

An aerial photograph of Keelung Port, Taiwan. The image shows a large harbor with several red gantry cranes and a large white cargo ship docked. The port is surrounded by a dense urban area with many buildings and a large green hill in the background. The water is a deep blue-green color. The text "PORT of Keelung, TAIWAN" is overlaid in large white letters, followed by "The Role of Fender – Protect City from Crash" and "ESG Implementation Roadmap" in smaller white letters.

PORT of Keelung, TAIWAN

The Role of Fender – Protect City from Crash

ESG Implementation Roadmap

Port and City Relationship

Keelung City

Area: 132.76 km²

Population Density: 2,720 per km²



Keelung City

Port of Keelung

Area: 608.4 ha

Major maritime gateway of Northern Taiwan

1984 The seventh largest container port in the world

2017 Selected as The Best Cruise Terminal in Asia

2018 The Number of Tourist Pass 1 Million

2021 Cargo Throughput over 16.6 Million ton



Port Boundary

Taiwan

Port of Keelung is the major maritime gateway of Northern Taiwan. Located on the northeastern tip of Taiwan (25°09'42.5"N 121°44'57.5"E), The total area of the port area is 608.4 hectares, the single-opening port covers 195.7 hectares of land territory and 412.7 hectares of waterway. The water depth varies between -15 and -15.5 meters, with the tide contributing to a maximum of 0.73 m difference. A natural, landform harbor with a shoreline characterized by pebble beaches, rocky shores and artificial seawalls. In recent years, development of Keelung Port has focused on containers and tourism.



Port Area **608.4** Ha

Water Are : **412.7** Ha

Land Area : **195.7** Ha

Max. Vessel Size
Accommodated

60k Tons Bulk Cargo

10k Teu Container

240k Tons Cruise Ship



Channel
Width-**280M**
Depth-**16M**



Bulk
Cargo: **19.2**mTons/Year
Container: **3.1**mTeu/Year

Port Capacity



Turning Basin Radius
325M

56 Piers
Berths



Average Loading/Unloading
Volume (2020-2022)

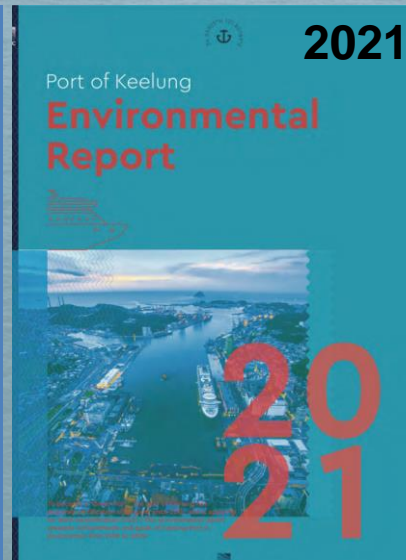
Bulk Cargo ÷ **7.77** m Freight/Yr

Container ÷ **1.58** m Teu/Yr

Environmental Commitment

The commitment to the environment from the Port of Keelung has been implemented in the environmental policy, signed by the president to the action plan. The environmental objectives are discussed and recognized by all departments of the company, and the implementation of the environmental system is checked and confirmed through the certification system, such as the ESPO EcoPorts Certification. The Port of Keelung first received the EcoPorts certification in 2015, and renewed in 2017, 2019, and 2021.

Environmental Report



Environmental Policy & Objectives



ISO 14064-1: 2018
ISO 45001:2018



Challenges for the Next Generation Port

- Next-generation ports must face the increased environmental uncertainty, and rapidly changing world economy. The development of ports and cities needs to be able to respond to changes.
- The hinterland around the port area is limited, and the closed spatial relationship to the city center increases the tension and future risk.
- The balance between port development and historic preservation in and around the port.





Facing the uncertainty of global
environmental and economic risk....

Can the port be the fender of the city?

The 3 Pr-strategies that the Port of Keelung
applied on the roadmap through Port ESG....

