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PORT OF TAICHUNG

ENVIRONMENTAL REPORT

TAIWAN INTERNATIONAL PORTS CORPORATION, LTD.

TIPC

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Environmental Policy and Objective

Environmental Objectives

Taiwan International Ports Corporation Environmental Policy

"Leverage innovation effectively to connect and communicate with global trade flows. Mature into a world-class port management group" is the vision of Taiwan International Ports Corporation(TIPC). TIPC manages and operates commercial ports in Taiwan and is engaged in maritime transport related services, free trade zones, and the development of relevant tourism and recreational projects.

While TIPC pursues business growth, we are well-aware of the importance of our social responsibility, which is to ensure both environmental and economic sustainability. With the goal to establish green and sustainable ports, we will proactively identify environmental risks that may be associated with our activities and manage the risks accordingly to minimize the environmental impacts.

We commit to:

1. Implement and follow through with the Green Port Policy to establish extraordinary world-class ports.
2. Comply with applicable environmental regulations to fulfill corporate environmental responsibility.
3. Execute pollution prevention, monitoring, and control mechanism to enhance environmental quality in and around port areas.
4. Reinforce environmental education to cultivate environmental awareness among employees.
5. Strengthen the communication with local communities,and pursue sustainable development for both the ports and the cities where we are operating.

Hsien-Yi Lee

Hsien-Yi Lee
Chairman of TIPC
Date: 2020 / 03 / 26

Shao-Liang Chen

Shao-Liang Chen
President of TIPC
Date: 2020 / 03 / 26

Port of Taichung
Environmental Policy

Environmental Policy
Port of Taichung

Taichung Port ,TIPC recognizes that, as a port operator, it has a responsibility to maintain and improve the port environment and to view environmental protection as an integral part of port operations. Therefore, we are committed to minimizing the impact of port operations on the environment and providing a high-quality, environmentally friendly, sustainable, and progressive port.

To achieve consistency between port environmental performance and policy, we will adhere to the following principles :

- **Compliance with environmental laws and regulations, maintenance of port environmental quality.**
- **Implementation of environmental monitoring to identify sources of pollution.**
- **Innovation in pollution prevention technology to achieve a green port.**
- **Moving towards autonomous management and achieving sustainable development.**

This environmental policy will be effectively communicated to all employees and will be made available for shipping companies, lessees (factories), and neighboring community residents to access on the Taichung Port,TIPC website.

President of Port of Taichung , TIPC Rung Tsung Chen

Date 12 / June / 2023

Port of Taichung
Environmental Objectives

Environmental Objectives
Port of Taichung

To implement the commitments of environmental policy, the following environmental objectives are set based on the operating characteristics of the port and sets the following ten major environmental issues from the port.

Improve port air quality
Continue to monitor port air quality, enhance environmental inspection and trace pollution sources.

Reduce fugitive dust in the port area
Promotion of enclosed operations for loading and unloading of scattered goods, management of loading and unloading, road dust washing and sweeping operations, and treatment of flying sand.

Implementation of ship's waste oil and sewage management
Regulate the discharge of waste oil and sewage from ships in the port area and commission qualified contractors to clean them up.

Environmentally-friendly development of port and land areas
Development of waterfront tourism and commercial activities and promotion of green beautification and landscape construction in the port area.

Improvement of ship exhaust emissions in the port area
Conversion to low-sulfur fuel, promotion of shore power equipment, and continuous promotion of ship speed reduction.

Enhance hazardous cargo management in the port area
Establish hazardous cargo safety management system, reinforce on-site inspection, and strengthening the integration of emergency response mechanisms.

Enhance the development of port waterways
Developing clean and hygienic waterfront spaces, the Zhongpao Canal, and tourism and recreational business areas.

Promoting ship resource recycling work
Promoting ship waste classification and resource recycling work.

Promoting measures to address climate change
Regular inventory of greenhouse gases, implementation of plant carbon sequestration, and promotion of renewable energy development.

Enhance Community Relationship
Strengthening public participation and increasing interaction with the local community.

The president of Taichung Port, is responsible for implementing, maintaining, and communicating this environmental policy. Also responsible for reviewing this policy every two years to ensure compliance, continuous improvement, and achievement of environmental objectives.

President of Port of Taichung, TIPC Rung Tsung Chen

Date 12 / June / 2023

01

Message from Port of Taichung, TIPC

As global maritime transportation progresses, international ports, like ours, are ambitiously setting their sights on "sustainable development." Taichung Port, the vibrant maritime gateway of Central Taiwan, is not only an essential hub for energy and bulk commodity storage but also a beacon of industrial innovation due to its expansive infrastructure. Moreover, catering to modern demands, it elegantly doubles as a nexus for passenger transportation and leisure tourism.

Proudly, since our pioneering achievement of the EcoPorts certification in 2015, Taichung Port has maintained an unwavering commitment to environmental excellence, undergoing meticulous re-evaluations biennially. The Taichung Port Authority, driving forward with vision and tenacity, has championed groundbreaking environmental policies. We have set benchmarks in port environmental planning, pollution mitigation, community engagement, and in upholding the highest standards of corporate social responsibility.

In our forward-thinking trajectory, we've synergized waterfront tourism with strategic asset revitalization. Collaborations with iconic establishments such as the Mitsui Outlet and the Golden Tulip Hotel have not only elevated the port's stature but have also fostered mutual prosperity for both the port and the vibrant cityscape. Aligning with the nation's progressive energy blueprint, we have seamlessly integrated dedicated zones for wind power, state-of-the-art connecting routes, and cutting-edge facilities for offshore wind turbines. Our relentless drive caters to the intricate nuances of wind turbine component production, logistics, and pre-assembly, solidifying our commitment to the sustainable evolution of the green energy ecosystem.

As we aspire for continued excellence and embark on the EcoPorts re-certification journey, it's not merely about compliance but our dedication to holistic excellence. Taichung Port stands as a testament to harmonizing development with environmental stewardship, cultural enrichment, tourism, community harmony, and pioneering green initiatives. Our resolute journey epitomizes the very essence of a globally-conscious port and resonates seamlessly with the United Nations Sustainable Development Goals (SDGs).

Rung Tsung Chen

President of Port of Taichung
Taiwan International Ports Corporations, Ltd.

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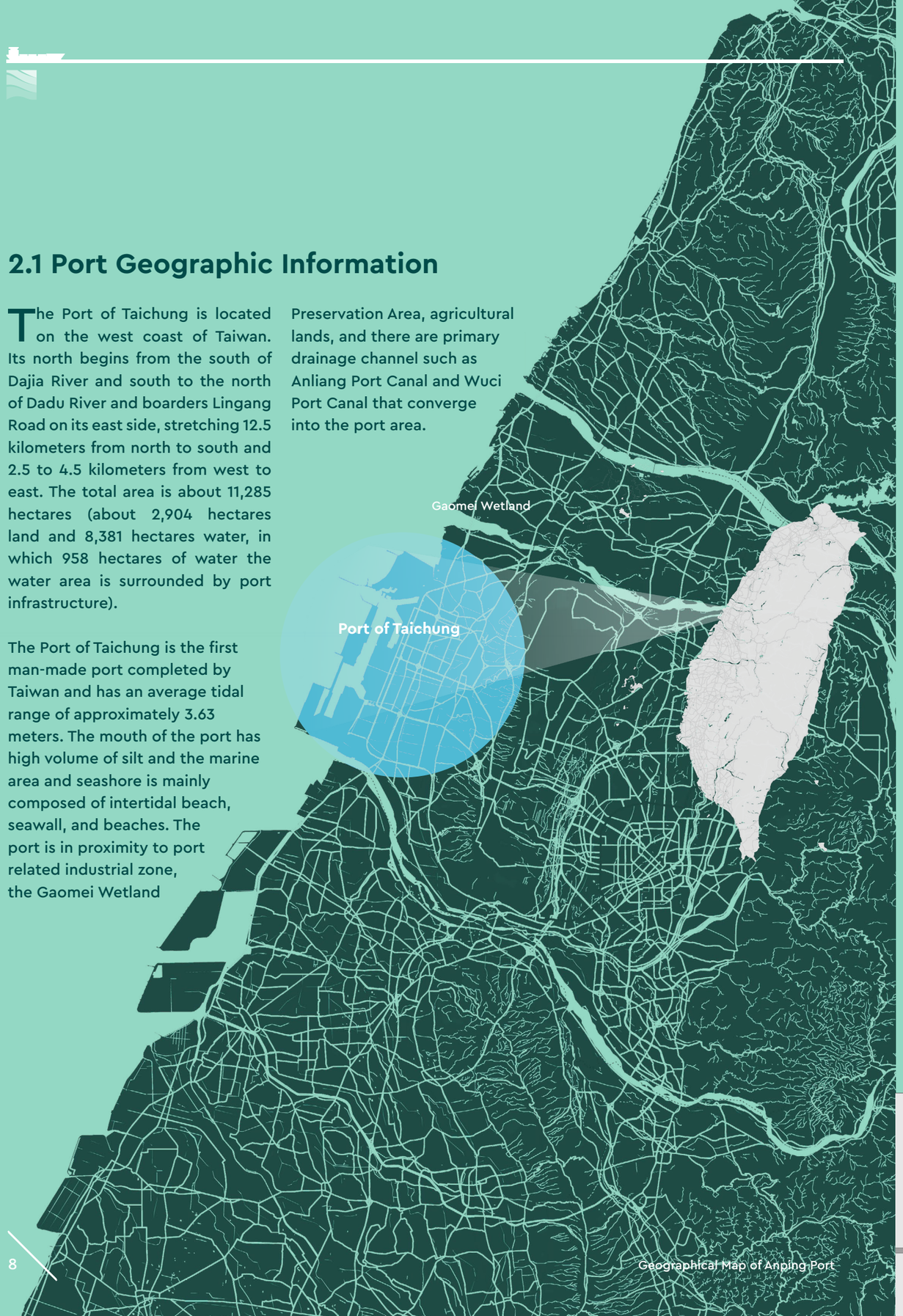
Port Profile

2.1 Port Geographic Information

The Port of Taichung is located on the west coast of Taiwan. Its north begins from the south of Dajia River and south to the north of Dadu River and boarders Lingang Road on its east side, stretching 12.5 kilometers from north to south and 2.5 to 4.5 kilometers from west to east. The total area is about 11,285 hectares (about 2,904 hectares land and 8,381 hectares water, in which 958 hectares of water the water area is surrounded by port infrastructure).

The Port of Taichung is the first man-made port completed by Taiwan and has an average tidal range of approximately 3.63 meters. The mouth of the port has high volume of silt and the marine area and seashore is mainly composed of intertidal beach, seawall, and beaches. The port is in proximity to port related industrial zone, the Gaomei Wetland Preservation Area, agricultural lands, and there are primary drainage channel such as Anliang Port Canal and Wuci Port Canal that converge into the port area.



Geographical Map of Anping Port

2.2 Legal Status and Port Operators

To promote modernized commercial port management system reforms, The Taiwan International Ports Corporation, Ltd. Establishment Act was promulgated on November 9, 2011.Taiwan amended the Commercial Port Law on December 28, 2011. It was then decided in March 2012 that the government should be separated from the enterprise for management of the ports. Public entities that used to manage the ports, including: Kaohsiung Harbor Bureau, Taichung Harbor Bureau, Keelung Harbor Bureau and Hualien Harbor Bureau, are integrated into a corporation (Taiwan International Ports Corporation, TIPC) to reduce legal and institutional restrictions on commercial port operations, enhance the ability of ports to respond to market changes, and increase their competitiveness. After the transformation, management of the Port of Taichung is now the responsibility of the Taichung Branch of TIPC. The Maritime and Port Bureau (MPB), Ministry of Transportation and Communications (MOTC) will be in charge of management issues related to public authority.

2.3 Main Commercial Activities

In accordance with the construction and development plan, 84 piers are planned to be constructed, with 64 piers currently in place. These include various types of piers for handling commodities such as grains, containers, general bulk cargo, cement, major bulk goods, coal, piped liquid goods, chemicals, oil products, liquefied petroleum gas, scrap iron, wind turbine heavy components, and passenger and cargo. Port commercial activities encompass passenger liners and leisure recreation, wind turbine component manufacturing and assembly, general manufacturing, and chemical industries, as well as containers. Passenger liner routes primarily focus on coastal and cross-strait transportation, and it stands as the international commercial port with the highest density of cross-strait flights.

Main Commercial Activities

Port of Taichung Main Commercial Activities	
Passenger ferries/leisure and recreation	Wind power component manufacturing and assembly
General manufacturing and chemical industries	Oil Refining and Storage Transportation
Container handling	Dry and liquid bulk cargo (non-petroleum)
Automobile	Others

2.4 Main Cargoes

The major goods imported into Taichung Port in 2021 and 2022 include products such as coal, metallic ores, liquefied petroleum gas, and wind turbine components. Following these are oil, clinker cement, other chemicals, and grains. The main exports from the port are steel products, wind turbine components, oil, mineral sands, other liquefied products, and chemicals.

Main Cargoes of Taichung Port

Petroleum	Pyrites minerals
Diesel , Gasoline, Fuel oil	Coal, Cement, Metallic ore, Blast, furnace slag, Talc, Iron ore, etc.
Dry bulk	Liquid bulk (non-oil)
Corn, Wheat, Soybeans, Timber (wood), Fertilizers, etc.	Chemical liquids, Liquefied natural gas (LNG), Cement for pipelines, etc.
Ores	Other
Scrap steel materials, Automobiles and their components, Machinery components, Wind turbine components, etc.	Cement clinker, General groceries, etc.

2.5 Business Statistics

Port of Taichung Business Statistics from 2021–2022

Business Item		2021	2022	Comparison between 2021 and 2022	
				Actual Number	%
Incoming and outgoing ships (ton)	Total number of ships	21,450	22,969	1,519	7.08%
	Total tonnage	288,676,635	271,893,950	-16,782,685	-5.81%
Cargo Stevedoring Quantity (shipping ton)	Container cargo	70,236,486	63,579,616	-6,656,870	-9.47%
	Bulk cargo	50,998,580	56,560,312	5,561,732	10.91%
	Channel cargo	18,032,632	15,457,232	-2,575,400	-14.28%
	Total	139,267,698	135,599,160	-3,668,538	-2.63%
Container Stevedoring Quantity (TEU)	Inbound container	983,925.25	871,977.75	-111,947.50	-11.38%
	Outbound container	995,369.25	913,387.25	-81,982	-8.24%
	Total	1,979,294.50	1,785,365.00	-193,929.50	-9.80%
Cargo Throughput (metric ton)	Imported cargo	59,722,474	55,798,901	-3,923,573	-6.57%
	Exported cargo	8,524,553	7,997,216	-527,337	-6.19%
	Domestic cargo	5,001,465	5,292,060	290,595	5.81%
	Total	73,248,492	69,088,177	-4,160,315	-5.68%
Number of Travelers	Domestic line	6,566	4,746	-1,820	-27.72%
	International line	894	0	-894	-100.00%
	Total	7,460	4,746	-2,714	-36.38%

03

Environmental Management

3.1 Organization Structure

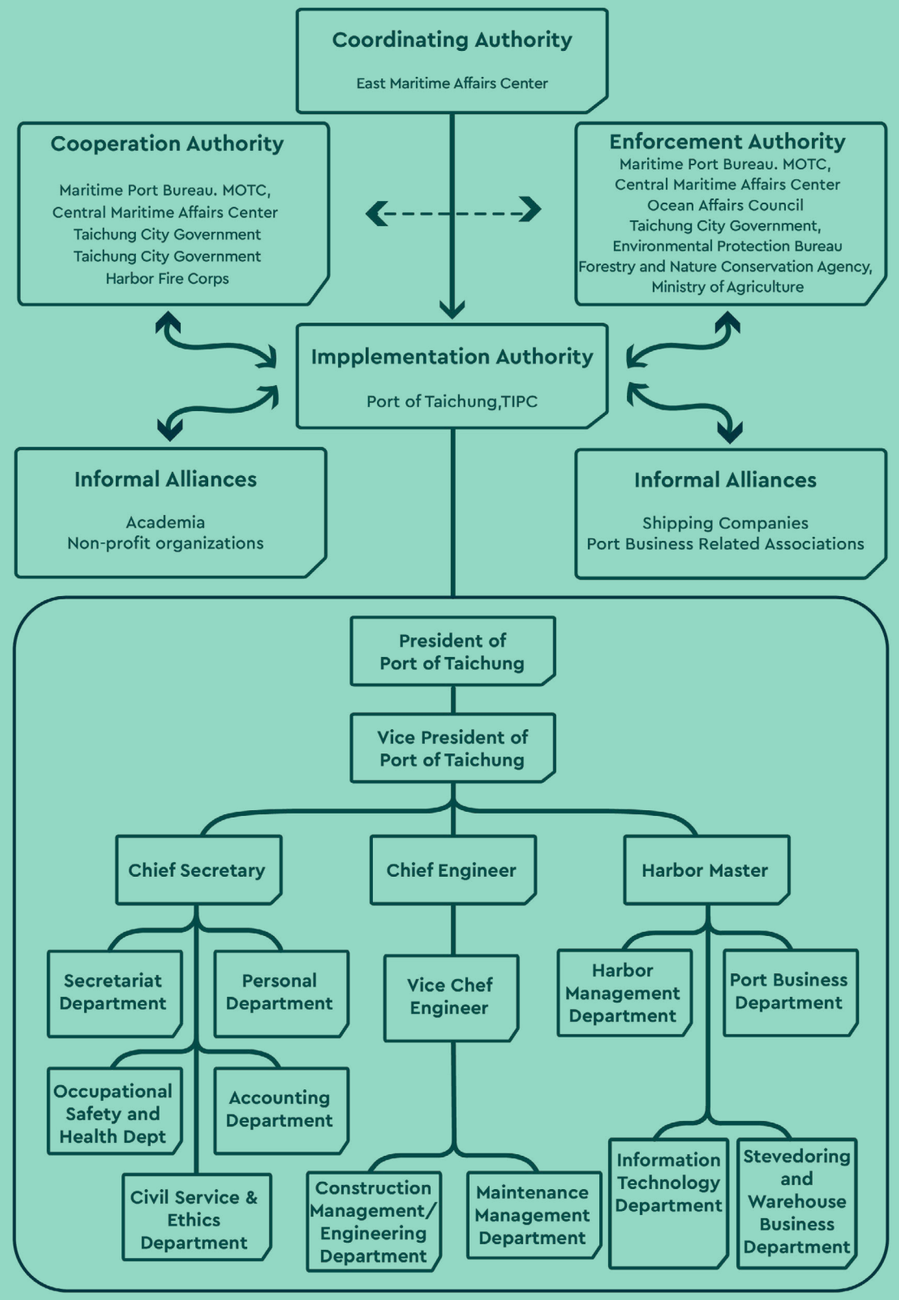
Within the commercial port area of the port of Taichung, environmental issues involve several entities. In addition to the port of Taichung, this includes the Central Taiwan Maritime affairs center of Maritime and Port Bureau, Ministry of Transportation and Communications, Ministry of Environment, Marine Conservation Agency and Coast Guard Administration of the Ocean Affairs Council of the Executive Yuan, Third Coast Patrol Team and Third (Taichung) Coast Guard Fleet of the Regional Fleet Sub-agency, Taichung Harbor Police Corps of the Ministry of the Interior's National Police Agency, Harbor Fire Corps (National Fire Agency, Ministry of the Interior), Central Harbor Branch of the Export Processing Zone Administration of the Ministry of Economic Affairs, Taichung Customs of the Ministry of Finance, Taichung Port Department of the Central Region Control Center of the Centers for Disease Control under the Ministry of Health and Welfare, and others.

