



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**



Turning Basin Radius

325M

56 Piers
Berths



Bulk Port Capacity

Cargo: **19.2**mTons/Year

Container: **3.1** mTeu/Year



Average Loading/Unloading
Volume (2020-2022)

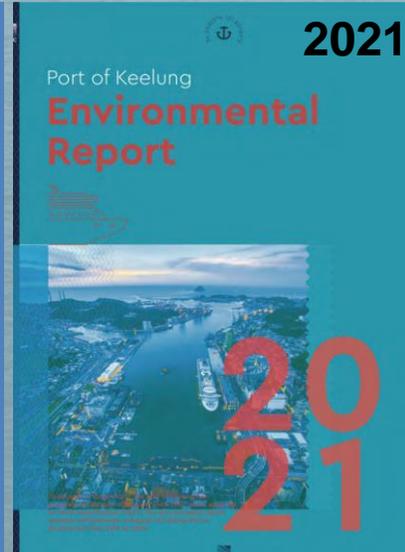
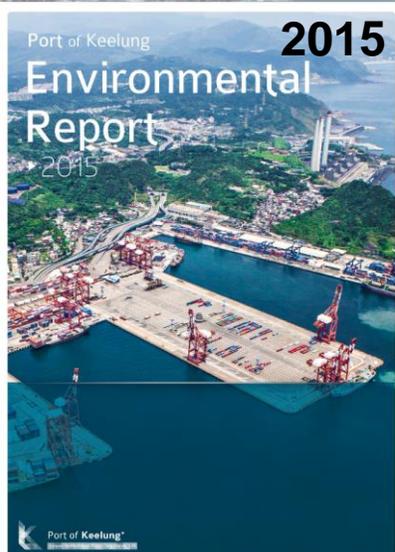
Bulk Cargo \approx **7.77** m Freight/Yr

Container \approx **1.58** m Teu/Yr

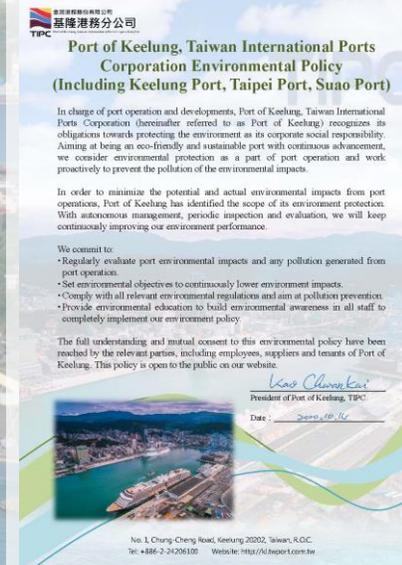
Environmental Commitment

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

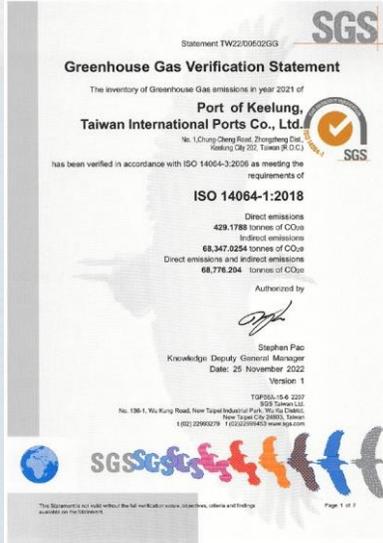


ESPO EcoPorts Certification

2015
2017
2019
2021



ISO 14064-1: 2018
ISO 45001:2018



Statement TW22106025G

Greenhouse Gas Verification Statement

The inventory of Greenhouse Gas emissions in year 2021 of
Port of Keelung, Taiwan International Ports Co., Ltd.
No. 1, Chung Cheng Road, Zhongsheng Dist., Keelung City 302, Taiwan (R.O.C.)

has been verified in accordance with ISO 14064-3:2006 as meeting the requirements of
ISO 14064-1:2018

Direct emissions
429,1788 tonnes of CO₂e
Indirect emissions
68,347,0254 tonnes of CO₂e
Direct emissions and indirect emissions
68,776,204 tonnes of CO₂e

Authorized by
Stephan Piac
Stephan Piac
Knowledge Deputy General Manager
Date: 25 November 2022

Version: 1

TSP055-154 2017
SGS Taiwan Ltd.
No. 136-1, Wu King Road, New Taipei Industrial Park, New Taipei City 28801, Taiwan
1 (80) 2299219 | 1 (02) 22992000 www.sgs.com

The Statement is valid without the full verification process, unless and in full compliance with the Terms and Conditions.

