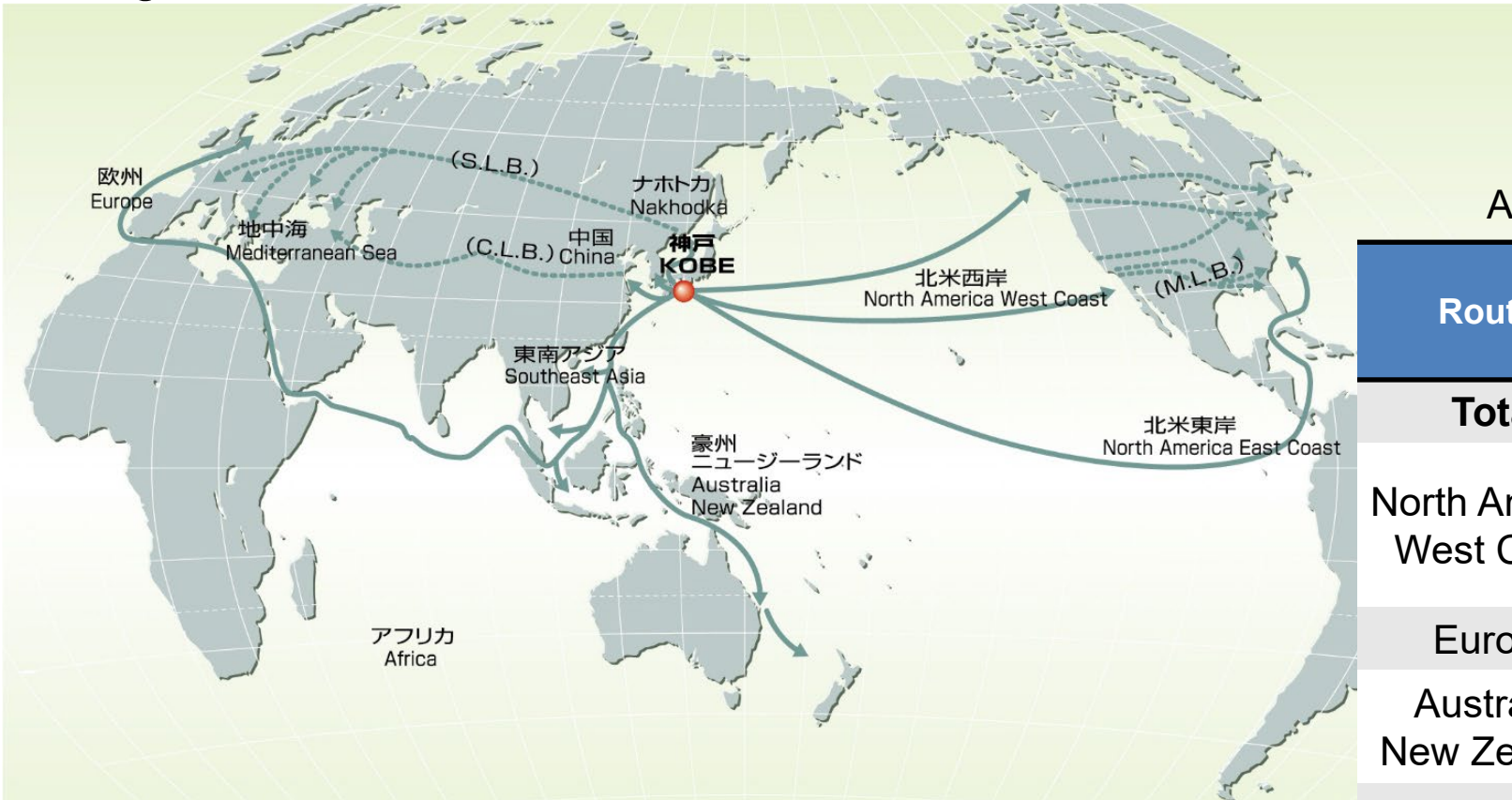


## ■ Main Import Items

- Coal
- Clothes and Footwear
- Chemical Industry Products
- Feedstuffs and Manure
- Processed Foodstuffs