As for the internal structure of the port of Taichung, it consists of eleven departments including the Occupational Safety and Health Department, Secretariat Department, Engineering Department, Maintenance Management Department, Harbor Management Department, Stevedoring & Warehousing Business Department, Business Department, Information Department, Personnel Department, Integrity Department, and Accounting Department.

Responsibilities of each unit within the Taichung Port Branch, TIPC

Department	Functions of the divisions at Taichung Port
Port Business Department	Attraction of local investments, implementation of port functions, and creation of benefit
Harbor Management Department	Port safety
Stevedoring & Warehousing Business Department	Tourist services
Information Technology Department	Development and maintenance of IT systems and equipment
Construction Management / Engineering Department	Port engineering and electrical and mechanical planning, design, construction and supervision
Maintenance management Department	Planning, design, construction, manufacturing supervision, communication management and maintenance management of port engineering and electromechanical equipment
Occupational Safety and Health Department	Port environmental protection, pollution prevention and management of occupational health and safety
Personnel Department	Human resource management
Civil Service Ethics Department	Enforcement of ethics and investigation
Accounting Department	Budget review and management of income and expenditures
Secretariat Department	General affairs management

Responsibility Chart of the Environmental Issues Management Unit forTaichung Port Branch, TIPC



3.2 Environmental Issues Related Regulations

Port of Taichung, TIPC adheres to international environment regulations and conventions, including adherence to relevant international shipping conventions such as the International Convention for the Prevention of Pollution From Ships (MARPOL73/78), the London Convention (Prevention of Marine Pollution by Dumping of Wastes and Other Matter), the International Convention for the Safe and Environmentally Sound Recycling of Ships, the International Convention on the Control of Harmful Anti-fouling Systems on ships (AFS Convention), and the International Convention for the Control and Management of Ships' Ballast Water and Sediments.

In addition to international environment regulations and conventions, the Port of Taichung, TIPC also complies with domestic environmental laws and cooperate with local law enforcement agencies in conducting harbor area environmental management. Domestic stevedore environment regulations are shown below.

Relevant Environmental Laws and Regulations Related to Ports in Taiwan

Competent Authority		Laws Title		Central Competent Authority	Local Law Enforcement Agencies
Sectors in the Ministry of transportation and communications		The Commercial Port Law	2023/06/28	Ministry of Transporation and Communications	Department of Central Maritime Affairs Center, Maritime and Port Bureau, MOTC
		Shipping Act	2014/01/22		
		The Law of Ships	2018/11/28		
		Act for the Establishment and Management of Free trade zones	2019/01/16		
Sectors related to agricultural		Wildlife Conservation Act	2013/01/23	Ministry of Agriculture	Agriculture Bureau, Taichung City Government
Sectors in the Ministry of the Interior		Fire Services Act	2023/06/21	Ministry of the Interior National Police Agency	Harbor Fire Corps
		Police Act	2002/6/12	Administration Police	Taichung Harbor Police Department
Sectors related to environmental protection		Marine Pollution Control Act	2023/05/31	Ocean Affairs Council	Environmental Protection Bureau of Taichung City
		Basic Environment Act	2002/12/11	Ministry of Environment	
		Air Pollution Control Act	2018/08/01		
		Water Pollution Control Act	2018/06/13		
		Waste Disposal Act	2017/06/14		
		Environmental Impact Assessment Act	2023/05/03		
		Environmental Education Act	2017/11/29		
		Noise Control Act	2021/01/20		
		Indoor Air Quality Management Act	2011/11/23		
		Toxic and Concerned Chemical Substances Control Act	2019/01/16		
		Soil and Groundwater Pollution Remediation Act	2010/02/03		
		Climate Change Response Act	2023/02/15		
		Environmental Agents Control Act	2016/12/07		
		Public Nuisance Dispute Mediation Act	2009/06/17		Taichung City Mediation Committee
		Taichung City Self- governance Articles of Bituminous Coal Control and Petroleum Coke Prohibition in Public and Private Places	2016/01/26	Taichung City Government	Environmental Protection Bureau
		Taichung City Low Carbon City Development Self-governace Article	2014/05/09		Local Administrative Government
Intersectoral		Disaster Prevention and Protection Act	2022/06/15	Ministry of Interior	Taichung City Government

3.3 Analysis of Major Environmental Issues

The port of Taichung sought to fully understand the thoughts of stakeholders by conducting a survey using questionnaires, targeting employees, the government, customers, and the community, among other stakeholders. A total of 123 questionnaires were collected, which served as the foundation for subsequent investigation into the degree of concern among stakeholders.

The port of Taichung has taken into account the issues and suggestions of interest to stakeholders and has made them the focus of improvements in the port environment. It continues to work on improving the port environment to maintain an ecologically sustainable green port.

Stakeholders	Number of Questionnaires	Percentage
Government Agencies	8	7%
Community or Local Groups	5	4%
Customers or Traders	62	50%
Suppliers or Contractors	7	6%
Employees (Colleagues)	41	33%
Total	123	100%

Stakeholders' Concerns on Environmental Issues

Targe	Concerned Environmental Condition	Corresponding Top Ten Environmental Issues in the Port of Taichung
Government Agencies	Port air and water quality maintenance, handling and storage of hazardous goods, port development, pollution from port activities	Issue 1: Air Quality Issue 3: Ship Sewage Discharge Issue 6: Hazardous Goods Management Issue 7: Port Water Area Development
Community or Local Groups	Port air and water quality maintenance, ship pollution, port development, environmental quality of the port area	Issue 1: Air Quality Issue 3: Ship Sewage Discharge Issue 5: Ship Exhaust Emissions Issue 7: Port Water Area Development Issue 8: Ship Waste Issue 10: Relationship with the Community
Customers or Traders	Port air quality maintenance, ship pollution, port development, climate change	Issue 1: Air Quality Issue 2: Dust Emissions Issue 3: Ship Sewage Discharge Issue 4: Port Land Area Development Issue 7: Port Water Area Development
Suppliers or Contractors	Port air quality maintenance, ship pollution, port development, climate change, pollution from port activities	Issue 1: Air Quality Issue 2: Dust Emissions Issue 3: Ship Sewage Discharge Issue 7: Port Water Area Development Issue 9: Climate Change
Employees	Port air and water quality maintenance, handling and storage of hazardous goods, port development, climate change	Issue 1: Air Quality Issue 6: Hazardous Goods Management Issue 9: Climate Change Issue 10: Relationship with the Community

Stakeholder Environmental Concerns & Measures

Issues	Stakeholder	Expectations from Stakeholders	Situation in Taichung Port
Dust Emission in Loading and Unloading Operations	**Government**	**Dust Emission in Goods Storage Areas**	• Continuous Reduction of Dust Emission from Open Storage of Dust-Prone Goods and Promotion of Indoor Enclosed Warehousing: To address dust emission from bulk cargo handling areas, measures should be taken to minimize the open storage of dust-prone goods. Encouraging operators to adopt indoor enclosed warehousing facilities is essential. • For open storage areas, dust control measures should be implemented, including the installation of dust control nets or barrier walls (at least 1.25 times the height of the storage), automatic sprinkler systems, and the use of dust-proof covers or cloths (covering at least 80% of the storage area) to prevent dust dispersion. Additionally, spill prevention measures should be in place. • In port areas, it is advisable to plan centralized management of bulk cargo storage to minimize dust emission. • Relevant operators must install sprinkler systems at the entrances and exits of the storage areas and intensify cleaning in the surrounding environment to mitigate dust dispersion.
	Port Operator	**Dust Emission in Bulk Cargo Handling Areas**	• To optimize ship scheduling, we will centralize the management of bulk cargo handling operations that are prone to dust emissions. • We will continuously promote and guide operators to use environmentally friendly handling equipment. • During operations, we will install dust control nets in the work areas and intensify sprinkling and cleaning to prevent dust dispersion. • We will strengthen port inspections, audits, and CCTV monitoring to ensure that operators comply with dust control measures. • Standard guidelines for suspending cement raw material handling operations at Taichung Port during strong winds will be established, and cement clinker handlers will be notified via SMS to halt operations when wind conditions reach the set standard in the port area.


Port Area Business Interviews 2021–2022


Port Area Business Interviews 2021–2022

Taichung Port

Environmental Issues

To fully understand the opinion of each stakeholder and adapt to the new EcoPort Certification, the Port of Taichung distributed internal questionnaires as an opinion poll among relevant stakeholders, including employees, the government, clients, and the community. The information obtained was used to evaluate the level of concern each stakeholder held. The data are plotted on the table to the right.

Top 10

1. Air Quality

Indicator

- Qualification rate of air quality indices: (PM_{10} and $PM_{2.5}$), SO_2, NO_2,CO, and O_3
- Response to Poor Air Quality Days

2. Dust

Indicator

- Convene handling prevention meetings and review the number of nvironmental-friendly loading and unloading equipment
- Handling operators audit
- Road dust cleaning

3. Ship Sewage Discharge

Indicator

- Collection of ship oily waste and bilge water
- Assistance in the declaration and management of ship oily waste and bilge water collections

4. Port andLand Development

Indicator

- Maintaining port waterfront and related recreational facilities
- Adjusting the location of Taichung Port Special Zone

5. Ship Exhaust Gas Emissions

Indicator

- The ratio of service vessels using shore power
- Vessel Speed Reduction
- Vessel Using Low-sulfur Fuel Management
- Tugboat of TIPC Marine Using Low-Sulfur Fuel

6. Hazardous Cargo Management

Indicator

- Number of harbor inspections, cargo spillage emergency response drills,and jointly supervised harbor safety drills

7. Development of Port Water Areas

Indicator

- The qualified rate of marine water quality (pH, DO, BOD, mineral oil, cyanide, total phenols)
- Salute to the sea cleanup
- Maintenance dredging of navigational waters.

8. Ship Waste

Indicator

- Promoting waste reduction and implementing resource recycling and reuse.

9. Climate Change

Indicator

- Port area new planting and replanting of vegetation
- The maintenance of green areas/ green belts in the port area
- Promoting solar photovoltaic energy in the port area.
- Greenhouse Gas Inventory

10. Strengthening Community Relations

Indicator

- Handling Community Welfare Subsidies, Activities, and Petitions
- Conducting Environmental Education Activities

04

State of the Environment

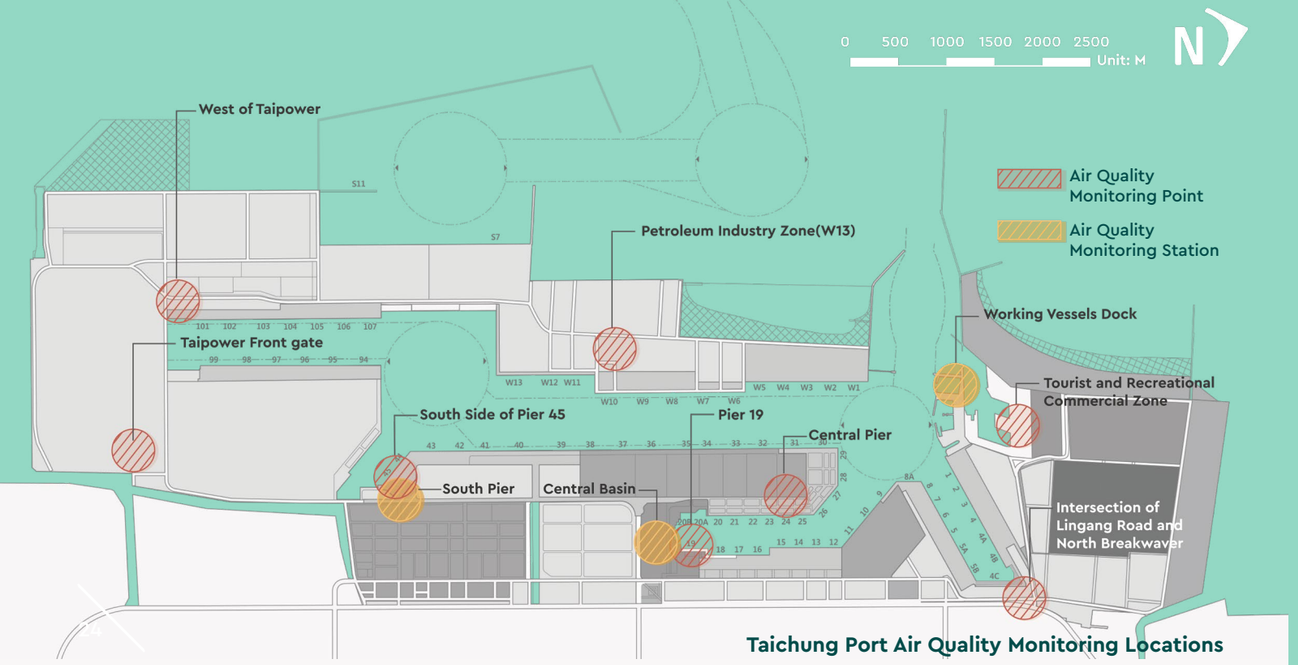
Air Quality

The air quality in Taichung Port is affected by external pollution transmission, open storage, ship emissions, vehicle emissions, loading and unloading operations, as well as emissions from both public and private units operating within and outside the port area. To understand the environmental air quality in Taichung Port, a total of 8 monitoring stations have been set up within the port. The monitoring items include suspended particulates (including TSP, PM_{10}, $PM_{2.5}$), sulfur dioxide, nitrogen oxides, carbon monoxide, ozone, and volatile organic compounds (VOCs). The monitoring results mostly comply with air quality standards. Additionally, in 2021, Taichung Port completed the installation of three air quality monitoring stations at the Working Vessels Dock, Central Basin, and South Pier, continuously monitoring the air quality within the port area.

Taichung Port Air Quality Survey and Monitoring Plan

Type	Frequency	Frequency
Air Quality General	Monthly	Particulate matter(PM_{10}, $PM_{2.5}$), SO_2, NO_2, CO, O_3
Volatile Organic Compounds(VOCs)	Seasonal	The types and concentrations of volatile organic compounds (VOCs)
	Once in the first and second half of the year	Instant (during actual operation) detection


Taichung Port Air Quality Monitoring Station



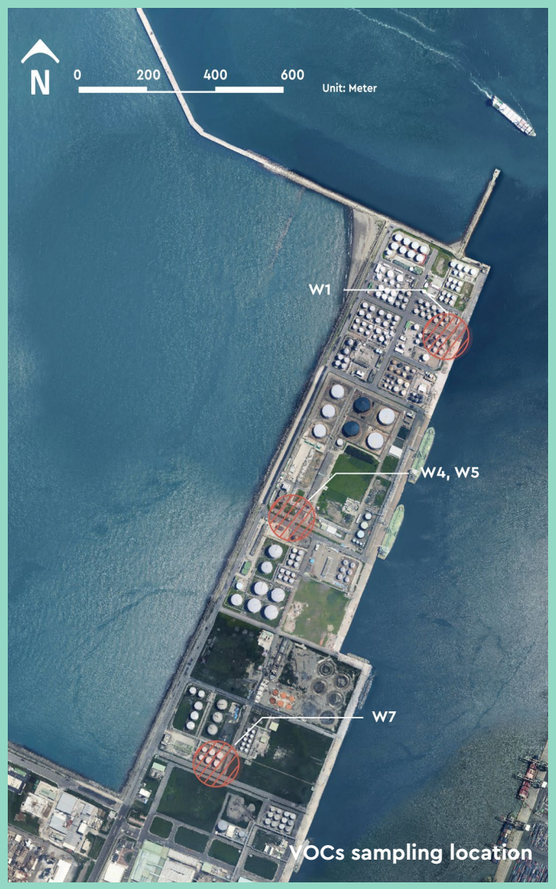
Taichung Port Air Quality Monitoring Locations

There are multiple types of chemicals storage tanks and channels in the West Terminal, and transporting of the chemicals are potential sources of volatile organic chemical fugitive emissions. Therefore, the Port of Taichung has been regularly conducting long-term VOC monitoring at peir 4, 5, and 7 of the West Terminal.

Analysis of the distribution of volatile organic compound species from 2021 to 2022 shows that aldehydes, ketones, alkanes, and aromatic compounds are the main species. Comparing with monitoring data from previous years, there is a downward trend in the concentration of volatile organic compounds over the years.

