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Port of Keelung

Environmental Report

2021

To become a "Green Port," the port of Keelung has acquired certification of E-ports since 2015, and is applying for third recertification (2021.) This environmental report presents achievements and goals of Keelung Port in environment from 2019 to 2020.

Environmental Report Work Team

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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

Environmental Objectives

臺灣港務股份有限公司
基隆港務分公司
TIPC Port of Keelung, Taiwan International Ports Corporation, Ltd.

Port of Keelung, Taiwan International Ports Corporation Environmental Policy (Including Keelung Port, Taipei Port, Suao Port)

In charge of port operation and developments, Port of Keelung, Taiwan International Ports Corporation (hereinafter referred to as Port of Keelung) recognizes its obligations towards protecting the environment as its corporate social responsibility. Aiming at being an eco-friendly and sustainable port with continuous advancement, we consider environmental protection as a part of port operation and work proactively to prevent the pollution of the environmental impacts.

In order to minimize the potential and actual environmental impacts from port operations, Port of Keelung has identified the scope of its environment protection. With autonomous management, periodic inspection and evaluation, we will keep continuously improving our environment performance.

We commit to:
- Regularly evaluate port environmental impacts and any pollution generated from port operation.
- Set environmental objectives to continuously lower environment impacts.
- Comply with all relevant environmental regulations and aim at pollution prevention.
- Provide environmental education to build environmental awareness in all staff to completely implement our environment policy.

The full understanding and mutual consent to this environmental policy have been reached by the relevant parties, including employees, suppliers and tenants of Port of Keelung. This policy is open to the public on our website.

Kao Chwan Kai
President of Port of Keelung, TIPC

Date : 2020.10.16

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Environmental Objectives Port of Keelung

To implement the commitments of Keelung Port environmental policy, the following environmental objectives are set based on the ten major environmental issues from the port.

Improve air quality
Implement air quality monitoring in the port area and strengthen port environmental inspections and ship environmental friendly strategies

Avoid the occurrence of fugitive dust in the port area
Plan vehicle routes and set water spraying equipment to effectively reduce fugitive dust

Reduce noise in the port area
Optimization noise monitoring in the port area and improve transportation noise control in the port area

Reduce waste in the port area
Avoid unnecessary waste of resources, handle waste properly, and implement resource recovery

Strengthen the management of vessel waste
Mandatory waste sorting for passenger ship and cargo ships as well as waste disposal and control

Enhance land area development of ports and harbors
Strengthen the development of port cities and integrate with nearby recreational resources to promote the development of regional tourism

Reduce vehicle emissions in the port area
Restrict high-polluting old diesel vehicles from entering the port area and control vehicle exhaust emissions.

Strengthen hazardous cargos handling and storage
Strengthen operational control and autonomous management of piers and storage areas to reduce cargo spillage

Strengthen community relations
Implement information disclosure

Reduce ship emissions
Promote speed reduction, use of low-sulfur fuel, and use of shore power for vessels

The President, Port of Keelung, TIPC is responsible for the implementation, maintenance and communication of the environmental objectives. To fulfil commitments, the objectives and corresponding action plans are reviewed and adjusted to the condition of the Port.

President of Port of Keelung,TIPC Kao Chwan Kai

Date 09 / 27 / 2021

Port of Keelung, Taiwan International Ports Corporation, Ltd. No.1 Chung-Cheng Road, Keelung 20202, Taiwan, R.O.C.

01

Message from Port of Keelung

As growing influence of climate change, eco-friendly and sustainable concept have been valued by international port authorities. The Taiwan International Ports Corporation, Ltd. (TIPC) is committed to advancing port infrastructure, improving facility and service, optimizing land use and preventing pollution. In recent years, we have not only pursuing the goal of becoming a Green Port, but been networking with global ports and active in international certification schemes of port environment management. The environmental performance of ports in Taiwan is thus recognized by the world. With our global presence, we are well positioned to achieve our goal as building Ecoport and Green Port.

Port of Keelung functions as a container terminal for ships that operate in near-sea shipping lines, hosts passenger and cargo vessels that travel between Taiwan and China, and foreign cruise liners. The port boasts its position as the Asia-Pacific hub of logistics distribution. The administration of the port continues to maintain stable growth in terms of profitability, and also strives to becoming a Green Port, control pollution within the port, and strengthen its relationship with the local community in a manner that contributes to the sustainability of the port.

Port of Keelung endeavors to reduce the environmental impact of operations within the port, cement its relationship with the residents of Keelung City, maintain its EcoPort status, engage with partners across the world, and rejuvenate the port city of Keelung through benchmarking strategies.

Kao Chwan Kai

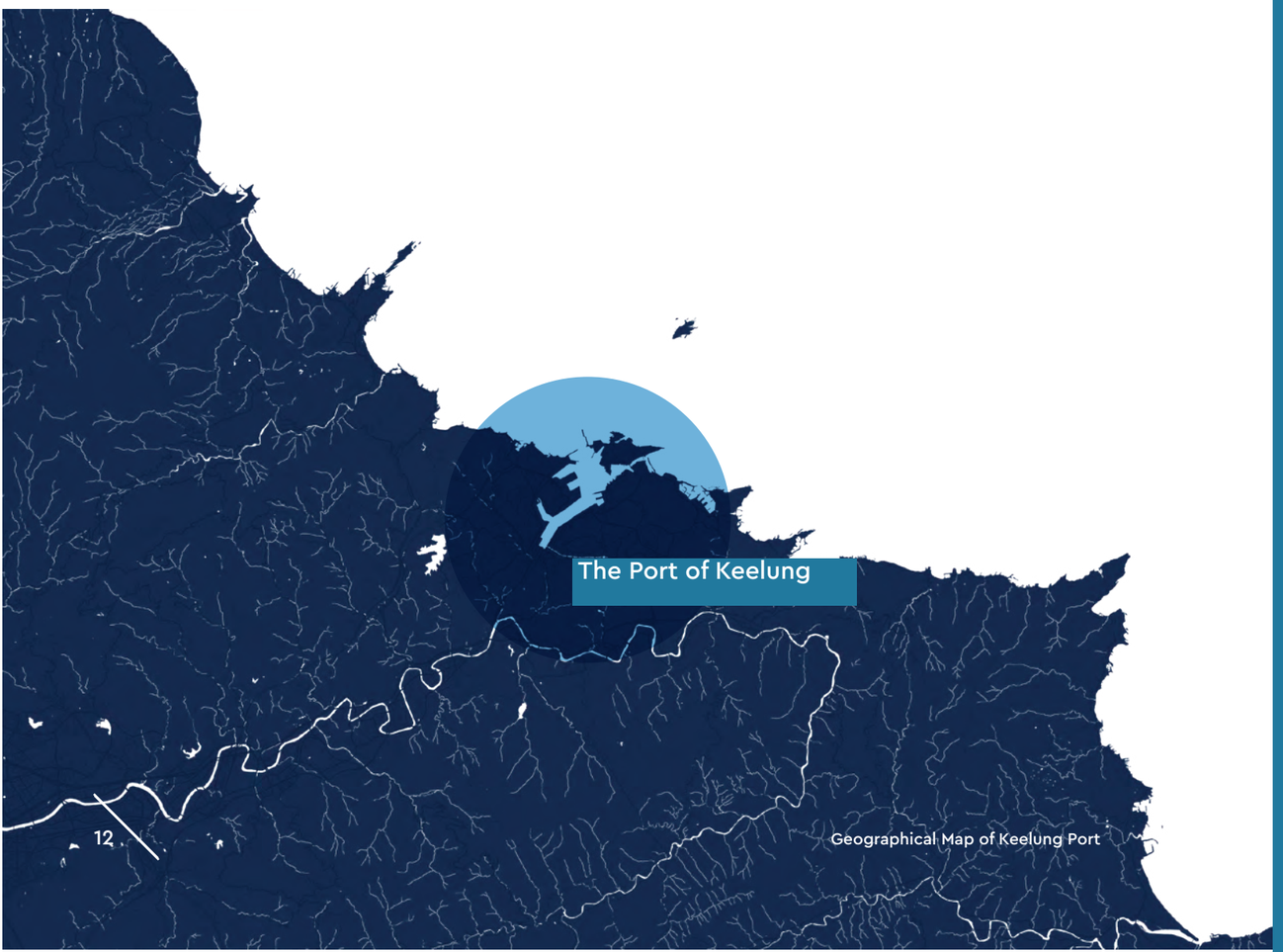
President of Port of Keelung
Taiwan International Ports Corporation, Ltd