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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**

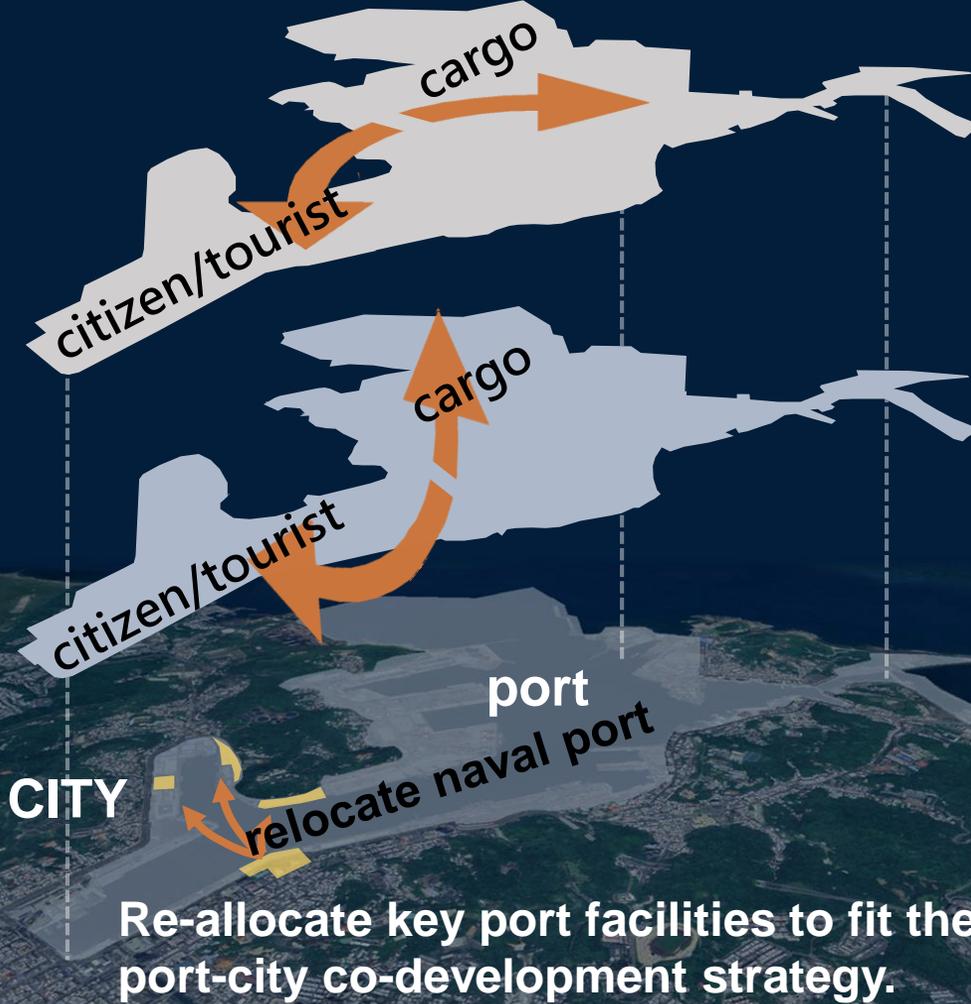
Protect Strategy

- 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 allocation **1**

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



Re-allocate key port facilities to fit the port-city co-development strategy.



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)