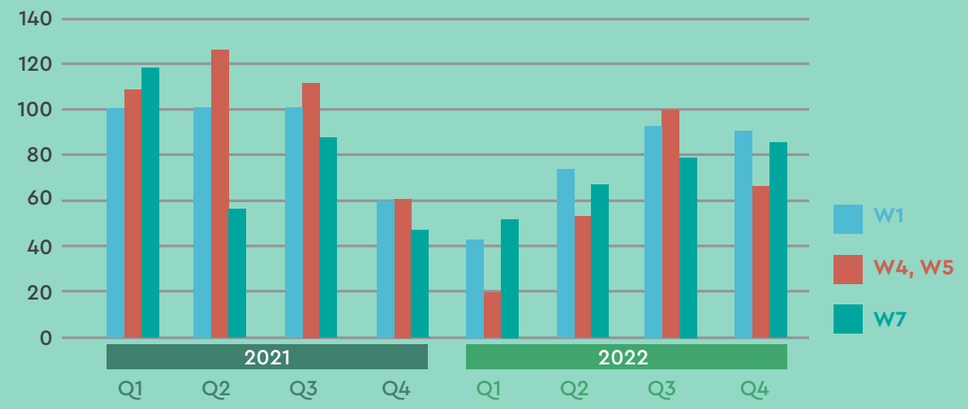
2021–2022 VOCs Concentration (ppb)

Monitoring Items	Compliance rate(%)	
	2021	2022
PM_{10}	93	100
$PM_{2.5}$	92	98
SO_2	100	100
NO_2	100	100
CO	100	100



VOCs sampling location

2021–2022 Volatile Gas Concentration (ppb)



Abate Dust Emission

Loading and unloading management and pollution prevention measures

Port of Taichung has been promoting the centralized management of bulk cargo and implementing the scattered cargo terminal berthing plan. Port of Taichung has collaborated with the Taichung City Environmental Protection Bureau and the Central Taiwan Maritime Affairs Center of the Ministry of Transportation and Communications to form the "Scattered Cargo Handling Equipment and Pollution Prevention Mode Review Committee." They have reviewed improvement plans for handling scattered cargo operations of various companies from 2021 to 2022. A total of one review meeting and two written plan reviews were conducted to encourage companies to use enclosed handling equipment and enhance pollution control facilities. Currently, enclosed discharge machines, rotating containers, and dust-collecting hoppers have been introduced, significantly reducing cargo scattering and improving operational efficiency.

Port of Taichung has established regulations requiring companies to conduct self-inspections and checks on relevant measures before, during, and after operations. They also continue to carry out inspections, supervision, CCTV monitoring, and joint inspections to strengthen on-site management.


Coal Environmental-Friendly Handling Equipment


Copper Ore Environmental-Friendly Handling Equipment


Pure Alkali Environmental-Friendly Handling Equipment

Vehicle transportation can also contribute to road dust emissions. To address this issue, the Port of Taichung has established car washing facilities in different zones at the operating terminals. There are a total of six public car washing facilities located at berths 5, 12–15, 29, 43, 103, and 105. These facilities are used to wash the vehicles' bodies and tires before they leave after completing shipping operations. This helps reduce the transport of particulate matter to public roads and minimize pollution dispersion.

The Port of Taichung has outsourced the road sweeping and washing operations in the port area. Street sweepers and road washing vehicles were used to clean the roads in 2021 and 2022, covering distances of 33,091.1 kilometers and 45,192.3 kilometers, respectively, to maintain cleanliness and reduce dust dispersion in the port area.

Every year, the Port of Taichung holds the "Taichung Port Business Forum" to promote environmental issues, such as dust emission, among operators. In 2021, they organized the "Fresh Air Action for Sustainability Seminar," and in 2022, they invited the Director of Taichung City Environmental Protection Bureau to speak on "Port Air Quality Maintenance and Pollution Prevention Policy Advocacy Seminar." These efforts aim to enhance operators' awareness of maintaining air quality and environmental protection in the port area.


105th Berth Car Wash Station


Street sweeping trucks

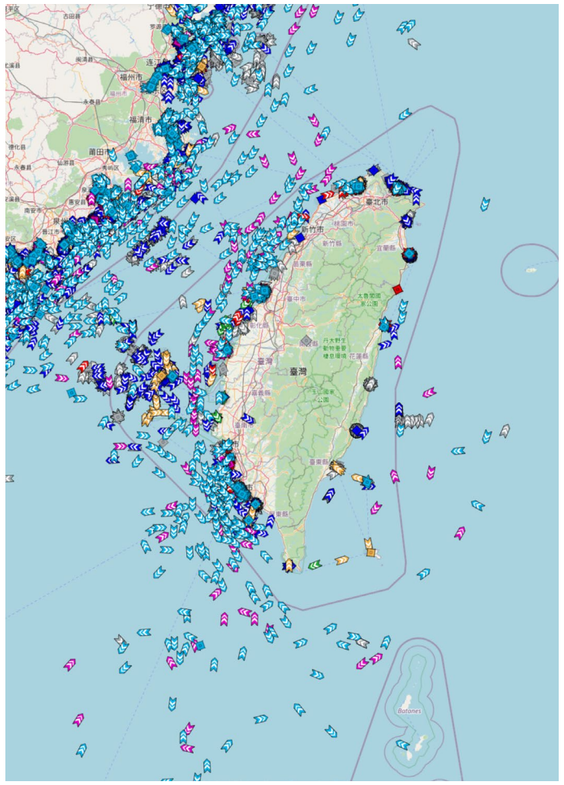

Port Air Quality Maintenance and Pollution Prevention Policy Advocacy Seminar

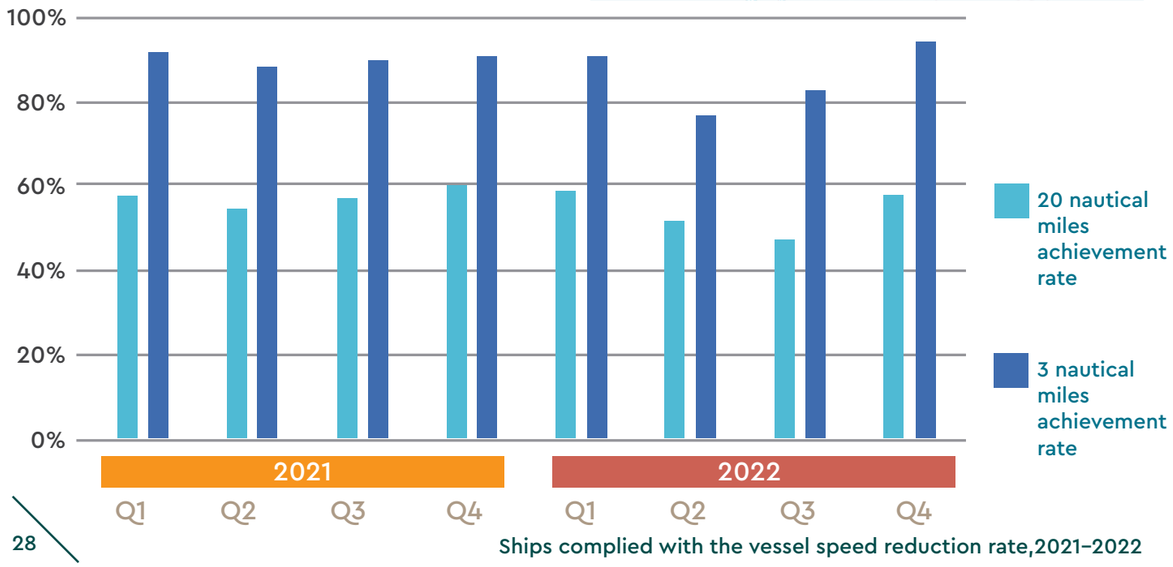

Road Washer

Air Quality Improvement Strategies

In 2019, the Port and Harbor Administration Rules for Commercial Ports were announced, incorporating regulations for ships to use low-sulfur fuel to reduce sulfur oxide emissions. Port of Taichung continues to enforce the requirement that all vessels operating in the port area use ultra-low sulfur diesel with a sulfur content of 10 ppm or less.

Ship slow-steaming can reduce exhaust emissions from fuel consumption. Port of Taichung actively advocates for ship operators to slow down to speeds below 12 knots. Ship slow-steaming messages are sent via the AIS system to incoming vessels, with one message sent every hour, achieving a 100% dissemination rate. Additionally, after each working day's ship berth meeting, an email reminder is sent to promote slow-steaming (248 times in 2021 and 249 times in 2022). According to the ship slow-steaming verification system, the achieved slow-steaming rates within the Port of Taichung's area (3 nautical miles) were 90.2% in 2021 and 83.9% in 2022.





Ships complied with the vessel speed reduction rate,2021–2022

Port Shore Power Usage

Taichung Port is actively promoting the use of shore power by ships to reduce emissions from using fuel, thus minimizing exhaust emissions. Currently, there are a total of 26 low-voltage shore power facilities installed at the workboat quay and shallow water ship quay in Taichung Port, which are available for use by relevant vessels. All port service vessels in Taichung Port have achieved a 100% adoption rate for using shore power.

The electricity consumption for the years 2020, 2021, and 2022 was 376,913 kWh, 424,249.6 kWh, and 980,290.7 kWh, respectively. There was an increase of 278,622.32 kWh in electricity consumption in 2022 compared to 2020.

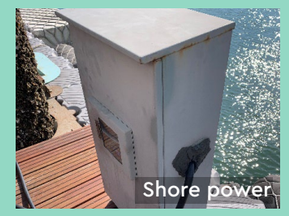
Taiwan International Ports Corporation, Taichung Port Branch, continues to encourage operators to use shore power. In addition to Kinmen Fast Ferry using low-voltage shore power at Berth 19, Asia Cement Corporation has also installed low-voltage shore power at Berth 27, allowing their fleet to use shore power while berthed and reducing emissions from using fuel during vessel berthing.Regarding high-voltage shore power facilities, in 2021, Taichung Power Plant added and activated two new facilities, and Taiwan Cement Corporation add and activate one high-voltage shore power facility in 2023.

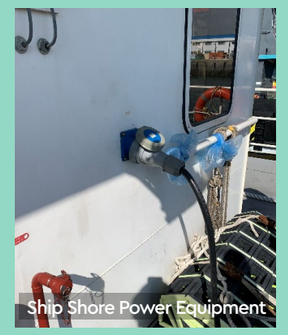
Various businesses within the Taichung Port area consumed approximately 1.56 million kWh and 1.47 million kWh of electricity in 2021 and 2022, respectively.

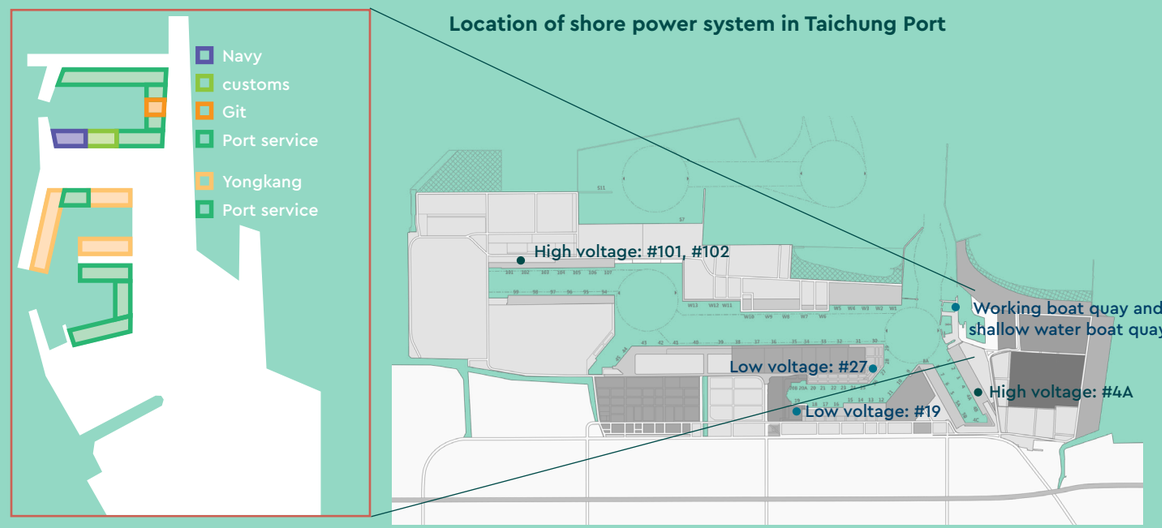
Taichung Port Air Quality Maintenance Zone

Between 2021 and 2022, Taiwan International Ports Corporation, Taichung Port Branch, collaborated with the Taichung City Environmental Protection Bureau to facilitate various administrative control measures. This included assisting in the dissemination of information to businesses and vehicle associations within the port area. They also cooperated with the Environmental Protection Bureau to install seven signage boards within the port area and supported the Environmental Protection Bureau in conducting air quality monitoring operations at the West Pier and Middle Breakwater to establish air quality background data (monitoring completed from September 2022 to April 2023).

The Taichung Port Air Quality Maintenance Zone was officially announced and implemented on September 23, 2023. In the future, they will continue to collaborate with environmental authorities on related initiatives, promote green port objectives, and gradually transition to electrification to reduce carbon dioxide and air pollutant emissions.


Shore power


Ship Shore Power Equipment



Port Area Environmental Planning

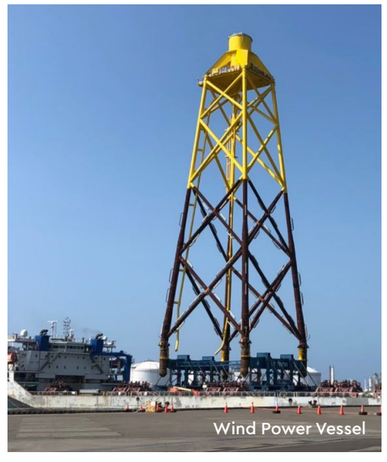
Proper and well-defined port operational zoning is of great importance, and the Taichung Port Authority has aligned with the government's green energy policies. Currently, wind power maintenance and operation bases have been established at berths #2, #5A, #5B, #36, and #106. These bases serve as production, storage, assembly, and transportation facilities for offshore wind turbines developed by various wind farms. Additionally, the working boat quay and shallow water boat quay have been planned as berths for wind power maintenance vessels, equipped with shore water and shore power systems.

The onshore area of the maintenance and operation bases includes the waterfront of the ship repair yard, the working boat quay, and the shallow water boat quay. Taichung Port Authority has also formulated relevant management regulations for the operation and utilization of the maintenance and operation bases to effectively manage the limited space for maintenance vessels and operations within the bases.


Pier 106


Pier 2

Service Operation Vessel


Wind Power Vessel

Indoor Air Quality

Tourism transportation has been an important business in Port of Taichung. However, due to the impact of the COVID-19 pandemic, the number of inbound and outbound passengers in 2021–2022 was only a few thousand. With the gradual containment of the pandemic and the reopening of borders, it is estimated that the number of passengers will recover to nearly one hundred thousand, similar to pre-pandemic levels. Ensuring a healthy environment in the passenger terminal building becomes crucial. To safeguard the health of passengers and port personnel, Port of Taichung conducts regular indoor air quality monitoring at the Passenger Service Center. The results of indoor air quality assessments for 2021 and 2022 have consistently exceeded indoor air quality standards.