## Regular container service routes

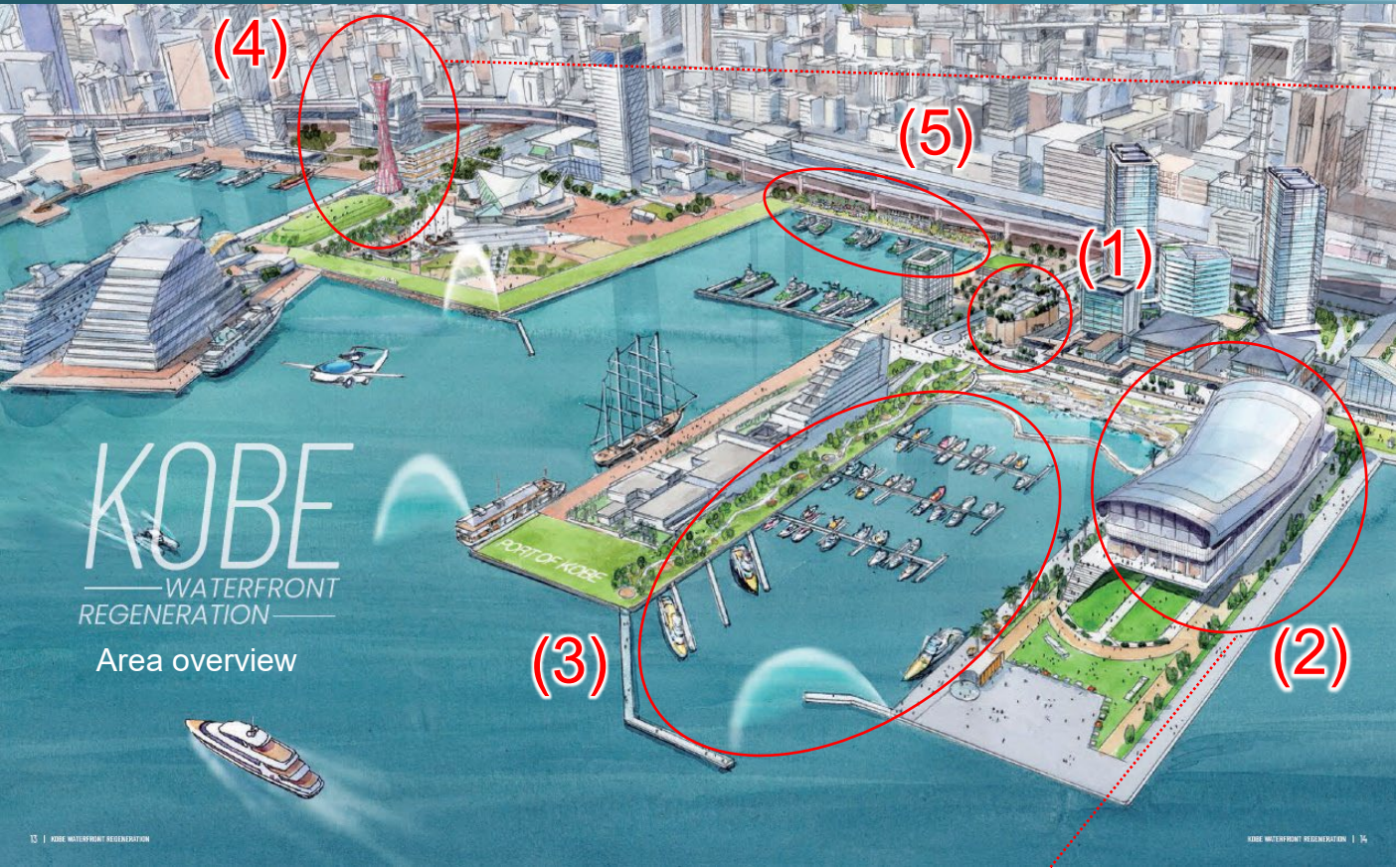


As of August 2023

Routes	No. of routes	Frequency (per month)
<b>Total</b>	<b>78</b>	<b>310</b>
North America West Coast	4	16
Europe	1	4
Australia, New Zealand	1	4
Southeast Asia	36	144
China	29	114
Korea and others	7	28