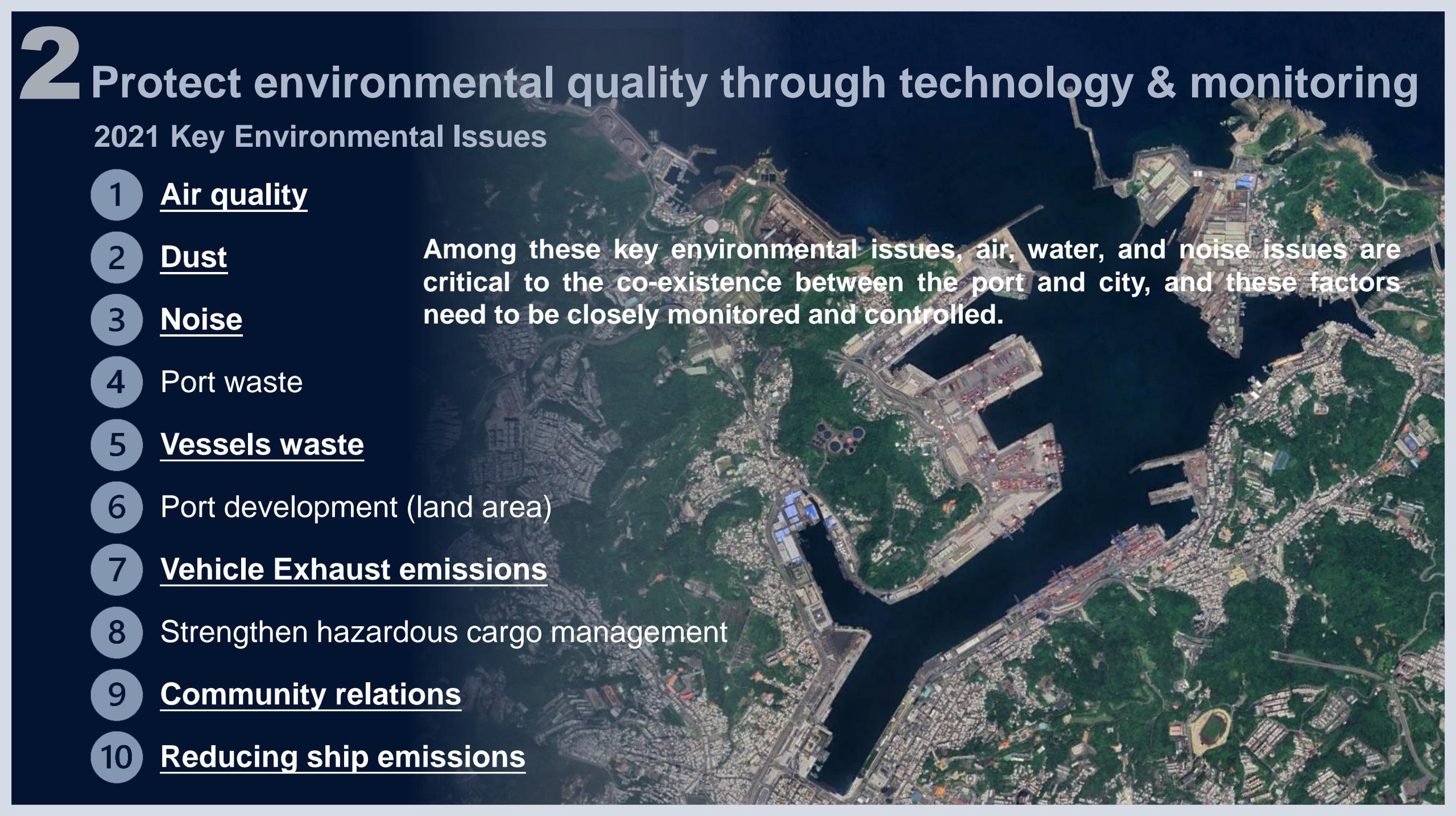
7 Vehicle Exhaust emissions

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



Noise Monitoring 24 hr

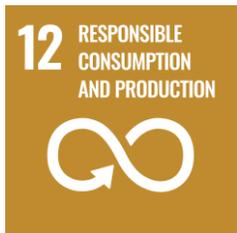
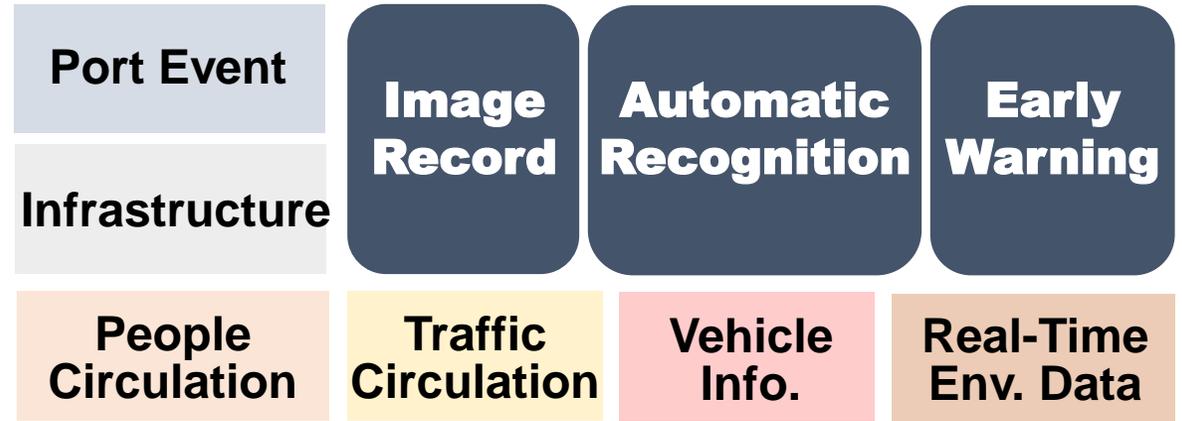
Day 07:00-20:00	< 80 dB
Evening 20:00-23:00	< 70 dB
Night 23:00-07:00	< 65 dB

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.



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

phase II
architecture
warehouse
urban design

phase I
landscape
open space
pathway

limited access

Public Access

2021-2025

2017-2020

2015-2016

Before 2015



Low Impact Port-City Development ³

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

Original Cruise terminal

Extended Cruise Terminal

New Sky Garden

