



Port of Taichung

Environmental Report



The environmental report presents Taichung Port's achievements in environmental protection from 2019 to 2020 as well as the environmental policy, commitments and action plan of the Port of Taichung, Taiwan International Ports Corporation.





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Taiwan International Ports Corporation Environmental Policy



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 Branch of TIPC understands its role as a port management entity that is responsible for maintaining and improving the environment of the Port and regards environmental protection as a part of port management. Therefore, the Taichung Branch of TIPC commits to mitigating the impact of port operation on the environment and aims to build an environmentally-friendly, sustainable and advanced high-quality port. In order to keep the port environmental performances consistent with the policy, the following principles will be put into practice:

- Abide by environmental regulations and maintain the environment of the port;
- Realize environmental monitoring and control sources of pollution;
- Innovate pollution prevention technology and attain the status of a green port;
- Head toward autonomous management and achieve sustainable development.

To achieve our promise in the environmental policy statement the following environmental objects are based on the ten major environmental impacts from the port:

- Improve air quality in port**
Improve air quality monitoring and promote autonomous air pollution reduction management programs
- Strengthen the management of dangerous goods in the port area**
Implement the management of dangerous areas and strengthen the consolidation of emergency response mechanisms
- Reduce the occurrence of fugitive dust in the port area**
Promote the fugitive cargo handling closed operation, road dust cleaning operation, and the remediation of drift sand.
- Improve ship emissions in the port area**
Low-sulfur fuel conversion, encourage ship speed reduction, and promote the use of shore power equipment
- Improve vehicle emissions in the port area**
Provide the vehicle identification control system and implement vehicle equipment management in the port area
- Develop the land environment of the port in a friendly manner**
Build a wind power operation and maintenance base, develop waterfront tourism and commerce, and promote afforestation and landscape construction of the port area
- Promote the vessel waste recycling**
Promote the waste sorting and resource recovery of vessel waste
- Restore and improve soil contamination in the port area**
Continued monitoring and supervision of contaminated sites in the port area
- Strengthen relationships with neighboring communities**
Enhance public participation and increase opportunities for interaction with local communities
- Enhance port water development**
Develop clean water space, main channel and leisure tourism area, etc.

The President of Taichung Branch is responsible for the implementation, maintenance, and communication and exchange of the environmental policy. The President is also responsible for reviewing the environmental policy every year, so as to comply with the commitments, and continue to improve and achieve the environmental objectives. The environment policy will be effectively conveyed to the staff, shipping companies, lessees and residents, and is available on the Taichung Branch of TIPC website.

President of Port of Taichung, TIPC

Date

Jon Yu Lu
27 / Aug / 2021



01

Message from Port of Taichung, TIPC

Port management has embraced ecological and sustainability-related concepts. Located at the center of Taiwan, the Port of Taichung of Taiwan International Ports Corporation (TIPC) is favorably positioned for wind power development. In compliance with the government's energy policy, TIPC constructed Taiwan's first wharf specifically designated for offshore wind power generation, representing a new milestone for local generation of offshore wind power in the country.

The Port of Taichung has been trying to exercise corporate social responsibility and to achieve the goal of a greener port. The company has devoted itself to maintaining a green zone area and to the greening and beautification of the port area. In addition, the introduction of Mitsui Outlet Park has achieved win-win prosperity for both the port and the city and has established an outstanding corporate image. According to the green port promotion program of Taiwanese ports, TIPC has dedicated itself to improving environmental management and has gradually improved the environment of the port area.

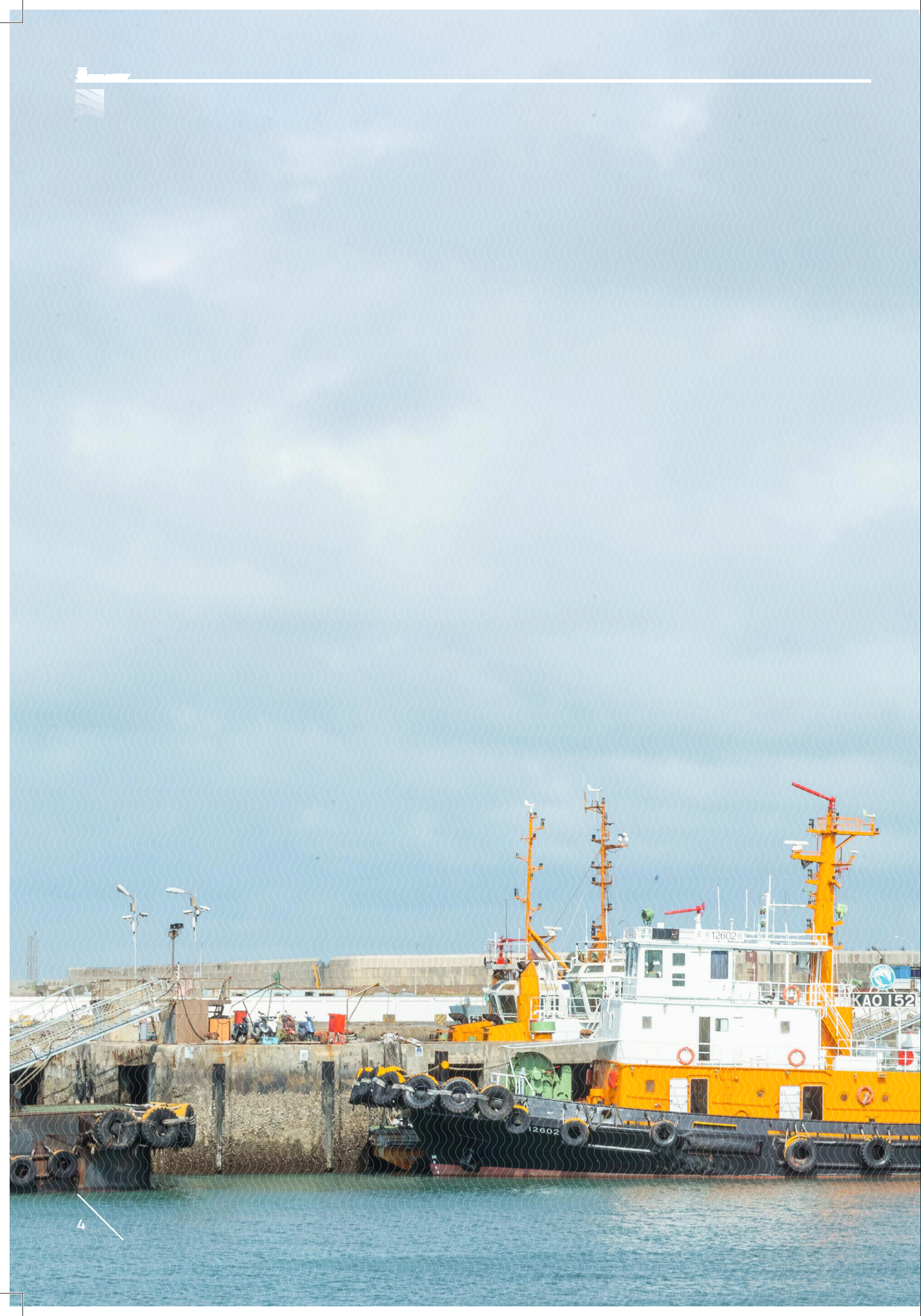
The Port of Taichung is a container port for near-sea trade and for commercial and cargo ships traveling between Taiwan and China. It is a port of call for transnational cruisers and an Asia Pacific logistics distribution center. As the port management continues to pursue steady economic growth for the port, concerns such as environmental planning, pollution control, and community relations are also considered integral to the sustainable management of the port. TIPC has been endeavoring to reduce the potential environmental load caused by the operation of the port and to strengthen friendly relations between the port and the city. By reapplying for EcoPorts Certification, the company wishes to achieve the objective of an ecological port with opportunities for international exchanges. Only with continuous improvement and progress can the port be able to take into account both prosperity and sustainable development.

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

02



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 borders 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 2,903 hectares land and 8,382 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 primary drainage channel mouths.



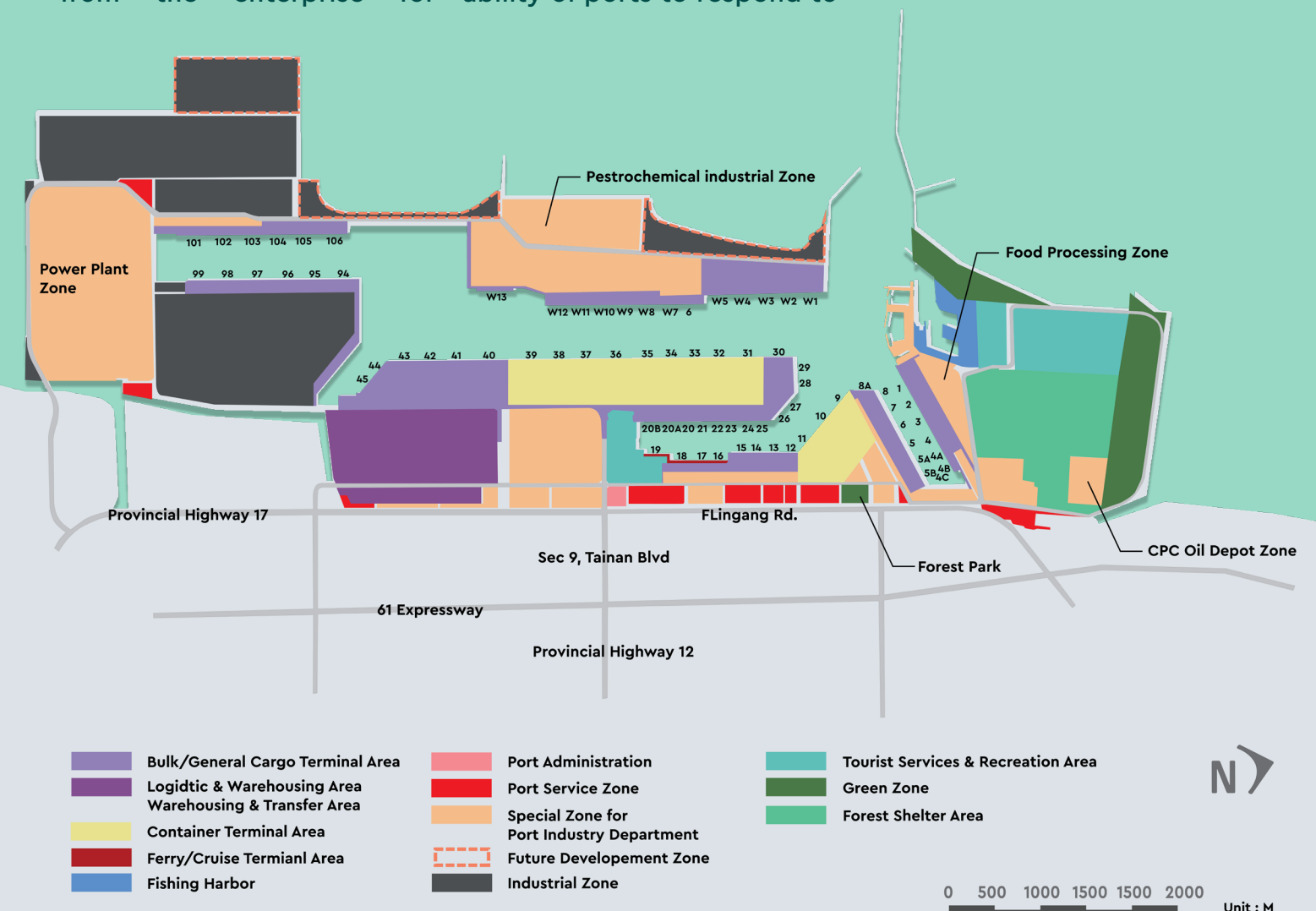
Geographical Map of Anping Port

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

Taichung port is planned to have a total of 78 piers and currently has 63 piers built. These piers include grains, containers, bulk cargo, cement, coal, channel liquid cargo, chemical and oil products, scrap steel, and passenger and freight. Coal takes up most of Taichung's commercial activities. Main commercial activities include cruise and entertainment, chemical industries, general manufacturing, and container. Shipping routes are mainly between the two straits, and is the Taiwan international commercial port with the highest concentration of cross-strait shipping.

Main Commercial Activities

Port of Taichung Main Commercial Activities	
Ferry terminal/recreation	Petroleum processing and storage
General manufacturing	Chemical processing
Container	Dry and liquid bulk cargo (non-petroleum)
Automobile	Others

2.4 Main Cargoes

Petroleum	Pyrites minerals
Crude oil	Cement, Phosphates, Sulphur
Dry bulk	Liquid bulk (non-oil)
Grains, Scrap iron, Timber, Soya	Liquefied gases, Chemicals, LNG (liquefied natural gas)
Ores	Other
Coal, Metallic mineral	Cars/Vehicles

2.5 Business Statistics

Port of Taichung Business Statistics from 2017-2018

Business Item		2019	2020	Comparison between 2019 and 2020	
				Actual Number	%
Incoming and outgoing ships (ton)	Total number of ships	17,492	18,487	995	5.69%
	Total tonnage	281,610,417	288,154,859	6,544,442	2.32%
Cargo Throughput (metric ton)	Imported cargo	55,694,258	57,111,553	1,417,295	2.54%
	Exported cargo	8,814,989	8,811,081	-3,908	-0.04%
	Domestic cargo	5,082,661	4,959,990	-122,671	-2.41%
	Total	69,591,908	70,882,624	1,290,716	1.85%
Cruise Passengers	Number of Travelers	99,444	11,835	-87,609	-88.10%