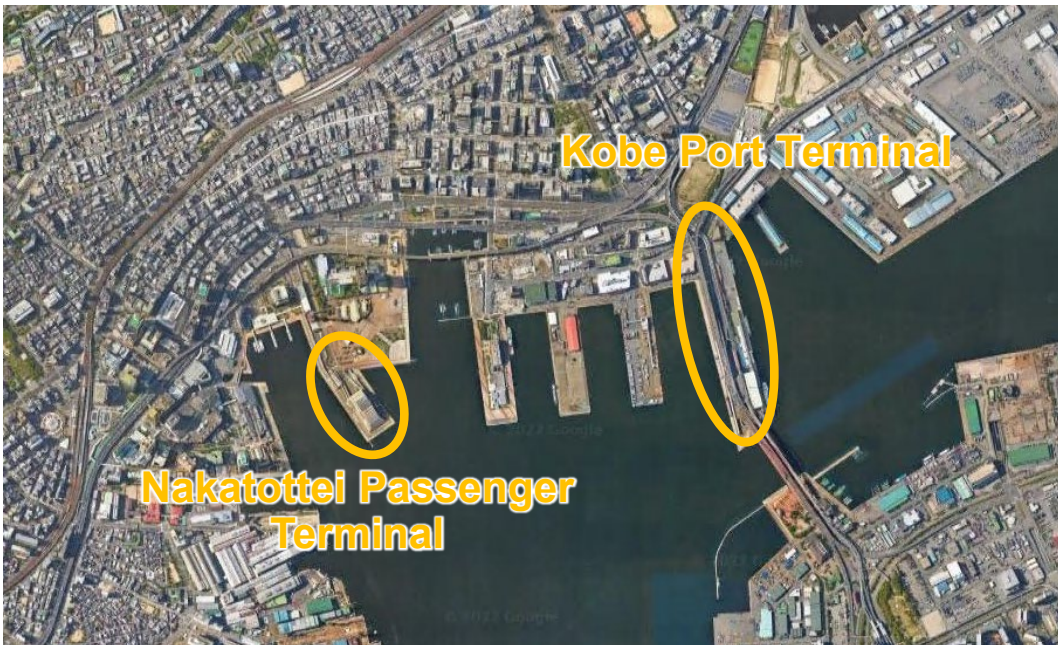
(4) Renovated Kobe Port Tower



(2) Glion Arena Kobe at Jetty No. 2





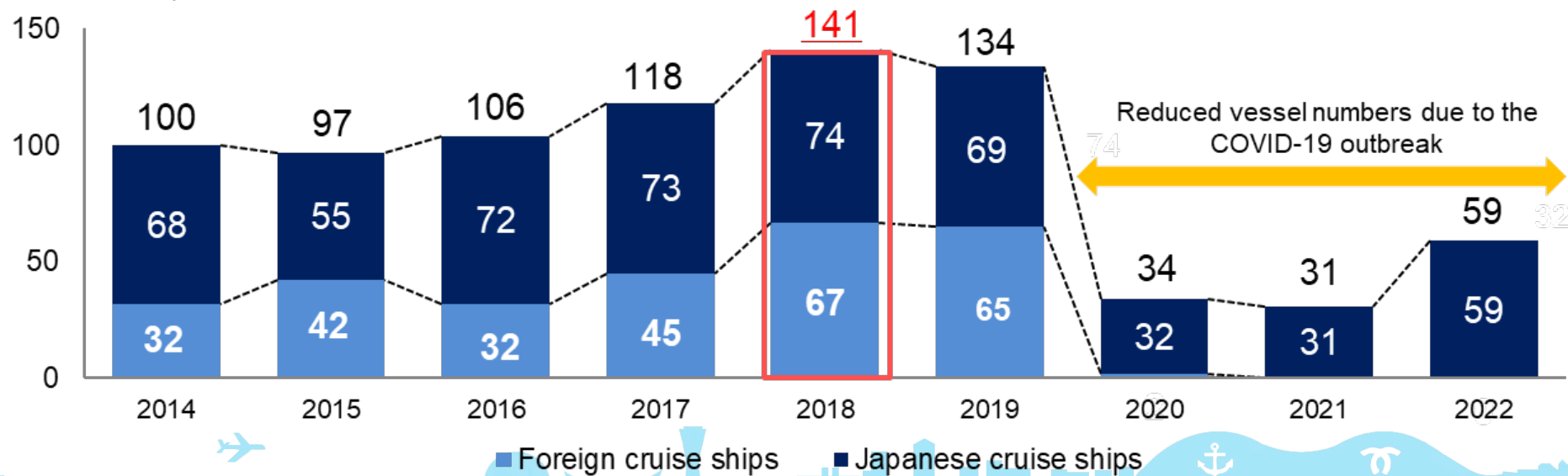


**Spectrum of the Seas**  
(Passenger capacity: 4,246)



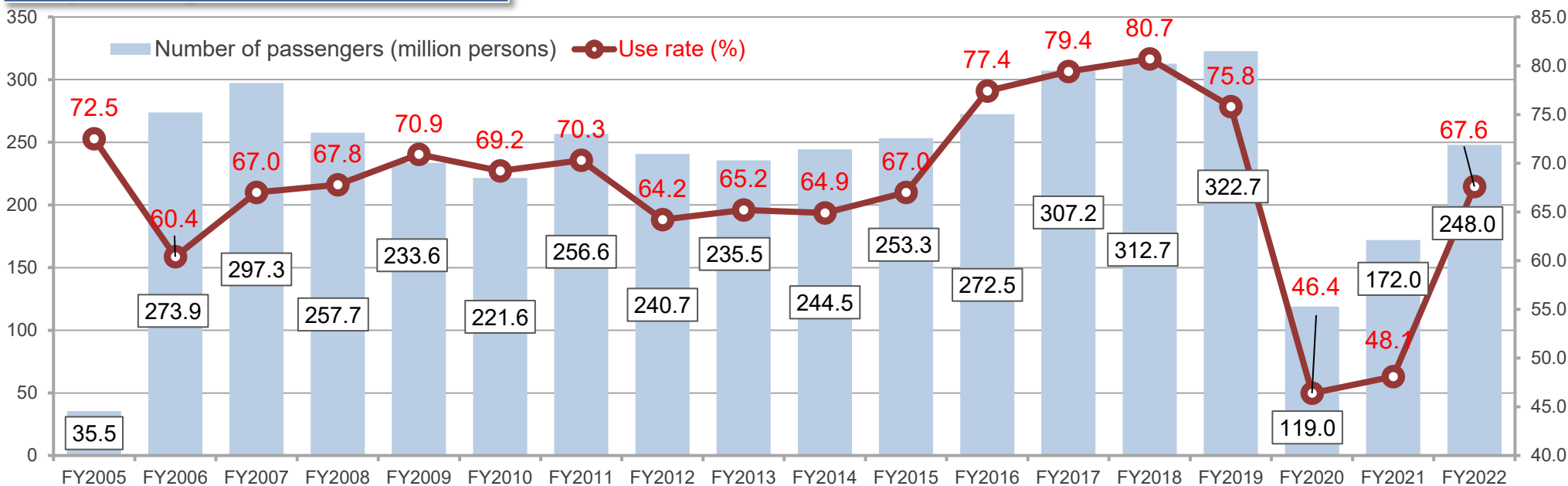
**Setouchi Cruise**

(Number of vessels)