Big U Project
(Smile Port)



BEFORE



AFTER



Low Impact Port-City Development 3



East Passenger Terminal



Big U Project
(Smile Port)

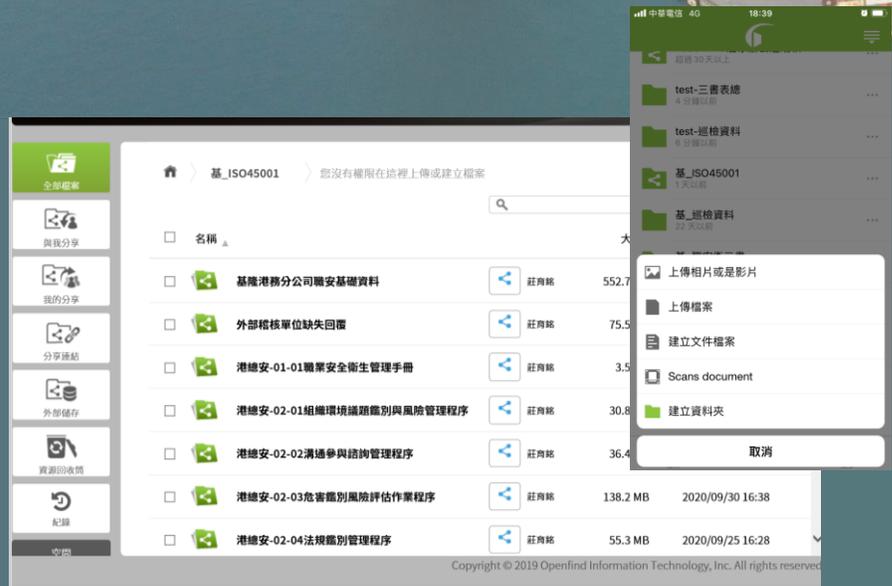


Big U Project is the key project to reconnect the port and city. The activated warehouses, port cultural experience area, harbor front plaza, cultural heritage, art plaza etc. open the space for public, and create the "smile curve" in the port-city interface.



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.



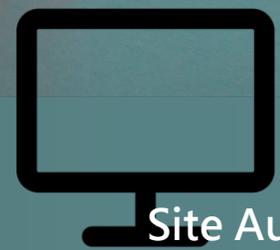
Upload / Check Occupational Safety Document



Loader / Stevedore



Occupational Safety Document



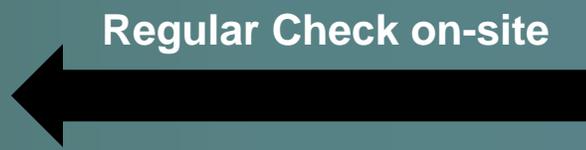
Site Audit Automatic Inspection Risk Assessment