02

Port Profile

2.1 Port Location and Port Area

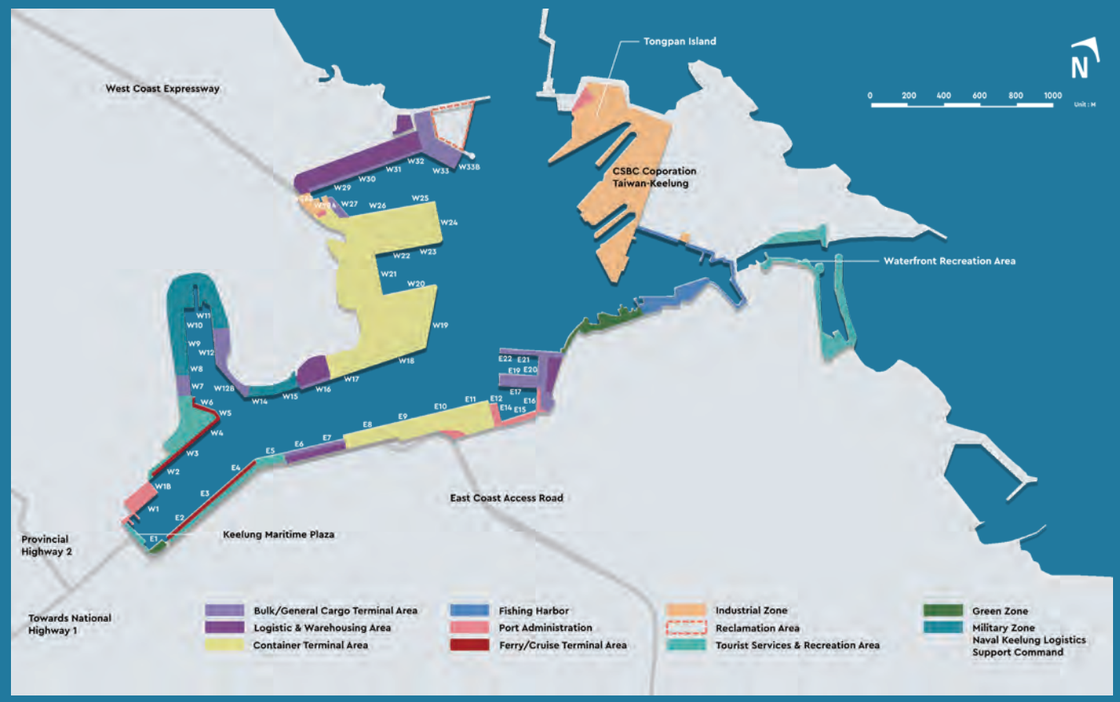
Port of Keelung is the top maritime gateway of Northern Taiwan. Located on the northeastern tip of Taiwan (25°09′42.5′′N 121°44′57.5′′E), The total area of the port area is 570 hectares, the single-opening port covers 190 hectares of land territory and 380 hectares of waterway. The water depth varies between -15 and -20 meters with the tide contributing to a maximum 0.73 m of difference. A natural, landform harbor with a shoreline characterized by pebble beaches, rocky shores and artificial seawalls, Port of Keelung benefits significantly from its sheltered water and strategic locale and the presence of crtical industries (e.g. CSBC Keelung Shipyard, TPC Hsieh-ho Power Station). The proximity to the city of Keelung and recreational facilities is also noted as an advantage, as a readily available labor force is essential to the operation of the port.



Geographical Map of Keelung Port

2.2 Legal Status and Port Operators

To promote modernized commercial port management system reforms, in March 2012, the national maritime system was divided into two parts, government and corporation. In other words, previously publicly managed organization was transformed into state enterprise organizations, which combined Keelung Port Bureau, Taichung Harbor Bureau, Kaohsiung Harbor Bureau, and Hualien Harbor Bureau into a company, named Taiwan International Ports Corporation. This company solved previous problems of commercial port, including limited by legal and system restrictions, unable to rapidly respond to market changes and decreased competitive strength in global. After restructuring, stevedore operation business of Keelung Port, Suao Port and Taipei Port is now the responsibility of Keelung Branch of TIPC. Maritime administration, operation items, and public authority within the harbor are handled by the North Taiwan Maritime Affairs Center of the Maritime and Port Bureau (MPB).Since established in March 2012, TIPC has dedicated itself to fostering core businesses, promoting free trade, and developing into a metropolitan port. Moreover, to boost its operational performance and efforts toward corporate social responsibility, Port of Keelung has gradually implemented an environmental-friendly program, authorized by Ministry of Transportation and Communications, called "Greening the Ports Action Plan," which includes obtaining the EcoPort certification, promoting environmental well-being, and striving for environmental sustainability.



2.3 Commercial Activities

There are 56 docks in Keelung Port commercial harbor area with 20 on the east shore and 36 on the west shore. Dock types include 15 container docks, 21 bulk cargo docks, and 6 passenger docks. In recent years, development of Keelung Port focuses on containers and tourism. Near-sea shipping lines is the main service of outer harbor which also includes near-sea container lines, shipping between Taiwan and People's Republic of China, logistics/marketing center in Asia-Pacific and container storage. Bulk goods include aggregates, oil, cement, metal and cars.

Main Commercial Activities and Cargoes in Keelung Port

Commercial activities	
Aggregates (sand and gravel)	Building and Repair
Cruise industry/ Ferry services	General Manufacturing
Cargo stevedoring	
Dry bulk cargo	Perishable Goods
Trade Cars/ Vehicles	General Cargo
Petroleum/ Oil Products	Ro-Ro

2.4 Main Cargoes

The main incoming cargo of Keelung Port in 2019 and 2020 is mineral products, followed by chemical or related industrial products, base metals and their products; the main outgoing cargo is plastic rubber and its products, followed by chemical or related industrial products, textiles and other products. Its products.

2019–2020 Main Import/Export Cargoes of Port of Keelung

Type	Main Import Cargoes			Main Export Cargoes		
	Mineral Products	Base Metals and Articles of Base Metal	Products of the Chemical or Allied Industries	Plastic and Rubber Products	Chemical and Industrial Products	Machinery, Electrical appliances and their products
2019	1,896,478	1,262,574	975,297	836,832	632,918	350,557
2020	1,488,366	1,391,269	952,016	858,501	622,751	358,631

2.5 Port Business

Keelung Port business statistics from 2019 to 2020

Service Category		2019	2020	Difference between 2019 and 2020	
				Amount	%
Incoming and Outgoing Ships	Vessels	6,279	5,360	–919	–14.64
	Gross ton	92,491,540	78,284,256	–14,207,284	–15.36
Volume of Cargo Handled	International Cargo((Revenue ton)	52,387,416	55,177,605	2,790,189	5.33
	Dry bulk and groceries (Revenue ton)	4,767,771	4,696,291	–71,480	–1.50
	Pipeline cargo (Revenue ton)	2,895,008	3,540,017	645,009	22.28
	Total (Revenue ton)	60,050,195	63,413,913	3,363,718	5.60
Volume of Cargo Handled (International)	Imports (ton)	790,000	810,000	20,000	2.53
	Exports (ton)	660,000	718,000	58,000	8.79
	Total(ton)	1,450,000	1,528,000	78,000	5.38
Volume of Imports & Exports	International line (number)	10,932,701	10,466,056	–466,645	–4.27
	Domestic line (number)	4,458,450	5,724,904	1,266,454	28.41
	Total(number)	15,391,151	16,190,960	799,809	5.20
Incoming and Outgoing Passenger	Number of passengers on domestic routes (Person times)	110,267	86,114	–24,153	–21.90
	Number of passengers on international routes (Person times)	981,093	173,040	–808,053	–82.36
	Total number of passengers (passenger times)	1,091,360	259,806	–831,554	–76.19