## Changes in the number of passengers and use rate



\*FY2022: April 2022 to January 2023

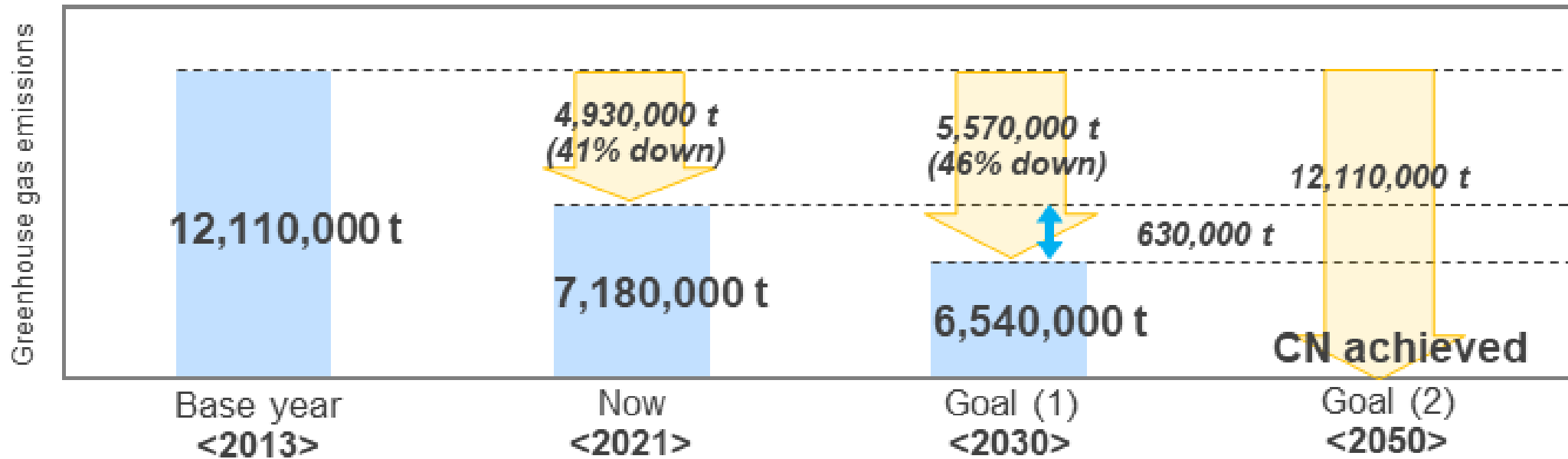




## Greenhouse Gas Reduction Targets and Plans

**FY 2030 target** 46% down from FY 2013

**2050 target** Achieving carbon neutrality (virtually zero CO<sub>2</sub> emissions)



# 2. Current CNP Activities at Kobe Port

## Supply Target and Plan for Hydrogen, Fuel ammonia, etc.

### ■ Estimation result of hydrogen demand potential

2030: approximately 44,000 tons  
 2050: approximately 574,000 tons

### ■ Supply plan for hydrogen, etc.

Secondary transportation  
 via Himeji Port



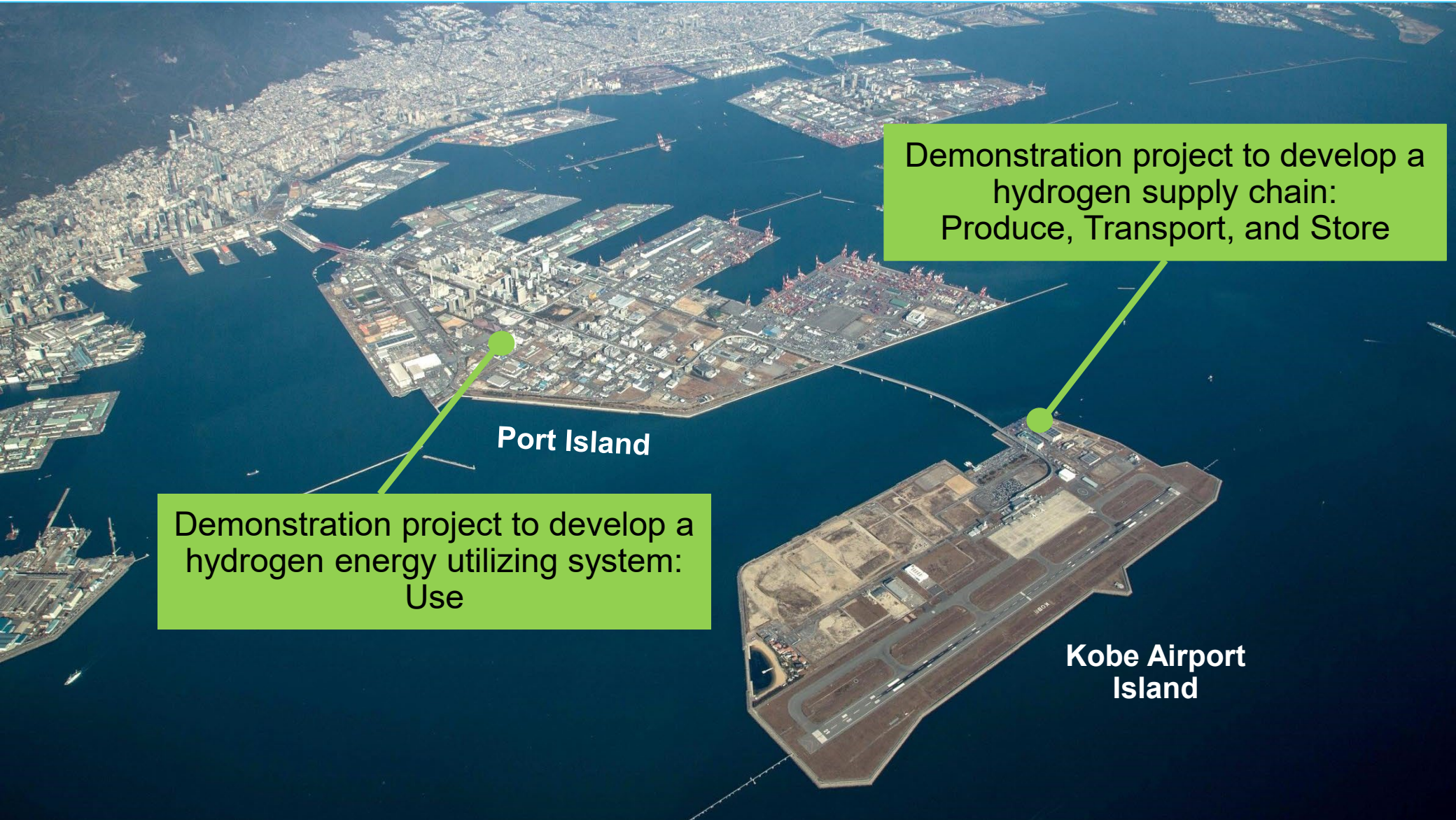
Image of the supply plan

### ■ Scale of hydrogen supply facilities

Type	Expected timeframe		Remarks
	2030	2050	
Transport ship	<b>5 units</b>	<b>58 units</b>	Trial calculation based on the premise of "Suiso Frontier" type (75 tx 2 units)
Storage tank	<b>5 units</b>	<b>58 units</b>	Trial calculation based on the premise of Kobe Airport Island Hy touch Kobe (150 t)



# 2. Current CNP Activities at Kobe Port



Demonstration project to develop a hydrogen supply chain:  