Taichung Port Passenger Service Center

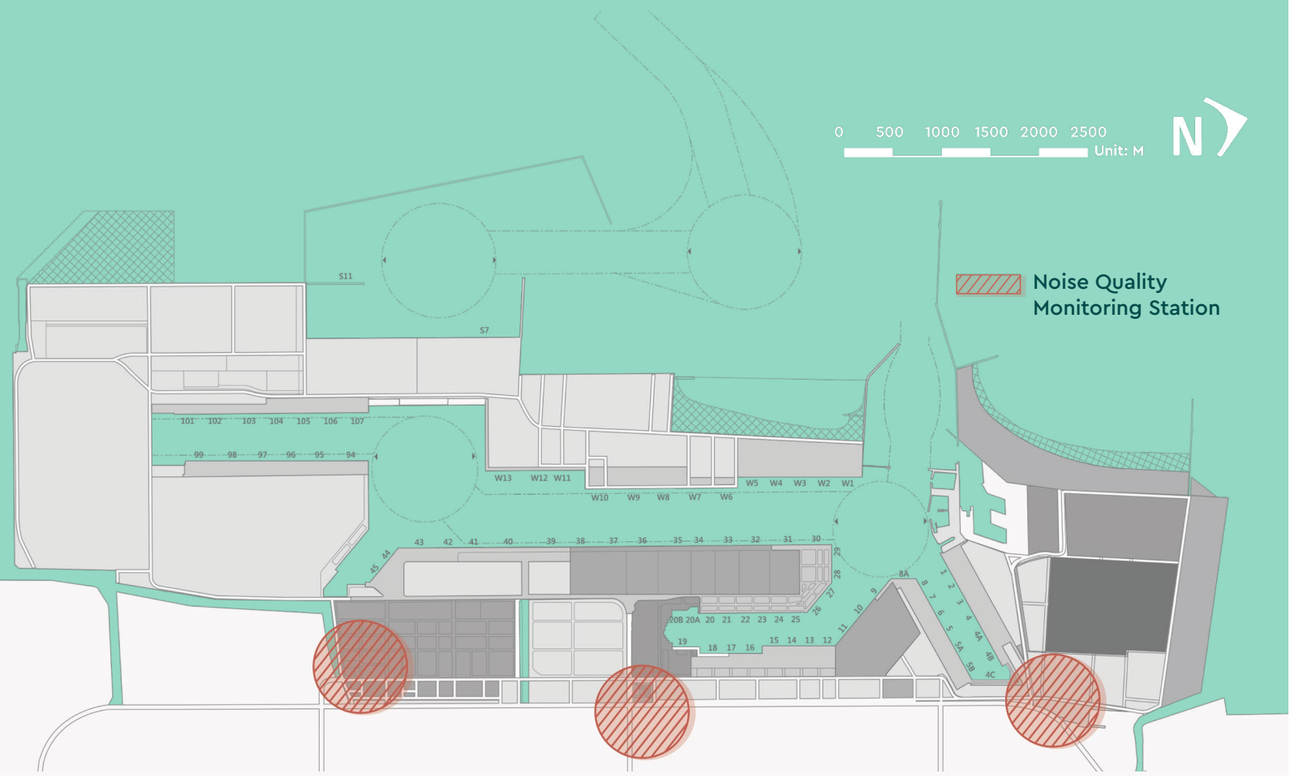

Lobby of the Taichung Port Passenger Servioe Center

Indoor Air Quality Monitoring Results

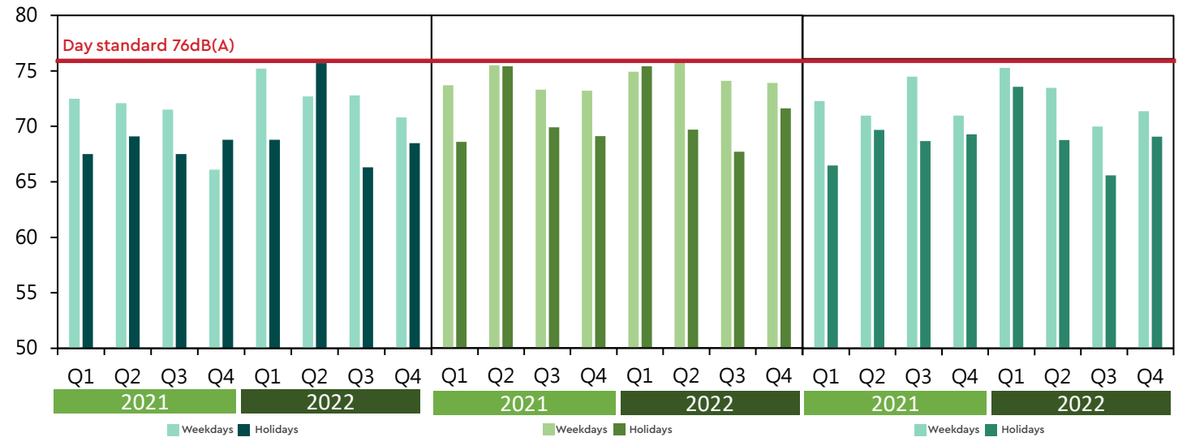
location/year		CO (ppm)	CO_2 (ppm)	O_3 (ppm)	HCHO (ppm)	Fungus (CFU/m³)	bacterial (CFU/m³)	PM_{10} (ug/m³)	$PM_{2.5}$ (ug/m³)
1F Arrival Hall Office	2021	<0.1	622	0.021	<0.01	249	159	20	5
	2022	0.2	650	0.017	<0.01	716	35	30	6
1F Hall	2021	<0.1	612	0.021	<0.01	384	196	17	4
	2022	0.3	584	0.015	<0.01	14	21	29	6
2F Arrival Hall Customs clearance	2021	<0.1	714	0.023	<0.01	304	175	20	4
	2022	0.2	582	0.016	<0.01	28	28	24	5
2F Departure hall Waiting room	2021	<0.1	652	0.024	<0.01	491	108	21	5
	2022	0.2	564	0.017	<0.01	28	28	23	5
Legal standard value		9	1000	0.06	0.08	1000	1500	75	35

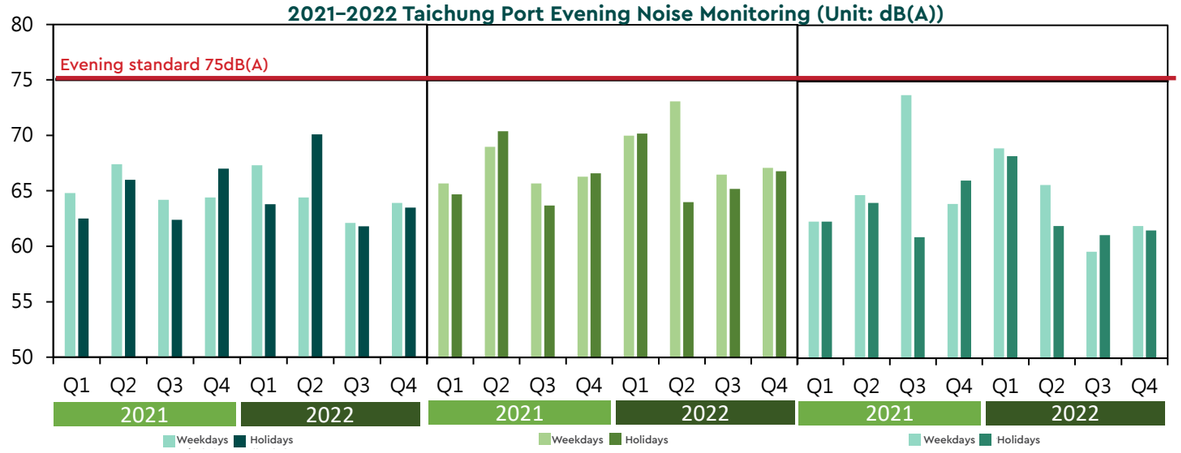
Port Noise

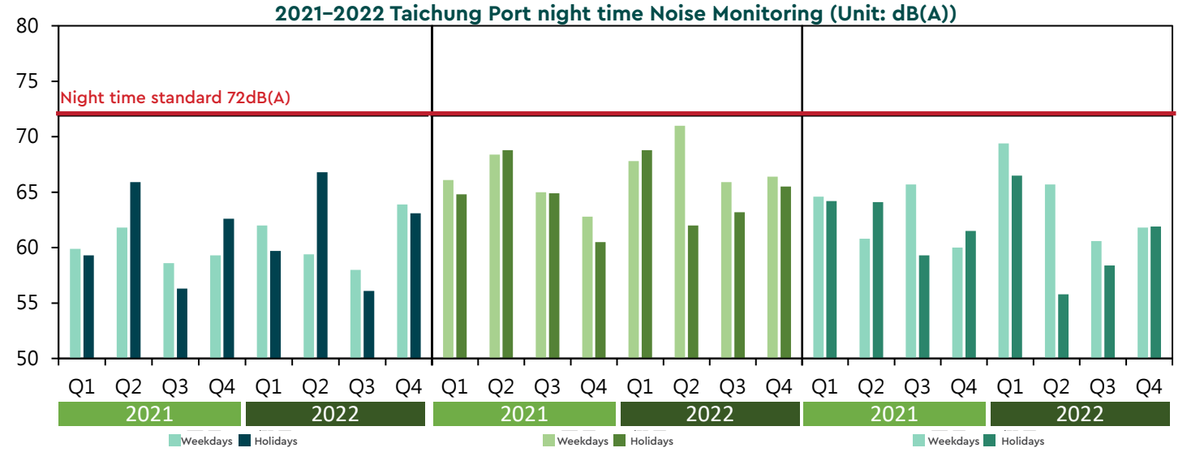
The noise monitoring results for the year 2021–2022 at three locations: "Taiwan Highway 17 and Highway 136 Intersection," "Zhong Er Road and Zhong Heng Yi Road Intersection," and "Lin Hai Road and North Dyke Road Intersection," all meet the standards of the fourth category control zone, which is the standard for road environmental noise levels in areas within 8 meters (inclusive) of the road.



Port of Taichung Noise Level Monitoring Sites







Port Water Quality

Inside the Port of Taichung, there are several drainage channels that receive water flow from upstream urban areas. Taichung Port Authority regularly conducts sampling and analysis of both onshore and offshore water quality. The onshore water quality is mainly affected by drainage from various urban areas, including domestic and livestock wastewater and industrial wastewater from nearby industrial zones.

Regarding offshore water quality, the Port of Taichung is located in a semi-enclosed water area, and its hydrological circulation and tidal self-purification effects are limited. It is also influenced by upstream land drainage. However, despite these challenges, the overall water quality in the Port of Taichung area has been compliant with Class C seawater quality standards in 2021 and 2022.

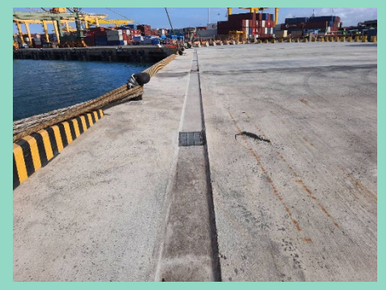
Water Quality Monitoring in 2021 and 2022

Items	Standard (note 1)	2021	2022
		Meet rate(%)	Meet rate(%)
pH	7.0~8.5	100	100
DO (mg/L)	≧2.0	100	100
BOD_5(mg/L)	≦6.0	100	100
Mineral oil((mg/L)	<2.0	100	100
Cyanide (mg/L)	<0.02	100	100
Phenolic compounds(mg/L)	<0.005	100	100

Note 1: Class C Marine Water Quality Standard
Note 2: According to Taiwan Coastal Marine Water Body Classification, water bodies within 2 km proximity to a drainage systems may lower water 1 level of water quality standard.

Water Quality Improvement Strategies

To enhance the water quality in the port area, reducing wastewater discharge into the harbor is essential. Taichung Port Authority has adopted environmentally-friendly, ecologically-conscious, and energy-efficient measures during the design and renovation of new and old docks. This includes the implementation of drainage diversion systems and the installation of sedimentation tanks. Wastewater containing sediment is collected through drainage channels and directed to the sedimentation tanks, preventing the direct discharge of sediment-laden wastewater into the harbor.

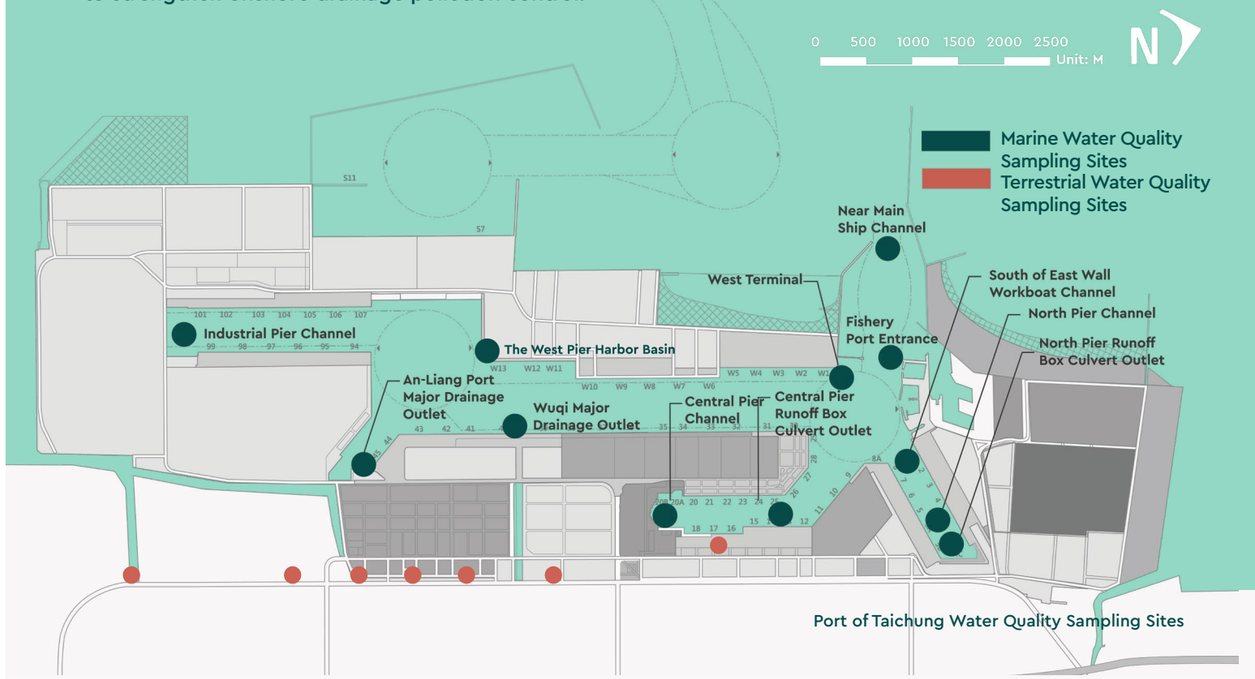


Drainage ditch interception system

Furthermore, the Port of Taichung has established a pollution prevention and reduction plan for the port area and submitted for review to the Environmental Protection Bureau; also cooperated with the Bureau in jointly inspecting the implementation of water pollution control plans by port area operators.

To address onshore water quality improvement, environmental agencies continue to promote pollution reduction and remediation projects in river basins, while also implementing strict controls and inspections on sewage and wastewater. Taichung Port Authority continuously monitors onshore water quality to understand the impact of upstream urban drainage on harbor water, and maintains communication with environmental agencies to strengthen onshore drainage pollution control.

New sedimentation tank



Port of Taichung Water Quality Sampling Sites

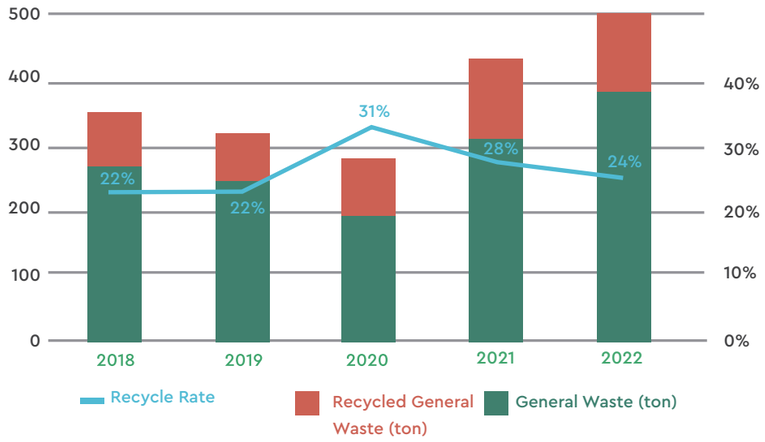
Waste Management

Promoting Ship Waste Sorting and Resource Recycling

The Taichung Port area includes international merchant ships, government vessels, port service ships, and working boats. General waste collection operations have reached a 100% reception rate. To improve resource recycling and subsequent waste disposal efficiency, the Taichung Port Authority has promoted the sorting of ship waste. Ships in the harbor are required to implement waste sorting and resource recycling. The port authority commissions qualified clearance agencies licensed by the Ministry of Environment to handle port ship waste collection and disposal. If unsorted waste is discovered during collection, the ship is immediately asked to improve before the waste is collected.

In 2021, the ship's general waste collection amounted to 314.05 metric tons, and the recycled waste collection was 123.571 metric tons, with a recycling rate of 28%. In 2022, the ship's general waste collection amounted to 386.47 metric tons, and the recycled waste collection was 119.71 metric tons, with a recycling rate of 24%. The general waste recycling rate of the ships reached over 20%.

Waste recycling statistics




Oily bilge Water Collected

Implementing Ship Waste Oil and Wastewater Management

The Taichung Port Authority has established the "Regulations for Ship Oil Waste Cleanup Operations," requiring ships in the harbor to entrust qualified waste oil and water removal (transportation) businesses that have been registered and approved by the Taichung Port Authority. The ships must submit a cleaning application, and only after review and approval by the Taichung Port Authority can the operation begin.

According to statistics, in 2021, the Taichung Port accepted applications from 123 vessels, receiving approximately 1,703.49 metric tons of waste (oil) water. In 2022, they accepted applications from 176 vessels, receiving approximately 2,078.46 metric tons of waste (oil) water. Both the number of applying vessels and the received quantity have increased compared to previous years.

Port of Taichung Oily bilge Water Collected

Year	Number of Ships	Oily Bilge Water (tone)	Collection Rate
2018	31	374.55	100%
2019	49	824.75	100%
2020	68	1,353.65	100%
2021	123	1,703.49	100%
2022	176	2,078.46	100%

Oily bilge Water Collected

Clean the Ocean

In line with the 2020 Executive Yuan's "Salute to the Sea" policy, the Taichung Port Authority continues its existing operations of ship domestic waste collection, harbor water cleaning, and public land maintenance. Simultaneously, it has assessed the resources needed for beach cleaning and included them in the contract specifications. The "Taichung Port Authority Coastal Cleaning and Maintenance Plan" has been established, implementing an on-site inspection mechanism, aiming to achieve the goal of keeping every inch of the coastline clean.

Salute to the Sea

To implement the concept of a green port, prevent marine environmental degradation, the Taichung Port Authority conducts beach cleaning activities. To broaden participation, it welcomes civil groups or enterprises such as the Fu Zhi Educational Foundation, the Taichung City Taiwan Fishermen's Association, Taiwan Power Company, and others to organize beach cleaning activities, expressing their passion for protecting the ocean through practical actions and collectively contributing to marine sustainable development and environmental protection.

Clean the Beach

Embrace the Ocean

Port of Taichung has opened the North Breakwater and Pier 100 as fishing areas, and in January 2022, initiated outsourced management for "Serving Anglers" and "Security Management," providing services such as area cleaning, lifesaving equipment inspection, and safety facility updates. In line with the Marine Conservation Agency's friendly fishing and sustainable resource policies, Taichung Port promotes a fishing report system, limits the use of fishing rods, and prohibits electric, poison, and blast fishing, as well as the capture of protected species. It also encourages the release of young fish, supporting resource sustainability.

The Taichung Port Authority is working to create an educational environment that fosters a connection to, love for, and understanding of the sea. By combining beach cleaning activities with on-campus marine education, the authority hopes to spread knowledge about marine-related issues, allowing them to become more widespread and deeply rooted.

Know the Ocean

Taichung Port Workplace Mutual Assistance Early Childhood Education Service Center

To respond to the government's encouragement of procreation policies and in alignment with the Executive Yuan's "Countermeasures for Taiwan's Aging Population Plan," active efforts have been made to establish the Taichung Port Workplace Mutual Assistance Early Childhood Education Service Center. This center aims to provide diverse childcare and family care services and create a family-friendly workplace environment. It officially commenced operations on October 31, 2022, and is operated by the Starlight Education Foundation. Currently, the center offers a total of three classes, enrolling mixed-age children aged 2 to under 6, with a total enrollment of 60 students. The center achieved full enrollment for both the 111th and 112th school years.