Source: Annual Statistical Report, TIPC, 2019–2020

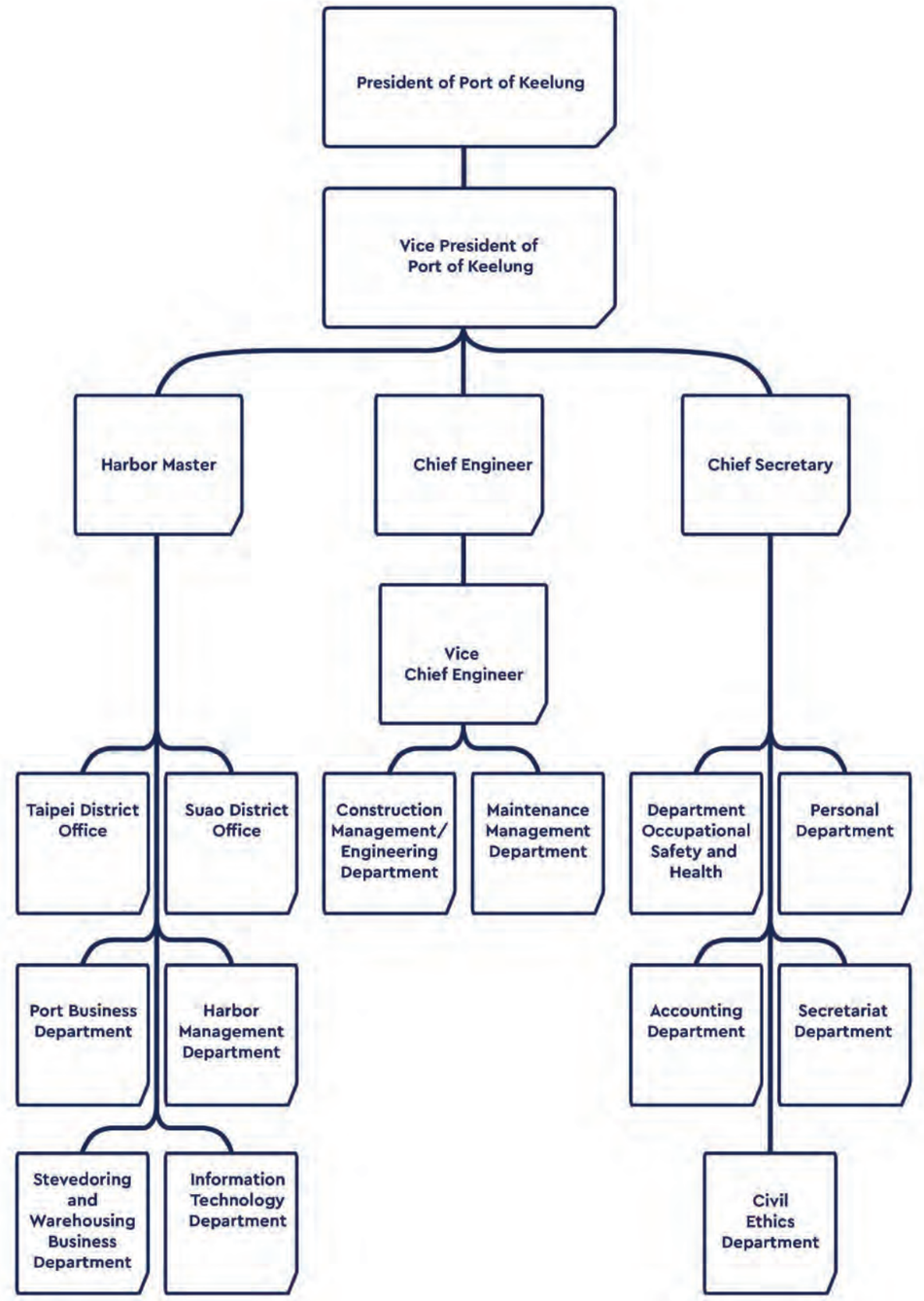
03

Environmental Management

3.1 Organizational Structure

According to Commercial Port Law regulations, the Port of Keelung, TIPC and the North Taiwan Maritime Affairs Center is responsible for environmental management in the Keelung commercial port area. Port of Keelung, TIPC is responsible for environmental issues in management and operations while the North Taiwan Maritime Affairs Center shall handle environmental issues that involve public authority. Environmental Protection Administration and the Bureau of Environmental Protection shall manage stevedoring and neighboring municipal areas, and monitor and supervise the environment. The Port of Keelung, TIPC has 13 internal departments, functions of the divisions of the Port of Keelung as follow:.

Department	Description
Secretariat Department	Property, cashier, public relationship affairs and document management of the branch
Construction Management / Engineering Department	Port planning, design, construction, supervision and contracting out
Harbor Management Department	Port safety management and port affairs management
Stevedoring and Warehousing Business Department	Tourist services and private store operation
Port Business Department	Attraction of local investments, implementation of port functions, and creation of benefit
Accounting Department	Budget review and management of income and expenditures
Information Technology Department	Development and maintenance of IT systems and equipment
Personnel Department	Company human resource management
Maintenance Management Department	Civil/electrical engineering, harbor construction and electrical maintenance/management
Occupational Safety and Health Department	Port environmental protection, pollution prevention and management of occupational health and safety
Civil Service Ethics Department	Enforcement of ethics and investigation
Taipei Port Branch Office of Keelung Port, TIPC	Taipei port operation and management
Suao Port Branch Office of Keelung Port, TIPC	Suao port operation and management



Organization Chart of the Port of Keelung, TIPC

3.2 Environmental regulations

The Keelung Port follows relevant international specifications, such as International Convention for the Prevention of Pollution from Ships (MARPOL73/78), London Dumping Convention, International Convention for the Control and Management of Ships' Ballast Water and Sediments, International Convention on the Control of Harmful Anti-fouling Systems on Ships etc. In addition to the international environmental specifications and conventions, the Keelung Port collaborates with local authorities in compliance with relevant environmental laws and regulations in Taiwan.

Conventions	Objective	Corresponding to the domestic legislation
International Convention for the Prevention of Pollution From Ships(MARPOL73/78)	Prevent pollution from ships	The Law Of Ships(article 101) The Commercial Port Law(article 75) No. 10150137211, 10150138211, 10150138451, 10250048611, and 10798000011 Administrative Law of the Ministry of Transportation and Communications
London Dumping Convention	Regulate marine dumping	Marine Pollution Control Act(article 20, 25) Regulations Governing Permission and Management of Marine Disposal
International Convention on the Control of Harmful Anti-fouling Systems on Ships	Terminate the use of toxic hull paint	Prohibition of the use of tributyltin oxide in manufacturing marine antifouling paint, specified in the "List of Prohibited Toxic Chemical Substances" of the Toxic Chemical Substances Control Act
International Convention for the Control and Management of Ships' Ballast Water and Sediments	Prevent the invasion of alien species along with ballast water, and protect marine ecology and biodiversity	Regulations on Equipment of Ships (article 174, 215, 216) International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004" issued by the Ministry of Transportation and Communications "Prohibition of Ballast Water Exchange in the Territorial Waters of R.O.C. and Related Pollution Control Measures" announced by the Environmental Protection Administration

Organizations involved in coping with the environmental issues in the port area of the Port of Anping

Department	Laws Title		Central Competent Authority	Local Law Enforcement Agencies
Sectors in the Ministry of transportation and communications	The Commercial Port Law	2021/04/28	Ministry of Transportation and Communications	North Maritime Affairs Center, Maritime and Port Bureau, MOTC
	The Law of Ships	2018/11/28		
	Shipping Act	2014/01/22		
	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	Department of Economic Affairs (Keelung City)
Sectors in the Ministry of the Interior	Fire Services Act	2019/11/13	Ministry of the Interior	Keelung City Fire Department
				Keelung Harbor Fire Brigade
Sectors related to environmental protection	Marine Pollution Control Act	2014/06/04	Ocean Affairs Council	Ocean Conservation Administration
	Basic Environment Act	2002/12/11	Environmental Protection Administration	Environmental Protection Bureau (Keelung City)
	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	2012/11/23		
	Toxic and Concerned Chemical Substances Control Act	2019/01/16		
	Soil and Groundwater Pollution Remediation Act	2010/02/03		
	Resource Recycling Act	2009/01/21		
	Greenhouse Gas Reduction and Management Act	2015/07/01		
	Public Nuisance Dispute Mediation Act	2009/06/17		Public Nuisance Disputes Mediation Committee (Keelung City)
Intersectoral Protection	Disaster Prevention and Protection Act	2019/05/22	Ministry of the Interior	Keelung City Government

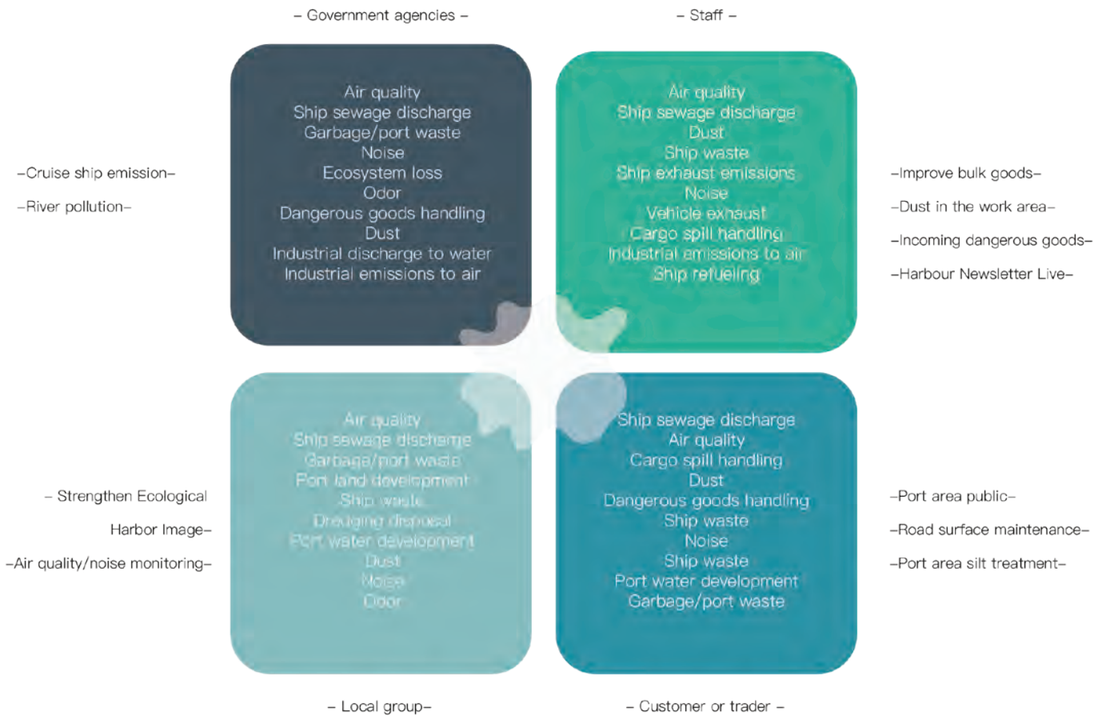
Figure of Organization chart of Anping Port