Protect Strategy • **Prevent** Strategy • **Preserve** Strategy

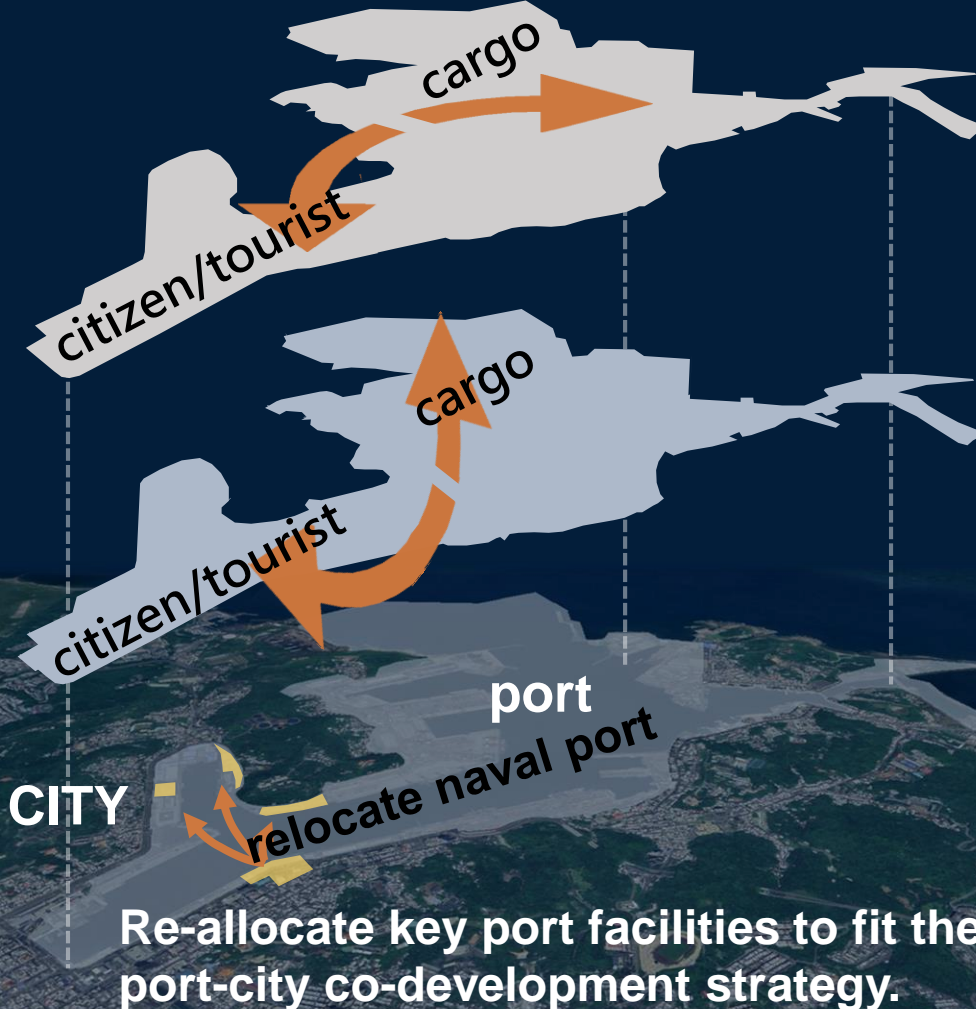
Protect Strategy

- 1 Protect city through spatial allocation**
- 2 Protect environmental quality through technology and monitoring**
- 3 Increase the accessibility to the port front through re-linking the port-city interface**
- 4 Increase occupational safety through cloud technology**



Protect city through spatial allocation¹

Re-allocate city related development toward inner harbor, and industry related development away from the city.



2 Protect environmental quality through technology & monitoring

2021 Key Environmental Issues

1 Air quality

2 Dust

3 Noise

4 Port waste

5 Vessels waste

6 Port development (land area)

7 Vehicle Exhaust emissions

8 Strengthen hazardous cargo management

9 Community relations

10 Reducing ship emissions

Among these key environmental issues, air, water, and noise issues are critical to the co-existence between the port and city, and these factors need to be closely monitored and controlled.