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

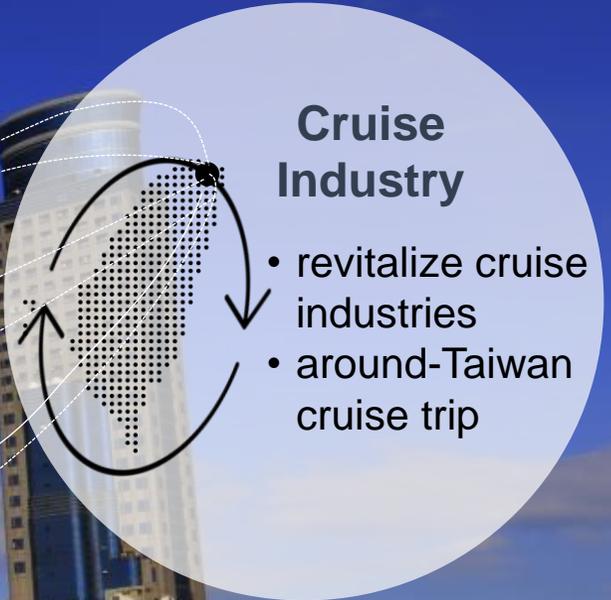


Provide space for emergency response in port hinterland



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

after the (COVID-19) pandemic



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

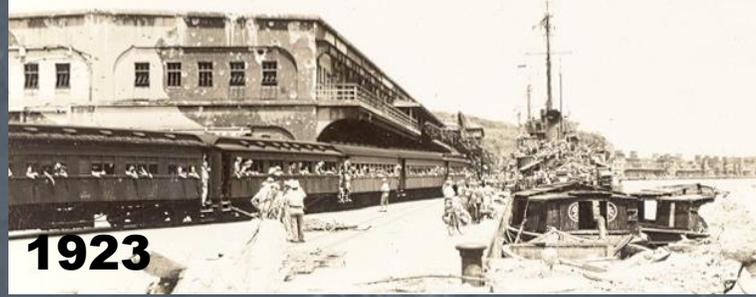
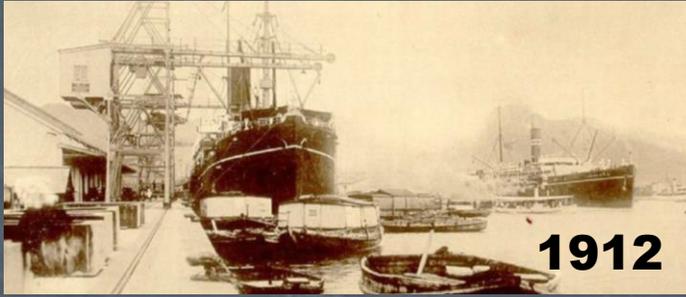


17 PARTNERSHIPS
FOR THE GOALS

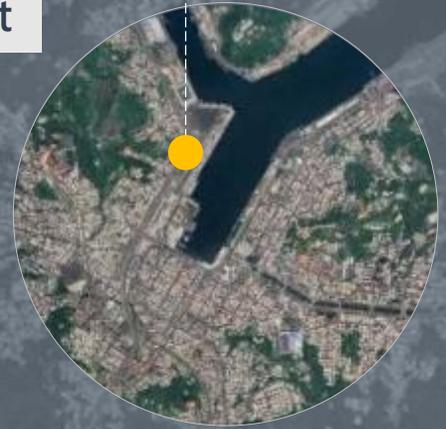


Reveal the historical and cultural value of the port through warehouse restoration 1