3.3 Analysis of major environmental issues

Procedure for selecting the top 10 environmental significant issues for the Port of Keelung: Top-level managers from each department of the Port of Keelung, TIPC select the top 10 environmental significant issues to the Port of Keelung according to environmental situation in 2019–2020, plans for docks in the future and opinion from relevant stakeholders. After organized and discussed with all departments of the branch, top 10 environmental significant issues for the Port of Keelung are decided.

Stakeholders

The Keelung Branch of TIPC believes that good communications with stakeholder help identify key environmental issues and create value. Therefore, the Keelung Branch of TIPC uses a variety of methods to communicate with stakeholder, including surveys and interviews. Their needs and expectations are gathered and incorporated into operation and environmental management.



Keelung Port

Environmental Issues

Top 10

1. Air quality

Indicator

-Qualification rate of air quality indices: suspended particulate matter (PM_{10} and $PM_{2.5}$), SO_2, NO_2 and O_3

-Replacing old devices with energy-saving devices

2. Dust

Indicator

-Frequency of street washer

-dispatches and water sprayers facilities inspection

3. Noise

Indicator

-Daily qualification rate for harbor noise quality

4. Port waste

Indicator

-General waste removed and recycling rate in the Port land area

5. Vessels waste

Indicator

-Marine water quality pass rate (pH, DO, BOD5, cyanide, phenols)

-Number of inspections and penalties

6. Port development (land area)

Indicator

-Maintain the green area

-Recreation area

7. Vehicle Exhaust emissions

Indicator

-Exhaust emissions from entering and leaving the port

-Dust-proof nets are placed on truck body before leaving the port

8. Strengthen hazardous cargo management

Indicator

-Number of inspection container freight station managers

9. Community relations

Indicator

-Number of events, number of participants

-Environmental-related petition cases

10. Reducing ship exhaust gas emissions

Indicator

-Ratio of service vessels using low-emission fuels or biodiesels and the volume of low-emission fuels used by service vessels

-Vessel speed restriction policy

-Ratio of service vessels using shore power

-Ships deceleration target completion rate

Responses to Stakeholders

Suggestions and issues provided from stakeholders will be considered in future environmental improvement plan. Besides, the Keelung Branch of TIPC will keep communicate with stakeholders to conduct continuously environmental improvement in Keelung Port

Stakeholders	Issues	Responses from Keelung Port
Tenants	Improvement of dust from bulk cargo	The new street sweeper performs port and street cleaning operations, can filter PM_{10} in the exhaust air stream, and avoid secondary air pollution. Strengthen the inspection of the bulk cargo operation area, and supervise the industry to take dust prevention measures.
Government the Local	Waste in water area of the port	Waste in water removed by cleaning vessels everyday. The average amount of waste removed weekly in 2019–2020: 2.24 tons. Purchase a cleaning vessel in 2020, which can remove oil in water and increase aeration . Purchase another cleaning vessels in 2021.
Staff in harbor, the local	Vessels exhaust emissions	Installation shore power system and adoption premium diesel Promotion of vessel speed reduction and the achieved speed reduction rate amount to 45.7% in 2019 and 47.8% in 2021.
Government staff in harbor, the local	Cruise exhaust emissions	Star Cruises used to be fined for cruise exhaust emission; yet, after adopting premium diesel, exhaust treatment and monitoring equipment, Star Cruises has not been fined since 2019. Owing to great improvement of Star Cruises, the branch of Keelung, TIPC held a visit to Star Cruises with related organizations and companies of Port of Keelung in 2019.

Cooperation to Improve Harbor Environment

To improve the water in Keelung Port and create a better environment, the Keelung Branch of TIPC continuously cooperates with Bureau of Environmental Protection, Keelung City.

River pollution improvement	
Keelung City Government Environmental Protection Bureau	-2018 Started Keelung City Water Environment Improvement Plan -2019, A water quality improvement project was carried out in Xuchuan River and Nanrong River, and 2 projects were carried out in Xiding River and Tianliao River.
International cruise home port	
Keelung City Government	-Launch of the cruise tour bus in 2019 -Take the cruise industry as the starting point for the transformation of Keelung City Port, and cooperate with the surr ounding industries of conferences, exhibitions, tourism and tourism in the future
Improvement of water quality in the port area	
Keelung Port Branch	-In 2019, the total weight of garbage removed from the coast of Keelung Port was 149.12 tons,The average weekly removal and transportation of sea surface garbage is 2.87 tons of floating garbage. -In 2020, the total weight of garbage removed from the coast of Keelung Port is 66.34 tons,On average, 1.28 tons of floating garbage are removed and transported from the sea surface each week.
Development of Keelung port	
Keelung Port Branch	-Building Warehouse at west dock #7 and %16 (2017~2020) -New construction project in Weat #27 warehouse -Cooperation project for home port international developing and tourism - Refitting West #2 and 3 historical warehouse as tourist center (2016~2021) -Transportation at East Dock #3 and #4 (2018~2021) -Moving of Navy ports and barracks at East dock #4 and #5 (2017~2022)

04

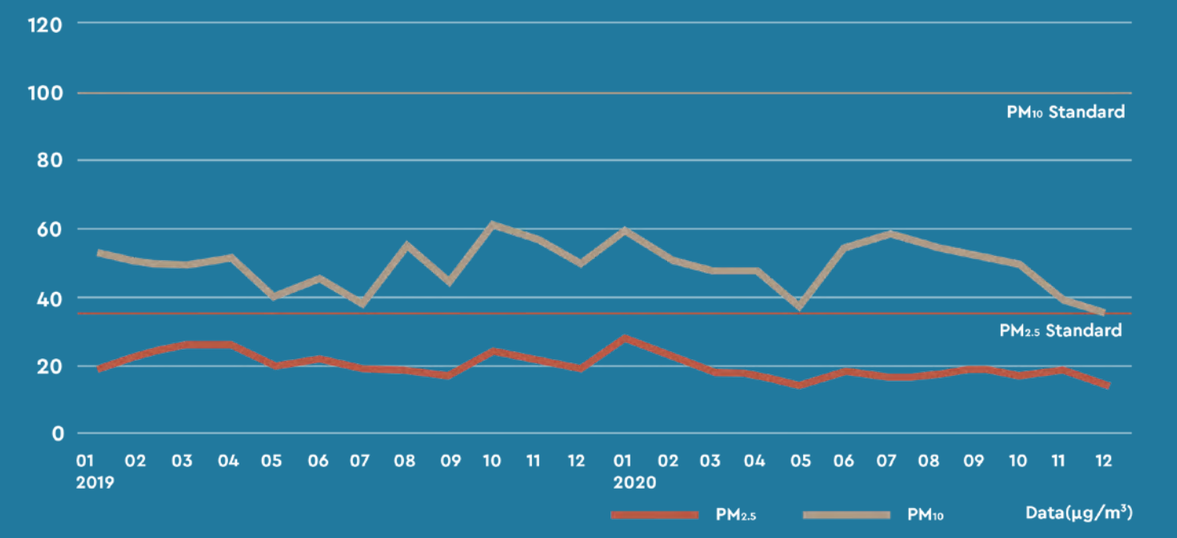
State of the Environment

Air Quality

The major sources of air pollution at the Keelung Port comprise vessel emissions, vehicle exhausts, dust emissions, and smokestack emissions from the nearby Hsieh-ho Power Plant. To improve the air quality in the port and harbor areas, the Port of Keelung, TIPC, is assisting the EPA in restricting the use of aging trucks and promoting the use of alternative fuels to reduce exhaust emissions. The monitoring items include particulate matters ($PM_{2.5}$、PM_{10}), sulfur dioxides (SO_2), ozone (O_3), nitrogen oxide (NO), nitrogen dioxide (NO_2), and wind speed etc. The air quality measurements are all meeting the Air Quality Standards in 2018–2020.