Protect environmental quality through technology & monitoring

Increase Air Quality 2

Tree Planting



Select wind-resistant, salt-tolerant and drought-resistant tree species



100,000 Trees in 2022



Shore Power Supply

13 Berths are equipped with Shore Power Supply, including cleaning boats, harbor boats, and public terminals.



Infrastructure
+
Monitoring
+
Buffer Zones

Air Quality



24 Hr Monitoring

SO ₂ < 80 ppb	PM ₁₀ < 100 µg/m ³
NO ₂ < 100 ppb	PM _{2.5} < 35 µg/m ³
O ₃ < 120 ppb	2021 · 2022 ✓

Protect environmental quality through technology & monitoring

Increase Water Quality & Reduce Noise

2

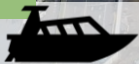
Water Quality Monitoring

- Water Quality Monitoring every season
- Sewage Treatment and Control



Cleaning Boats

Trash Clean-up in the Port
ave. **96.3** ton/year



Infrastructure
+
Monitoring
+
Control

Noise
Monitoring 24 hr

Day 07:00-20:00 <80 dB

Evening 20:00-23:00 <70 dB

Night 23:00-07:00 <65 dB

Protect environmental quality through technology & monitoring

Smart Port + Monitoring + Action 2

Through the **smart port project**, real-time monitoring of land and underwater operations in the port area, as well as ships, vehicles, and people entering/leaving the port area, the safety of the port & city can be maintained. If an unusual or high-risk situation is automatically recognized through the system, it can immediately send a warning and response to the maintenance department. The system also incorporates real-time environmental data.

Port Event

Infrastructure

People
Circulation

Image
Record

Traffic
Circulation

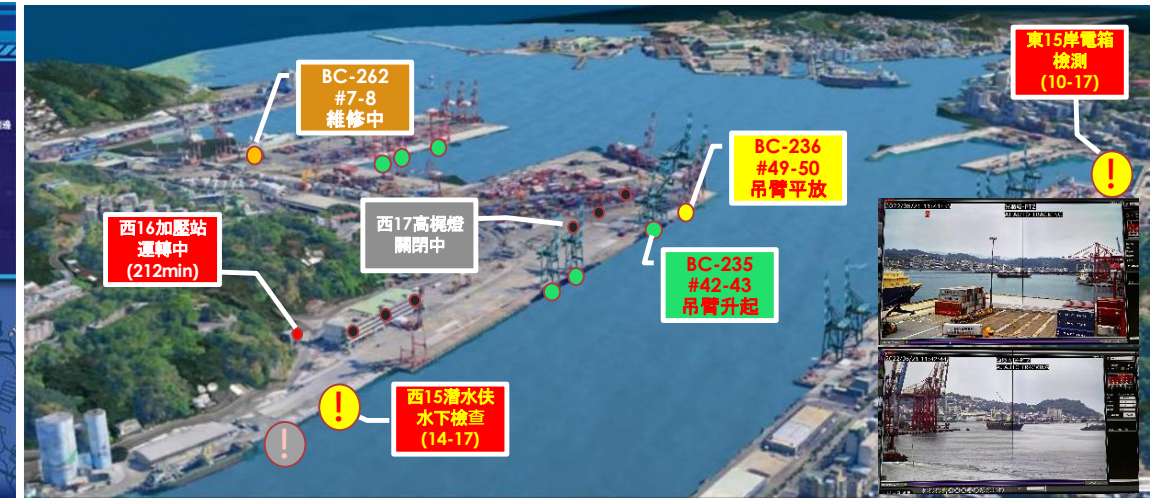
Automatic
Recognition

Vehicle
Info.

Early
Warning

Real-Time
Env. Data

Information Strategical Center



2

Protect environmental quality through technology & monitoring Port Environment & Ecology Environmental Education Center

Milvus migrans is a key species in and around the Port of Keelung because of the unique port environment. Port eco-system is protected through survey, analysis, and monitoring.