Produce, Transport, and Store

Demonstration project to develop a hydrogen energy utilizing system:  
Use

Port Island

Kobe Airport Island





### Demonstrating technologies to produce, transport, and store hydrogen



#### NEDO subsidized project

Hydrogen is produced from unused energy (lignite, or brown coal) in Australia. The hydrogen is liquefied into liquefied hydrogen (LH<sub>2</sub>) and transported to Japan on a special carrier. The project demonstrates the storage of hydrogen in the LH<sub>2</sub> storage tank at Hy touch Kobe.

#### Technology Research Association

CO<sub>2</sub>-free Hydrogen Energy Supply-chain Technology Research Association



#### Supports provided by Kobe City

- Field support
- Public berth development
- Raising awareness to encourage social acceptance



# 2. Current CNP Activities at Kobe Port

The world's first successful large-scale international transport of LH<sub>2</sub>

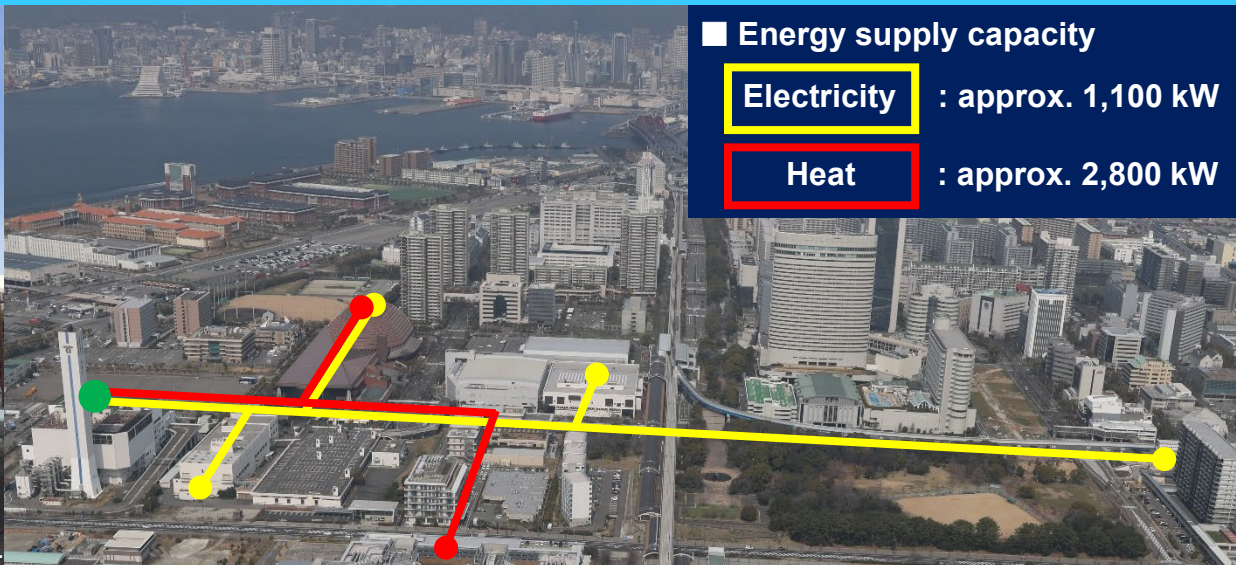
source: Kawasaki Heavy Industries, Ltd.



## Supplying electricity and heat generated by a gas turbine fueled by hydrogen



©Kawasaki Heavy Industries, Ltd.