The Taichung Port Workplace Mutual Assistance Early Childhood Education Service Center integrates resources from the Taichung Port Branch and educational resources to provide various port-related resources to the center. This collaboration allows for the creation of suitable port experience courses and activities for both teachers and students, aiming to establish a workplace mutual assistance early childhood education service center with distinctive characteristics related to Taichung Port.

Through the various programs, activities, and visits to various agencies and institutions hosted by the Taichung Port Workplace Mutual Assistance Early Childhood Education Service Center, external individuals can gain an understanding of the environmental ecology, business operations, and societal engagement of Taichung Port. This serves as a positive promotion of Taichung Port and enhances its image as a high-quality enterprise.

Taichung Port Workplace Mutual Assistance Early Childhood Education Service Center

Taichung Port Workplace Mutual Assistance Early Childhood Education Service Center

Orientation Ceremony

Year-End Children's Fun Activity

Marine Life Reforestation Activity

Children's Day Joyful Party Event

Engaging in Aerospace Course Video Exchange with NASA Space Center

Birthday Celebration Event

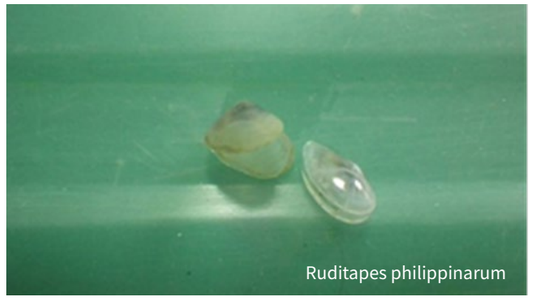
Environmental Ecological Concern

The Port of Taichung conducts two ecological surveys of terrestrial and marine areas each year. According to the results of the surveys conducted over the past two years, the dominant plant species in the surrounding terrestrial ecology of the port area are native species. Birds such as the Brown Shrike and the Northern Lapwing have been observed within the survey area, and other ecological species (butterflies, amphibians, mammals) are generally common types. In the marine ecology, the dominant species of phytoplankton is the Chaetoceros sp., and the dominant species of zooplankton is the copepods. Among benthic organisms, mollusks are the main dominant species, followed by crustaceans.


Brown Shrike


Northern Lapwing


Halpe zola


Ruditapes philippinarum

Environmental Green Beautification

The Port of Taichung is developing towards low-carbon and low-pollution operational practices and continues to promote port area greening, landscaping, and afforestation projects. Between 2021 and 2022, the Port of Taichung's greening and afforestation plans include ongoing maintenance operations for areas such as "Taichung Port Road and Green Square," "Surroundings of the Harbor Building," and "Protected Forests and Low Development Zones." It is estimated that the total number of plantings between 2021 and 2022 will include 25,642 trees and 36,060 shrubs, with a total greening maintenance and afforestation budget of approximately 50 million Taiwan dollars.

In addition to continuous port beautification efforts, the Port of Taichung has been promoting and advocating the "Port Area Businesses Green Beautification Plant Adoption" in recent years. This collective effort is aimed at enhancing the green beauty of the port environment while also reducing the company's maintenance costs.

As of the end of 2022, the maintained green belt area in the Port of Taichung was approximately 490 hectares. Overcoming challenges such as seasonal droughts and other natural factors to achieve today's flourishing greenery has not been easy for the Port of Taichung. Nevertheless, the Port of Taichung looks forward to achieving the goal of transforming the port area into a park in the future. The port also plans to leverage the natural air purification properties of trees to mitigate port operational pollution and enhance environmental carbon sequestration benefits.

The 2021 Earth Guardian Tree Planting Event at Taichung Port


Greenery and Planting in Low-Intensity Development Areas

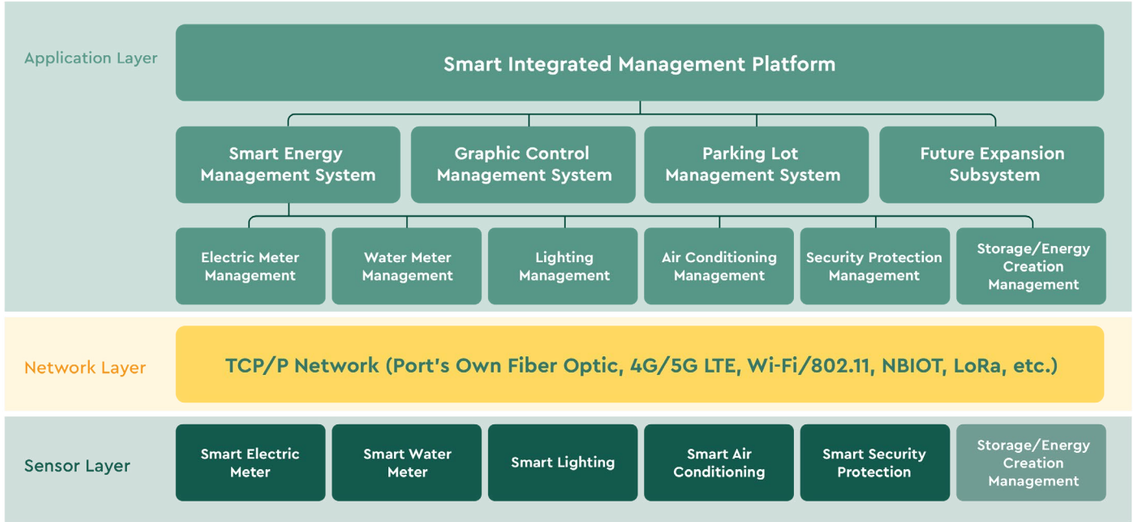
Greenery and Planting in Front of the Passenger Service Center Parking Plaza

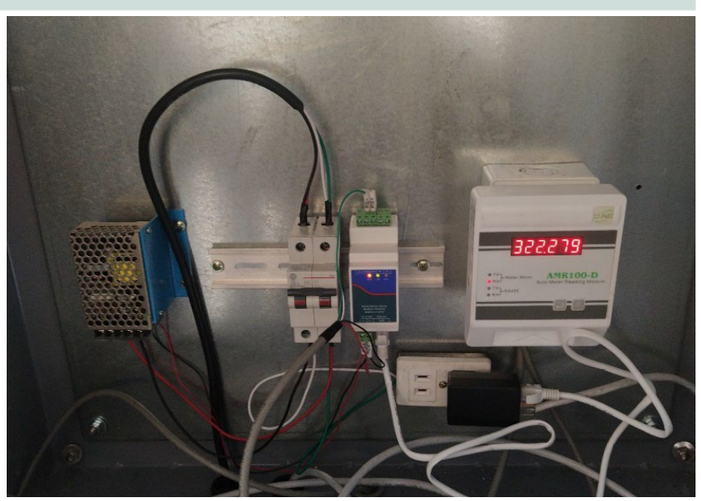

The 2022 Taichung Port Corporate Sponsorship Coastal Afforestation Activity Plan

Developing Smart Energy Management

The Port of Taichung is planning to develop a Smart Energy Management System and Integrated Smart Management Platform. This will involve the integration of smart electricity meters, smart water meters, smart lighting, smart air conditioning, and smart security within the Smart Energy Management System, with provisions for future expansion in energy storage and creation infrastructure, aiming to achieve the goal of intelligent energy management within the port area. Further, the Smart Energy Management System, SCADA (Supervisory Control and Data Acquisition) Management System, and Parking Management System will be integrated into the Smart Integrated Management Platform, accomplishing goals of scalability, graphic control display, interconnected alarming, and optimization of inspection costs and manpower for efficient management.

Smart Water Metering and Real-Time Water Consumption Statistics



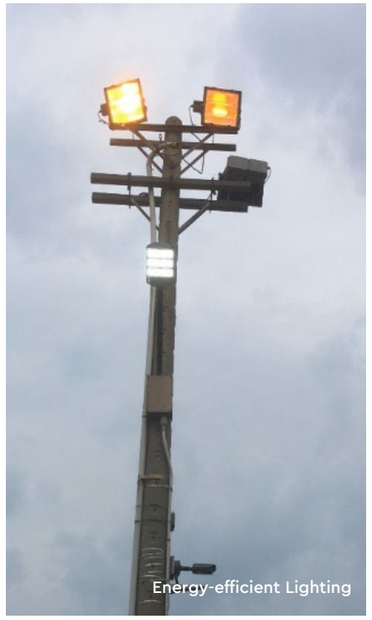


Reducing Energy and Resource Consumption

The Taichung Port Branch Company oversees the vast Port of Taichung, where public lighting includes dock and road illumination with thousands of related fixtures. The port has been steadily replacing these with energy-saving lights to cut electricity use. From 2021 to 2022, a total of 373 high-energy-consuming lights were replaced, and LED lights now make up 49% of the port's lighting.

Number of Lighting Fixtures in Taichung Port Area

Lights and Power Ratings	High Energy-consuming Lights		Energy-saving Light Fixtures
	Sodium Lamps (units)	Metal Halide Lamps (units)	LED Lights (units)
Dock Loading and Unloading Illumination	366	6	54
Commercial Port Area Roads	400	0	518
Control Station External Area	1,004	0	1,094
Total	1,734	6	1,666


Energy-efficient Lighting

The Taichung Port Branch Company reuses the cooling discharge water from Chung Long Iron and Steel Company, setting up pressurized water collection facilities. This reused water is provided to both the Taichung Port Branch Company and businesses within the port area for road and dock watering and dust suppression in construction, achieving the goal of sustainable water resource utilization


Water Truck Using Recycled Water


Effluent Water Recycling and Recharge Station

Resource Reutilization:

Embankment Protection: Utilizing soft construction methods like sand tubes and sandbags, filled with local soil, replaces traditional purchased block stones and other materials. The recycling and reuse of existing materials from port seawalls or breakwaters reduce purchasing and transportation costs and minimize resulting pollution.
Materials for New Dock and Seawall Construction: Primarily sourced from the planned area or nearby waters, minimizing the need for maintenance dredging, and achieving the goal of utilizing surplus soil and rock resources.
Harbor Channel Excavation: The soil excavated from the harbor channel is used as material for protecting and nourishing the seaward embankment, aligning with both coastal protection and reuse concepts."

Greenhouse Gas Emission Inventory

Since 2014, the Port of Taichung has conducted an annual greenhouse gas inventory according to the 'Taichung City Low Carbon City Autonomy Ordinance,' using that year as the baseline for planning its carbon reduction blueprint. In response to the update of the ISO14064-1 standard to the 2018 edition, the 2020-2021 greenhouse gas emissions were inventoried according to this standard. The organizational boundary was set by identifying all emission sources within the boundary based on operational control rights. After evaluation, the baseline year was proposed to be adjusted to 2020, focusing mainly on port area management and office administrative operations. The inventory for the previous year is completed by the end annually, followed by third-party verification. In line with national policy and international trends, the goal is to achieve net-zero carbon emissions by 2050, with annual rolling reviews to plan new carbon reduction blueprints.

Hosting the Taichung Port Area 2050 Net Zero Carbon Emission Advocacy Meeting

ISO 14064-1 Greenhouse Gas Inventory Introduction, Verification, and Training

Estimation of Resource Consumption and Greenhouse Gas Emissions by Taichung Port Branch,TIPC

Tems	Emission Coefficient (kgCO2e per unit)		2021		2022	
			Consumption	Emissions (ton)	Consumption	Emissions (ton)
Water (m^3)	The emission factor for the year 2021 is 0.161.		25,413	4.1	24,948	4.0
Power (kWh)	2021	2022	5,818,676	2,961.7	6,179,980	3,059.1
	0.509	0.495				
Gas (L)	2.2631(Per liter)		23,721	53.7	23,759	53.8
	2021 Ministry of Environment					
Paper (pack)	3.6(every pack)		1,605	5.8	1,428	5.1
	virgin wood pulp					
total				3,025.3		3,122

Note: Carbon Emission from Resource Consumption = [Actual Usage x Emission Factor]
The water usage, oil consumption, and paper carbon emission coefficients for 2022 have not been officially announced yet; therefore, the coefficients from 2021 are temporarily used for calculations

Installation of Solar Photovoltaic System

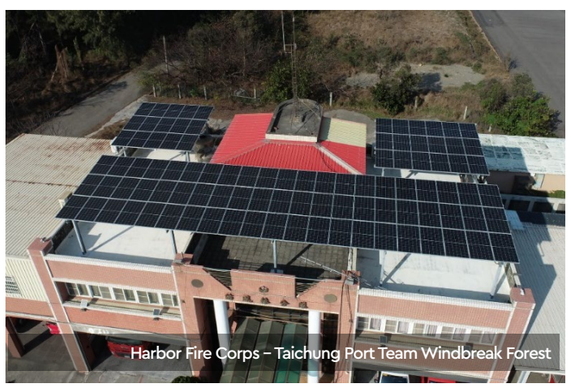
With abundant sunlight, the Port of Taichung offers essential conditions for the development of solar photovoltaic energy. The Port of Taichung leases parts of its building rooftops to solar energy providers for the installation of solar power equipment and encourages tenants in the port area to utilize their building rooftops for solar power installations. This aligns with global green energy trends and collectively promotes a green and net-zero transition. The installation of solar power generation facilities in the Taichung Port area has been installed capacity was 28,837 kWp, 40,712 kWp, and 45,482 kWp, respectively. This increase in capacity has been accompanied by a gradual rise in electricity generation. In 2020, 2021, and 2022, the electricity generated was 32,655,823 kWh, 44,579,941 kWh, and 49,802,845 kWh, respectively. This increase in solar power generation has contributed to a reduction in carbon emissions, with an estimated reduction of approximately 47,336 metric tons of CO2e between 2021 and 2022.

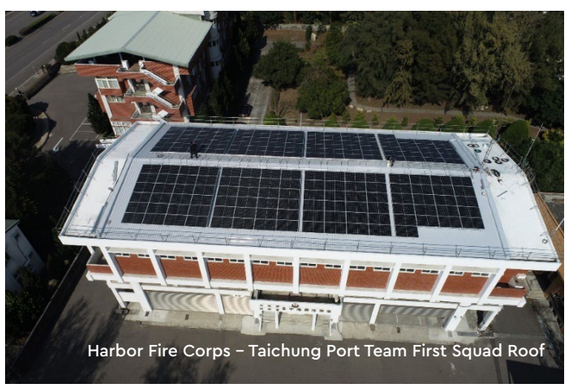

Roof of the Second Office of Taichung Port Branch , TIPC


Roof of the Multi-level Parking Facility at Taichung Port Branch , TIPC

In response to energy transition policies and aiming to expand the use of public rooftops by national central authorities for green energy promotion and diversified value-added applications, the Taichung Port Branch Company cooperated with the Bureau of Energy, Ministry of Economic Affairs in 2022 to carry out the 'Joint Bidding for Public Rooftops of Central Authorities.' Solar photovoltaic (PV) systems were installed on the rooftops of Harbor Fire Corps – Taichung Port Team and three other branches, with a total installed capacity of 193.88 kWp. The facilities are expected to begin grid-connection and power generation in February and March 2023, with an estimated annual electricity output of approximately 210,000 kWh. The estimated carbon reduction is expected to reach 107 tons.

Fire Brigade Rooftop Solar Panels


Harbor Fire Corps – Taichung Port Team Windbreak Forest


Harbor Fire Corps – Taichung Port Team First Squad Roof

Enhancing Port Area Dangerous Goods Management

Taichung Port is a major loading and unloading port for hazardous materials and petrochemical goods. Taichung Port Authority focuses on the centralized management of hazardous materials in the area, primarily at the West Pier.

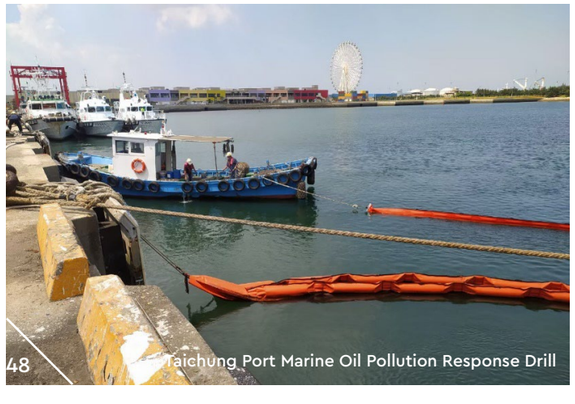
The Taichung Port Authority conducts irregular joint inspections with relevant units for petrochemical storage tanks and transport pipelines in the port area, joint supervision related to the safety of hazardous materials, and exercises related to emergency response plans for chemical or oil spills. These efforts enhance the ability to respond to emergencies in the event of an accident.