03



Environmental Management

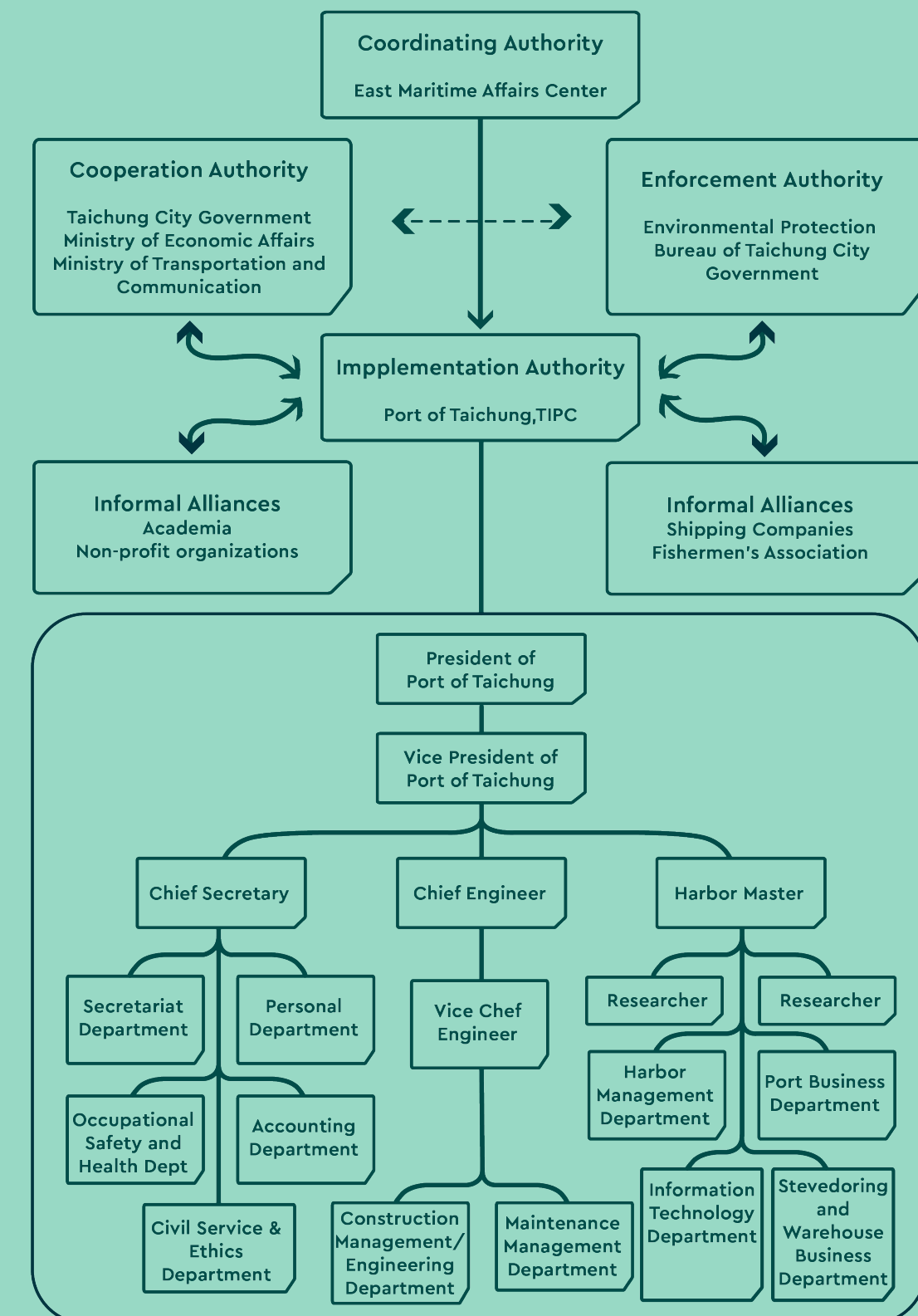
3.1 Organization Structure

In addition to the Port of Taichung, TIPC, environmental issues within the Port of Taichung also involves the Maritime and Port Bureau Central Taiwan Maritime Affairs Center, the Bureau of Environmental Protection, the Environmental Protection Administration, the Coast Patrol Corps 3 and Offshore Flotilla 3 of the Central Coastal Patrol Office, the Taichung Harbor Police Office (National Police Agency, Ministry of the Interior), the Taichung Harbor Fire Brigade, the Taichung Export Processing Zone, the Taichung Customs, and the Centers for Disease Control Central Area Control Center – Taichung Harbor Office.

Organization

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 Division	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

Authorization of environmental management units





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 Compe- tent Authority	Local Law Enforce- ment Agencies
Sectors in the Ministry of transportation and communications		The Commercial Port Law	2021/04/28	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	Council of Agriculture	Agriculture Bureau, Taichung City Government
Sectors in the Ministry of the Interior		Fire Services Act	2019/01/07	Ministry of the Interior National Police Agency	Taichung Harbor Fire Brigade, National Fire Agency
		Police Act	2002/6/12	Administration Police	Taichung Harbor Police Department
Sectors related to environmental protection		Marine Pollution Control Act	2014/06/04	Ocean Affairs Council	Environmental Protection Bureau of Taichung City
		Basic Environment Act	2002/12/11	Environmental Protection Administration	
		Air Pollution Control Act	2018/08/01		
		Water Pollution Control Act	2018/06/13		
		Waste Disposal Act	2017/06/14		
		Environmental Impact Assessment Act	2003/01/08		
		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		
		Greenhouse Gas Reduction and Management Act	2015/07/01		
		Public Nuisance Dispute Mediation Act	2009/06/17		
		Environmental Agents Control Act	2016/12/07		
	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- governance Article	2014/05/09		Local Administrative Government	
Intersectoral		Disaster Prevention and Protection Act	2019/05/22	Ministry of Interior	Taichung City Government



04



State of the Environment



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.

2. Hazardous Cargo Management

Indicator

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

3. Dust

Indicator

- Convene handling prevention meetings and review the number of machines
- Handling operators audit
- Road dust cleaning

5. Vehicle exhaust gas emissions

Indicator

- Promotion of a comprehensive use of the Automatic gate control System among shipping lines
- Diesel truck inspections

6. Port development (land area)

Indicator

- Maintain harbor green space and green belt areas
- Maintenance of waterfront and friendly space in the port area and other recreational facilities
- Landscape maintenance rate for harbor green areas (number of plants planted)
- The location of special zone in adjustment, Port of Taichung

8. Soil pollution

Indicator

- Soil contamination sites in the port area with EPA approved control plans

9. Relationship with Local Communities

Indicator

- Number of times of charitable event

1. Air Quality

Indicator

- Qualification rate of air quality indices: total suspended particles(TSP), suspended particulate matter (PM₁₀ and PM_{2.5}), SO₂, NO₂, CO, and O₃
- Amount of greenhouse gas
- Greenhouse gas reduction

4. Ship exhaust gas emissions

Indicator

- The ratio of service vessels using shore power
- Vessel Speed Reduction
- Vessel Using Low-sulfur Fuel Management
- Vessels of TIPC use fuel superior to low sulfur fuel

7. Ship waste

Indicator

- Promote waste reduction and implement resource recycling

10. Port development (water related)

Indicator

- Qualification rate of marine water quality
- Wetland cleanup
- The dredging and maintenance of the channel water
- Pre-engineering construction of coastal preservation facilities

In order to truly understand the opinions communities, through questionnaires, which is of related parties, Taichung Port conducts used as the basis for follow-up investigations opinion surveys of related parties, such as employees, the government, customers, and on the degree of concern of related parties. Regarding the issues and suggestions of stakeholders concerned, Taichung Port has included the focus of environmental improvement in the port area, and continues to improve the environment in the port area to maintain an ecologically sustainable green port.

Issues	Stakeholder	Situation in Taichung Port
Dust in the bulk cargo operation area	Government Port operator	<ul style="list-style-type: none">• Continue to promote the use of environmentally friendly loading and unloading equipment by the counseling industry.• Dust-proof nets should be installed in the work area during the operation and watering and cleaning should be strengthened to avoid dust.• Strengthen port inspections, inspections and CCTV monitoring, and supervise the industry to implement dust prevention and control measures.
Ship exhaust gas emissions	Port operator	<ul style="list-style-type: none">• Strengthen CCTV monitoring, port inspections and inspection operations.• Ban the emission of black smoke from ships.
Waste in port waters	Government	<ul style="list-style-type: none">• The volume of garbage removal in intercoastal waters and beaches will be 100.06 metric tons in 2019 and 136.396 metric tons in 2020.• Cooperate with the Executive Yuan's salute to the sea policy and strengthen beach cleaning up from 2020.



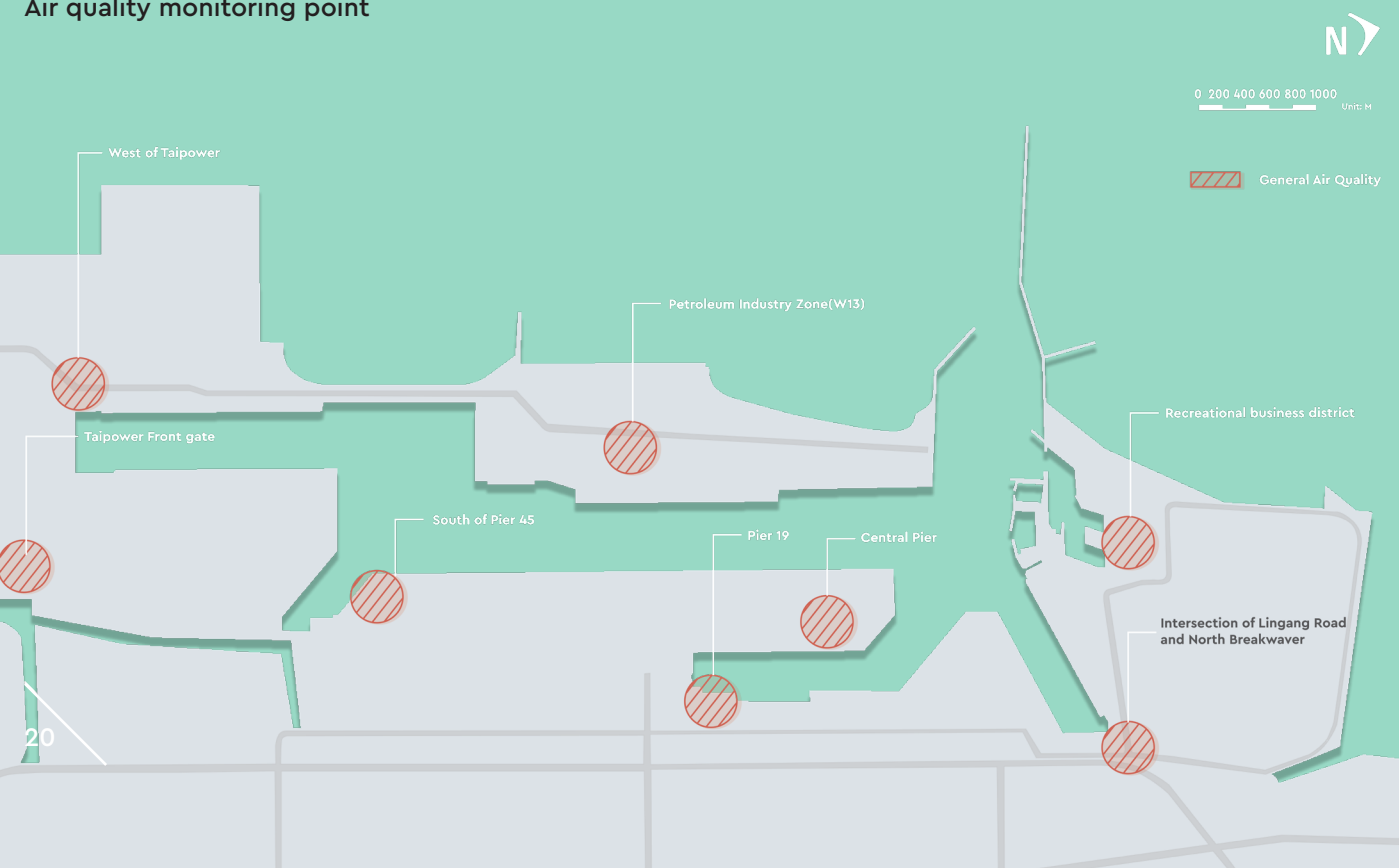
Air Quality

Air quality near the Port of Taichung is affected by transboundary pollution, open stacking, vessel emissions, vehicle exhaust emissions, dust emissions from handling cargo, photochemical reactions, and smokestack emissions from public and private institutions. To understand the environmental air quality of Taichung Port, Port of Taichung handles air quality monitoring projects each year, including particulate matter(TSP, PM₁₀, PM_{2.5}), SO₂, NO₂, CO, O₃ and VOCs.

Air Quality Survey and Monitoring Planning Form

Type	Frequency	Frequency
Air Quality General	Monthly	particulate matter(TSP, PM ₁₀ , PM _{2.5}), SO ₂ , NO ₂ , CO, O ₃
Volatile Organic Compounds(VOCs)	Seasonal	(VOCs)Type and concentration
	Once in the first and second half of the year	Instant (during actual operation) detection

Air quality monitoring point



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 pair 4, 5, and 7 of the West Terminal.

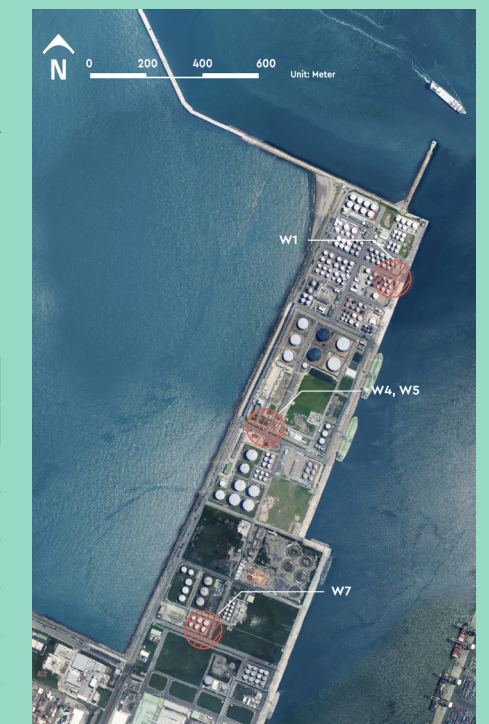
According to the monitoring

2019–2020 VOCs Concentration (ppb)

Monitoring Items	compliance rate(%)		
	Goal	2019	2020
TSP	100	96.87	100
PM ₁₀	100	97.91	90.62
PM _{2.5}	100	91.66	92.70
SO ₂	100	100	100
NO ₂	100	100	100
CO	100	100	100

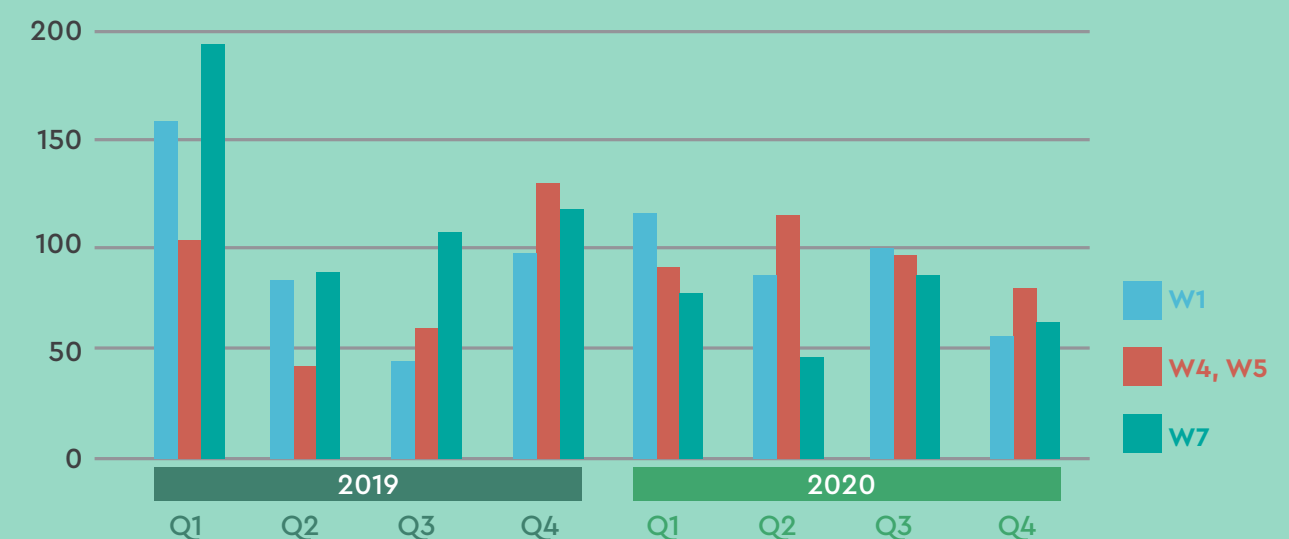
reports(2019–2020), main VOCs at the Port of Taichung include, alkanes, ketones, aromatics and aldehydes. Alkenes are gases with lower concentrations during the sampling period. The Port of Taichung was the first international port to establish a total VOC emissions control scheme by the EPA with detailed management strategy and guidelines.