Air Quality Monitoring Stations and Sites

Real-time monitoring equipment for air quality



Greenhouse Gas Emissions

Keelung Port uses the Taiwan Air Pollution Emission Line Source Manual to calculate port GHG emissions from vehicles, and resources consumption.

Carbon Emissions of Port Vehicles

The Taiwan air pollution emission [TEDS 8.1] line source manual calculation formula was adopted to estimate carbon emissions by inbound and outbound container trucks.

Container truck carbon emissions ($kgCO_2e$) =

Total number of vehicles per year × Average fuel consumption(L) in the port area× Emissions factor ($kgCO_2e/L$)

Note:
Total number of vehicles per year = {Total cargo throughput (TEU) − Container transhipment throughput (TEU)} ÷ 2
Automotive Research & Testing Center data were reviewed to determine the average fuel consumption rate in the port area. The monthly fuel consumption rate was 2.47 km/L. The research findings of Harbor and Marine Technology Center, MOTC, were also reviewed. The average travel distance to Keelung port is 1.03 km, and the round-trip distance is 2.06 km. Thus, fuel consumption of Keelung Port was estimated to be 1 L.

Year	Inward / Outward Container Throughput (TEU)	Heavy Goods Vehicle Carrying Limit(TEU)	Unit	Total Number of Passes per Year	Fuel Consumption (L)	Emission Factor ($kgCO_2e/L$)	Carbon Emissions (tonne)
2017	1,420,000	2	No. of vehicles	710,000	1	2.60	1,846.0
2018	1,470,000			735,000			1,911.0

Carbon Emissions from Resource Consumption

The total carbon emissions of Keelung Port from resource consumption is decreasing. In spite of increasing power usage, significant decline in fuel consumption causes a reduction of GHG emissions.

Resource	Emission Factor $kgCO_2e$	2019		2020	
		Amount of Resource Consumed	Carbon Emission (tonne)	Amount of Resource Consumed	Carbon Emission (tonne)
Water	0.154	189,651	29,2	214,353	33.0
Electricity	0.533	12,003,354	6,397	12,774,944	6,809
Fuel	2.60	1,532,409	3,984.2	118,229	307.3
Paper	2.8	4,262	11.9	3,944	11.0
Total			10,422.3		7,160.3

Air Quality Improvement Strategies

Services vessels of Keelung Port have totally adopted premium diesel, which contains a sulfur content lower than 10 ppm, as the fuel for half of its harbor vessels. Moreover, the port has promoted the electrification of port service facilities, including the installation of shore power systems at official-purpose docks to supply electricity to ported vessels. A total of 22 shore power systems to reduce exhaust gas emissions from ported vessels were installed.In addition, the Port of Keelung encourages vessel speed reduction (VSR), which is to reduce average speed of vessels within 20 nautical miles to the port to under 12 knots per hour to abate air pollution. The achieved speed reduction rate was 45.7% in 2019 and 47.8% in 2020

Operating enterprise	Cleaning boat/ Sightseeing boat	Service vessel	Custom	Coast guard	Navy	Cement ship/ Small business wheel
Dock	#W1, #E2B	#W5, #W6, #W12B #W28 #E15	#W1	#E4, #E16	#W1B, #E5, #W12	#W12, #E1

Shore power services at Keelung Port

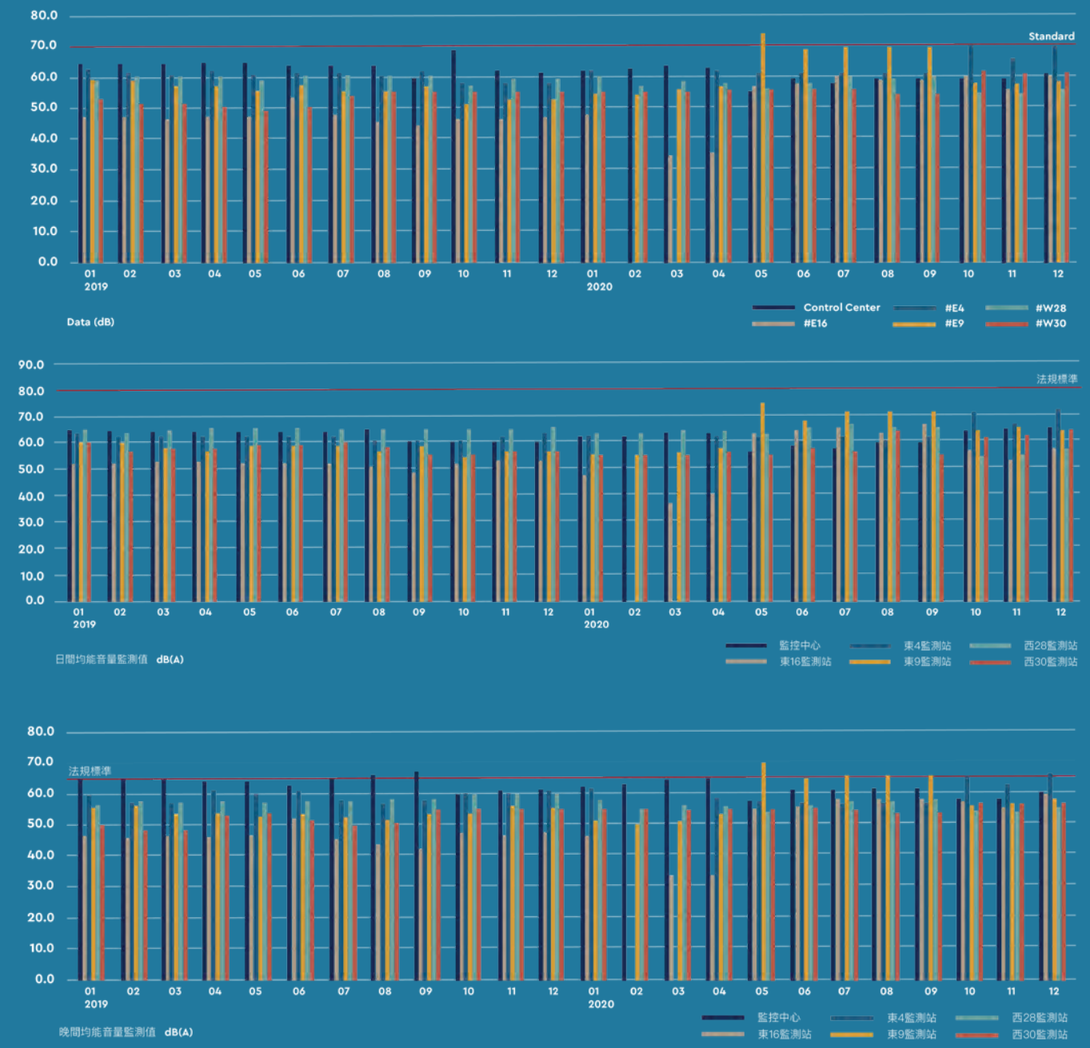
Reduce Dust Pollution

To reduce dust emission, air pollution and maintaining an adequate working environment and quality of life standards at the harbor and in urban areas. The Department of Occupational Safety and Health inspected docks 660 and 708 times in 2019 and 2020, respectively, and found that carriers, shippers, freight forwarders, loading and unloading contractors, and other handlers involved handled cargo in accordance with existing environmental regulations and the Commercial Port Law. The Port of Keelung has implemented control measures for dust emissions. The control measures have two aspects, cargo handling and vehicle control. In addition, the Keelung Port also requests stevedoring companies to abide by the related regulations. Besides, the Port of Keelung also purchased a street sweeper which can filer PM_{10} and reduce air pollution.

Aspect	Control Measures
Vehicle Control	• Implemented diesel vehicle self-management program promoted by the Keelung City Government • Inspect incoming and outgoing diesel vehicles • Install water sprinklers at sand and gravel stacking sties
Equipment	• Water sprayers：East 40 units , West 57 Units • Carwash facilities：3 units , 1 unit of street sweeper • Purchase 2 cleaning vessles in 2019–2020

Noise

The Port of Keelung neighbors the Keelung City area. Because of noise from cargo handling, transportation, and traffic at the harbor travels to surrounding residential areas, affecting their livability. To ensure the quality of life of residents in the neighborhood of Port of Keelung, all lessees and ship operators in Port of Keelung shall restrict the noise of their operations to the statutory limits. To reduce harbor noise from vehicle, the Port of Keelung, TIPC, has maintained access traffic systems on the eastern and western harbor fronts and separate port traffic from the commuting routes of nearby residents and avoid disturbing community life. In 2019 and 2020, volume monitoring results for the day, evening, and night have demonstrated that readings exceeded at some of the test stations. This is probably due to neighboring traffic and the docking of ships at the port.