The Port of Keelung undertakes the responsibilities of environmental protection awareness and port education by applying for the Environmental Education Site Certification.

Environmental Education Site will provide qualified:

- ***site for port education***
- ***environmental courses***
- ***public awareness and training***



3 Increase the accessibility to the port front through re-linking the port-city interface

W2-3 Terminal
Warehouse Activation

East Passenger
Terminal

Big U
Project

phase III
program
connection
spatial value

2021-2025

phase II
architecture
warehouse
urban design

2017-2020

phase I
landscape
open space
pathway

2015-2016

limited access

Public Access

Before 2015



Low Impact Port-City Development³

Port of Keelung is one of the critical cruise homeport in Asia. To effectively serve cruise passengers, the construction of East Passenger Terminal combined with the renovation of the existing building, connection with new buildings, and open space for the public.

East Passenger Terminal



Big U Project
(Smile Port)

Original Cruise terminal

Extended Cruise Terminal

New Sky Garden



BEFORE



AFTER



Low Impact Port-City Development

3



East Passenger Terminal

Big U Project
(Smile Port)



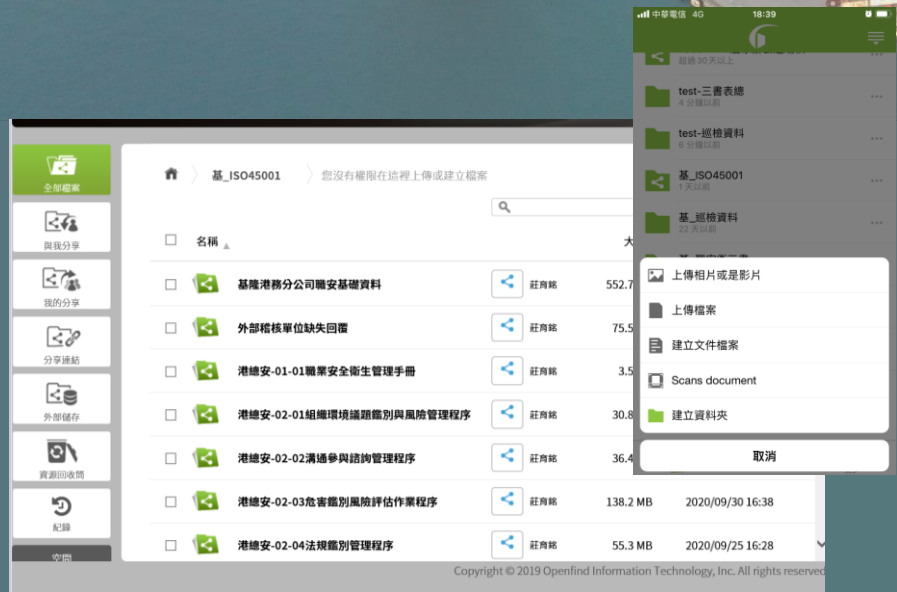
Big U Project is the key project to reconnect the port and city. The activated warehouses, port cultural experience area, harbor front plaza, cultural heritage, art plaza etc. open the space for public, and create the “smile curve” in the port-city interface.



4 Increase occupational safety through cloud technology

Occupational Safety Cloud

Occupational Safety Documents are uploaded in the cloud, which can be reviewed and verified by the occupational safety department. The system can reduce the risk, increase safety and efficiency. It also provide a safety commitment to surrounding communities, and the City of Keelung.