24-hour and instantaneous sampling monitoring values are in line with regulatory standards. The amount has not exceeded the standards approved by the EPA.



VOCs sampling location

2019–2020 Volatile Gas Concentration (ppb)





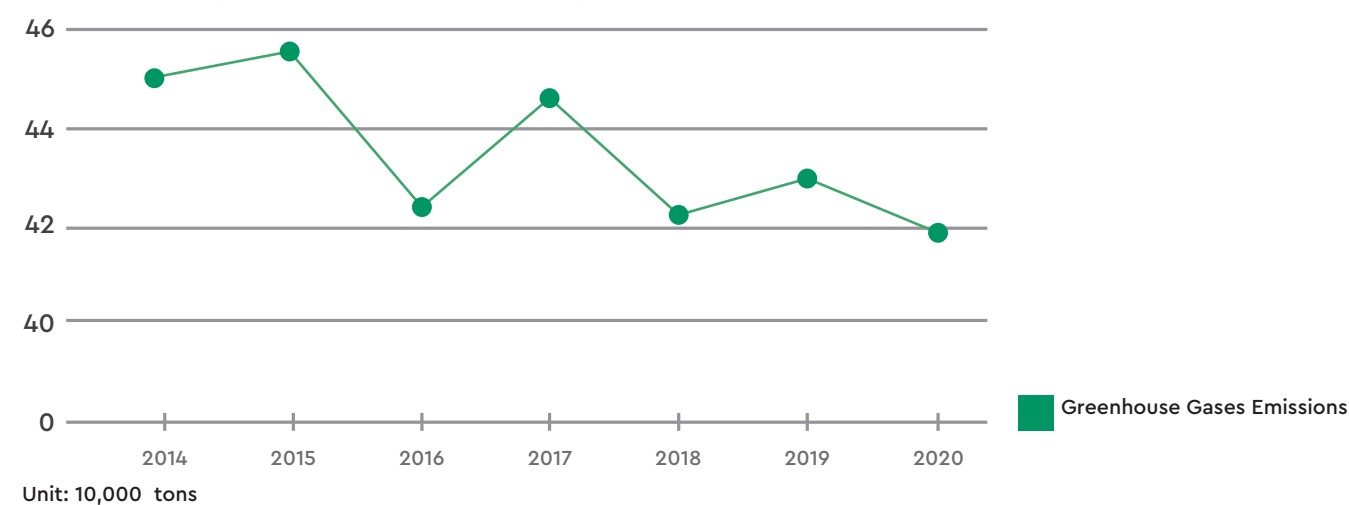
Greenhouse Gases Emissions

On May 9 2014, the City of Taichung announced the "Taichung City Low Carbon City Development Self-governance Article," and released the "Taichung City GHG emissions self-management ordinance on Jan 5 2017. According to this local ordinance, the Taichung Branch must submit a GHG self-management plan.

The scope of Taichung Port's self Management Plan includes industrial sector, harbor operations, ship operations, and administrative emissions.

The Port of Taichung's greenhouse gas emissions have been gradually decreasing through the years, indicating that the reduction goal of the voluntary management project has been achieved for both the fixed emission source and the mobile emission source.

Port of Taichung Greenhouse Gases Inventory



Greenhouse Gases Emissions



Discussion of the Independent Management Committee on Greenhouse Gas Emissions Management and Reduction

Estimated resource consumption and greenhouse gas emissions

tems	Emission Coefficient (kgCO2e per unit)	2019		2020	
		Consumption	Emissions (ton)	Consumption	Emissions (ton)
Water (m³)	2019	30,623	4.5	29,489	4.4
	0.150				
Power (kWh)	2019	6,531,622	3324.5	6,087,520	3098.5
	0.509				
Gas (L)	2.263(Per liter)	48,201	109.0	25,620	57.9
	2019 EDA report				
Paper (pack)	3.6(every pack)	1,834	6.6	1,673	6.0
	virgin wood pulp				
total			3444.6		3166.8

Note: GHG emissions from resource consumption=(consumption x emission coefficient)



Greening in low development areas



Port Area Environmental Planning

The delineation of a good and appropriate terminal operation area is very important. Taichung Port is in line with the government's green energy policy. Currently, the port of Taichung has set up a wind power transportation yard. The work boat channel and shallow water boat channel are planned as docks for wind power operation and maintenance ships and provide shore water and shore. Electricity system, and plan related wharf such as w2, w5A, w5B, w21, w36, w43, and w107 and related assembly storage area, as the production, storage and assembly of offshore wind turbines for each wind farm developer and for transportation.



Indoor Air Quality

Tourist transportation has been one of the most important business for the Branch. Each year there are more than 10 or 100 thousands travelers. Thus, the environmental quality of the passenger terminal is

important, and the Branch conducts periodic indoor air quality monitoring. The results in 2019 and 2020 show that the indoor air quality are mostly better than the standards.



Indoor Air Quality Monitoring Results

location/year		CO	CO ₂	O ₃	HCHO	Fungus	bacterial	PM ₁₀	PM _{2.5}
		(ppm)	(ppm)	(ppm)	(ppm)	(CFU/m ³)	(CFU/m ³)	(ug/m ³)	(ug/m ³)
1F Arrival Hall Office	2019	<0.1	622	0.0134	<0.01	35	36	14	4
	2020	<0.1	650	0.0203	<0.01	130	206	23	6
1F Hall	2019	<0.1	612	0.0142	<0.01	49	21	15	5
	2020	<0.1	584	0.0213	<0.01	454	479	24	5
2F Arrival Hall Customs clearance	2019	<0.1	714	0.0135	<0.01	49	92	15	4
	2020	<0.1	582	0.0196	<0.01	240	182	27	5
2F Departure hall Waiting room	2019	<0.1	652	0.0139	<0.01	56	70	12	4
	2020	<0.1	564	0.02	<0.01	130	49	29	6
Legal standard value		9	1000	0.6	0.08	1000	1500	75	35



Air Quality Improvement Strategies

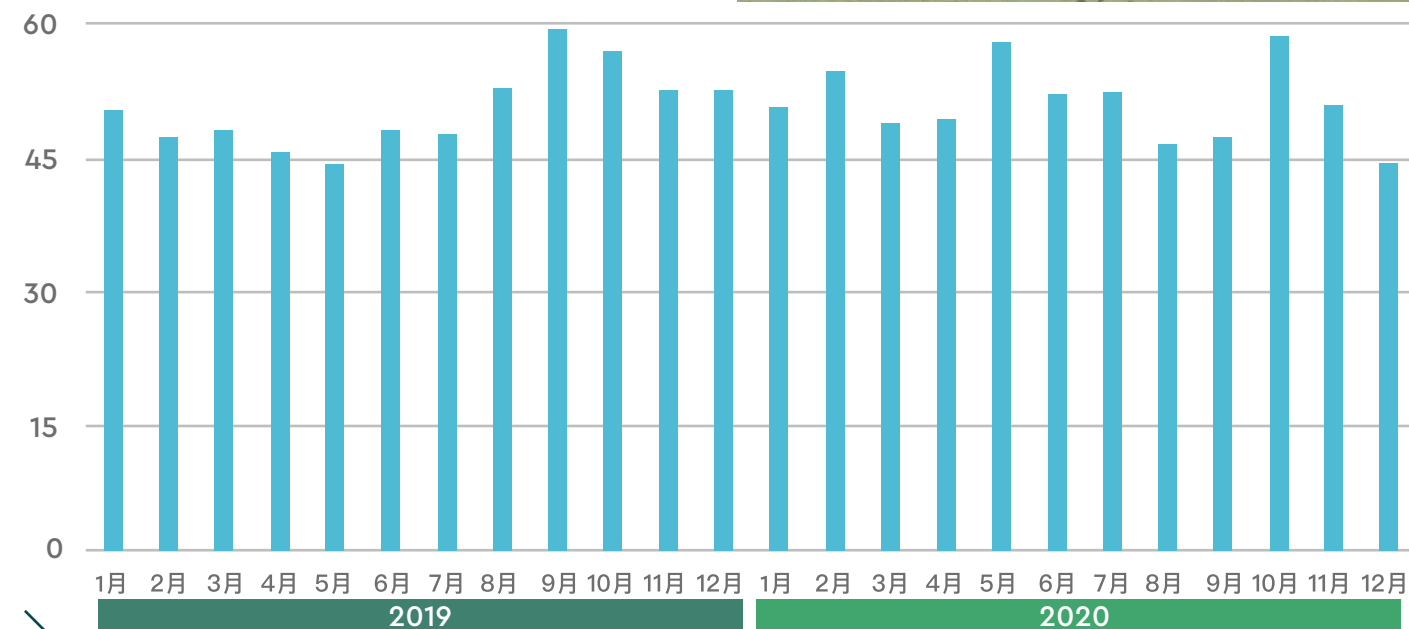
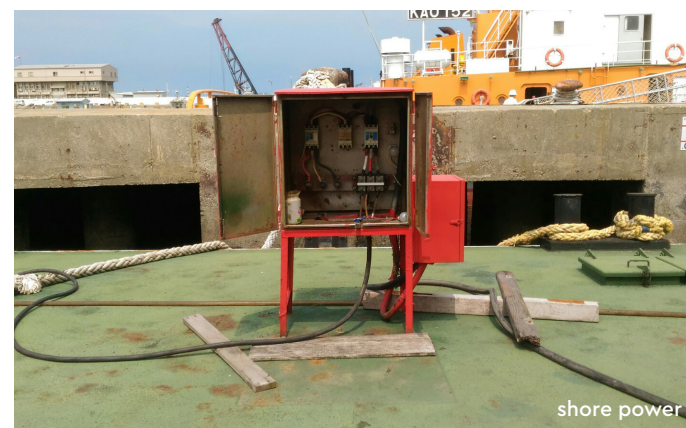
To improve the air quality, the Port of Taichung, TIPC, has promoted numerous measures, including readjusting port business zones, promoting vessel speed restrictions and advocating fuel conversions, shore power equipment planning, and self-management to reducing the number of emission sources for greenhouse gases and other air pollutants., 100% service rate for automatic vehicle access controls, and issue 700 personnel access cards per year.

Environmental Friendly Vessels

The Port of Taichung, TIPC built a speed-restriction check system in 2015 and has been put to use in 2016. Limiting vessel speeds substantially reduces the carbon emissions from fuel combustion engines; therefore, this policy has been actively promoted to shipping companies in the past 2 years. Since September 12th 2013, the port sends vessel speed reduction reminder text messages to ships entering the port once per hour and promotes the message at daily ship meetings. The ships complied with the vessel speed

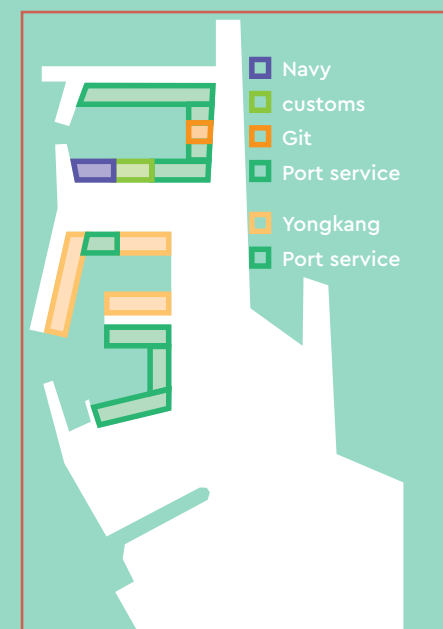
reduction rate:
2020: 51.1%, 2019:49.6%, 2018: 48.7%, 2017: 44.1%, 2016: 48.5%.

Moreover, fuel conversion concepts have also been periodically advocated to shippers to reduce SO₂ emissions since 2013. In 2019 and 2020, we maintain 100% use of low-pollution fuel in service vessels . Additionally, shore power equipment is available to prevent vessels from generating unnecessary fuel emissions. Accordingly, all service vessels used this service since 2013.



ships complied with the vessel speed reduction rate,2019-2020

Location and usage of shore power system in Taichung Port



year	2015	2016	2017
Usage (kWh)	280,000	310,000	300,000
year	2018	2019	2020
Usage (kWh)	250,000	280,000	380,000



Port Duty Tug in Shore Power Area

Abate Dust Emission

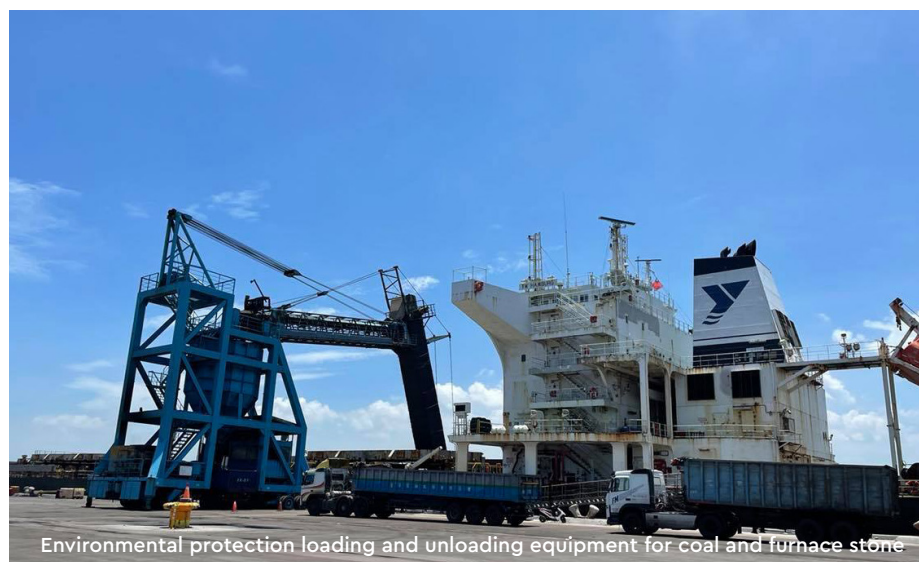
Loading and unloading management and pollution prevention measures

In the Port of Taichung, emission-prone cargoes have always been handled with conventional grabs and funnels; the dust emission during the handling process easily causes particulate pollution, and the transportation using vehicles also contaminates the roads. The policy was implemented for coal, copper, and sand starting from January 1, 2017. The handling operations for other emission-prone cargoes were required to be in compliance with relevant environmental protection laws

Cement clinker and slag must be handled by a sealed unloader from June 30, 2019 onward. (Or adopt the alternative prevention measures agreed by the Taichung City environmental protection competent authority)

The handling company proposes an improvement plan for fugitive cargo handling operations, and propose handling methods and anti-fouling measures according to the cargoes under its own responsibility. The Branch invited the Environmental Protection Bureau of Taichung City Government and the Central Maritime

Affairs Center, Maritime Port Bureau, MOTC to form the "Fugitive Cargo Handling Equipment and Operation Pollution Prevention Model Review Team" to conduct a rolling review of each handling company's handling improvement plan from 2019 to 2020, with a total of 2 review meetings.