Real-time measurement of noise environment monitoring

Noise Monitoring Environment on the East Coast of Keelung Port

Noise Monitoring Stations and Sites

Water Quality Improvement Strategies

Reduce river pollution

Currently, Keelung Port basin collects the effluent of four major drainage channels, comprising the Xiangfeng Street channel, Niouchougang River, Hsuchuan River, and Tienliao River. These channels transport upstream sewage, which deteriorates water quality in the harbor basin. To improve water quality in harbor, the branch of Keelung, TIPC dispatches cleaning vessels to remove trash from the waters of the port. The average amount of waste removed from water was 2.87 tons and 1.28 tons weekly in 2019 and 2020, respectively. The branch also purchased two cleaning vessels in 2019 and 2020. Apart from waste in water, according to results of depth of docks in Port of Keelung, the branch of Keelung, TIPC will select 4–5 docks to dredge. Moreover, Bureau of Environmental Protection, Keelung City also started "Improvement Project for Water Environment in Keelung City" in 2018, which will improve water quality of Hsuchuan River, Xiding River, Nanrong River and Tienliao River.

Reduce Vessel Sewage Discharge

To prevent unauthorized oily bilge discharge from entering the harbor, the Port of Keelung, TIPC, conducts to ensure that inbound ships treat their oily bilge water in accordance with regulations. Oily bilge water is primarily discharged by ships and vessels. According to relevant regulations, vessel wastewater (sewage), waste oil, solid waste, or other contaminants must be stored onboard or discharged to onshore collection facilities unless otherwise permitted for ocean discharge. The oily bilge and sewage water collection process was fully implemented in Keelung Port. In 2019, 731.05 tons of wastewater (including oily wastewater) was removed from 95 ships, and in 2020, 240.34 tons was removed from 25 ships, and is expected to be continually maintained through periodically inspecting vessel docking environments in coordination with relevant authorities, thereby eliminating unauthorized discharge and harbor pollution.

Reduce harbor waste

The Port of Keelung, TIPC, is promoting waste reduction and recycling plans to reduce harbor and vessels waste. Recycling and waste reduction plans are implemented in accordance with the Four-in-One Recycling Program that has been promoted by the EPA since 1997. Additionally, the EPA initiated the Mandatory Garbage Sorting requirement in 2005, requiring waste to be separated into recyclable, kitchen refuse, and general garbage, in which the major recycled items include waste paper.

Reducing land area waste at Keelung Port

Temporary waste bins are placed at fixed locations to store waste within the Keelung Port land area, and they are periodically emptied by commissioned operators. Additionally, dock leasing businesses and cargo handling companies must independently commission qualified waste-cleaning professionals to remove industrial waste (including bilge and sewage water). In 2019, general waste amounting to 841.58 tons and the recycling amounting to 133.28 tons were removed from the Keelung Port land area. In 2020, the general waste removed amounted to 1,298.73 tons and the recycling amounted to 105.26 tons.

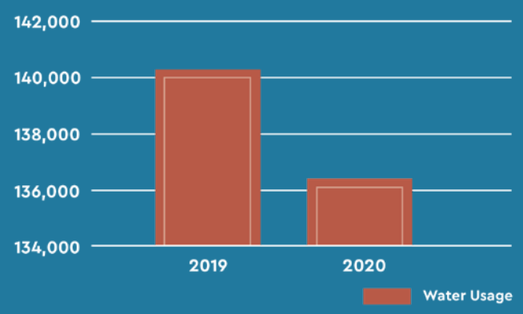
Reducing vessels waste

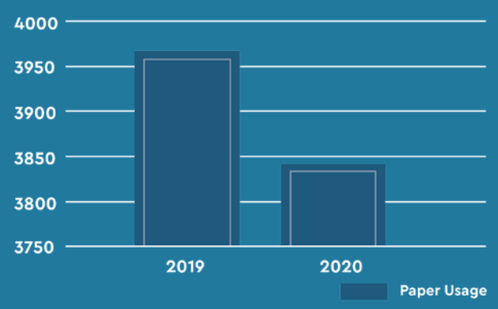
Waste produced from vessels is partially delivered to waste treatment site by the contractors, hired by The Port of Keelung, TIPC, partially removal by shipping companies themselves. The removal rate of vessels waste was 100% in 2019 and 2020. Waste removed from vessels per capita every month was 0.40 kg in 2019 and 0.36 kg in 2020.

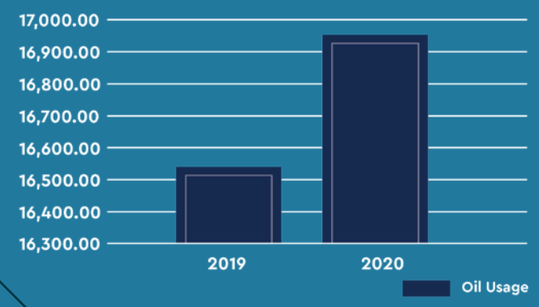
Keelung Port Resource Usage

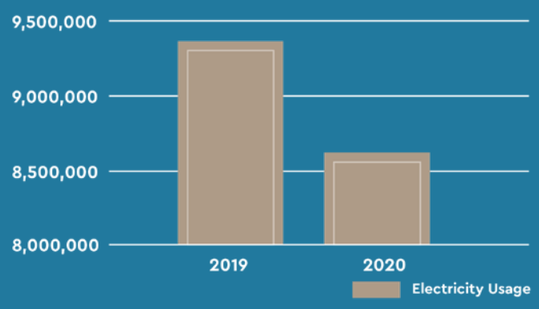
Keelung Port Branch pays great attention to the use of water and electricity in the port area, and often advocates that all colleagues cherish resources, establish consensus on conservation, and jointly supervise the water and electricity use in the port area. If abnormalities are found, they will immediately report to the branch maintenance unit to deal with it, reducing resource waste to lowest. In 2019 and 2020, the consumption of electricity and paper used for water consumption decreased slightly due to the covid-19 epidemic, while the consumption of oil increased slightly.

Category	Strategies
Water	• Conduct leak inspections to control monthly water usage
Electricity	• Turn off unnecessary lights in hall ways • Gradually replace traditional lightings to energy saving once • Do not use AC under 28℃ , and keep office above 26℃ • Turn off office lightings during lunch break
Fuel	• Promote ride sharing • Limited idle speed duration to less than 3 min • Regularly recorded the fuel consumption of official vehicles
paper	• Encouraging online administrative service and online document signing • Print documents on both sides and reuse used paper









Reduce ship exhaust emissions

The hazardous cargo storage, and transportation service companies in the port may cause potential environmental hazards because cargo leakage accidents can cause harm to neighboring ecology and residents. Therefore, improving cargo management and port security has become a crucial task for Keelung Port. Companies operating in the port shall devise corresponding emergency response plans and organize joint disaster drills to increase their capability of addressing emergency events. The Keelung Branch of TIPC inspects stevedoring in the port from time to time and manages dangerous cargo in the port. In addition, the Branch contacts each port unit on a regular basis to develop emergency response plans for cargo leakage and improve the response capacity for responding to such events. The Branch stipulated that emergency response drills shall be organized once per year and a joint safety promotion twice per year.

According to statistics, 12 jointly supervised harbor safety drills were conducted in 2019, 12 harbor safety drill were conducted in 2020. The Branch also conducted emergency response drills for dangerous cargo every year in 2019–2020 and will keep conduct once emergency response drills per year and twice joint safety promotions per year.

4.3 Keelung Port Environmental Performance Index

Ten Significant environmental issues of the Keelung Port		Index item	Calculation method	Index target		Description of calculation	
						2019	2020
1	Air quality	Qualification rate of air quality indices: suspended particulate matter (PM_{10} and $PM_{2.5}$), SO_2, NO_2 and O_3,	Rate of air quality measurements meeting the Air Quality Standards (measured at harbor test stations)	• Minimum standard for daily average PM_{10}: 100.00%; • Minimum standard for daily average $PM_{2.5}$: 85.00%; • Minimum standard for hourly average SO_2: 99.95%; • Minimum standard for hourly average NO_2: 100.00%; • Minimum standard for hourly average O_3: 97.00%;		• PM_{10} daily average pass rate: 100.00% • $PM_{2.5}$ daily average pass rate: 100.00% • SO_2 hourly average pass rate: 100.00% • NO_2 hourly average pass rate: 100.00% • O_3 hourly average pass rate: 100.00	• PM_{10} daily average pass rate: 100.00% • $PM_{2.5}$ daily average pass rate: 84.38% • SO_2 hourly average pass rate: 100.00% • NO_2 hourly average pass rate: 100.00% • O_3 hourly average pass rate: 100.00
		Replacing old devices with energy-saving devices	Proportion of use of electric gantries or overhead cranes	A usage rate of 100%		• 4 electric-powered overhead cranes have already put into service, achieving 100% replacement	• 4 electric-powered overhead cranes have already put into service, achieving 100% replaceme
2	Dust	Frequency of street washer dispatches and water sprayers facilities inspection	Frequency of street washer dispatches and water sprayers facilities inspection	• Street washers should be dispatched for a minimum of 62 times • Water sprayers facilities should be subjected to a minimum of 4 inspections per season.		• Street washers: 248 dispatches • Water sprayers facilities inspection: 4 times per season	• Street washers: 248 dispatches • Water sprayers facilities inspection: 4 times per season
3	Noise	Daily qualification rate for harbor noise quality	Daily rate of qualified noise quality measurements at harbor test stations *the harbor plant site is a Type 4 noise control zone, meaning that noise is limited to 80 db during daytime (7 AM to 7 PM), 70 db during evenings (7 PM to 11 PM), and 65 db during nighttime (11 PM to 7 AM	Harbor noise quality: 100.00% seasonal daytime qualification rate, 95.00% evening, and 93.00% nighttime		• Daytime equivalent sound energy level (Leq): 100.00% • Evening Leq: 100.00% • Nighttime Leq: 100.00%	• Daytime equivalent sound energy level (Leq): 100.00% • Evening Leq: 98.81% • Nighttime Leq: 96.99%