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

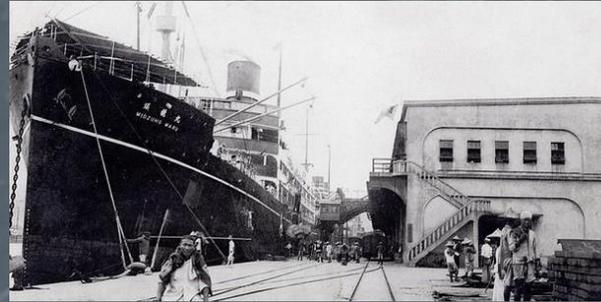
W2 Terminal



2

Public Participation Design

W2-3 Terminal
Warehouse
Activation Project

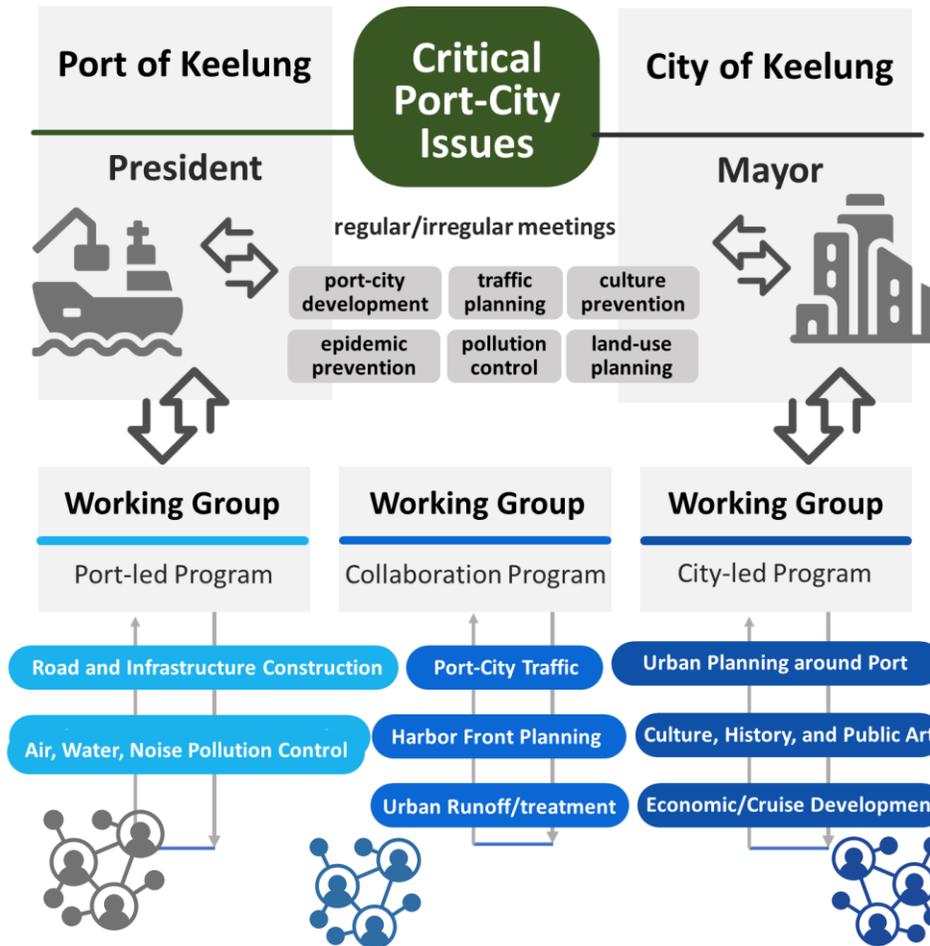


In the design's early stage, public participation was involved in the W2-3 activation project. The first floor of the W-2 warehouse is an open space with cultural and educational functions. Under the conditions of port operation, security, and safety, port operation zones are separated from public. The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