Environmental protection loading and unloading equipment for coal and furnace stone



Copper soil environmental protection loading and unloading equipment

On October 9, 2019 and June 30, 2020, the "Fugitive Cargo Wharf Berthing and Handling Operation Management and Liability Statement Implementation Review Meeting" were held to list the common deficiencies in the handling process and urge the handling operators to cooperate in improving and strengthening on-site management.

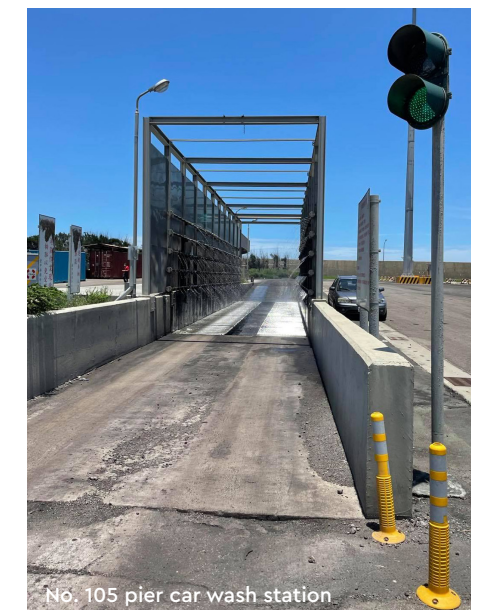
There are five public car wash bays located at the back line of wharf 5, 12-15, 29, 43 and 105 to provide washing of vehicle bodies and tires before the departure of transport vehicles from ship handling operations to reduce the problem of pollutants brought to public roads and other pollution emissions.

On June 25, 2019 to promote its implementation. On October 9, 2019 and June 30, 2020, the "Fugitive Cargo Wharf Berthing and Handling Operation Management and Liability Statement Implementation Review Meeting" were held to list the common deficiencies in the handling process and urge the handling operators to cooperate in improving and strengthening on-site management.

The sweeping of 33,091.1 and 45,192.3 kilometers in 2019 and 2020, respectively, is estimated to reduce PM10 emissions by approximately 164.2 tons.



Street washing trucks



No. 105 pier car wash station



street sweeping trucks

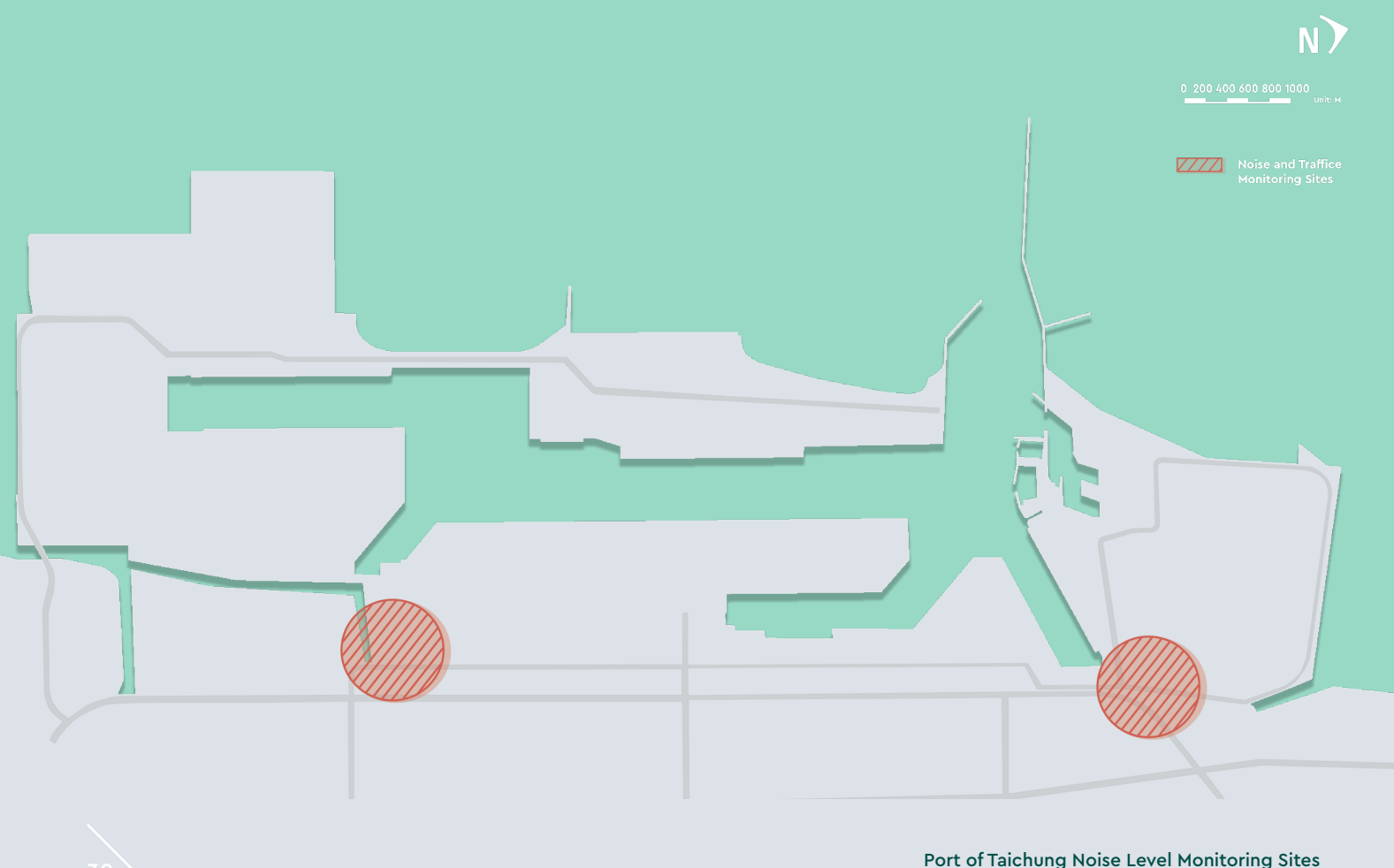


Taichung Port Area Terminal Loading and Unloading Pollution Improvement Seminar

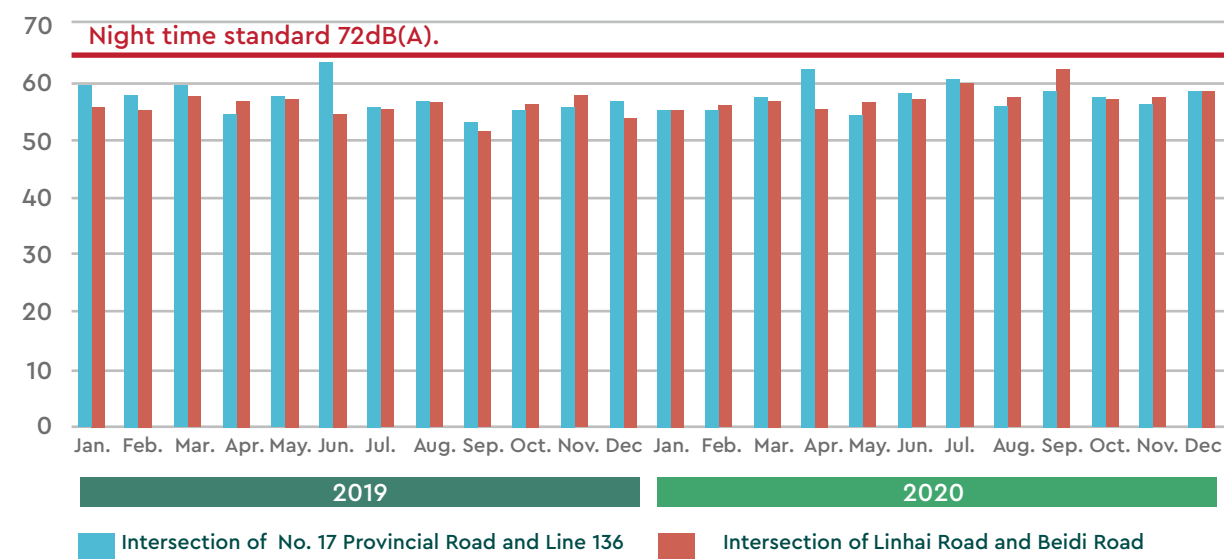
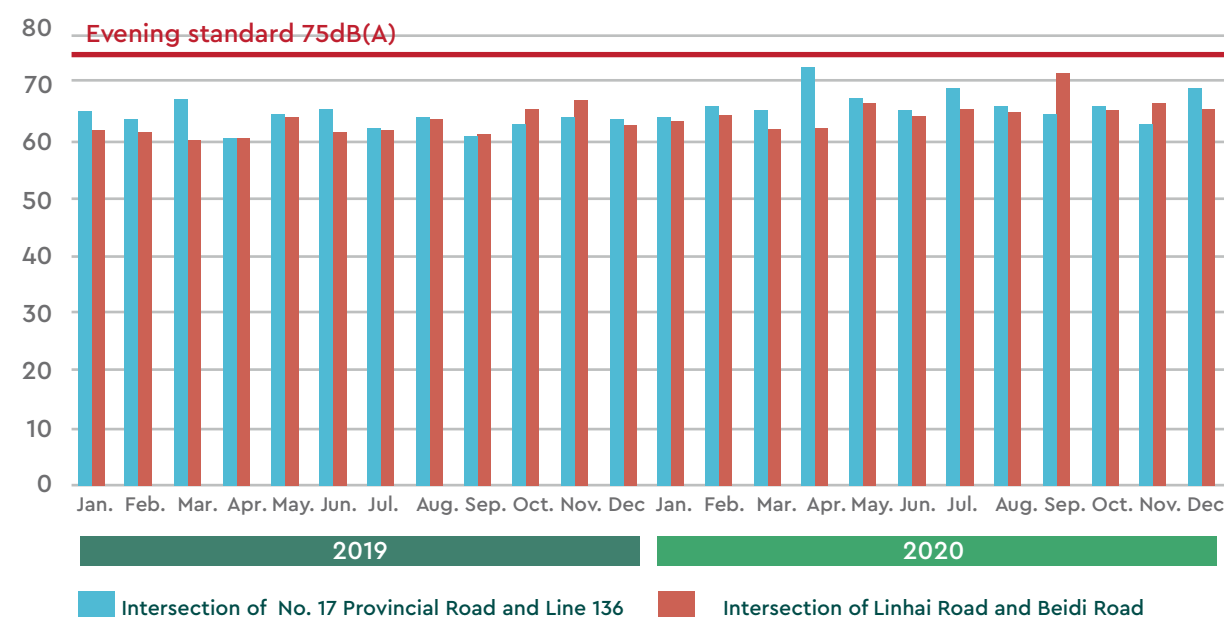
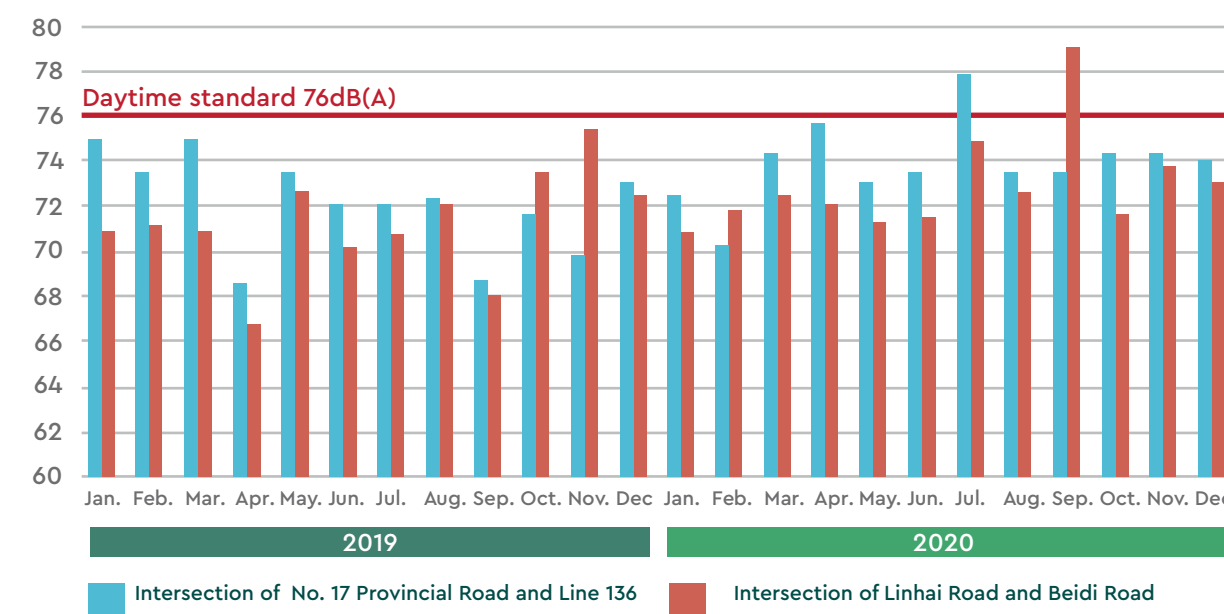


Port Noise

To ensure port environmental quality, two sites were chosen to monitor noise level in proximity to the port. These sites were all major intersections near the port area. In 2020, there were occasional over-regulations in the daytime. The other noise level required for these sections is the Class D Road Noise Level Standard. According to the noise environmental prediction mode, most results show that the noise level complies with the Class D Road Noise Level Standard beside one particular day, and the impact level of the transport vehicle is assessed as no influences.



2019-2020 Taichung Port Daytime Noise Monitoring (Unit: dB(A))



Port Water Quality

In the Port of Taichung, there are several medium and large drains from the city in the upstream into the basin. We conducted sampling and analysis for land and marine water quality that the water quality of the land area is mainly influenced by the discharge of various medium and large drains, including the domestic and livestock sewage in the vicinity and the industrial wastewater discharged from the adjacent industrial areas.