Keelung Port Environmental Performance Index

Ten Significant environmental issues of the Keelung Port		Index item	Calculation method	Index target		Description of calculation	
						2019	2020
4	Port waste	General waste removed and recycling rate in the Port land area	Port waste removed from the port land area Port waste recycling rate in the port land area	3% port waste recycling rate in the harbor land area based on general waste removed		• General waste removed from the harbor land area: 841.58 ton • Amount of general resource recovery: 133,28 ton • General waste recycling rate in the port land area: 133.28/841.58=15.84%	• General waste removed from the harbor land area: 1,298.73 ton • Amount of general resource recovery: 105.26 ton • General waste recycling rate in the harbor land area: 105.26/1298.73=8.1%
5	Vessels waste	General waste removed rate in vessels per capita every month	Monthly average waste removed from vessels÷ Monthly average number of tourists × 100%	100% ratio of waste removed from vessels		• Waste removed from vessels per capita every month: 0.31 kg • Ratio of Waste removed from vessels: 100%	• Waste removed from vessels per capita every month: 0.51 kg • Ratio of Waste removed from vessels: 100%
6	Port development (land area)	Maintain the green area	Statistics of port green area over the years	Maintain the green area		• According to statistics, the port green area is about 1 hectare in 2019.	• In 2020, the port green area will be about 1.3 hectares.
		Recreation area	Keelung Port Ocean Plaza	Recreation area		• In 2019, the area of recreational area is about 0.8 hectares.	• In 2020, the area of recreational area will be about 0.9 hectares.
7	Vehicle Exhaust emissions	Exhaust emissions from entering and leaving the port	Comply with the rate of using self–management environmental label	Environmental label usage ratio		• Before August 5, 2019, 100% of trucks entering and leaving the port area are required to have self–management label.	• After August 5, 2019, there is no mandatory requirement to use the self–management label.
		Dust–proof nets are placed on truck body before leaving the port	The number of vehicles with dust–proof nets before leaving the port ÷ total number of vehicles with a port card × 100%	Rate of vehicles with dust–proof nets :95 %		• The total number of outbound trucks carrying fugitive cargo is 130,798 • 130,798 trucks covered with dust–proof nets before leaving the port (2 fines were imposed) • 130,796 vehicles ÷ 130,798 vehicles×100%=99.9%	• The total number of outbound trucks carrying fugitive cargo is 66,934 • 66,934 trucks covered with dust–proof nets before leaving the port (1 fines were imposed) • 66,933 vehicles ÷ 66,934 vehicles×100%=99.9%
8	Strengthen hazardous cargo management	Number of inspection container freight station managers	Number of inspection container freight station managers to implement self management plans	Number of inspection container freight station managers to implement self management plans,10 times per year		Number of inspection container freight station managers to implement self management plans,12 times	Number of inspection container freight station managers to implement self management plans,12 times
9	Community relations	Number of events, number of participants	Calculate the actual number of occurrences	Orgnized 2 events with More than 50 participants		Orgnized 2 events with More than 52 participants	Orgnized 2 events with More than 58 participants
		Environmental–related petition cases	Count the number of appeals related to the environment	The number of environmental appeals is less than 6		The number of environmental appeals is 0	The number of environmental appeals is 6

Keelung Port Environmental Performance Index

Ten Significant environmental issues of the Keelung Port		Index item	Calculation method	Index target		Description of calculation	
						2019	2020
10	Reducing ship exhaust gas emissions	Ratio of service vessels using low-emission fuels or biodiesels and the volume of low-emission fuels used by service vessels	• Number of service vessels using low-emission fuels (marine diesel oil or super diesel) ÷ total number of service vessels × 100% • Volume of low-emission fuels used by service vessels	100% of service vessels using low-emission fuels or biodiesels		• Ratio of service vessels using low-emission fuels: 100% • Service vessels owned by the Port of Keelung, TIPC: Shuttle Boat:2, deck barge:1 and cleaning vessels :2 • Service vessels using low-emission fuels (super diesel): 4 • Low-emission fuels used by service vessels and cleaning vessels: 13,968 L of super diesel • Marine diesel oil used by service vessels:0 L	• Ratio of service vessels using low-emission fuels: 100% • Service vessels owned by the Port of Keelung, TIPC: Shuttle Boat:2, deck barge:1 (no power), tug boat: 1 and cleaning vessels :2 • Service vessels using low-emission fuels (super diesel): 5 • Low-emission fuels used by service vessels: 12,134 L of super diesel • Marine diesel oil used by service vessels:0L
		Vessel speed restriction policy	• Number of inbound vessel speed restriction guidance activities held (communication records/work logs) • Number of meetings (through written) invitations for addressing vessel speed restrictions • Number of berth meetings addressing vessel speed restriction policies	At least maintain 100 meeting or through written propaganda letter per year		• Automatic reminders for inbound speed restriction are issued hourly, for a total of 8,760 messages. • Number of berth meetings (e.g. daily berth meeting) addressing vessel speed restriction policies: 248 times	• Automatic reminders for inbound speed restriction are issued hourly, for a total of 8,760 messages. • Number of berth meetings (e.g. daily berth meeting) addressing vessel speed restriction policies: 248 times
		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		Ratio of service vessels using shore power: 100%	Ratio of service vessels using shore power: 100%
		Ships deceleration target completion rate	The automatic identification system for ship deceleration is applied to determine the deceleration of ships within 20 sea miles from the port	The achieved speed reduction rate was 40%		The achieved speed reduction rate was 45.7%	The achieved speed reduction rate was 47.8%

05

Emergency Response

5.1 Emergency Response

In order to maintain port safety, Port of Keelung conducts daily land and marine environment inspection. When any suspicious behavior was identified, the inspection personnel will immediately notify for correction or inform competent legal authorities for legal enforcement.

In 2019 and 2020, major port accidents were construction site leakage and vessel collision (no spillage). For port pollution and disaster, Port of Keelung, Keelung City Environmental Protection Department, and the Northern Maritime Affairs Center of Maritime and Port Bureau of MOTC each accepts Public Nuisance Petitions.Regarding catastrophic events such as vessel or fire explosions, the Port triggers emergency response procedure to cope with disastrous incidence.

Accidental incidents at Keelung Port

Accident type/Year	2019	2020
Vessel collision, shipwreck, fire, oil and other chemical spillage	4	3
Ship machinery breakdown, tilt, strand	4	1
Major warehouse, storage tank explosion, fire, chemical spillage	0	1
Man overboard, occupational accident, sea drifter, others	4	9