Upload / Check Occupational Safety Document



Loader / Stevedore



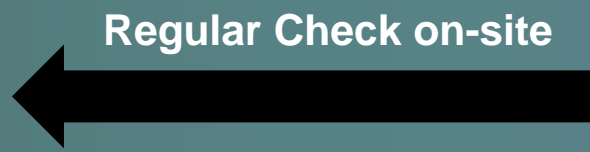
Site Audit Automatic Inspection Risk Assessment



Review / Verify Occupational Safety Document



Dept. of Occupational Safety, TIPC



Regular Check on-site

ISO 45001:2018

Prevent Strategy - from point control to the world connection

during the (COVID-19) pandemic

Point - Port as the Control Point to Prevent the Epidemic Spread

Line - Separate the Circulation Movement for Epidemic Prevention

Zone - Provide space for emergency response in port hinterland

after the (COVID-19) pandemic

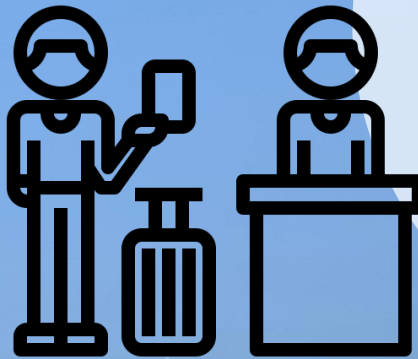
Reconnection - Re-boost the International Tourist Connection &
Revitalization the Urban Economy through Cruise Industry



Port as the Control Point to Prevent the Epidemic Spread

Smart Port + Epidemic Prevention

during the (COVID-19) pandemic



Smart Service @ Passenger Terminal

- epidemic prevention gate
- automatic foreign currency exchange
- automatic immigration counter
- automatic tax refund machine



Separate the Circulation Movement for Epidemic Prevention



Border Quarantine

- border quarantine for cruise and cargo ship
- crew diversion
- separate the quarantine space and circulation from the regular citizen ordinary life



Epidemic Prevention for City

- CIQS cooperation
- provide space (warehouses, port hinterland) for emergency response



Provide space for emergency response in port hinterland



Re-boost the International Tourist Connection & Revitalization the Urban Economy through Cruise Industry after the (COVID-19) pandemic

Cruise Industry

- revitalize cruise industries
- around-Taiwan cruise trip

165 Million USD
net production value

Cruise Industry in
Keelung Port-City

Preserve Strategy


- 1** Reveal the historical and cultural value of the port through warehouse restoration
- 2** Public Participation Design

11 SUSTAINABLE CITIES
AND COMMUNITIES



17 PARTNERSHIPS
FOR THE GOALS






The Historical Role

The Port of Keelung is surrounded by hills, which prevent the strong northeast wind in winter and typhoons in summer. The geographic location increases the importance of its strategic position. Many forts were built in order to prevent the enemy troop from landing during the war, and finally successfully resisted the invasion.

● Fort Ruins



The Historical Role

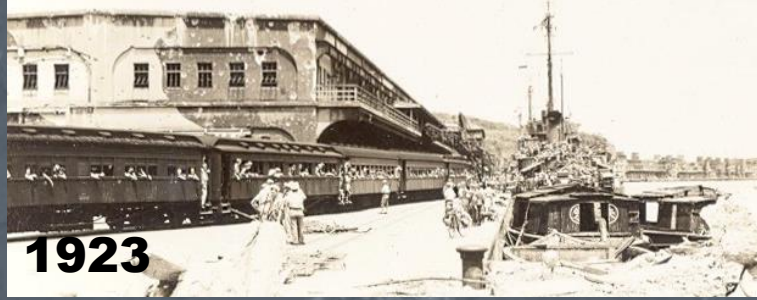
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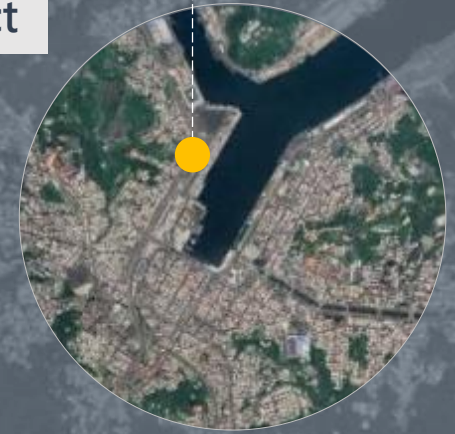
● Fort Ruins

Reveal the historical and cultural value of the port through warehouse restoration¹

The W2-3 Terminal Warehouse has been the important passenger and cargo warehouse since the Japanese occupation period. The steel frame architecture construction method from the 1930s has critical historical value and was registered as a historical building in 2014. The two warehouses have been modified and rebuilt many times after the war. The appearance, including the main facade, the seaside elevation, and three outdoor ladders, differs from the historical view. The W2-3 activation project restores the steel structure, repairs the indoor and outdoor spatial relationship, and preserves the cultural assets as part of the port spirit.