Hazardous Materials Management Statistics

Item/year	2015	2016	2017	2018	2019	2020	2021	2022
Drill	1	1	1	1	1	1	1	1
Joint Supervision	4	4	4	4	4	4	24	24

Monitoring Center


Joint Supervision of Hazardous Materials


Taichung Port Marine Oil Pollution Response Drill

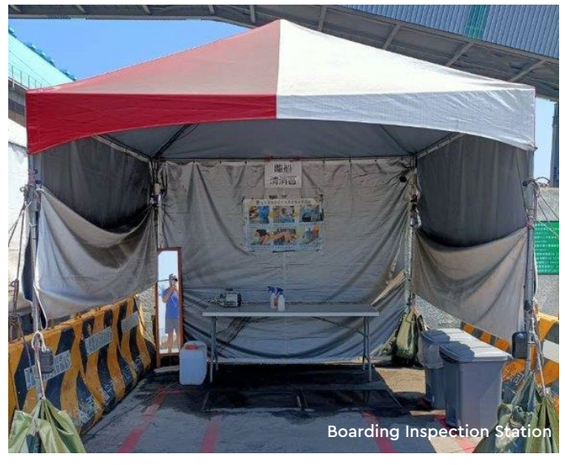

Taichung Port Marine Oil Pollution Response Drill

Port Epidemic Prevention Covid-19 Operations

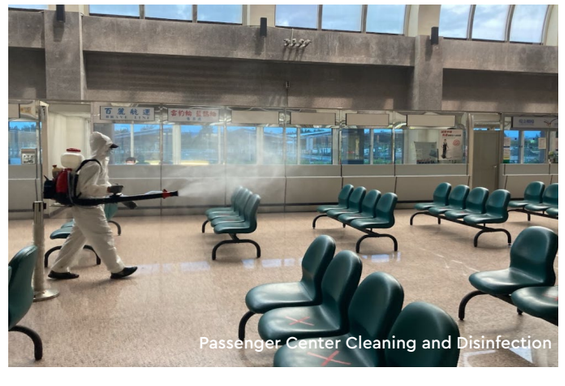
To implement international commercial port epidemic prevention policies, Taiwan International Ports Corporation has established "Port Epidemic Prevention Covid-19 Operation Guidelines." The guidelines regulate various port operations by controlling the timing, space, and personnel flow, ensuring smooth execution of both epidemic prevention and operations. They include measures and principles for personal safety protection, crew management, refueling and watering operations, and boarding procedures. Monitoring is done through inspections and CCTV.

The Taichung Port Authority Passenger Service Center has coordinated with Covid-19 prevention efforts by installing infrared automatic body temperature measuring devices at the entrance and providing non-contact forehead thermometers. This ensures the monitoring of passengers' temperature, and professional disinfection companies are engaged for sanitizing the center before and after passenger clearance. The Kinmen fast ferry, chartered by the Ministry of National Defense and docked at the port, transports off-duty soldiers between "Taichung Port and Wuciou" at the beginning and middle of each month. The military completed the setup of temporary rapid screening stations and screening operations on June 30, 2021 year of the Republic of China calendar. Passengers on the Kinmen fast ferry undergo rapid screening by the military, and only those who test negative are allowed to board. Related epidemic prevention operations are continuously adjusted according to the epidemic prevention guidelines for public transportation stations set by the Ministry of Health and Welfare's Centers for Disease Control.

Pier Cleaning and Disinfection


Boarding Inspection Station


Military Personnel Rapid Screening Station and Inspection Operations


Passenger Center Cleaning and Disinfection

Environmental Performance Indicators

Ten Significant environmental issues of the Taichung Port		Index item	Calculation method	Index target		Calculation	
						2021	2022
1	Air Quality	Qualification rate of air quality indices: (PM_{10} and PM2.5), SO_2, NO_2,CO, and O_3	Rate of air quality measurements meeting the Air Quality Standards (measured at harbor test stations)	The compliance rate for PM_{10},$PM_{2.5}$,SO_2,NO_2,CO,O_3 is 100%.		• PM_{10} daily average pass rate: 92.71% • $PM_{2.5}$ daily average pass rate: 91.67% • SO_2 daily average pass rate: 100.00%, hourly average pass rate: 100.00% • NO_2 hourly average pass rate: 100.00% • CO hourly average pass rate: 100.00%, 8-h average pass rate: 100.00% • O_3 hourly average pass rate: 100.00%, 8-h average pass rate: 97.92%	• PM_{10} daily average pass rate: 100.00% • $PM_{2.5}$ daily average pass rate: 97.87% • SO_2 daily average pass rate: 100.00%, hourly average pass rate: 100.00% • NO_2 hourly average pass rate: 100.00% • CO hourly average pass rate: 100.00%, 8-h average pass rate: 100.00% • O_3 hourly average pass rate: 100.00%, 8-h average pass rate: 100.00%
		Response to Poor Air Quality Days	Compliance Rate = (Number of times the subsidiary cooperated with contingency measures) / (Number of times the environmental protection bureau issued notifications) × 100%	Compliance rate of 100%		• A total of 114 times of Environmental Protection Bureau report • Taichung Branch of TIPC cooperated with contingency 114 times • 114÷ 114×100%=100	• A total of 51 times of Environmental Protection Bureau report • Taichung Branch of TIPC cooperated with contingency 51 times • 51÷ 51×100%=100
2	Dust	Convene handling prevention meetings and review the number of nvironmental-friendly loading and unloading equipment	• Number of rolling reviews or rolling review meetings for the Port Area Loading and Unloading Prevention Plan. • Review the number of convene handling machines	• Conduct at least one rolling review or rolling review meeting for the Loading and Unloading Equipment Plan annually • The quantity of ecological handling equipment were reviewed for 2 years and should not be lower than the quantity in 2018. (2018 quantity: 6)		• one rolling review meeting in 2021 • Quantity of Environmentally-Friendly Loading and Unloading Equipment: • Enclosed Loading and Unloading Equipment: 11 sets (applicable for cargoes such as coal, copper concentrate, and furnace slag). • Dust Collection Loading and Unloading Equipment: 2 sets (applicable for alkali powder cargo).	• one rolling review meeting in 2022 • Quantity of Environmentally-Friendly Loading and Unloading Equipment: • Enclosed Loading and Unloading Equipment: 11 sets (applicable for cargoes such as coal, copper concentrate, and furnace slag). • Dust Collection Loading and Unloading Equipment: 2 sets (applicable for alkali powder cargo).
		Handling operators audit	• Rolling review of the Port Area Loading and Unloading Control Plan or the number of rolling review meetings. • Number of environmental loading and unloading equipment reviews.	• More than 50 times of audits conducted by the branch • Cooperated with the Maritime Port Bureau and Port and Ministry of Environment for joint inspection and counseling for more than 10 times		• Times of audits conducted by Taichung Branch of TIPC: 192 • Times of cooperating with the Maritime Port Bureau and Port and Ministry of Environment for joint inspection and counseling: 12	• Times of audits conducted by Taichung Branch of TIPC: 120 • Times of cooperating with the Maritime Port Bureau and Port and Ministry of Environment for joint inspection and counseling: 14
		Road dust cleaning	• Daily cleaning and sweeping operation • Cleaning road length(km/year)	• Daily cleaning and sweeping operations should be conducted. • The total cleaning and sweeping distance should reach 57,600 kilometers per year.		• Daily execution of cleaning and sweeping operations. • Total kilometers covered for cleaning and sweeping: 57,841 kilometers. • Estimated reduction in PM10: 151.54 metric tons, PM2.5: 35.11 metric tons. (1 street cleaning vehicle, 2 street sweeping vehicles, with an additional street cleaning vehicle starting in March).	• Daily execution of cleaning and sweeping operations. • Total kilometers covered for cleaning and sweeping: 63,143.7 kilometers. • Estimated reduction in PM10: 165.44 metric tons, PM2.5: 38.33 metric tons. (2 street cleaning vehicles, 2 street sweeping vehicles)
3	Ship Sewage Discharge	Collection of ship oily waste and bilge water	Number of accepted ship oily waste and bilge water collections ÷ Number of ship collections executed by qualified waste oil and sewage receiving institutions	The execution rate of entrusting qualified contractors to clean ship oily waste and bilge water reaches 100%.		• The execution rate is 100%, • 123÷123×100%=100%	• The execution rate is 100%, • 176÷176×100%=100%
		Assistance in the declaration and management of ship oily waste and bilge water collections.	The number of ship oily waste and bilge water collection applications per month ÷ the number of submissions to the environmental protection competent authority.	Execution rate 100%		• The execution rate is 100%, • 12÷12×100%=100%	• The execution rate is 100%, • 12÷12×100%=100%
			Quantity of ship oily waste and bilge water collected	Collecting quantities for the months of January to December.		Quantity of ship oily waste and bilge water collected: 1,703.49 metric tons.	Quantity of ship oily waste and bilge water collected: 2,078.46 metric tons.

Environmental Performance Indicators

Ten Significant environmental issues of the Taichung Port		Index item	Calculation method	Index target		Calculation	
						2021	2022
4	Port and Land Development	Maintaining port waterfront and related recreational facilities	The area of port waterfront and related recreational facilities and friendly spaces.	To maintain or increase the area of the port waterfront and friendly spaces for recreational facilities.		The recreational area and friendly space in the harbor cover a total area of 24.82 hectares, divided as follows: • Mitsui Outlet: 17.77 hectares • The bottom end of Chubo Canal: 2.84 hectares • North Wharf: 3.69 hectares • Berth 100: 0.52 hectares	The recreational area and friendly space in the harbor cover a total area of 24.82 hectares, divided as follows: • Mitsui Outlet: 17.77 hectares • The bottom end of Chubo Canal: 2.84 hectares • North Wharf: 3.69 hectares • Berth 100: 0.52 hectares
		Adjusting the location of Taichung Port Special Zone	The area of the port recreation zone.	Recreational Area Development Planning		The future development and construction plan of Taiwan International Commercial Port (years 2017–2021) includes the following adjustments and areas: • The former Coastal Recreation Special Zone will be renamed as the Tourism and Recreation Commercial Zone, and related locations will be adjusted. • The Tourism and Recreation Commercial Zone covers an area of 137.53 hectares, and the Port Service Professional Zone (II) covers an area of 54.45 hectares, totaling 191.98 hectares.	The future development and construction plan of Taiwan International Commercial Port (years 2022–2026) includes the following changes and areas: • The reconstruction of the waterfront protection at the bottom of the central mooring canal will create 0.89 hectares of new land. Additionally, the area south of Central Cross-Island Highway 18, which is currently used for pleasure yachts, will be developed for tourism, recreation, and commercial purposes, adding a total of 5.41 hectares. • The land use on the west side of the port, totaling 4.63 hectares, and the adjacent area of 4.19 hectares near Taiwan Power Company and Chunglun Field, will be converted from Port Service Professional Zone (II) to Industrial and Commercial Zone (IV), resulting in a reduction of 8.82 hectares. • The Tourism and Recreation Commercial Zone will cover an area of 142.94 hectares, and the Port Service Professional Zone (II) will cover an area of 45.98 hectares, totaling 188.92 hectares.
5	Ship Exhaust Gas Emissions	The ratio of service vessels using shore power	Number of service vessels using shore power ÷ total number of service vessels × 100%	All service vessels using shore power		• 24÷24×100%=100% • Self-operating tug boat: 4, outsourcing vessel: 8, TIPC Marine Corp tug boat: 4 and Shuttle Boat: 4, wind power maintenance boat: 2, number of vessels using shore power: 24, shore power usage 424,250	• 24÷24×100%=100% • Self-operating tug boat: 4, outsourcing vessel: 8, TIPC Marine Corp tug boat: 4 and Shuttle Boat: 4, wind power maintenance boat: 2, number of vessels using shore power: 24, shore power usage 980,291
		Vessel Speed Reduction	Reduce speed to under 12 knots	Publicity rate:100% Ratio of vessel speed reduction 50%		• Number of vessel:10,724; Publicity times: 10,724 • 10,724÷10,724 ×100%=100% • According to the Ship Speed Reduction Check System, the ship speed reduction rates are as follows: • Outside the port area (20 nautical miles): 57.6% • Inside the port area (3 nautical miles): 90.2%	• Number of vessel:11,496; Publicity times: 10,724 • 11,496÷11,496 ×100%=100% • According to the Ship Speed Reduction Check System, the ship speed reduction rates are as follows: • Outside the port area (20 nautical miles): 52% • Inside the port area (3 nautical miles): 83.9%
		Vessel Using Low-sulfur Fuel Management	Number of penalties imposed by the Central Maritime Affairs Cente	Penalties according to regulations		Number of cases penalized: 0	Number of cases penalized: 0
		Ship of TIPC Marine Using Low-Sulfur Fuel	Number of TIPC Marine Vessels Using Low-Sulfur Fuel (Sulfur content below 0.5%) ÷ Total Number of TIPC Marine Vessels × 100%	The proportion of TIPC Marine vessels using low-sulfur fuel (with sulfur content below 0.5%) is 100%.		• Utilization rate: 6/6 × 100% = 100% • 3 tugboats and 3 offshore wind maintenance vessels use marine gas oil (MGO). • The marine gas oil (MGO) has a sulfur content of 10 ppm or below. • Total marine gas oil (MGO) usage by ship of TIPC marine: 952,790 KL.	• Utilization rate: 7/7 × 100% = 100% • 3 tugboats and 4 offshore wind maintenance vessels use marine gas oil (MGO). • The marine gas oil (MGO) has a sulfur content of 10 ppm or below. • Total marine gas oil (MGO) usage by ship of TIPC marine: 2,120,653 KL.

Environmental Performance Indicators

Ten Significant environmental issues of the Taichung Port		Index item	Calculation method	Index target		Calculation	
						2021	2022
6	Hazardous Cargo Management	Number of harbor inspections, cargo spillage emergency response drills,and jointly supervised harbor safety drills	• Number of joint supervision for dangerous goods safety • Number of emergency response drills in the port area	• Number of supervisions: 24 times per year • Emergency drills: 1 time per year		• Joint supervision related to dangerous goods safety in the port area: 24 times. • Emergency response drill in the port area: 1 time.	• Joint supervision related to dangerous goods safety in the port area: 24 times. • Emergency response drill in the port area: 1 time.
7	Development of Port Water Areas	The qualified rate of marine water quality (pH, DO, BOD, mineral oil, cyanide, total phenols)	The proportion of monitoring values from water quality stations in the port area that meet the "Marine Environment Classification and Ocean Quality Standards.	Water Quality in the sea area: The compliance rate for monitoring pH, DO, biochemical oxygen demand (BOD), mineral oils, cyanides, and total phenols every six months is 100%.		Compliance rate for Class III Sea Area Water Quality Standards: • pH: 100% • Dissolved Oxygen (DO): 100% • Biochemical Oxygen Demand (BOD): 100% • Mineral oils: 100% • Cyanides: 100% • Total phenols: 100%	Compliance rate for Class III Sea Area Water Quality Standards: • pH: 100% • Dissolved Oxygen (DO): 100% • Biochemical Oxygen Demand (BOD): 100% • Mineral oils: 100% • Cyanides: 100% • Total phenols: 100%
		Salute to the coastal cleanup	• Regularly report the status of port coastal cleanup and maintenance on the Ministry of Environment's Coastal Cleanup Information Platform. • Report the amount of waste cleared from water bodies and coastal areas. • In case of natural disasters or upon receiving notifications, initiate cleanup operations and ensure timely completion within the designated limits.	• Submit monthly reports with a 100% reporting rate. • Annually report the quantity of waste cleared from water bodies and coastal areas. • Immediate cleanup and emergency cleanup operations should be completed within 7 days upon receiving notifications, achieving a 100% completion rate.		• Report the cleaning and maintenance status for each month (January to December) on the Ministry of Environment's information platform, achieving a 100% reporting rate. • The quantity of waste cleared from water bodies and coastal areas is 164.145 metric tons. • This year, there was 1 immediate cleanup and 0 emergency cleanups. All cleanup operations were completed within 7 days upon receiving notifications, achieving a 100% completion rate.	• Report the cleaning and maintenance status for each month (January to December) on the Ministry of Environment's information platform, achieving a 100% reporting rate. • The quantity of waste cleared from water bodies and coastal areas is 165.221 metric tons. • This year, there was 1 immediate cleanup and 2 emergency cleanups. All cleanup operations were completed within 7 days upon receiving notifications, achieving a 100% completion rate.
		Maintenance dredging of navigational waters.	The actual dredging volume ÷ planned dredging volume × 100%	Dredging execution rate reached 100%		The dredging execution rate reached 208%. • Estimated dredging volume: 185,980m^3 • Actual dredging volume: 386,437m^3 • Working area: Main channel inside the southern breakwater and southwest position outside the southern breakwater.	The dredging execution rate reached 201%. • Estimated dredging volume: 179,045m^3 • Actual dredging volume: 360,696m^3 • Working area: Main channel inside the southern breakwater and southwest position outside the southern breakwater.
8	Ship Waste	Promoting waste reduction and implementing resource recycling and reuse.	Waste transportation volume and waste recycling rate	The general waste recycling rate of ships reaches 20%.		The general waste transportation volume of ships is 314.05 metric tons. The ship's recyclable waste transportation volume is 123.571 metric tons. The general waste recycling rate of ships is 28%.	The general waste transportation volume of ships is 386.47 metric tons. The ship's recyclable waste transportation volume is 119.71 metric tons. The general waste recycling rate of ships is 24%.