The overall water quality of the Taichung Port is still in line with Class C waters due to the influence of land drainage and the semi-closed waters of Taichung Port, where the hydrological cycle and tidal self-purification are limited. If we refer to the water quality standard of Class B waters, except for dissolved oxygen and biochemical oxygen demand, the water quality of Taichung Port is also in compliance with the water quality standard of Class B waters, indicating that the overall water quality of Taichung Port is still good.

Water Quality Monitoring in 2019 and 2020

Items	Standard (note 1)	2019	2020
		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

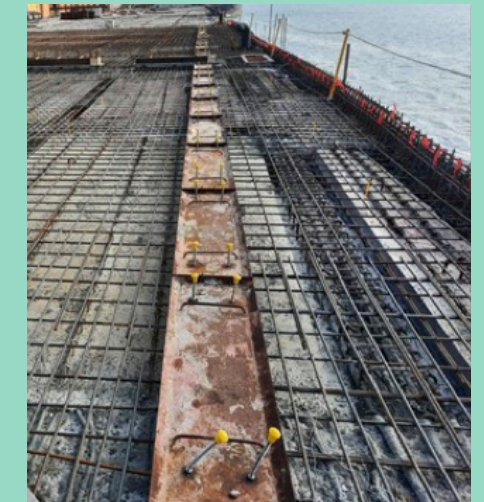
Note 2: According to Taiwan Coastal Marine Water Body Classification, water bodies within 2 km proximity to a drainage systems may lower water 1 level of water quality standard.

Water Quality Improvement Strategies

In order to improve the water quality of the port area and reduce the discharge of port wastewater into the basin, the Branch has set up primary sedimentation tanks for runoff wastewater during the design of new wharfs and the renovation of old ones to prevent runoff wastewater from flowing directly into the basin, and has formulated a plan to prevent and reduce pollution in the port area and cooperate with the Environmental Protection Bureau to check the discharge of runoff wastewater by operators in the port. In terms of improving land water quality, the Environmental Protection Agencies continue to promote pollution reduction and remediation projects in river basins, and also carries out sewage and wastewater control and inspection and enforcement. The Branch continues to monitor the water quality of the land area to understand the impact of water discharges from cities in the upstream on the water quality of the basin, and has established a platform with the Environmental Protection Bureau to help strengthen the control of pollution from land discharges.

Taichung Port old wharf (#12, #15) maintenance and reconstruction project

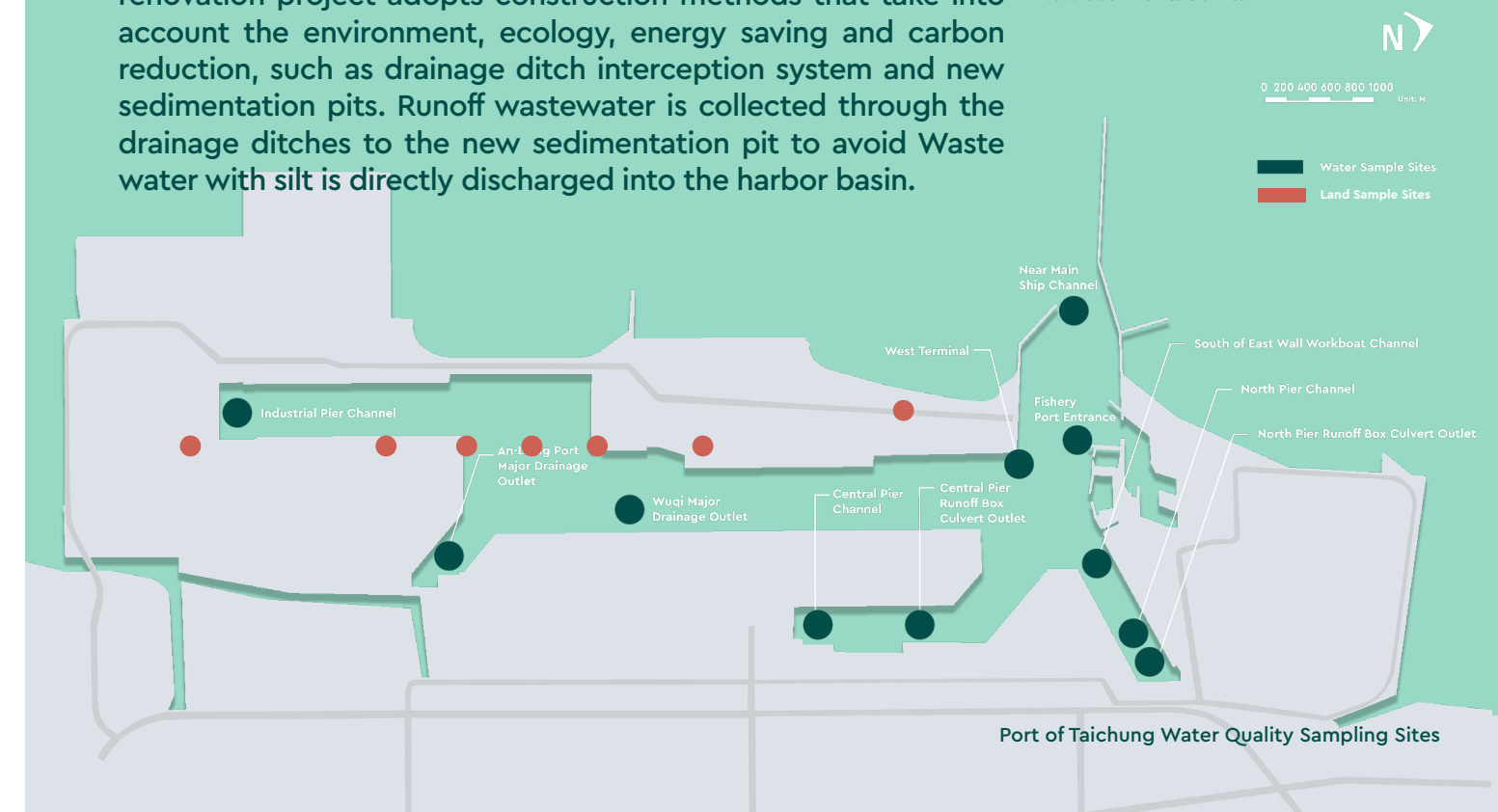
This project is the repair and renovation of the old wharf. The new renovation project adopts construction methods that take into account the environment, ecology, energy saving and carbon reduction, such as drainage ditch interception system and new sedimentation pits. Runoff wastewater is collected through the drainage ditches to the new sedimentation pit to avoid Waste water with silt is directly discharged into the harbor basin.



Drainage ditch interception system



New sedimentation tank



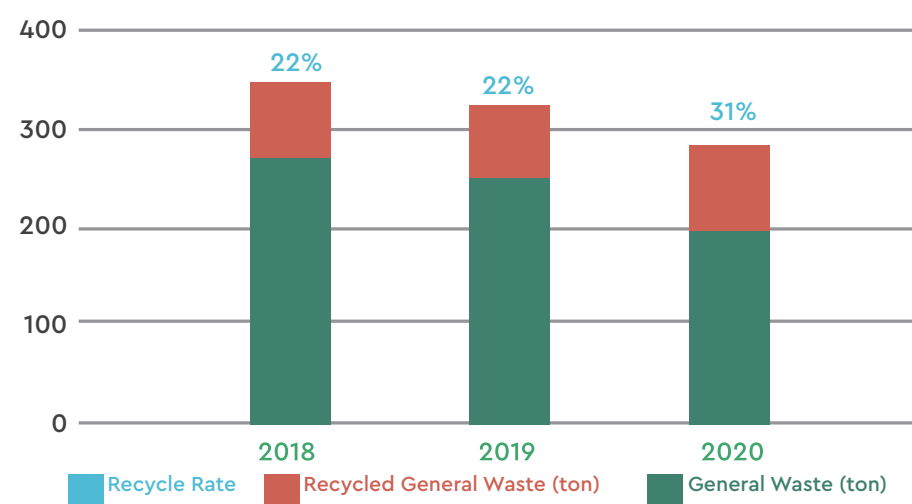
Waste Management

Vessel Waste

In order to reduce resource consumption and waste generation in the port area, the branch company for ships in the port area, including international merchant ships, official ships, port service ships and work ships, etc., compulsorily implement the classification of general ship waste in order to improve resource recovery and Follow-up waste treatment efficiency, our branch commissions manufacturers to collect, transport and treat general waste from ships

The Port of Taichung, TIPC, promoted the reduction of ship waste and implemented resource recycling. In 2019, 248.5 tons of general waste was collected from the ships, and the 71.906 tons of waste recycled, recycling rate was 22.44%. In 2020, 193.43 tons of general waste was collected, and the 88.896 tons of waste recycled, recycling rate was 31.49%.

Waste recycling statistics



Oily bilge Water Collected

Oily bilge Water Collected

To prevent willful discharge of vessel sewage in the harbor, the Port of Taichung, TIPC, has reinforced controls on waste management and oily bilge water treatment.

Currently, all oily bilge water has been treated and cleaned by commissioned operators with appropriate accreditation (2019 and 2020) at the Port of Taichung.

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%



Oily bilge Water Collected

Ecology survey

Conduct two marine ecology survey each year. In 2020, the dominant plankton species are *Spinosa* in June and *Chaetoceros* in October. As for animal plankton, the dominant

species is Copepods, accounting for 64.70% and 61.93% of the population in June and October. In June, 1 species of Annelida, 1 species of Echiurida, 3 species of Crustacea, 74 species

of Mollusca, 1 species of Echinodermata were found. In sum, there were 5 main categories and 12 species of benthic organisms in total.



Spilopelia chinensis



Parnara bada



Himantopus himantopus



Portunus hastatoides

Energy Saving

Using energy-saving devices & technology

Gradually adopting high efficiency lightings, is large, there are hundreds of street lights. Street light lighting is one of the main energy saving is an important environmental issue at Port consumption. Since the port of Taichung. As of the end of

May 2020, there are in total 2,105 high pressure sodium gas lamp and 1319 LED lamps installed.

Light and power output	High pressure sodium gas lamp			LED	
	70W	400W	1000W	160W	Double lamps 160W*2
Roadside	266	1,481	0	1,269	0
Wharfs	0	83	275	50	0
Total	266	1,564	275	1,319	0

Optimizing power supply system. Upgrade and replace high energy consumption appliances.

The central air-conditioning spiral host system in the office building was replaced with a high-efficiency energy-saving maglev host system, and the air-conditioning boxes on each floor were replaced with frequency conversion, cooling towers were built, equipment replaced with new ones, etc., and solar photovoltaic systems were actively promoted in the port area.

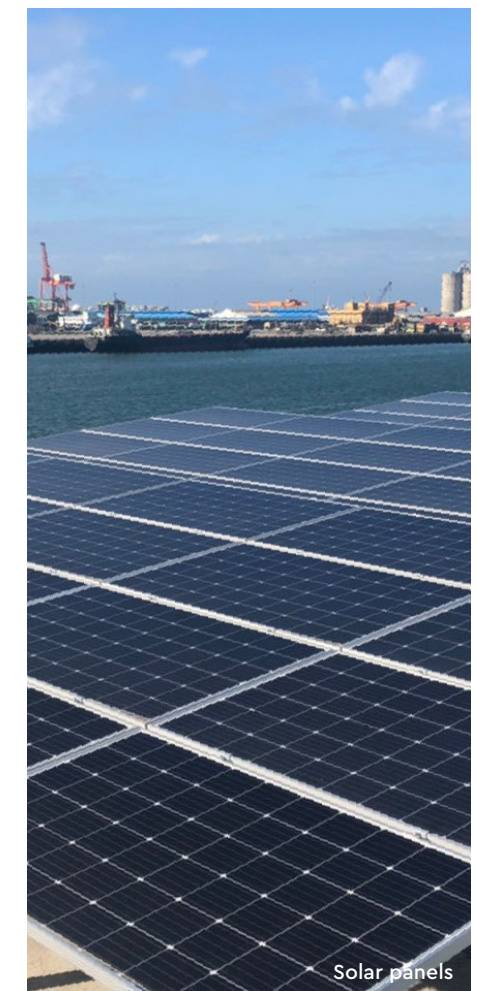
Green Materials

Steel: Steel is not only a strong material that can be used sparingly, but also a material that can be recycled and reused.

Concrete: Slag from water-quenched blast furnaces was used to substitute a portion of the cement to reduce carbon emission and pollution.

Green Construction Methods

- Embankment foundation protection: Soft construction methods, such as the application of sand bags, were used for in situ landfills instead of the traditional outsourcing of materials.
- Old revetment and seawall materials were recycled and reused. The use of local materials reduced outsourcing and transportation costs, as well as pollution derived from such operations.
- Filling materials for new piers and revetments: These materials were primarily obtained from the neighboring waters of the construction site to reduce the demand for dredging and utilize surplus earthwork.
- The waste earthwork produced from dredging navigable waterways in the port area, as well as the grates and concrete paving removed from the bottom section of Beiboqu, were crushed and applied to the seaside embankment protection and beach-nourishment construction operations.



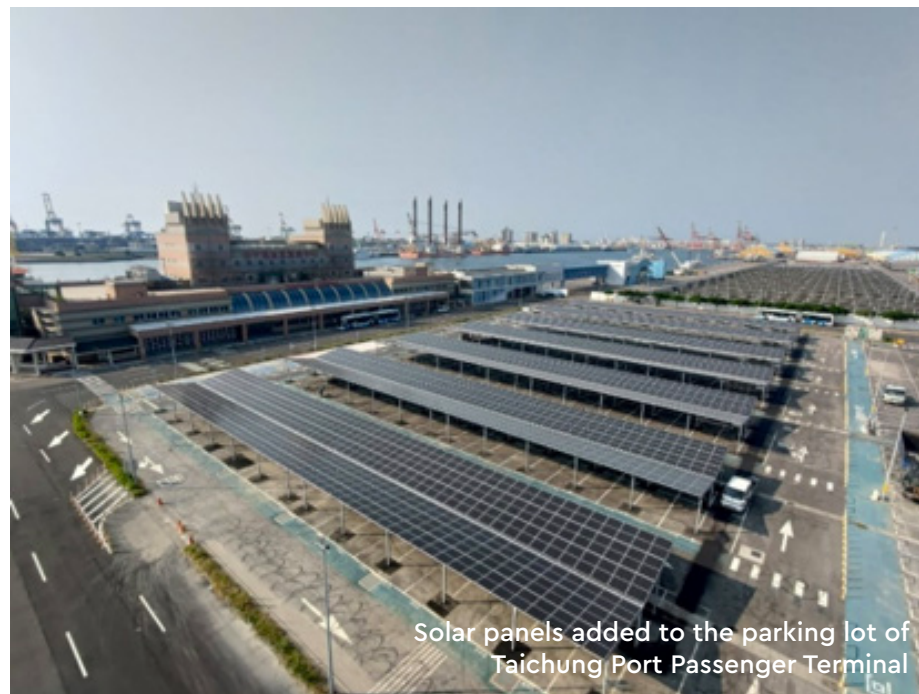
Solar panels



Energy Saving

Solar panels added to the parking lot of Taichung Port Passenger Terminal

In order to complete the environment required for green energy development and achieve the energy transformation goal of non-nuclear homes, the Taichung Port Affairs Branch installed photovoltaic power generation facilities in the parking lot in front of the Taichung Port Passenger Terminal with a capacity of 1,692.42kwp, which was completed on September 23, 2021. Completed daily, the annual power generation capacity can reach 2.16 million kWh, the carbon reduction amount is as high as 1,100 metric tons, which is equivalent to the carbon dioxide adsorption capacity of three Daan Forest Parks, and it can provide about 590 households with electricity every year.