Energy supply capacity	
Electricity	: approx. 1,100 kW
Heat	: approx. 2,800 kW

### NEDO subsidized project

The project demonstrates the technology to supply electricity and heat generated by a gas turbine fueled by hydrogen at Kobe Hydrogen CGS Energy Center to nearby Kobe public facilities.

### Primary contractors

Kawasaki Heavy Industries, Ltd. and Obayashi Corporation



### Supports provided by Kobe City

- Field support
- Coordination with energy suppliers
- Raising awareness to encourage social acceptance





## Developing onshore power supply facilities



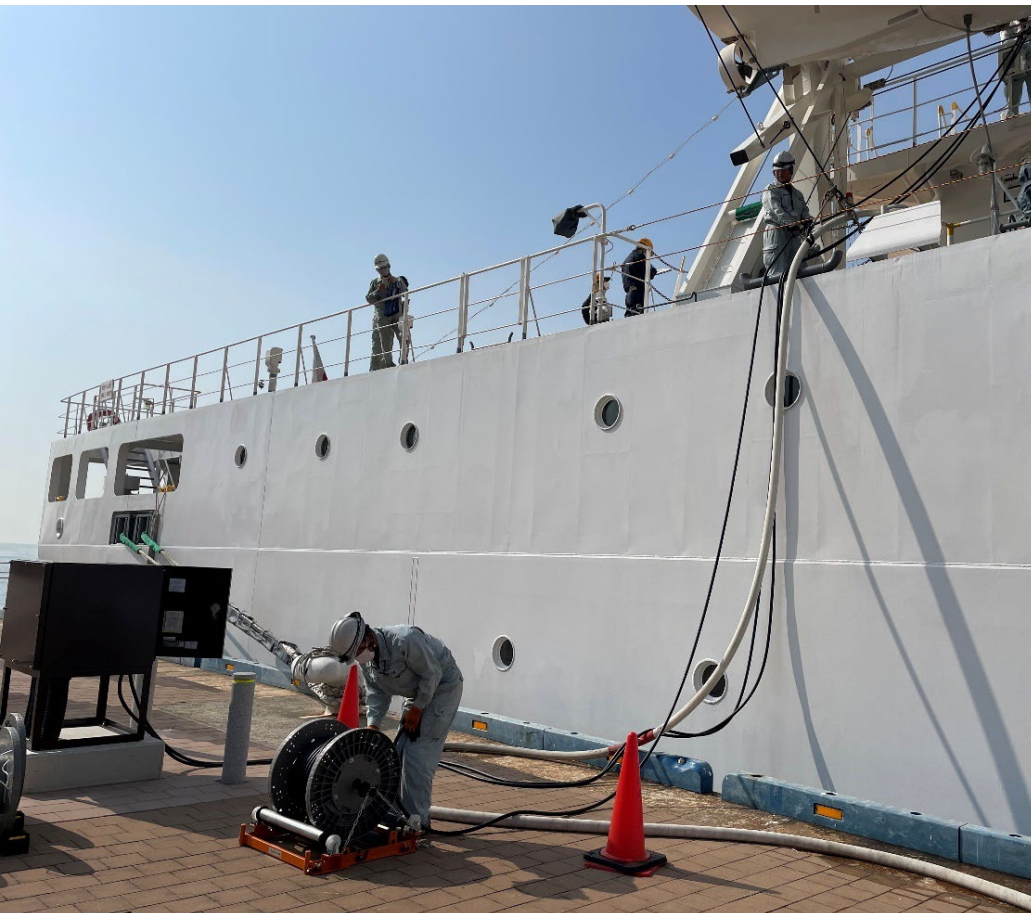
Shinko Jetty No. 1

Shinko East Wharf



### Shinko Jetty No. 1

Onshore power supply to a training sailboat  
Started from November 28, 2023



### Shinko East Wharf

Onshore power supply to a coastal container ship  
Started from April 25, 2024

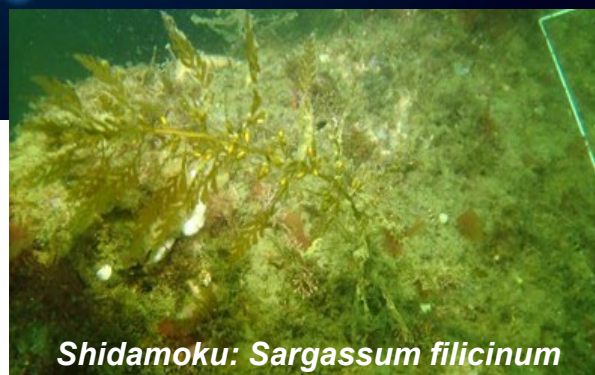
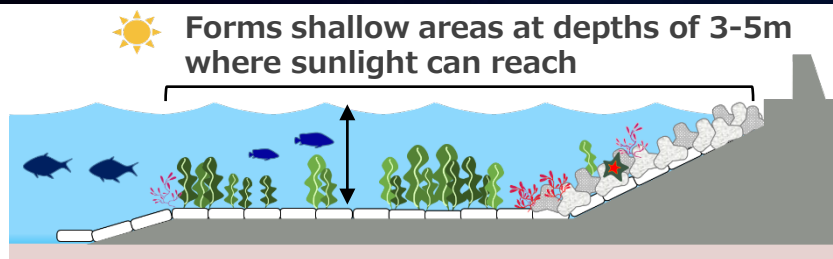
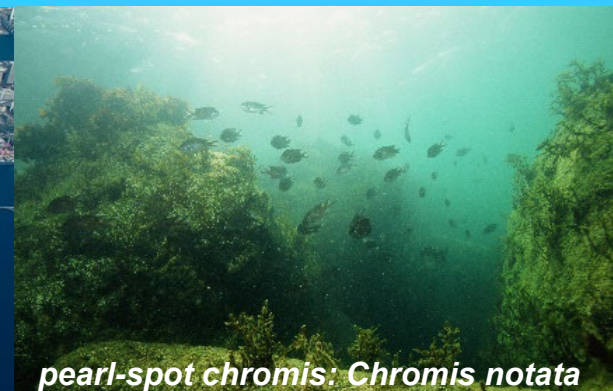