Environmental Performance Indicators

Ten Significant environmental issues of the Taichung Port		Index item	Calculation method	Index target		Calculation	
						2021	2022
9	Climate Change	Port area new planting and replanting of vegetation	Number of new (replacement) plantings.	Number of new (replacement) plantings in the port area reaches 5,000 plants per year.		The total number of new (replacement) plantings in the port area is 11,600 plants, including 8,600 trees and 3,000 shrubs.	The total number of new (replacement) plantings in the port area is 50,102 plants, including 17,042 trees and 33,060 shrubs.
		The maintenance of green areas/green belts in the port area	The maintenance of green areas/green belts in the port area	The maintenance of green spaces/green belts in the port area covers an area of 200 hectares.		The maintenance of green belts covers approximately 490 hectares, which includes the following areas: 1.Security forest area: 166 hectares. 2.Low development area on the north side: 67 hectares. 3.Second-phase improvement area of the north siltation zone: 30 hectares. 4.Key green areas around the harbor building: 22 hectares 5.Maintenance of grass cutting and planting in the port green area: 198 hectares. 6.Industrial professional area II: 4 hectares. 7.Cooperative afforestation: 3 hectares.	The maintenance of green belts covers approximately 490 hectares and includes the following areas: 1.Security forest area: 166 hectares. 2.Low development area on the north side: 67 hectares. 3.Second-phase improvement area of the north siltation zone: 30 hectares. 4.Key green areas around the harbor building: 22 hectares. 5.Maintenance of grass cutting and planting in the port green area: 198 hectares. 6.Industrial professional area II: 4 hectares. 7.Cooperative afforestation: 3 hectares.
		Promoting solar photovoltaic energy in the port area.	• Power generation capacity • Reduction in carbon emissions • Installed capacity	• Solar energy generation capacity • Reduction in carbon emissions • Capacity of the installation		• Power generation: 44,564,310 kWh • Carbon reduction: 22,683,234 kilograms of CO_2 • Installed capacity: 40,698 kWp	• Power generation: 49,802,845 kWh • Carbon reduction: 24,652,4088 kilograms of CO_2 • Installed capacity: 45,482 kWp
		Greenhouse Gas Inventory	Greenhouse Gas Emission Inventory	Greenhouse Gas Generation		• Category 1 (Scope 1): 91.8778 • Category 2 (Scope 2): 2,925.8699 • Total Emissions: 3,017.748 (metric tons CO2e/year)	• Category 1 (Scope 1):296.3970 • Category 2 (Scope 2): 3,158.2530 • Total Emissions: 3,454.650 (metric tons CO2e/year)
10	Strengthening Community Relations	Handling Community Welfare Subsidies, Activities, and Petitions	Calculating the Actual Occurrence Count	Number of Activities Held: 6 times Percentage of Petition Handling: 100%		• A total of 6 environmental education course activities were held. • 51 public petitions were received and handled, achieving a 100% handling rate	• A total of 16 environmental education course activities were held. • 63 public petitions were received and handled, achieving a 100% handling rate
		Conducting Environmental Education Activities	Number of Environmental Education Course Activities Held	Number of Activities Held: 3 time		This year is the stage of applying for environmental education facility site certification, with a total of 9 environmental education course activities held.	On June 15th, the environmental education facility was officially certified by the Environmental Protection Administration of the Executive Yuan (now Ministry of Environment). In the second half of the year, 3 environmental education course activities will be conducted.

05

Emergency Response

Port of Taichung Emergency Response

The Port of Taichung conducts periodic joint inspections with relevant units on the petrochemical storage tanks and transportation pipelines in the port area, as well as joint supervision related to hazardous goods safety, and drills related to chemical or oil spill emergency response plans.

In addition to regular inspections and emergency response drills, the Port of Taichung also urges businesses in the West Terminal to form regional joint defense organizations and establish the West Terminal Association. Through the organization of volunteer firefighters, they conduct regular disaster prevention and rescue drills with units such as the Harbor Fire Corps, Taichung Port Team, Fire Bureau.

Port Area Emergency Incidents: Record of Exercises by the Port of Taichung from 2021 to 2022

Year	Drill Title	Content	Date
2021	Disaster Prevention and Rescue, Port Facility Security, and Epidemic Prevention Joint Live Drill in the Port Area of Taichung	1. Mobilization of over 100 personnel and more than 20 vehicles and equipment from 15 agencies and units in the Port of Taichung. This included the Harbor Fire Corps, Taichung Port Team, Fire Bureau, Police Department, Third Coast Guard Fleet, Third Shore Patrol Team, Central Disease Control Center, Central Navigation Center, Aviation Investigation Office, Taichung Customs, Border Affairs Corps, Taiwan Power Company, Taichung Port Volunteer Fire Brigade, Western Wharf Area Company Association (including China Global, Chang Chun, and Overseas Petrochemical Companies), Zhonglong Port Iron Co., Ltd., and other civilian units and volunteer firefighters. 2. Conducted at Berth No. 102 in the Port of Taichung, focusing on four major areas: disaster prevention and rescue, port facility security, rioter apprehension, and port epidemic prevention and cleaning. The exercise aimed to enhance both vertical and horizontal communication and coordination for emergency response. 3. Additional scenarios involving high-altitude rescue equipment such as ladder trucks and turret firefighting equipment, along with epidemic cleaning and disinfection, were included. These showcased the Port of Taichung's capabilities in handling high-altitude fire emergencies and port epidemic control measures.	10/26
2022	Port of Taichung 111th Year Compound Exercise	1. Mobilization of nearly 150 personnel and more than 20 vehicles, equipment, and vessels from 18 agencies and units in the Port of Taichung. This included the Harbor Fire Corps, Taichung Port Team, Taichung Port Police Department, Third Shore Patrol Team of the Maritime and Coast Guard Administration, Central Navigation Center of the Ministry of Transportation, Taichung Customs, Border Affairs Corps of the Ministry of the Interior, Taichung Port Volunteer Fire Brigade, Western Wharf Area Company Association (including China Global, Chang Chun, Overseas, He Xing, Hong Shu, Yong Sheng, He Sheng and other petrochemical tank companies), Taiwan Power Company's Taichung Power Plant, Zhonglong Port Iron Co., Ltd., CPC Corporation's LNG Plant, Yongkang Ship Company, and other Port CIQS agencies, volunteer firefighters, and regional joint defense organizations. 2. Conducted at the West No.1 Berth area of the Port, combining the newly constructed Western Wharf area's firefighting facilities, the 4th quarter live drill of the Harbor Fire Corps, Taichung Port Team, and the new firefighting team and equipment capacity from Taiwan Power Company. The exercise also incorporated existing public and private disaster response capabilities within the port. 3. Focused on port facility security, rioter threat response, regional joint defense within the port area, fire rescue, waterborne firefighting towing, and other emergency response mechanisms. The exercise provided both vertical and horizontal communication, emergency rescue handling, and showcased and tested the self-protection and regional joint defense of Port of Taichung's businesses. Additionally, it demonstrated the port's mutual protection and support scheduling capabilities.	12/09

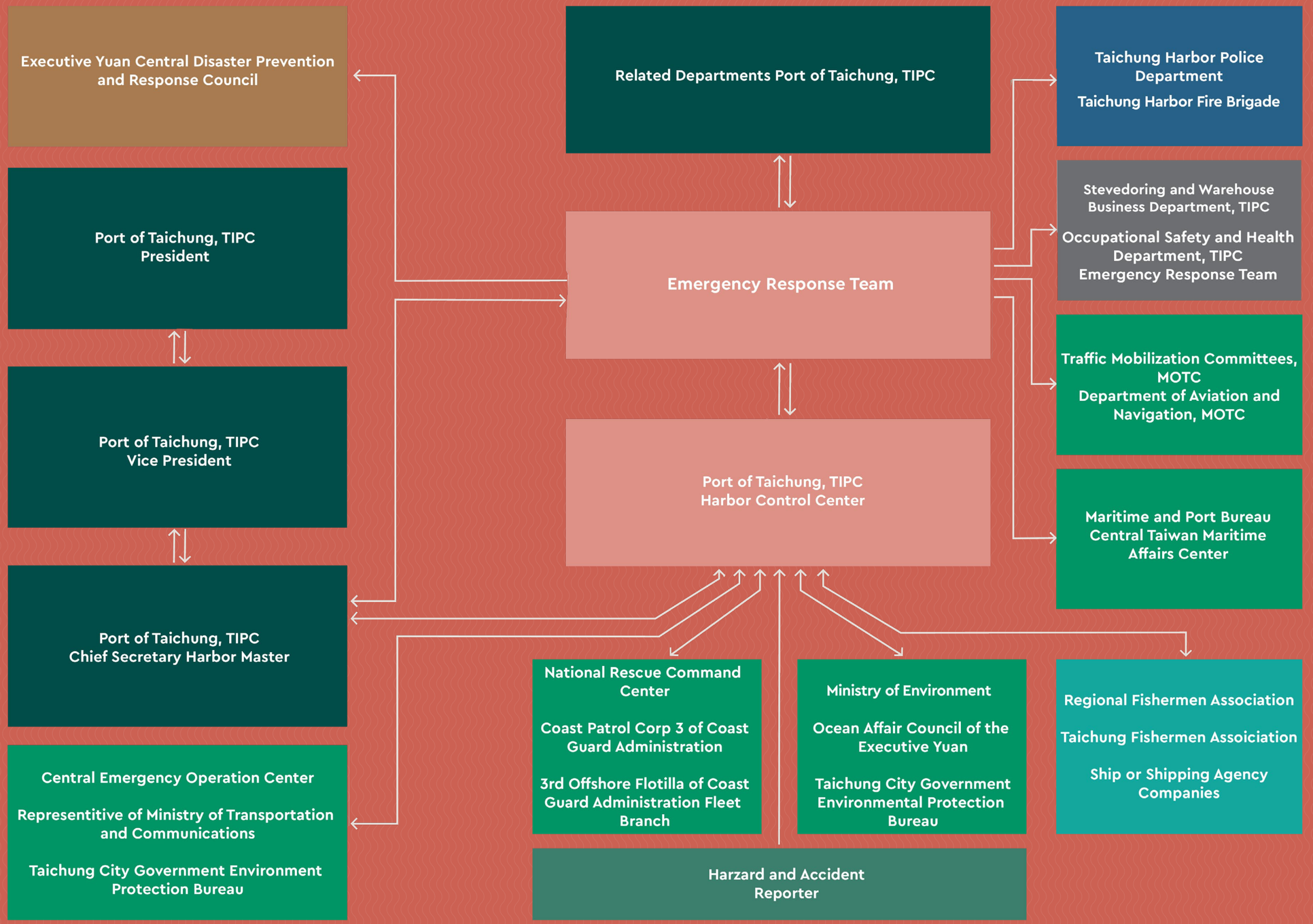
Emergency Events in the Port Area, 2021–2022

Event Title	Date	Handling Process
Evergreen #31 Bridge Crane Dismantling, 300-ton Crane Overturns	2021/09/06	1. The incident unit immediately notifies the police and fire department to provide assistance in the event of a disaster. 2. Our company dispatches personnel to the workplace accident site for investigation and to ensure the preservation of the accident scene. 3. Our company promptly convenes an emergency response meeting with relevant units to provide instructions on related matters and express concern for the victims. 4. We notify the workplace accident unit to report in accordance with Article 37 of the Occupational Safety and Health Act and cooperate with labor inspection units for subsequent analysis of the causes of the incident and investigations related to liability attribution.
Chenergy#W7 Storage Tank Fire	2022/04/08	1. The accident was caused by a fire that inadvertently broke out during construction on an idle diesel (empty) storage tank. 2. Chenergy Company has successively reported the incident to environmental, firefighting, and other related agencies. 3. The flames were immediately extinguished on-site, and the port firefighting unit and the Western Wharf Area Joint Defense Organization continued to guard until the situation was resolved and then withdrew. The port company continues to inspect the subsequent air, water environment, and safety recovery, and handle the situation appropriately.
Fire in the transportation equipment at Taiwan Power Company's Taichung Power Plant	2022/04/29	1. Power plant staff discovered smoldering during a routine inspection, and the fire was extinguished internally by Taiwan Power Company. 2. There were no extended disasters or effects on power generation and unit operation.
Fire in the Dockyard Area	2022/07/20	A fire broke out during welding operations on a ship, and was controlled and extinguished by the area personnel and the Harbor Fire Corps.

2021 Taichung Port Disaster Prevention, Port Facility Security, and Epidemic Prevention Joint Live Drill

2022 Taichung Port Comprehensive Port Exercise

Port of Taichung Emergency Response



06

Involvement and Cooperation

Port of Taichung has proposed best solutions for environmental issues in the port area, demonstrating its capabilities in implementing port environmental management. The two exemplary practices are: (1) Promoting Localization of Wind Power in Taichung Port; and (2) Taichung Port Environmental Education Center. These two best practices can serve as references for other eco-friendly ports and be shared with the European Sustainable Logistics Chain Foundation for the benefit of other ecological port partners.

Promoting Localization of Wind Power in Taichung Port

Attention/Motives

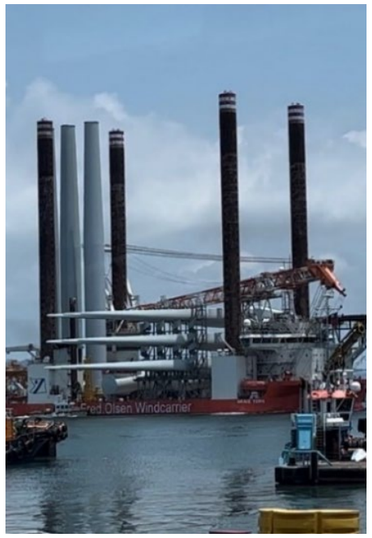
Global warming is an important issue faced by countries worldwide. In this critical era of energy transition, our island, Taiwan, possesses a unique advantage with world-class offshore wind resources in the Taiwan Strait. Offshore wind power plays a crucial role in Taiwan's energy transformation. On August 16, 106 (2017), the Executive Yuan approved the "4-year Offshore Wind Power Promotion Plan," which established a three-stage strategy: "demonstration, potential, and zones" to drive offshore wind energy development.

Led by the Ministry of Economic Affairs, the plan aims to achieve a cumulative 5.7GW of installed offshore wind capacity by 114 (2025) with an annual power generation of 21.5 billion kWh, supplying approximately 5.91 million households. Furthermore, the government plans to release an additional 1.5GW of installed capacity annually after 2025.

Taiwan's commitment to offshore wind power reflects its dedication to tackling climate change and transitioning towards a sustainable energy future.

Solution

In line with the Executive Yuan's offshore wind policy, TIPC has strategically leveraged Taichung Port as a hub for wind turbine pre-assembly, domestic manufacturing, port operations & maintenance, and talent training. TIPC has dedicated 107.3 hectares in the Taichung Port Industrial Zone (II) for wind turbine component manufacturing, introducing new roads and infrastructure to support industry needs. The new Taichung Port No. 106 heavy cargo wharf aids in the import and export of goods, bolstering the green energy supply chain. To foster talent, TIPC established the 'Taiwan Wind Energy Training Corporation' in 2018, training 3,000 professionals and issuing over 9,000 licenses.



Implementation/Timeline

1. August 26, 2016: Decision made in the Executive Yuan Energy and Carbon Reduction Office meeting to establish a designated zone.
2. December 30, 2016: Contract signed with Yeong Guan Holding Co,Ltd. Taiwan Branch (B.V.I) EONG GUAN HOLDINGS CO., LIMITED, primarily producing hubs. Factory construction completed on April 8, 2023, with an estimated annual capacity of 80,000 to 100,000 tons.
3. October 5, 2018: Contract signed with Tien Li Offshore Wind Technology Co., Ltd., mainly producing blades. Phase one of the factory started operating in February 2022, employing 600 staff members.
4. March 5, 2019: Contract signed with Century Huarxin Wind Energy Co., Ltd., primarily producing tower sections and transition pieces. Factory construction is currently underway.
5. August 26, 2019: Contract signed with Siemens Gamesa Renewable Energy Offshore Wind Limited, mainly producing nacelles. Phase one of the factory began operating in October 2021, and a second phase is currently under construction.
6. 2020: Completion of infrastructure improvements – #106 Terminal and new roads in the localization zone used for wind turbine component handling since 2021.
7. September 30, 2022: Contract signed with Siemens Gamesa Renewable Energy Offshore Wind Limited, for the production of various wind turbine components. Factory construction is currently underway.

Effect/Benefit

1. Localization of the Industry: Taiwan's offshore wind power development emphasizes a "localization" strategy, allowing local companies to participate and enhance their technical and service capabilities.
2. Industrial Cluster: Establishing an offshore wind power industry supply chain at Taichung Port enables the near-completion of assembling the upper structures of entire wind turbines by combining locally-produced components.
3. Increased Employment Opportunities: The diverse talent and technical requirements in the upstream and downstream sectors of the offshore wind power industry create employment opportunities. Investments by various companies drive talent development and job opportunities in Taiwan's offshore wind power sector.
4. Building a Low-Carbon, Sustainable Home: Energy transition, coupled with the implementation of localization policies, presents a great opportunity for industrial transformation and upgrading. It brings commercial opportunities to related industries, contributes to energy security, fosters green economic development, and strives to achieve the goal of renewable energy accounting for 20% of total power generation by 2025.

Investment Amount

The construction of #106 Heavy-Lift Wharf and its associated infrastructure costs approximately NT$1.4 billion. Additionally, new industrial roads, tailored to transport wind turbine components, amount to around NT$400 million.

Furthermore, each company has made its respective investments as follows:
Evergreen Energy Materials (BVI) Co., Ltd., Taiwan Branch: NT$5.22 billion
Tien Li Offshore Wind Technology Co., Ltd.: NT$3 billion
Century Huarxin Wind Energy Co., Ltd.: NT$4 billion

Environmental Issue

Climate Change
Renewable Energy Promotion

Stakeholders

- Taichung Branch of TIPC
- Port staff
- Local people

Participating Units

- Taichung Port Authority Corporation
- Taiwan Wind Energy Training Company
- Yeong Guan Holding Co,Ltd. Taiwan Branch (B.V.I) EONG GUAN HOLDINGS CO., LIMITED
- Tien Li Offshore Wind Technology Co., Ltd.
- Century Huarxin Wind Energy Co., Ltd.
- Siemens Gamesa Renewable Energy Offshore Wind Limited

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Taichung Port Environmental Education Center

Attention/Motives

Taichung Port boasts a rich local cultural heritage and abundant ecological resources. However, the public's access to information about the port's cultural history, industrial patterns, operational status, and environmental protection is limited to online sources, and the information provided may not be comprehensive enough to convey Taichung Port Authority Corporation's commitment to creating a "Green Port" concept. In recent years, the Environmental Protection Administration of the Executive Yuan (now Ministry of Environment) has been actively promoting environmental education for all, cultivating environmental citizens and learning communities to achieve sustainable development. It has also supported various public and private organizations and educational institutions to become certified environmental education facilities, offering comprehensive environmental education services to the public. Taichung Port Authority Corporation, due to its excellent facilities and abundant resources, was selected as one of the potential places for guidance by the administration in 2020.