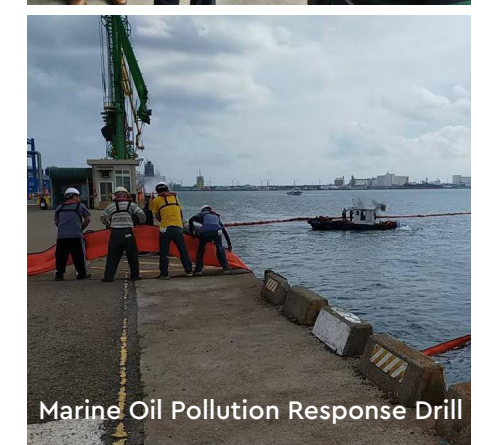


Reinforce Hazardous Goods Management

The Taichung commercial harbor handles, stores, and transports hazardous as well as petrochemical bulk goods, and provides centralized management at the West Terminal. The Port of Taichung, TIPC, and relevant authorities perform nonscheduled inspections on petrochemical storage tanks and transport pipelines, supervise relevant safety operations involving hazardous goods, and perform emergency drills in response to chemical or oil spills.

Statistics on Hazardous Goods Management

Item/year	2015	2016	2017	2018	2019	2020
Inspection	50	51	50	50	50	50
Drill	1	1	1	1	1	1
Joint Supervision	4	4	4	4	4	4





Environmental Performance Indicators

Ten Significant environmental issues of the Taichung Port		Index item	Calculation method	Index target		Calculation	
						2019	2020
1	Air Quality	Qualification rate of air quality indices: total suspended particles (TSP), suspended particulate matter (PM ₁₀ and PM _{2.5}), SO ₂ , NO ₂ , CO, and O ₃	<ul style="list-style-type: none">Rate of air quality measurements meeting the Air Quality Standards (measured at harbor test stations)	<ul style="list-style-type: none">Air quality measurements meeting the Air Quality Standards (measured at harbor test stations)		<ul style="list-style-type: none">TSP 24-h qualification rate: 100.00%PM₁₀ daily average pass rate: 100.00%PM_{2.5} daily average pass rate: 88.31%SO₂ daily average pass rate: 100.00%, hourly average pass rate: 100.00%NO₂ hourly average pass rate: 100.00%CO hourly average pass rate: 100.00%, 8-h average pass rate: 100.00%O₃ hourly average pass rate: 100.00%, 8-h average pass rate: 100.00%	<ul style="list-style-type: none">TSP 24-h qualification rate: 93.65%PM₁₀ daily average pass rate: 95.24%PM_{2.5} daily average pass rate: 85.71%SO₂ daily average pass rate: 100.00%, hourly average pass rate: 100.00%NO₂ hourly average pass rate: 100.00%CO hourly average pass rate: 100.00%, 8-h average pass rate: 100.00%O₃ hourly average pass rate: 95.24%, 8-h average pass rate: 96.88%
		Amount of greenhouse gas	<ul style="list-style-type: none">Greenhouse gas inventory results	<ul style="list-style-type: none">Greenhouse gas reduction decrease year by year		<ul style="list-style-type: none">A total of 83 times of Environmental Protection Bureau report (This branch has been cooperating with the contingency since March 2019)This branch cooperated with contingency 83 times83÷ 83×100%=100	<ul style="list-style-type: none">A total of 90 times of Environmental Protection Bureau report (This branch has been cooperating with the contingency since March 2019)This branch cooperated with contingency 90 times90÷ 90×100%=100
		Greenhouse gas reduction	<ul style="list-style-type: none">According to the Taichung Port Greenhouse Gas and Air Pollution Emission Source Management and Reduction Self-Management Plan(2018), a location within the management scope of this branch, the total amount of greenhouse gas inventory in the year-the total amount of greenhouse gas inventory in 2014	<ul style="list-style-type: none">Greenhouse gas reduction		<ul style="list-style-type: none">2014: 450,000 tons2019: 434,000 tons43.4-45=-16,000 tons	<ul style="list-style-type: none">2014: 450,000 tons2020: 420,000 tons42-45= -30,000 tons
2	Hazardous Cargo Management	Number of harbor inspections,cargo spillage emergency response drills,and jointly supervised harbor safety drills	<ul style="list-style-type: none">Number of harbor inspections,cargo spillage emergency response drillsNumber of jointly supervised harbor safety drills	<ul style="list-style-type: none">50 harbor inspectionsAt least one cargo spillage emergency response drill per yearAt least 4 jointly supervised harbor safety drills per year		<ul style="list-style-type: none">50 harbor inspections hazardous CargoOne hazardous cargo spillage emergency response drill4 jointly supervised harbor safety drills	<ul style="list-style-type: none">50 harbor inspections hazardous CargoOne oil spillage emergency response drill4 jointly supervised harbor safety drills
3	Dust	Convene handling prevention meetings and review the number of machines	<ul style="list-style-type: none">Handling prevention rolling review meetingsReview the number of convene handling machines	<ul style="list-style-type: none">Handling prevention rolling review meetings once a yearThe quantity of ecological handling equipment were reviewed for 2 years and should not be lower than the quantity in 2018. (2018 quantity: 6)		<ul style="list-style-type: none">1 meeting heldNumber of closed handling equipment: 6 sets (Applicable cargos include coal, copper clay, furnace lining, etc.)	<ul style="list-style-type: none">1 meeting heldNumber of closed handling equipment: 10 sets (Applicable cargos include coal, copper clay, furnace lining, etc.)
		Handling operators audit	<ul style="list-style-type: none">Times of cooperating with the Maritime Port Bureau and Port and Environmental Protection Department for joint inspection and counseling	<ul style="list-style-type: none">More than 50 times of audits conducted by the branchCooperated with the Maritime Port Bureau and Port and Environmental Protection Department for joint inspection and counseling for more than 10 times		<ul style="list-style-type: none">Times of audits conducted by the branch: 89Times of cooperating with the Maritime Port Bureau and Port and Environmental Protection Department for joint inspection and counseling: 12	<ul style="list-style-type: none">Cases transferred by the branch: 87Times of cooperating with the Maritime Port Bureau and Port and Environmental Protection Department for joint inspection and counseling: 14
		Road dust cleaning	<ul style="list-style-type: none">Number of sweeps(times / month)Cleaning road length(km/ year)	<ul style="list-style-type: none">Number of sweeps: 20 times / monthCleaning road length 30,000 km/ year		<ul style="list-style-type: none">Number of sweeps: 24-26 times / monthCleaning road length 33,091.1 km/ yearReduce PM₁₀: 86 metric tons per year	<ul style="list-style-type: none">Number of sweeps: 20 times / monthCleaning road length 33,091.1 km/ yearReduce PM₁₀: 78.2 metric tons per year



Environmental Performance Indicators

Ten Significant environmental issues of the Taichung Port		Index item	Calculation method	Index target		Calculation	
						2019	2020
4	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		<ul style="list-style-type: none">22÷22×100%=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: 22, shore power usage 282,602The total annual berthing hours of the tugboat are 119,549 hours. When berthing, shore power (no fuel oil) is used to estimate its pollution reduction benefits: NO_x: 125.9 tons, SO_x: 26 tons, PM₁₀: 5 tons, PM_{2.5}: 4.6 tons.	<ul style="list-style-type: none">23÷23×100%=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: 23, shore power usage376,913. (Planning wind power maintenance boat: 1)The total annual berthing hours of the tugboat are 118,229 hours; shore power (no fuel oil) is used when berthing to estimate its pollution reduction benefits: NO_x: 125.7 tons, SO_x: 26 tons, PM₁₀: 5 tons, PM_{2.5}: 4.6 tons.
		Vessel Speed Reduction	Reduce speed to under 12 knots	Publicity rate:100% Ratio of vessel speed reduction 50%		<ul style="list-style-type: none">Number of vessel:8748; Publicity times: 87488748÷8748 ×100%=100%Ratio of vessel speed reduction 49.6%	<ul style="list-style-type: none">Number of vessel:9244; Publicity times: 92449244÷9244 ×100%=100%Ratio of vessel speed reduction 51.1%
		Vessel Using Low-sulfur Fuel Management	Number of penalties imposed by the Central Maritime Affairs Center	Penalties according to regulations		<ul style="list-style-type: none">Number of penalties imposed by the Central Maritime Affairs Center:2	<ul style="list-style-type: none">Number of penalties imposed by the Central Maritime Affairs Center:0
		Vessels of TIPC use fuel superior to low sulfur fuel.	Number of service vessels using low sulfur fuel÷service vessels × 100%	The ratio of using low-sufer fuel or biodiesel reaches 100% among service vessels		<ul style="list-style-type: none">Among the 4 harbor crafts and 2 wind power maintenance boat, 6 use low-sufer fuel. 6 ÷ 6 × 100% = 100%Super Diese(limits of 10 ppm sulfur) Low-sufer fuel for work vessels: Consumption of marine gas oil: 96,000 KL	<ul style="list-style-type: none">Among the 4 harbor crafts and 3 wind power maintenance boat, 7 use low-sufer fuel. 7 ÷ 7 × 100% = 100%Super Diese(limits of 10 ppm sulfur) Low-sufer fuel for work vessels: Consumption of marine gas oil: 69,500 KL
5	Vehicle exhaust gas emissions	Promotion of a comprehensive use of the Automatic gate control System among shipping lines	The ratio of incoming and outgoing roadways installed with an automatic gate control system	Built gates of incoming & outgoing roadway are automated.		<ul style="list-style-type: none">The ratio of incoming& outgoing roadways installed with an automatic gate control system: 18 ÷ 18 × 100% =100%	<ul style="list-style-type: none">The ratio of incoming& outgoing roadways installed with an automatic gate control system: 18 ÷ 18 × 100% =100%
		Diesel truck inspections	Number of Diesel truck inspections	Number of Diesel truck inspections :12/year		<ul style="list-style-type: none">Number of Diesel truck inspections:28/year	<ul style="list-style-type: none">Number of Diesel truck inspections:22/year
6	Port land area development	Maintain harbor green space and green belt areas	Maintain harbor green spaces and green belt areas	Continue maintaining 200 ha of harbor green space		<ul style="list-style-type: none">Green belt area maintained: 390 ha166 ha conservation forest; 66 ha north of low-development area; 30 ha 2nd phase north side silt improvement area; 20 ha of green space surrounding harbor buildings; 20 ha of harbor green space (mowed); 7.8 ha industrial zone (II).	<ul style="list-style-type: none">Green belt area maintained: 383 ha166 ha conservation forest; 66 ha north of low-development area; 30 ha 2nd phase north side silt improvement area; 20 ha of green space surrounding harbor buildings; 16 ha of harbor green space (mowed); 5 ha industrial zone (II).
		Maintenance of waterfront and friendly space in the port area and other recreational facilities	Area of waterfront and friendly space in the port area and other recreational space facilities	Maintain or increase the area of waterfront and friendly space and other recreational facilities in the port area		<ul style="list-style-type: none">2019 calculate waterfront and friendly spaces in the port area:3 haThe artificial turf at the bottom of main channel: 1 haThe embossed floor at the bottom of main channel: 2 ha	<ul style="list-style-type: none">2019 calculate waterfront and friendly spaces in the port area:3 haThe artificial turf at the bottom of main channel: 1 haThe embossed floor at the bottom of main channel: 2 ha2020 calculate waterfront and friendly spaces in the port area: 1.45 ha (The surface of north breakwater improvement project: 1.45 ha)



Environmental Performance Indicators

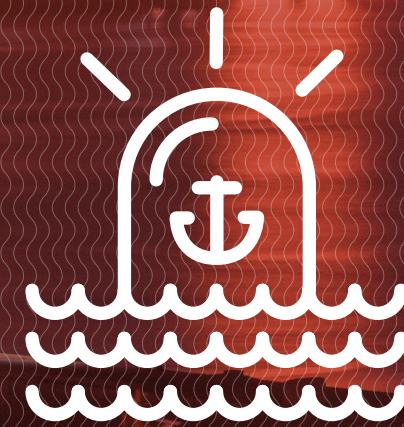
Ten Significant environmental issues of the Taichung Port		Index item	Calculation method	Index target		Calculation	
						2019	2020
6	Port land area development	Landscape maintenance rate for harbor green areas (number of plants planted)	Number of newly planted plants	More than 5000 trees plant in one year		<ul style="list-style-type: none"> Arbor: 42,670 Shrub: 2,550 	<ul style="list-style-type: none"> Arbor: 26,020 Shrub: 13,010
		The location of special zone in adjustment, Port of Taichung	The area of the recreation zone in the port	Development and planning of recreation-related zones		<p>Future Development and Construction Plan of Taiwan International Commercial Port(2017-2021)</p> <p>The name of the original waterfront recreational special zone was adjusted to tourism and recreational commercial area and related location adjustment.</p> <p>Tourism and recreational commercial area: 137.53 ha port service special zone: 191.98 ha total: 191.98 ha.</p>	<p>Future Development and Construction Plan of Taiwan International Commercial Port(2022-2026)</p> <p>The reclamation of 0.89 hectares of new land were created by the construction of a water-friendly shoreline at the bottom of the Main channel and used the area south of central cross-island highway for tourism, recreation and commercial development.</p> <p>The 4.63 hectares of land to the west of the port area and the 4.19 hectares of land adjacent to the Taipower and Chung Lung sites are to be rezoned from Port Service (II) to Industrial Special Zone (IV), for a total reduction of 8.82 hectares.</p>
7	Ship waste	Promote waste reduction and implement resource recycling	Waste removal amount Waste resource recovery rate The disposal rate of the vessel oil and sewage by qualified service providers	Vessel waste recycling rate: 20% The disposal rate of the vessel oil and sewage by qualified service providers:100%		<ul style="list-style-type: none"> General waste removed from the ship: 248.5 tonne, General waste recycling from the ship:71,906 kg. General waste recycling rate in the harbor land area: 22.44% Performed vessels:49, the amount of cleaning ship oily wastewater is 824.75 tonnes(not include tug boat) $46 \div 46 \times 100\% = 100$ 	<ul style="list-style-type: none"> General waste removed from the ship: 193.43 tonne, General waste recycling from the ship:88,896kg. General waste recycling rate in the harbor land area:31.49% Performed vessels:49, the amount of cleaning ship oily wastewater is 1353.65 tonnes(not include tug boat) $68 \div 68 \times 100\% = 100$
8	Soil pollution	Soil contamination sites in the port area with EPA approved control plans	EPA approved control plans \div Soil contamination sites in the port area $\times 100\%$	Progress of soil pollution control work		<ul style="list-style-type: none"> Tow EPA approved control plans (Pan Overseas Corp. and Chenergy Global Corporation all have pollution control plans approved by the EPA) $2 \div 2 \times 100\% = 100$ 	<ul style="list-style-type: none"> 4 sites (Pan Overseas Corp. and Chenergy Global Corporation and CPC Corporation Taichung Oil Supply Center : 2 sites) all have pollution control plans approved by the EPA. $4 \div 4 \times 100\% = 100$ On September 14, 2020, the Branch held a meeting to discuss the follow-up of the oil pipeline leakage incident at the Taichung Oil Supply Center of CPC Corporation, and requested CPC Corporation to respond and remedy the situation as soon as possible, and supervised CPC Corporation to carry out the follow-up remediation work with the Environmental Protection Bureau.