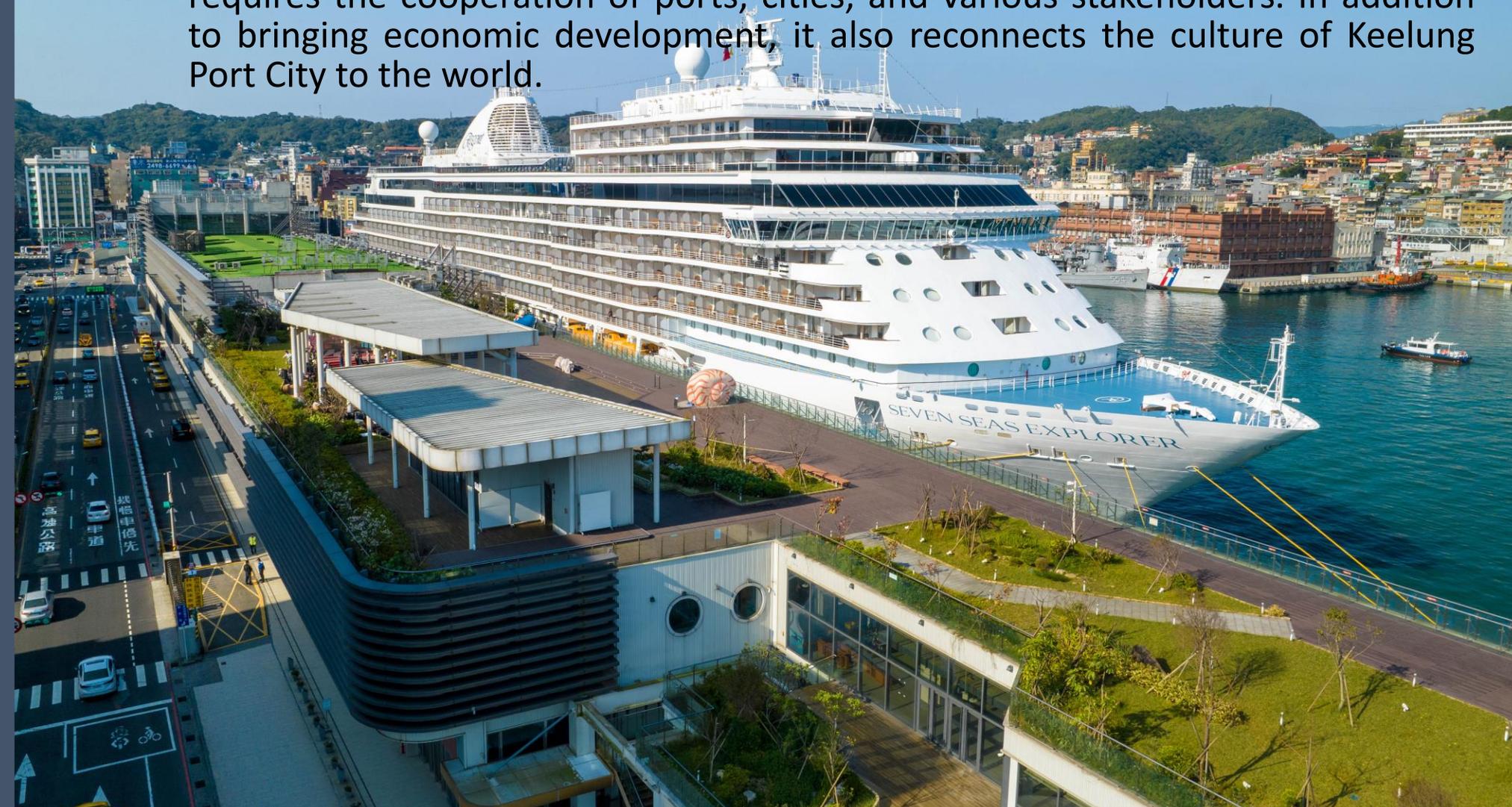
Connecting Port with City, History, and Inheritance