Solution

To enhance public awareness of port cultural development and contribute to environmental education in Taiwan, Taichung Port Authority Corporation adheres to the guidelines of the Environmental Protection Administration of the Executive Yuan (now Ministry of Environment) for "Environmental Education Facility Certification Application." Utilizing existing spaces, buildings, facilities, and integrating port cultural history, natural ecological resources, and offshore wind power industry development, the company aims to establish and provide comprehensive environmental education services, information, and resources. This will be achieved through professional environmental education personnel, curriculum planning, and operational management to ensure a sustainable connection with nature, environment, culture, and the community. The related measures include:

1.Collecting and inventorying existing resources, natural ecology, and basic data required for the certification application.
2.Carrying out the bidding process for the "Taichung Port Environmental Education Facility Certification Program," followed by the development of three specialized environmental education courses for Taichung Port. The company will also conduct recruitment and training of environmental education instructors. Based on the integrated information mentioned above, the "Taichung Port Environmental Education Center" certification application will be prepared and submitted for review to the Environmental Protection Administration of the Executive Yuan(now Ministry of Environment). After successful review, the certification will be obtained.

Taichung Port Environmental Education Activities

Revealing the Secrets of Offshore Wind Power – Environmental Education Program

Implementation/Timeline

- In May 2021, a recruitment event was held to hire 26 environmental education instructors, and 3 individuals were selected to attend the certification course organized by the Environmental Protection Administration of the Executive Yuan(Now Ministry of Environment), obtaining certification credentials.
- In June 2021, three environmental education program schemes were established, namely "Let's Talk About Taichung Port," "Unveiling Offshore Wind Power," and "The Wonders of a Green Port." Nine trial classes were conducted.
- In August and September 2021, two sessions of environmental education instructor training courses and two sessions of facility observation and learning were conducted. Partnerships were established with six organizations, schools, and communities.
- In October 2021, data collection for environmental education facility certification was carried out, along with related course planning.
- On October 29, 2021, the formal application for "Taichung Port Environmental Education Center" facility certification was submitted to the Environmental Protection Administration of the Executive Yuan, Environmental Protection Personnel Training Institute (Now National Environmental Research Academy).
- On February 23, 2022, the preliminary review meeting for environmental education facility certification was held by the Environmental Protection Personnel Training Institute(Now National Environmental Research Academy).
- On June 7, 2022, the final review meeting for environmental education facility certification was conducted by the Environmental Protection Personnel Training Institute(Now National Environmental Research Academy).
- On June 15, 2022, the official certification document was issued by the Environmental Protection Administration of the Executive Yuan(now Ministry of Environment), certifying "Taichung Port Environmental Education Center" as a recognized environmental education facility. Simultaneously, the center opened reservations for courses to the public.

Effect/Benefit

1. Incorporating ESG principles of corporate social responsibility, promoting environmental friendliness, and advocating ecological sustainability, we have established a bridge between the port and the public.
2. From March 2021 to December 2022, a total of 12 environmental education courses were conducted, with a total of 263 participants.

Investment Amount

During the certification application process, Taichung Port Authority Corporation collected relevant basic information, established courses, conducted training for environmental education instructors, and compiled data. The total cost for these operations amounted to NT$1,808,550.

Environmental Issue

- Waste Disposal

Stakeholders

- Taichung Branch of TIPC
- Port staff
- General public

Participating Units

- Taichung Branch of TIPC
- Moral-Selection technology Consultant Co., LTD.,

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Involvement and Collaboration

The Taichung Branch of TIPC actively collaborates with both domestic and international organizations, including governmental agencies, academics, and industries. Besides sustainable development related exchanges, there are also joint collaboration on technological research, investment, inspection, etc.

協會

Association of Pacific Ports (APP)

The APP hosts conferences involving industry, government, and educational institutions on a regular basis for the benefit of port management bureaus, port management committees, and other relevant parties. It serves to provide ports in the Pacific region with a platform for exchanging professional skills, management knowledge, and relevant practical experience. The Port of Taichung, TIPC participates in conference on an occasional basis every year and exchanges operation experience with members from other countries so as to gain a better understanding of modern port operations and current development trends at Pacific ports.

The International Association of Ports and Harbors

The International Association of Ports and Harbors is currently the most influential port and harbor organization in the world, and is a non-governmental organization that provides consulting to various primary UN organizations (ECOSOC, IMO, UNCTAD, UNEP, ILO, WCO, etc.). The Port of Taichung, TIPC participates in the World Ports Conference, which is held once every two years, so as to gain a better understanding of global port development trends.

National Taiwan Ocean University

In order to enhance international competitiveness and transportation quality, create a sound educational and academic research environment, and allow the port and educational institutions to prosper together, Taiwan International Ports Corporation signed a memorandum of cooperation with three public universities in 2012. In the future, the parties to the memorandum will be involved in academic exchanges, research and development, cooperative undertakings between companies and educational institutions, education and training, student internships, and port operation seminars. In addition to enhancing training quality, the educational institutions involved can also provide intelligence to port affairs companies, and thus play an active role in assisting practical port management and operations, which will achieve a win-win outcome.

National Quemoy University

National Sun Yat-Sen University

Forestry and Nature Conservation Agency, Ministry of Agriculture

The Forestry Bureau (Now Forestry and Nature Conservation Agency) implemented a forest renewal project between 2003 and 2006, and a preliminary coastline forest ecology recovery and afforestation project in 2012.

Institute of Transportation, MOTC

The Institute of Transportation has conducted research projects on such subjects as "Congestion Relief," "Capacity Increase," "Expansion and Use of Current Transportation Facilities," and "Establishing a Long Term Transportation Development Plan." In the past, the Port of Taichung, TIPC has worked with the Institute of Transportation on such projects such as "Port Ecological Landscape Planning, Design and Research" and "Energy Conservation and CO_2 Emission Reduction at Taiwan's Ports," etc.

Environment Protection Bureau

The Port of Taichung, TIPC and the Environmental Protection Bureau of Taichung City Government have cooperated on audits and drills in the port area on the regular basis and assist the Environmental Protection Bureau of the Executive Yuan in hosting relevant meetings such as the "meeting for discussion of atmospheric dust suppression in central river regions," "public hearing for proposal of air pollution prevention in Taichung City," "public hearing for greenhouse gas emission management and reduction in Taichung city," "drill for atmospheric dust prevention by rivers," "seminar for monitoring, investigation, reporting and control of soil sediments" and "meeting for discussion of regular pollution source control in the Taichung port area."

Ministry of Environment

The Taichung Branch of TIPC participates in major discussion meeting held by the Ministry of Environment. For example, the "Port Area Air Pollution Reduction Discussion Meeting," "Environmental Assessment Act Promotion Campaign," and "Promotion Campaign for Port Transportation Pollution Control Measures." The Taichung Port has amended the "Terms and Conditions for the Application of TIPC International Commercial Port Access Pass" and only issue pass less than 3 months to trucks without a self-management seals.

Central Maritime Affairs Center, Maritime and Port Bureau

The Port of Taichung, TIPC cooperates with the Central Maritime Affairs Center to perform regular audits and drills.

Harbor Fire Corps, National Fire Agency, Ministry of the Interior

Taiwan International Ports Corporation, Harbor Fire Corps, collaborates with the Harbor Fire Corps, Taichung Port Team, under the Fire Bureau of the Ministry of the Interior, to conduct workplace fire training.

Industrial Technology Research Institute

To comply with the energy saving policy promoted by the central government, Port of Taichung entrusted energy management professionals to conduct energy researches and will require future public project contractors to meet national standards.

07

Training

Employee Education

Port of Taichung follows the content of environmental policies and provides appropriate environmental education training. This not only cultivates environmental awareness among employees and enhances their environmental knowledge but also improves the competitiveness of Taichung Port.

Each year, Taiwan Branch allocates personnel for internal staff environmental education and external training programs. For internal environmental education, we comply with the "Environmental Education Act" and develop an annual environmental education plan. Each employee is required to participate in at least four hours of environmental education. In 2021 and 2022, a total of 14 environmental education training activities were conducted, covering topics such as ecological conservation, energy saving and waste reduction, health and disaster prevention, ESG sustainable development, resilient cities, and marine conservation.

External training programs related to environmental issues include training for environmental education personnel, ISO14064, and ISO45001 courses, occupational safety and health management training for supervisors, first aid personnel safety and health education, fire safety managers, hazardous substance specialists, IMDG Code international maritime dangerous goods regulations training, port facility security officer (PFSO), and ISPS Code international ship and port facility security training.


Resource Recycling: Hands-on Orchid Propagation


Succulent Plant Combination Potting Course


Annual CPR and AED Operation Training


Stay Healthy and Love Yourself Forever – New Coronavirus Care and Health Maintenance


Parent-Child Learning and Experience Camp


Parent-Child Learning and Experience Camp

Session	Time	Activity Name	Number of Participants
1	2021/4/8	Tree Planting Event to Protect the Earth and Taichung Port (May 2021)	65
2	2021/5/11	Resource-Efficient Reuse – Orchid Propagation Workshop	30
3	2021/8/5	Emergency Response Drills for Water Pollution Incidents in Taichung City (2021)	15
4	2021/8/5	Environmental Education Volunteer Training(1st sessions)	23
5	2021/8/19	Environmental Education Volunteer Training(2nd sessions)	23
6	2021/9/8	Plant Pathology, Pest Control, and Plant Health Workshop	27
7	2021/9/10	Occupational Safety and Health Education for Construction Workers and Self-Employed (Co-organized with the Ministry of Labor)	47
8	2021/9/10	Environmental Education Seminar for a Fresh and Sustainable Taichung Port	13
9	2021/9/15	Disaster Prevention and Rescue Training for Water Athletes (2021)	8
10	2021/9/22	Psychological Course: Overcoming Pandemic Stress	28
11	2021/9/22	Current Situation of Air Pollution Prevention and Control	25
12	2021/10/6	Environmental Education Facility Site Visits and Learning	24
13	2021/10/25	Cardiopulmonary Resuscitation (CPR) + Automated External Defibrillator (AED) Training (2021)	55
14	2021/10/25	Safe Handling Training for Dock Operations	39
15	2021/10/26	Port Disaster Prevention and Rescue, Port Facility Security, and Epidemic Prevention Joint Drill	18
16	2021/10/29	Taichung Port and Ocean Beach Cleanup Event	62
17	2021/11/1	"New Life, New Trees, and Everlasting Growth" Tree Planting Activity	20
18	2021/11/16	Firefighting Training	61
19	2021/12/10	Promoting 2050 Net Zero Carbon	10
20	2022/2/1	ISO45001 System Hazard Identification, Risk Assessment, and Risk Management Course	18
21	2022/2/16	"ISO14064-1 Greenhouse Gas Inventory Introduction and Verification Training" Course	4
22	2022/2/16	Port Air Quality Maintenance and Pollution Prevention Policy Advocacy	20
23	2022/3/24	Taichung Port and Ocean Beach Cleanup Event	38
24	2022/4/16	Taichung Port Sponsored Coastal Tree Planting Event	20
25	2022/6/9	"How Did Turtles Disappear? 3 Actions for Reducing Plastic and Low-Carbon Living"	26
26	2022/6/24	Use of Thin and Vertical Greening Cultivation Medium for Recycling Natural Waste	27
27	2022/6/30	Taichung Port Emergency Response Drills for Marine Pollution	15
28	2022/8/8	Succulent Plant Combination Potting Course	37
29	2022/8/11	Occupational Safety and Health Education Training for New Employees	17
30	2022/8/16	Water Athlete and Disaster Prevention and Rescue Training – Tsunami Disaster Prevention Development and Countermeasures in Taiwan	18
31	2022/8/17	The Function of Plants in the Environment	26
32	2022/8/25	Landscape Tree Pruning Techniques Education and Training	23
33	2022/8/30	ESG Important Report Reading Meeting	5
34	2022/9/8	Field Visit to National Public Information Library	30
35	2022/9/13	Environmental Education Facility Site Visits and Learning	24
36	2022/9/15	Practical Applications of Green Technology – Environmental Issues, Green Technology, Low-Carbon Living	27
37	2022/9/23	ESG Important Report Reading Meeting	5
38	2022/10/27	ISO45001 Internal Auditor Course	35
39	2022/10/28	ESG Important Report Reading Meeting	10
40	2022/11/3	Clean Home Campaign	30
41	2022/11/4	ISO45001 Emergency Response Commander Course	23
42	2022/11/8	Occupational Safety and Health Construction Risk Assessment and Risk Management Course	45
43	2022/11/23	Firefighting Training	52
44	2022/11/28	ESG Important Report Reading Meeting	5
45	2022/12/9	Taichung Port Annual Port Complex Exercise	20
46	2022/12/16	"Art Port, Clean Village" Field Visit	30
47	2022/12/26	ESG Important Report Reading Meeting	5
48	2022/10/4 、2022/10/11	Occupational Safety and Health In-Service Education Training for Employees	193
		Total	1191

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Communication and Publication

Communication and Publication

Port of Taichung strives to maintain continuous communication and engagement with stakeholders and the public through a variety of channels. Activities, seminars, workshops, publications, webpages, and exhibition spaces are among the key avenues used to disseminate relevant information about Port of Taichung. These efforts aim to provide the general public, port stakeholders, academic institutions, and various business units within Port of Taichung with valuable insights and understanding of its operations and developments.

Front Page of Taichung Port Website

Chinese and English web pages for TIPC Green Policy

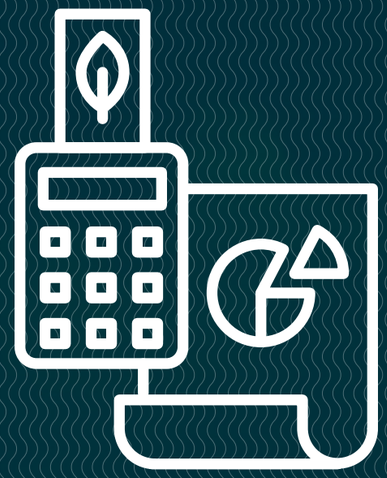
Port of Taichung disaster prevention related publications in 2021–2022

Harmony of the Port – Colorful Portraits

Taipei City Loving Home – One Day

Donate White Rice, Cultivate Blessing Fields

Donate Receipts, Spread Love



09

Green Accounting

Environmental Investment and Cost

Taiwan International Ports Corporation's investment in environmental issues can be categorized into employee training, environmental maintenance and management, environmental monitoring, publications, emergency response, and communication. The objectives are to enhance employees' environmental awareness, maintain and improve environmental quality, build emergency response capabilities, and increase public awareness of the port. The total cost expended by the Port of Taichung, TIPC for the environmental issues was €6,782,206 and €6,326,912 in 2021 and 2022, respectively. (Rate of exchange 34.0)

- **Staff:** This includes personnel expenses for environmental staff, as well as education and training expenses related to environmental matters.
- **Environmental Maintenance and Management:** This involves expenses for greening and beautification within the port area, waste clearance, road maintenance, seawall maintenance, and port dredging activities.
- **Environmental Monitoring:** This includes costs for monitoring air quality, noise levels, water quality, sediment quality, and other relevant environmental parameters. It also covers expenses for environmental inspections and the maintenance of the port surveillance system.
- **Emergency Response:** This category covers expenses for handling accidental incidents, materials used for pollution control within the port area, hazardous substance testing fees, and disaster recovery activities.
- **Communication and Publications:** This involves expenses for fostering community engagement, conducting promotional activities, and producing environmental publications.

The total cost expended by the Port of Taichung, TIPC for the environmental issues in 2021 and 2022
(Unit: €EUR)

Items	2021	2022
Employees	4,882	7,059
Environmental Maintenance and Management	2,354,471	3,211,206
Environmental Monitoring	4,153,206	2,974,794
Emergency Response	107,088	89,824
Communication and Publication	162,559	44,029
Total	6,782,206	6,326,912

Environmental Assets

Taiwan International Ports Corporation's development positioning for Taichung Port includes Central Taiwan's shipping and industrial value-added services, energy and bulk goods storage and transshipment, passenger and tourism port, and industrial and commercial development base near the port. Taichung Port has initiated a series of port development and general construction projects, some of which involve environmental issues. These projects include constructing and renovating buildings with a focus on green architecture, building and maintaining waterfront landscape facilities to enhance public access to the port, restoring historical buildings for port area revitalization, establishing an education and protection center to provide public educational services, constructing and renovating piers to support the offshore wind power industry, and ongoing replacement of old equipment to improve operational efficiency and reduce pollution emissions.

The total fixed asset investment in environmental issues by Taichung Port Authority in 2021 and 2022 amounted to €13,542,176 and €23,742,882, respectively

Fixed assets invested in environmental issues in 2021 and 2022
(Unit: € EUR)

Items	2021	2022
Land Improvements	9,232,265	12,124,735
Houses and Buildings	625,765	3,640,147
Machinery and Equipment	1,572,147	2,241,676
Transportation and Equipment	1,981,559	5,640,676
Other Equipment	130,471	95,647
Total	13,542,176	23,742,882

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Improvement Recommendations

Since its inception in 1976, the Port of Taichung has continuously invested in its infrastructure to adapt to the growth of the domestic economy and changes in the shipping market. Over the past 40 years, the port has grown significantly. While pursuing port development, we also recognize the importance of balancing economic interests with environmental restoration. Our future efforts will focus on sustaining the Port of Taichung's global maritime presence while prioritizing environmental considerations.

As the port operator, Port of Taichung acknowledges its responsibility to maintain and improve the port environment. We view environmental protection as an integral part of port operations and are committed to minimizing the impact of port activities on the environment. Our policy principles include compliance with environmental laws, safeguarding the port area, implementing environmental monitoring, identifying pollution sources, adopting innovative pollution prevention technologies, achieving a green port, and advancing towards autonomous management for sustainable development.

Port of Taichung actively promotes the Green Port policy and obtained the European EcoPort certification in 2015. We conduct periodic reviews for recertification and align our vision with the non-nuclear homeland and energy transition objectives. Green energy development will be a driving force behind economic growth. In line with the national energy development policies, we will continue to enhance the environmental aspects necessary for green energy development, create a high-quality offshore wind energy industry zone and operational base, and advance the sustainability of the port, aligning with the United Nations Sustainable Development Goals (SDGs).

Our commitment to environmental protection and sustainable development reflects our positive outlook and determination for a greener and brighter future.

If you have any inquiries regarding this report, please contact us.

Port of Taichung

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