Environmental Performance Indicators

Ten Significant environmental issues of the Taichung Port		Index item	Calculation method	Index target		Calculation	
						2019	2020
9	Relationship with Local Communities	Number of times of charitable event	Calculate the actual number of occurrence	Activities and events held times: 6 Appeals Reception rate: 100%		<ul style="list-style-type: none"> 36 activities held Appeals Reception: 29, $29 \div 29 \times 100\% = 100$ 	<ul style="list-style-type: none"> 23 activities held Appeals Reception: 29, $29 \div 29 \times 100\% = 100$
10	Port development (water related)	Qualification rate of marine water quality (pH, DO, Biochemical oxygen demand (BOD))	The monitoring values of the water quality stations in the port area are in accordance with the ratio of "Marine Environmental Classification and Marine Quality Standards".	Sea water quality : (pH, DO, BOD, Mineral oil, Cyanide, Phenolic compounds) Qualification rate every half year reaches 100% The periodicity of monitoring data is six months.		Class C marine water quality standard qualification rate <ul style="list-style-type: none"> pH 100% DO 100% BOD 100% Mineral oil 100% Cyanide 100% Phenolic compound 100% 	Class C marine water quality standard qualification rate <ul style="list-style-type: none"> pH 100% DO 100% BOD 100% Mineral oil 100% Cyanide 100% Phenolic compound 100%
		Wetland cleanup	The fundings of the waters wetland cleanup execution Make an emergency cleanup open contract Regular maintenance of the wetlands in the port area every six months Report to EPD coastal cleanup information platform.	More than 6.5 million of the fundings of the waters wetland cleanup execution 1 emergency cleanup open contract. The execution rate of the regular maintenance of the wetland in the port area every six months is 100%. The report rate of the EPD coastal cleanup information platform is 100%.		<ul style="list-style-type: none"> The fundings of the waters wetland cleanup execution: 697.98 million. (Litter collection from shoreline waters and beaches: 100.06 metric tons.) 1 emergency cleanup open contract. 2019 Emergency Removal and Emergency Response to Water Area Waste Disposal in the Port Area and Harbor Basin of the Port of Taichung The execution rate of the regular maintenance of the wetland in the port area every six months is 100%. The report rate of the EPD coastal cleanup information platform: -(platform not yet established)	<ul style="list-style-type: none"> The fundings of the waters wetland cleanup execution: 11.0875 million. (Litter collection from shoreline waters and beaches: 136.396 metric tons.) 2 emergency cleanup open contract. 2019 Emergency Removal and Emergency Response to Water Area Waste Disposal in the Port Area and Harbor Basin of the Port of Taichung (Phase 1 extended) Water area waste disposal and oil spills removal operations in the shoreline of the wharfs of the Port of Taichung The execution rate of the regular maintenance of the wetland in the port area every six months is 100%. The report rate of the EPD coastal cleanup information platform: 100%
		The dredging and maintenance of the channel water	Actual dredging volume \div Planned dredging volume $\times 100\%$	The execution rate of the dredging volume reaches 100%.		(2019-2020) <ul style="list-style-type: none"> The execution rate of the dredging volume reaches 124%. The estimated dredging volume: 644,543.5 m³. The actual dredging volume: 800,566.84 m³. Operating scope: The main channel inside the south breakwater and the southwest position outside the south breakwater. 	(2019-2020) <ul style="list-style-type: none"> The execution rate of the dredging volume reaches 124%. The estimated dredging volume: 644,543.5 m³. The actual dredging volume: 800,566.84 m³. Operating scope: The main channel inside the south breakwater and the southwest position outside the south breakwater.

05



Emergency Response



Port of Taichung Emergency Response

The Port of Taichung, TIPC, and relevant authorities perform nonscheduled inspections on petrochemical storage tanks and transport pipelines, supervise relevant safety operations involving hazardous goods, and perform emergency drills in response to chemical or oil spills.

Port of Taichung Accident Handling Process

Event	Date	Handling Process
China Container Hazardous Materials Container Leakage in Container Depot #10W	2019/5/13	<ol style="list-style-type: none">Port of Taichung, Taiwan International Ports Corporation received a report that a container of empty SiH4 cylinders was found on board before the ship entered the port and the exterior of the cargo was damaged. An emergency response team was then created.After entering the port, checked the cylinder did not leak before unloading then should it be lifted onto the wharf. Following this, the shipper arranged for a vehicle transported away to the gas plant after approval from the fire brigade and other emergency response teams.
Chemical Lorry Overturned in the Port Area	2019/12/13	<ol style="list-style-type: none">Port of Taichung, Taiwan International Ports Corporation received a report that a lorry overturned at the junction of Zhongnan 1st Road and South Cross 8th Road in the port area and some propylene glycol methyl ether leaked. The driver suffered a minor hand injury and was taken to the hospital first.Through joint prevention organizations in the port area and the police and fire brigade's command to allocate traffic alert, the cargo owners dispatched contingency vehicles and empty lorries to pick up the accident vehicle and chemical transshipment. In the end, the accident vehicle left the port area and environment was recovered.
Fuel Leakage while TAIAN NO.2 Collision at Wharf #29-30	2020/10/19	<ol style="list-style-type: none">Upon receiving the report of the collision of the Taian No. 2 with Wharf No.29, resulting in fuel leakage, the Port of Taichung, Taiwan International Ports Corporation set up an emergency response team and invited the vessel and other relevant units to hold a contingency meeting on site, requesting to strengthen the deployment of oil barrier, control the access of people and vehicles on site, dispatch tank trucks to pump oil and related emergency response work.Most of the oil pollution on site was stopped by oil barriers in the shoreline waters of Wharf No.29, and the oil was continuously removed by absorbent cotton and pumping; other scattered oil pollution was removed immediately by the Port of Taichung, Taiwan International Ports Corporation and the vessel by sending cleaning vessels to inspect the nearby waters.The Branch also invited the vessel and the Environmental Protection Bureau to hold a meeting to request the vessel to speed up the removal of scattered oil pollution and the dirt of the wharf fender. The branch and the Environmental Protection Bureau strengthened the supervision of the actual cleanup situation, and the emergency response team were discharged after the cleanup was completed.
China Container Vessel Chemical Leakage in Container Depot #10W	2020/12/17	<ol style="list-style-type: none">MAERSK ABERDEEN (aberdeen) was reported the hazardous cargoes leakage (Polyester resin) before entering the port by the maritime pilot.The accident container was a re-export container. The Port of Taichung, Taiwan International Ports Corporation, assisted the vessel in berthing and had the personnel board the vessel to clean up the container, and the vessel and the container left the port after completion of cleaning.

In addition to periodic inspections and emergency response drills, the Port of Taichung, TIPC, monitors and encourages business operators at the West Terminal to establish regional response organizations

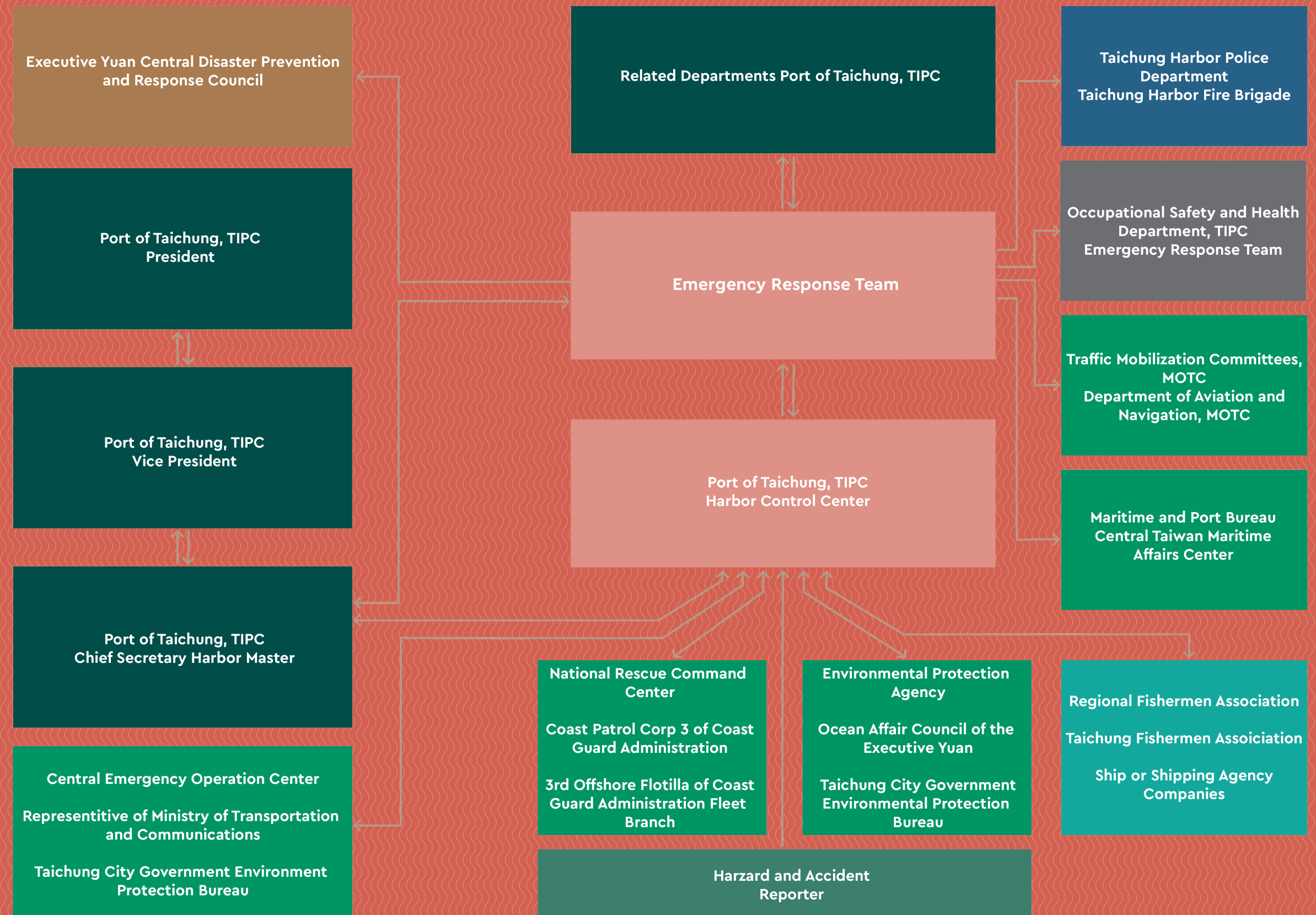
Port of Taichung Conducted Drills in 2019-2020

Year	Drill name	Content	Date
2019	Taichung Port Ching-Yung Drill	Responded to crowd trouble, armed assault (man-made hazard), hit and run, etc. by combining with the port police fire brigade and other authorities (organizations).	4/22
2019	Waters Joint Search and Rescue Drill	Conducted practical exercises on the safety protection of port facilities, rescue of passengers who fall into the sea, and the treatment of marine oil spill by combing the administration in the port area, Taiwan International Ports Corporation, Ltd., coast guard units (vessel, coast guard, coast patrol), National Airborne Service Corps, Fire Bureau of Taichung City Government, Taichung Hai Lung Volunteer Fire Department, Taichung City Water Life Saving Association, port police, fire brigade and medical team, Taichung Environmental Protection Bureau, Taipower Taichung Power Plant, shipping agents, lessees and tugboat operators in the port area, etc.	9/27
2020	Taichung City's Joint Anti-landing Live-fire Drills	Conducted major crisis response, ambulance and other drills by combining with the military and the operators in Taichung port area, special prevention corps, police, fire brigade, medical team, Taiwan International Ports Corporation, Ltd., etc.	7/16
2020	Taichung Port Ferry Port Facility Security Drill	Conducted the report and response drill by combining with the port police, customs, coastal patrol, the upstream and downstream wharf lessees of Excel Chemical Corporation, the public wharfs, anchorages, marine waters, waterways and other port facility units (PF) of the Branch, the Port Security Committee of the Taichung Port. Through rehearsing the security level situation and handling actions of each agency and unit, we hope to strengthen the horizontal and vertical communication, report mechanism and response handling capability of port security of relevant agencies and units in the port area, and to promote the follow-up exercises.	10/13





Port of Taichung Emergency Response



06



Involvement and Cooperation



The improvement of fugitive cargo handling machines (for example, pure alkali)

Attention/Motives

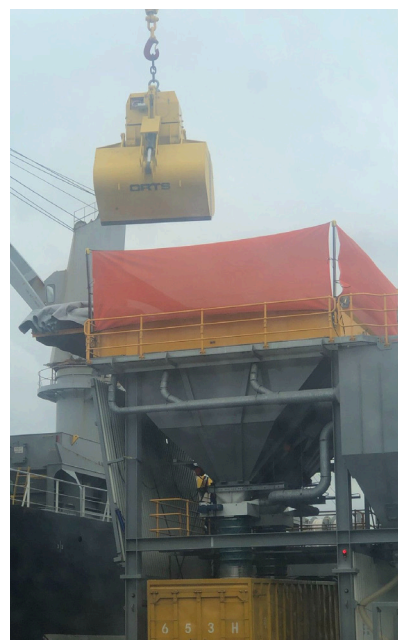
In the past, fugitive cargoes at Taichung Port were handled by traditional grabs and funnels, which easily caused fugitive dust as particles when the grabs were moved or fed into the funnels. Taichung Harbor Warehousing & Stevedoring Co., Ltd. is responsible for handling the fugitive cargo, "pure alkali," which is imported from abroad about 100,000 to 200,000 metric

tons per year. This cargo is in the form of powder and is relatively light. In order to reduce the dust emission caused by the operation, our branch has advised the operators to improve the operation equipment in response to the unfavorable factors such as the strong northeastern monsoon in Taichung Port.