W2-3 Terminal
Warehouse
Activation Project



W3 Terminal



W2 Terminal



Port Spirit and Culture Can Pass On to the Next Generation through the Space and Memory

Dimension of Sea - Keelung

作者：謝世明、鄭偉廷
1995年 基隆市

基隆港是基隆市唯一的港口。

1995年，基隆市立美術館開幕，本畫廊是當時唯一舉辦國際畫展之美術館，以展示臺灣畫壇，呈現當時的藝術、文化、社會、生活面貌。

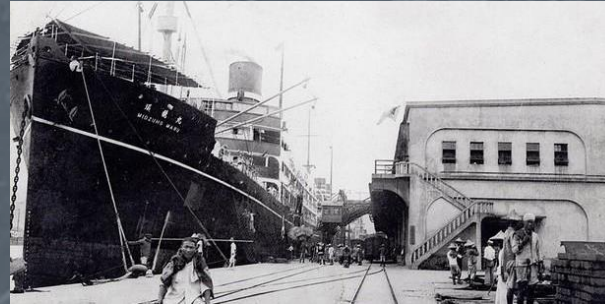
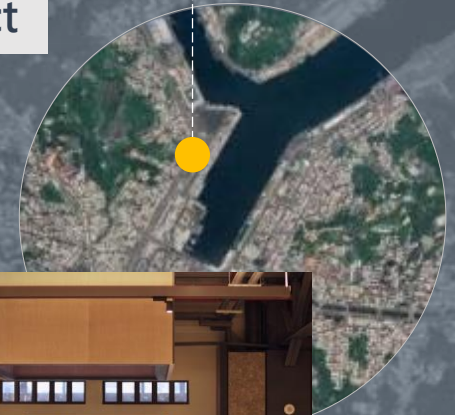
Dimension of Sea 作為一個展覽空間，記錄了當時的藝術、文化、社會、生活面貌。