## 2. Current CNP Activities at Kobe Port

BE KOBE

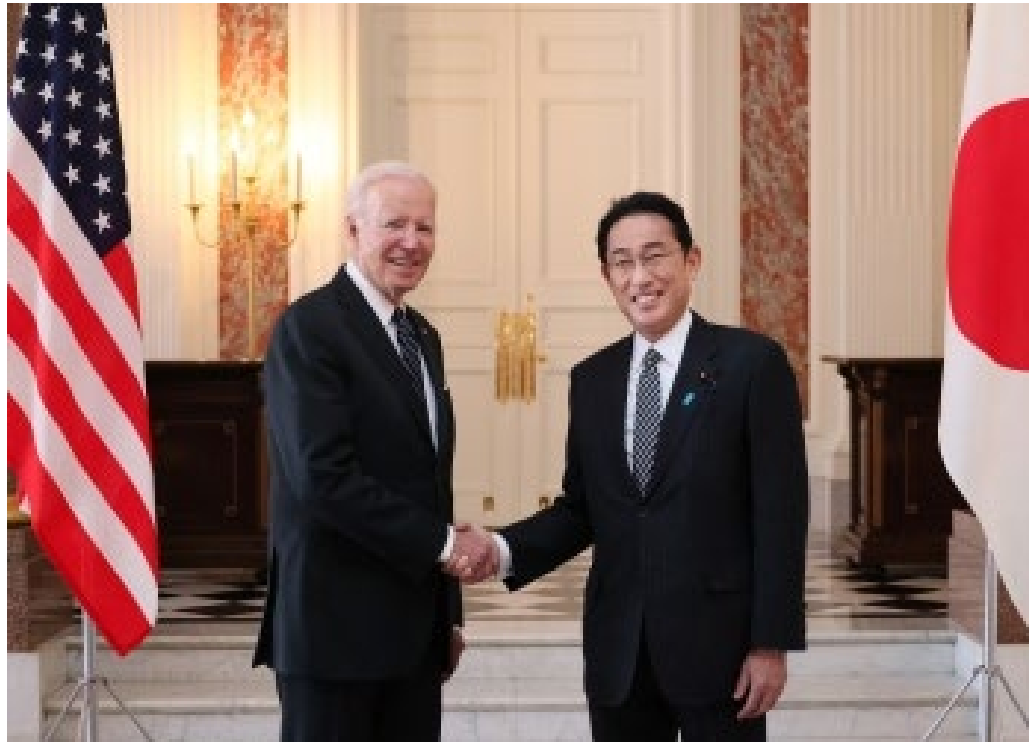
### Protecting blue carbon ecosystems as a CO<sub>2</sub> sink near the Kobe Airport Island



### Japan-U.S. Joint Leader's Statement on May 23, 2022

Fact sheet: The U.S.-Japan Competitiveness and Resilience (CoRe) Partnership

[Excerpt] The United States and Japan held the Carbon Neutral Port (CNP) Workshop, and concurred to further strengthen the collaboration and identified the ports of Los Angeles and Yokohama and **Kobe** as pilot cases.





## 2. Current CNP Activities at Kobe Port

### Partnership agreement with Long Beach Port to decarbonize the port on October 14, 2022

The port authorities of Long Beach and Kobe signed a memorandum of understanding on partnership port.

The two ports will cooperate and share information to develop port infrastructure and sophisticate port operations with the common goal of decarbonization, including the use of hydrogen.



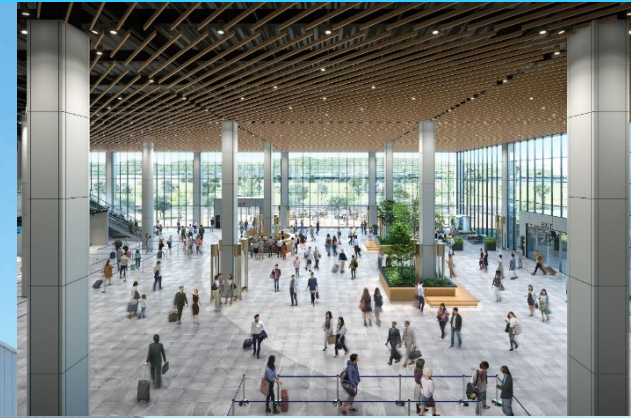
# 2. Current CNP Activities at Kobe Port