Solution

Since 2017, the branch has been holding seminars on the improvement of handling machines, and has provided guidance to the operators to develop the "Fugitive Cargo Handling Operation Improvement Plan". The Taichung Harbor Warehousing & Stevedoring Co., Ltd. has been planning the purchase of hydraulic closed grab and dust collector funnels regarding pure alkali cargoes since 2018, and after more than a year of coordination and planning with foreign manufacturers, it was decided to introduce hydraulic grab (made in Germany) and dust collector funnels (made in New Zealand), two sets each:

1. Hydraulic grab: Operated by the operator with the action panel, timely control of the grab opening (closing) timing and tightness adjustment to reduce the cargo falling to the wharf surface.
2. Dust collector funnels: 8.9m, 8.5m and 9.6m in length, width and height respectively. Powered by generator and positive pressure dust suppression system, automatic detection and positive pressure valve closure after the cargo flows into the hopper. Dust is concentrated in the bin and not easy to overflow, maximum dust collection flow can reach 21,000 cubic meters per hour.



Implementation/Timeline

1. Date of purchase and contract: The Taichung Harbor Warehousing & Stevedoring Co., Ltd. has completed the contract with the foreign manufacturer. The contract for the hydraulic grab was completed on September 24, 2019 and the contract for the dust collector funnel was completed on November 13, 2019.
2. Import date: Hydraulic closed grab were introduced to Taichung Port on May 21, 2020; dust collector funnel were introduced on July 23, 2020.
3. Machine operation date: The first voyage of pure alkali vessels were launched on December 3, 2020, with two sets of machines operating simultaneously.

Effect/Benefit

1. Dust suppression effect: Compared with traditional grabs and funnels, the dust suppression effect reaches 70% to 80%.
2. Reduced cargo fall: When using traditional grabs and funnels, the understanding between two operators is important, and the angle of opening or releasing the bucket is limited, so the cargo is prone to fall on the wharf surface, resulting in no practical value. The improvements not only significantly reduced the occurrence of falls, but also reduced the cost of labor to clean up and dispose of waste.
3. Improved handling efficiency: The traditional method can load about 10 vehicles per hour, but after adopting the new machine, it can reach 20 vehicles per hour, that is, the handling capacity is increased by about 230 metric tons per hour, which doubles the handling efficiency and reduces the berthing cost of vessels.

Investment Amount

No additional investment capital from the branch. The Taichung Harbor Warehousing & Stevedoring Co., Ltd. and the shipper jointly purchased two sets of machinery in accordance with the handling improvement plan, initially estimated at approximately €1,73,020 EUR each, including hydraulic closed grabs, dust collectors funnel and generators

Environmental Issue

Dust

Stakeholders

- Taichung Branch of TIPC
- Port staff
- Local people

Participating Units

- Maritime and Port Bureau (Ministry of Transportation and Communications)
- Taichung Branch of TIPC
- Taichung Port Warehouse Co., Ltd.

Strategies: Establish Example, Enforce, and Promote Performance

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Salute to the Sea – Coastal Cleanup and Maintenance Program

Attention/Motives

Surrounded by sea, Taiwan has rich marine resources, diverse topography and ecological environment. However, the coast is affected by human activities, topography, and tides, which tend to accumulate driftwood, discarded fishing nets and garbage, damaging the environment. The coastline under the jurisdiction of the Port of Taichung is 25.98 kilometers in length, and has implemented coastline cleaning and maintenance work such as collection of domestic waste from ships, cleaning of harbor basin waters, cleaning of public land areas, and regular cleaning of beaches every six months. In order to achieve the goal of always having clean beaches, the Executive Yuan proposed the "Salute to the Sea" system in May 2020, hoping to keep every inch of the coast clean.

Solution

In order to implement the Executive Yuan's "Salute to the Sea" policy and implement the coastal cleaning and maintenance work of commercial ports, the Port of Taichung, Taiwan International Ports Corporation not only continues to carry out the original cleaning work such as the collection of domestic waste from ships, the cleaning of harbor basin waters, the cleaning of public land areas and the regular cleaning of beaches every six months, but also strengthens related measures:

- Check the resources required for wetland cleanup energy and establish the related operation regulations.
- Set up an internal examination team and hold regular examination meetings to track, review and achieve the progress of the Ministry of Transportation through the implementation of PDCA target management.
- Conduct the tender operation of "Salute to the Sea – Opening operation of beach waste removal and disposal in Taichung port area," and to set up the "Coastal Cleanup and Maintenance Program" of the Branch to specify the cleaning target and improve the cleaning capacity of beaches, from regular cleaning every six months to monthly, and use the strange hand to dig 30–50cm to screen out the waste, use beach buggies and personnel to pick up and other cleaning methods.



Implementation/Timeline

- A one-month discussion and evaluation were conducted in June 2020 to complete the check of the resources required for wetland cleanup energy and establish the related operation regulations.
- Taichung Port Branch set up an internal examination team and hold regular examination meetings on June 29, 2020.
- Finish the tender operation of "Salute to the Sea – Opening operation of beach waste removal and disposal in Taichung port area" on July 28, 2020.
- Set up the "Coastal Cleanup and Maintenance Program" of the Branch on July 30, 2020.
- Perform related cleaning works from July 30, 2020~December 31, 2020.

Effect/Benefit

Significantly improving the cleanliness of the coastal beaches. To implement the Executive Yuan's "Salute to the Sea" policy. From August 2020 to December 2020, a total of 17.02 metric tons of waste and 7.17 metric tons of resource waste were removed, and about 6 local jobs were created.

Investment Amount

The total cost for the cleaning work of the existing vessels' domestic waste collection, harbor basin water cleaning, common land area cleaning and semi-annual beach cleaning is NT\$18.99 million, and an additional NT\$3.49 million were invested on July 28, 2020 to carry out the beach cleaning operation.

Environmental Issue

- Waste Disposal

Stakeholders

- Taichung Branch of TIPC
- Port staff
- General public

Participating Units

- Taichung Branch of TIPC
- Chan-Hsin Environmental Engineering Co., Ltd.,

Strategies: Establish Example, Enforce, and Promote Performance

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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,



National Quemoy University

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



National Sun Yat-Sen University

port affairs companies, and thus play an active role in assisting practical port management and operations, which will achieve a win-win outcome.



Forestry Bureau, Council of Agriculture

The Forestry Bureau implemented a forest renewal project between 2003 and 2006, and a preliminary coastline forest ecology recovery and afforestation project in 2012. The afforestation area in the Low Density Development Area at the Port of Taichung is 8.1 hectare, and a total of 40,000 Casuarina Trees have been planted. The afforestation area in Special Zone for Industry II is 4.17 hectare, and a total of 20,000 Casuarina Trees have been planted.



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 CO₂ 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."



Environmental Protection Administration

The Taichung Branch of TIPC participates in major discussion meeting held by the EPA. 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. The Port of Taichung, TIPC cooperates with Taichung Harbor Fire Brigade to train personnel in extinguishing fires in offices.



Taichung Harbor Fire Brigade

The Port of Taichung, TIPC cooperates with Taichung Harbor Fire Brigade to train fire extinguishing in office places.



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

In compliance with its environmental policies, the Taichung Branch of TIPC provides suitable environmental education and training programs to raise environmental awareness, and improve the competitiveness of the Port of Taichung.

In 2019 and 2020, the Taichung Branch of TIPC organized more than 8,400 man-hours of environmental training. Courses such as "Green Building-Ecology, Energy Conservation, Waste Reduction, Healthy and Sustainable Cities, Green Foundations, Resilient Cities", "Environmental Education

Seminars-Only Good Water Has Good Resources (Water Environment and Marine Conservation)", "Docklands Introduction of Tree Pests and Diseases and Prevention Education and Training" to enhance the environmental protection awareness of colleagues and practice green life. The number of employees in the branch is 337 in 2019; 328 in 2020.

2019-2020 Environmental Education Hours

Types		2019(man-hr)	2020(man-hr)
Category by Field	Social Issues	5	951
	Climate Change	2.5	5
	Disaster Prevention	6	6
	Natural Preservation	124	2456
	Public Nuisance	12	5
	Resource Management	3466.5	1228
	Cultural Preservation	0	109.5
	Community Outreach	1	30.5
Category by Course Type	Course	1303	142
	Speech	1269	258
	Web Learning	2	3
	Experience Sharing	989	384
	Outdoor learning	18	0
	Site Visit	0	1228
	Video	7.5	750.5
	Hands-on Activity	0	399
	Other Event	0	1620.5



08



Communication and Publication



Communication and Publication

Promotion activities, seminars, workshops, publication, web-sites, and exhibitions have been organized to align Taichung Port with contractors and potential partners. Therefore, publishing the port's relevant information is helpful to the public, port companies, academic institutions, and subsidiary units.



Front Page of Taichung Port Website



Chinese and English web pages for TIPC Green Policy



Port of Taichung disaster prevention related publications in 2019-2020



Charity sale



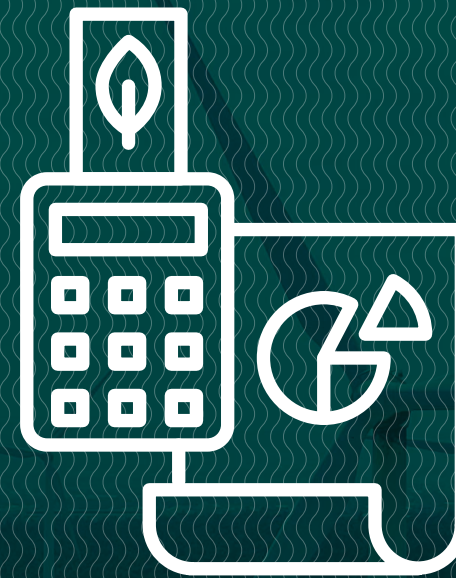
Volunteer activities



Famous artists give spring couplets



Charity event for premature



09

Green Accounting

Environmental Investment and Cost

The investments made by the Port of Taichung, TIPC pertaining to the environmental issues can be primarily divided into employees, environmental maintenance and management, environmental monitoring, publications, and emergency response and communication. The objectives are to improve employee's awareness of the environment, maintain and improve the quality of the port environment, enhance the emergency response capability, and elevate the public's knowledge of the port.

- **Employees:** Personnel expenses for those involved in environmental operations education, employee education.
- **Environmental maintenance and management:** Port area landscaping, removing wastes, dredging port berths.
- **Environmental monitoring:** Aspects such as air, noise, water quality, sediment and environmental inspections
- **Emergency response:** Costs for accident management and for purchasing pollution removal materials
- **Communication and publications:** Costs for maintaining websites, holding promotional activities, etc.

The total cost expended by the Port of Taichung, TIPC for the environmental issues in 2019 and 2020 (Unit: thousand EUR)

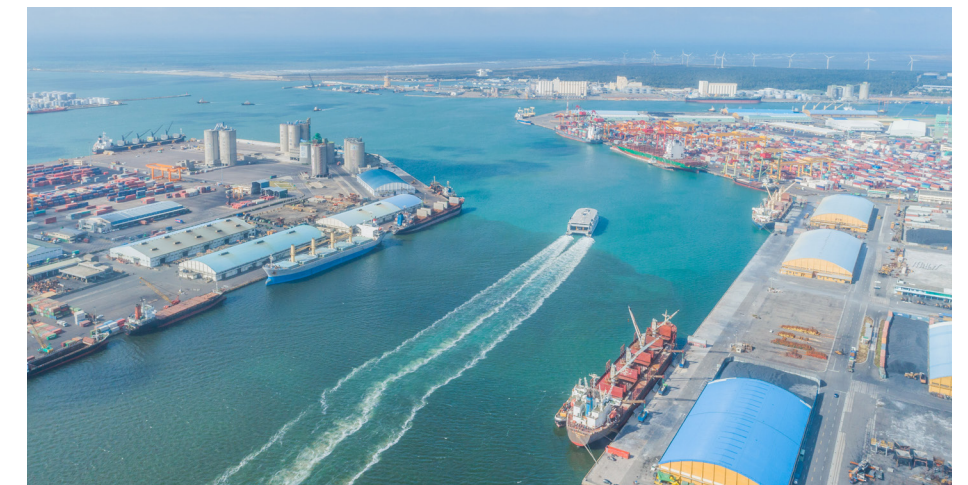
Items	2019	2020
Employees	5	31
Environmental Maintenance and Management	859	1,204
Environmental Monitoring	309	383
Emergency Response	61	93
Communication and Publication	34	1
Total	1,268	1,712

Environmental Assets

Port of Taichung has implemented a series of harbor development projects for Taichung Port to develop into a value-added logistics hub in central Taiwan, as well as a base for port industry development and an eco-friendly green harbor. Some of them involve environmental issues, such as construction projects that are to new architecture's transition toward green buildings, increased public exposure to harbors, pier reconstruction with shore power equipment systems, and replacement of old

equipment to increase work effectiveness and decrease pollutant emission. In 2019 and 2020, the respective amounts of fixed-asset investment toward

environmental issues made by Port of Taichung, TIPC were approximately €20,927 thousand and € 6,122 thousand.



Fixed assets invested in environmental issues in 2019 and 2020 (Unit: thousand EUR)

Items	2019	2020
Land Improvements	14,420	3,818
Houses and Buildings	1,707	692
Machinery and Equipment	3,194	533
Transportation and Equipment	1,548	1,074
Other Equipment	58	5
Total	20,927	6,122

10



Improvement Recommendations

Since operations began in 1976, the Port of Taichung has never ceased investing in the infrastructure of the port in response to domestic economic growth and the evolving shipping market. In 40 years, the port has grown. In future, the Port of Taichung will work to continue its growth on the global ocean shipping stage and remain attentive to the natural environment on the basis of its advantages.

Port of Taichung actively promotes the green port policy. After passing the European eco-port certification for the first time in 2015, it will continue to apply for re-assessment certification every two years. With the vision of a non-nuclear homeland

and the goal of energy transition, the development of green energy will be a new engine driving economic development. In the future, in addition to cooperating with the national energy development policy, we will continue to complete the environment required for green energy development, create high-quality offshore wind power industrial parks and operating bases, and achieve the goal of energy transformation for nuclear-free homeland.

As a port operation and management unit, the Port of Taichung is responsible for the maintenance and improvement of the port environment. It regards

environmental protection as a part of port operations, and therefore promises to work to reduce the impact of port operations on the environment, and provide environmental protection and sustainable development. The policy principles of a sustainable and progressive high-quality port include compliance with environmental protection laws and regulations, maintenance of the port environment, implementation of environmental monitoring, control of pollution sources, innovation of pollution prevention technology, a green port, independent management, and sustainable development.



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



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