本畫廊是基隆市唯一的港口，也是基隆市唯一的港口。

2

Public Participation Design

W2-3 Terminal Warehouse Activation Project



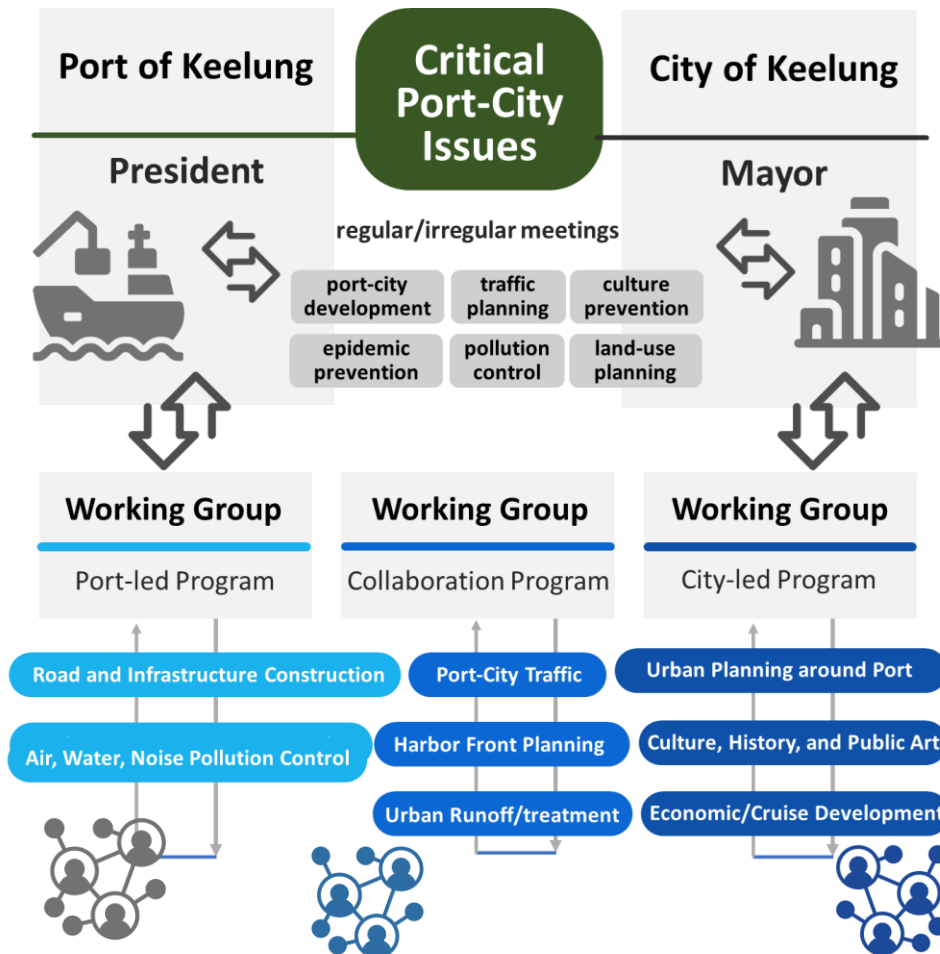
In the design's early stage, public participation was involved in the W2-3 activation project. The first floor of the W-2 warehouse is an open space with cultural and educational functions. Under the conditions of port operation, security, and safety, port operation zones are separated from public. The outer wall on the seaside is replaced with glass to respond to public expectations of being port front.





Port-City Cooperation Platform

Port and city are two major, and separate entities. The development between the port and the city needs close cooperation to reduce the conflicts. The Keelung port city demonstrates how to facilitate collaboration through the port-city platform.



Current Mayor
Kuo-liang Hsieh
City of Keelung
2022-

President
Chwan-Kai Kao
Port of Keelung
2019-present



Mayor Yu-Chang Lin
City of Keelung
2014-2022

President Chwan-Kai Kao
Port of Keelung
2019-present



Port-City Cooperation

2022 City EXPO

The 2022 City Expo takes "the Starting Point of City" as the theme, looking back at the history of Keelung...

Connecting Port with City, History, and Inheritance





Port-City-World Reconnection - Cruise Resumption

On **March 7, 2023**, two international cruise ships, Seven Seas Explorer and Westerdam, were resumption at the Port of Keelung. The cruise industry requires the cooperation of ports, cities, and various stakeholders. In addition to bringing economic development, it also reconnects the culture of Keelung Port City to the world.