## Carbon-Neutral Airport (CNA)

### Progress towards Kobe CNA

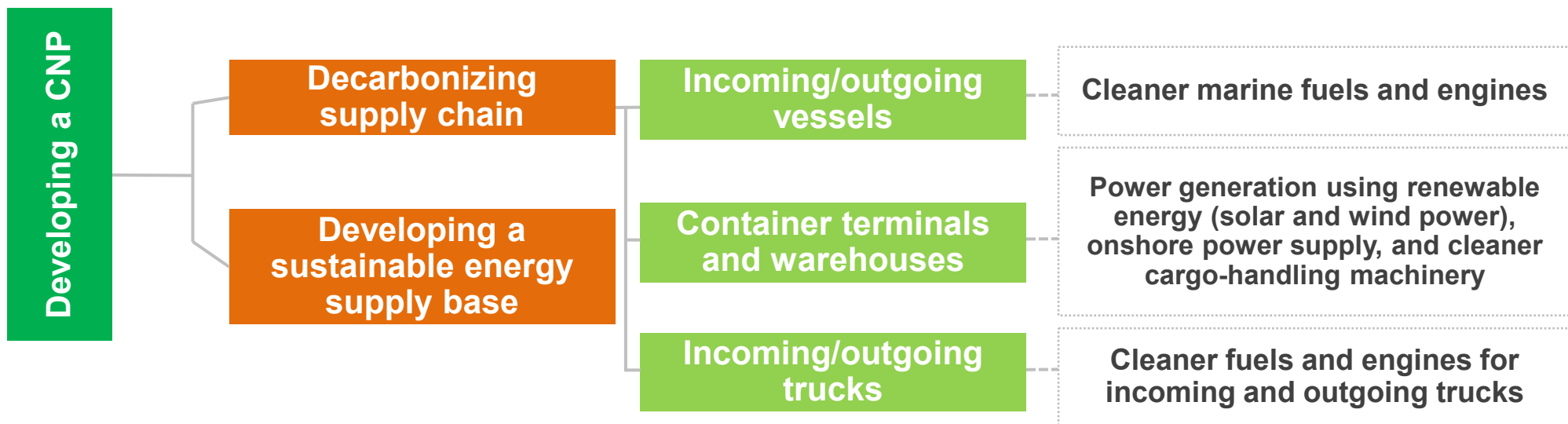
(July 2021)  
MLIT selected the airport as a priority research airport.

(October 2022)  
Kobe Airport Decarbonization Promotion Council was established.

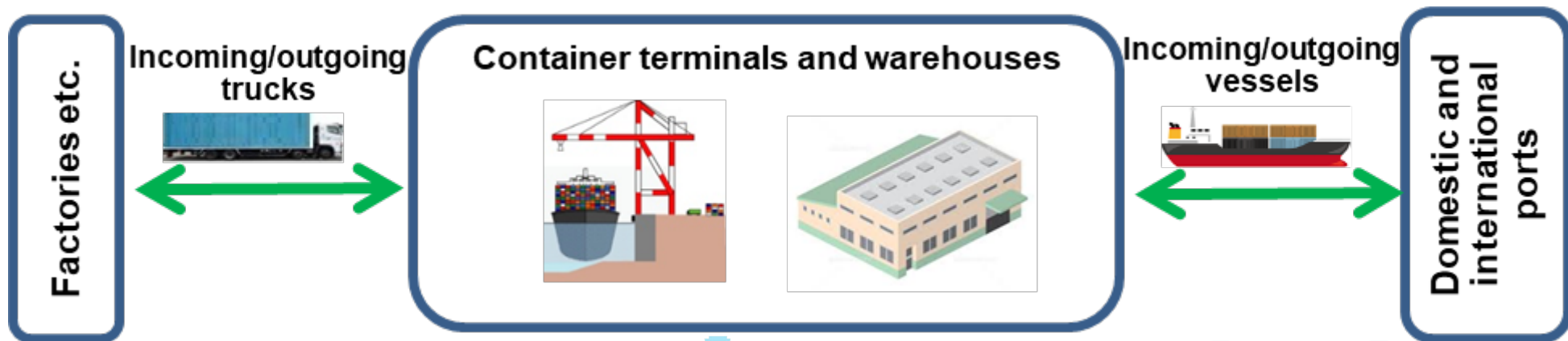




## ● How to develop a CNP



## ● A supply chain model



## ● Activities in FY2024

### Incoming/outgoing vessels

- Hydrogen-powered Kobe City service boat
- Electrification of domestic cargo ships

### Container terminals and warehouses

- E-methane demonstration project, solar power generation, and LED lighting equipment
- Onshore power supply for ships at Shinko Jetty No. 1 and Shinko East Wharf
- Demonstration of cleaner rubber-tired gantry crane (RTG) by using a hydrogen engine

### Incoming/outgoing trucks

- Elimination of congestion at container terminal by using the COMPASS system

New hydrogen-powered service boat



Onshore power supply



Demonstration of hydrogen-fueled RTG





An aerial night view of Kobe, Japan. The image shows the city's skyline with numerous illuminated buildings. In the foreground, a large stadium with a green field is visible, surrounded by parking lots and roads. To the right, the prominent Kobe Port Tower is lit up in a warm orange glow. In the background, a large Ferris wheel is brightly lit with colorful lights. The water of the harbor is dark, reflecting the city lights. The overall scene is a vibrant and modern urban landscape at night.

**Thank you very much  
for your attention**