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

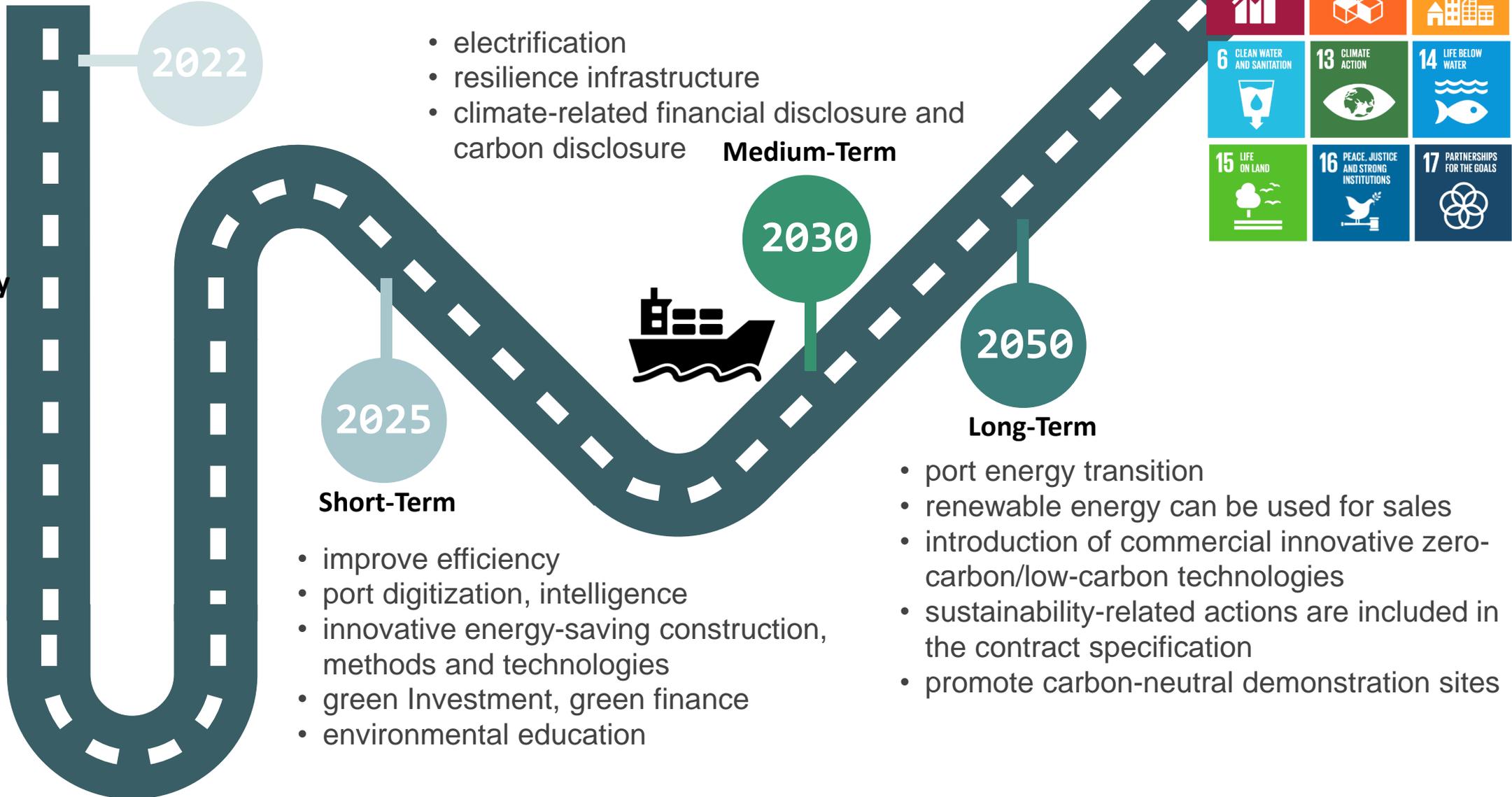


Port ESG Roadmap

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

Protect
Prevent
Preserve

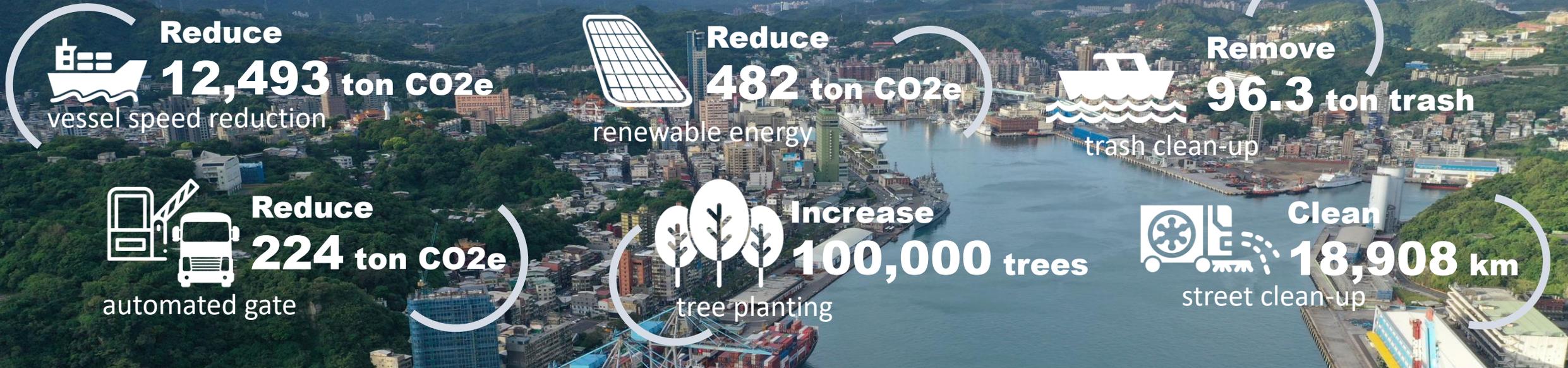
- Implement



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...



prepare for the change...



PORT of Keelung, TAIWAN - The Role of Fender