ESG Roadmap

toward...
compatible port-city
sustainable development
responsible governance

Port of Keelung

ESG Implementation Roadmap

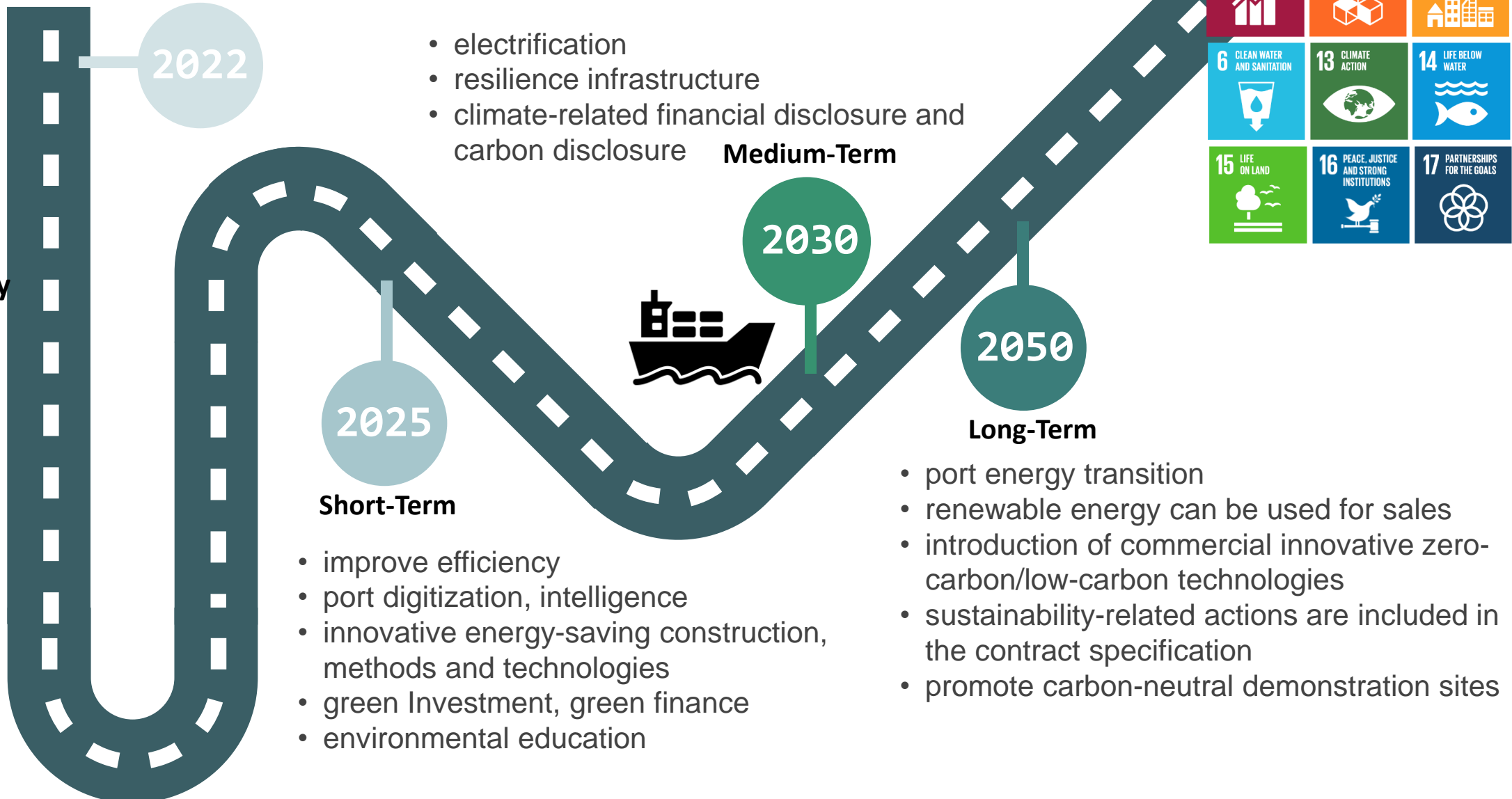


Port ESG Roadmap

- Set Goal
- Define Risk
- Env. Inventory
- Strategies

Protect
Prevent
Preserve

- Implement



Port of Keelung - ESG Implementation Benefits and Impacts

- Integrate port and urban development, and reduce the city and port conflicts
- Respond to future climate and environmental uncertainties
- Reduce the risk of environmental impacts
- Reach the 2050 Port Carbon Neutral
- Collaborate with the shipping industry, and revitalize the economy
- Increase the diversity and possibility of port-city development
- Validate port corporate social responsibility and sustainable management value

several environmental performance indexes in 2022...

Reduce



12,493 ton CO2e

vessel speed reduction



Reduce

482 ton CO2e

renewable energy

Remove



96.3 ton trash

trash clean-up



Reduce

224 ton CO2e

automated gate



Increase

100,000 trees

tree planting



Clean

18,908 km

street clean-up

prepare for the change...

PORT of Keelung, TAIWAN - The Role of Fender