Inspection statistics at Keelung Port

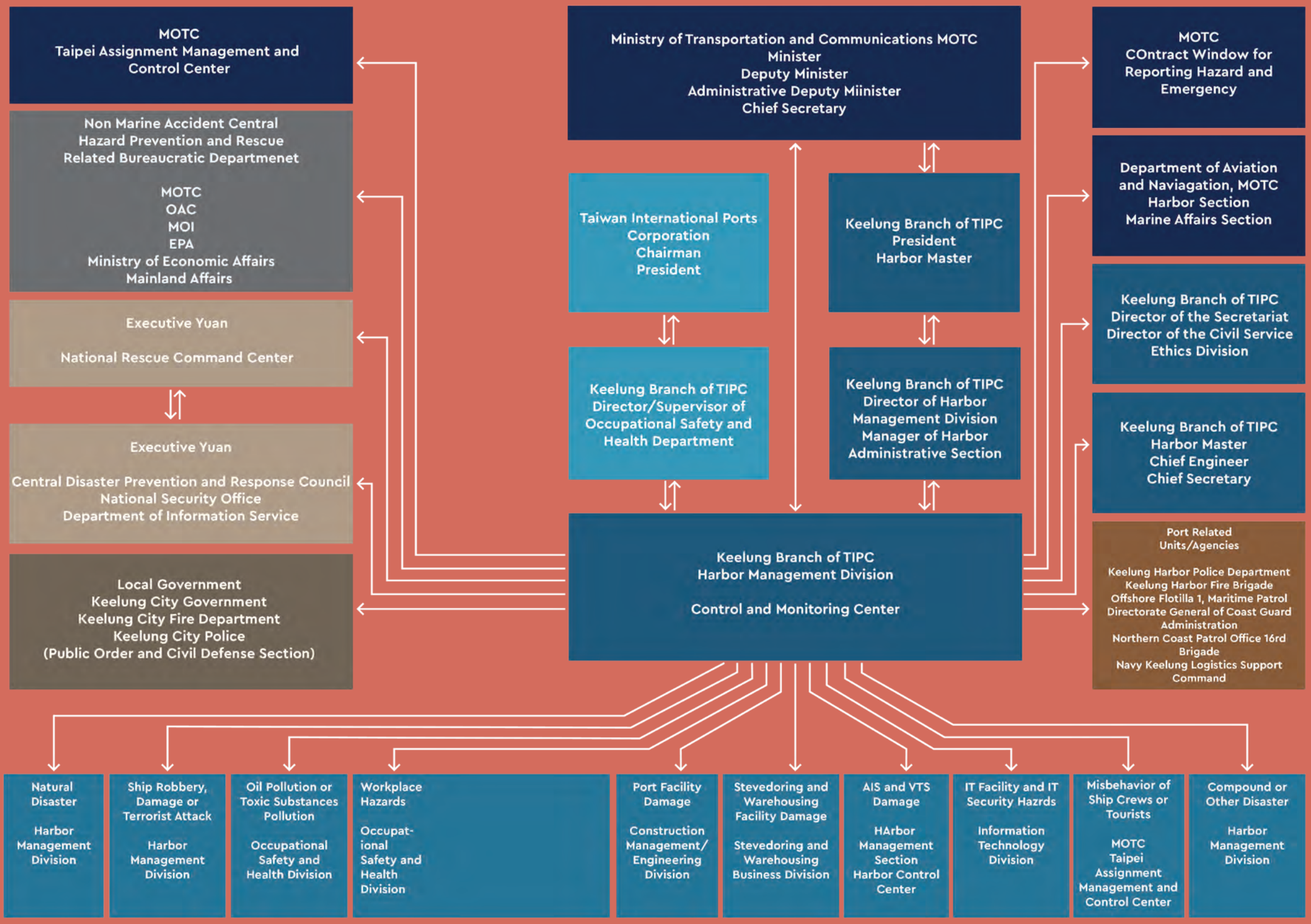
Inspection type	2019	2020
Port Environmental Inspection	1,001	773
Pollution Prevention Spot Check	0	0

To ensure port safety, the Branch Office imposed regulations on bulk stevedoring, increased the management of stevedoring, prevented overloading or leaking, and improved emergency response plans and communication mechanisms.

Keelung Port 's Drill record from 2019 to 2020

Date	Drill Record	Content
2017.1.24	Hazardous Cargo shortage and Industrial Pipelines Operation Audit	1. According to the results from "Hazardous Cargo Management System"Port of Keelung conducts unannounced inspections on the management of hazardous goods. 2. As part of the monthly joint safety inspections, Port of Keelung conducts unannounced inspections on the storage of hazardous goods and tracks improvements of companies.
2017.6.14 2017.6.16	Joint Safety Inspection with NMAC in 2017	In accordance with pertaining rules and regulations, Port of Keelung collaborates with the North Maritime Affairs Center (NMAC) of the Maritime and Port Bureau to conduct Joint Safety Inspection.
2018.6.1 2018.6.4	Joint Safety Inspection with NMAC in 2018	In accordance with pertaining rules and regulations, Port of Keelung collaborates with the North Maritime Affairs Center (NMAC) of the Maritime and Port Bureau to conduct Joint Safety Inspection.

Flow Chart for Disaster and Accident Notification in Port of Keelung



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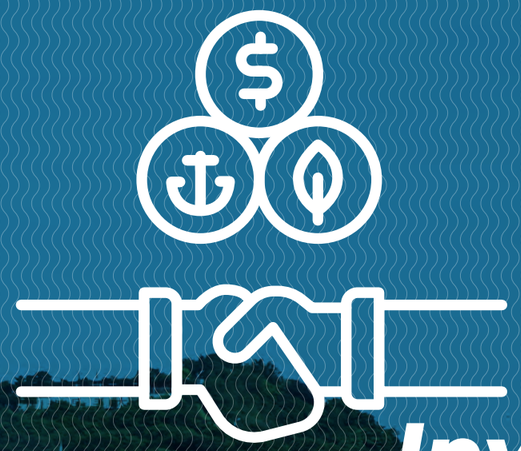


Involvement and Cooperation

6.1 The Historical Building Restoration and Re-use Construction Project of Keelung Harbor West2 and West3 warehouses Terminal

A. Attention/Motives

- To define the unique price of the history and culture of the port of Keelung.
- As the space of guiding the history and culture of city through repairing, reinterpreting.
- To achieve the propose of education and inheriting history.
- To satisfy with the general demands, and correspond with the sustainable and reusable price of culture heritage.

B. Solution

1. Use plenty of windows to take advantage of the natural light. (For example: ceiling suspension, outer wall use glass blocks.)
    - Reuse the steel structure to extend the service life.
    - Exchange air the inside/outside cold and heat by all heat exchanger, reducing the burden for the air-conditioner to save electricity.
    - To achieve the insulation from the roof to roof covering, reducing the burden of air-conditioning of 1st and 2nd floors.
2. Use widely of the green construction method.
3. Use the environment-friendly materials.-In order to reduce CO_2 emission in the construction procedure, choosing the steel structure.
4. Take on importance in the management and maintenance.

C.Execution schedule

Start：03/27/2019

Expected completion：02/2022

D.Investment amount

€ 20,611,053

E. Involving the 17 Sustainable Development Goals (SDGs) of the United Nations: (SDGs)：

SDGs Goal 11, "make cities and human settlements inclusive, safe, resilient and sustainable".

F.Effect/benefit

- Repairing the cultural space that provides international tourism services to promote the city's marketing.
- The unique peculiarity is the principle of the city.
- Become the window for international conversation.
- The window for urban culture.
- The expectation of the civilization.

G.Expectation effect.

- The continuing and the cultural investment preventing.
- Provide the resource for the local culture&historical studies.
- Build the open and leisure spaces in the city.

H.Involving environmental issues

- Strengthen the guiding system of the port of Keelung.
- The window of international communication and cultural tourism.

I.Relevant group

- Port operating unit, Keelung Port Police Corps.
- Residents of surrounding communities

Simulation pictures for West2 and West3 warehouses Terminal

6.2 Salute to the Sea-Coastal Cleaning and Maintenance Plan

A. Attention/Motives

Marine debris is a very important issue. Through the effects of the human disposal, terrain and the waves, debris are easily stuck in the bay to break the environment. The plans that wish to keep and protect the seafront environment and ocean resources, take both ocean protecting and relevant industrial development.

B. Solution

To maintain the cleanliness of the port of Keelung, the government regulated accurately of the clean frequency 'Clean everyday, immediately' that should be executed and supervised firmly.

C.Execution schedule

Cleaning the environment will be sustainable and periodical.
In accordance with Dealing With The Sea Project-Maintenance Of Coastal Cleanliness, the implement period is from 2020 until 2023.

D.Investment amount

2019 purchased no.737 cleanning vessel € 549,250.
2020 purchased no.739 cleanning vessel €587,577.

Cooperate with the Environmental Protection Administration Executive Yuan – Coastal Cleaning and Maintenance Project.

From July to December 2020, Keelung Port allocated approximately € 1,086,416 for coastal cleaning.

E.Effect/benefit

Coastline Cleaning of Keelung Port for approximately 14.35 kilometers.

In 2019, the total weight of coastal garbage removed at Keelung Port was 149.12 tons, and the average weekly removal of sea surface garbage was 2.87 tons of floating garbage; the land general waste removal volume was 841.58 metric tons, the recycle volume was 133.28 metric tons, and the garbage recycling rate was 15.84%.

In 2020, the total weight of the garbage removed from the coast of Keelung Port is 66.34 tons, and the average weekly removal of sea surface garbage is 1.28 tons of floating garbage; the general waste removal volume of land area reaches 1,298.73 tons, the recycle volume is 105.26 tons, and the garbage recycling rate is 8.1%.

F.Involving environmental issues

Garbage/port waste.

G.Participating company

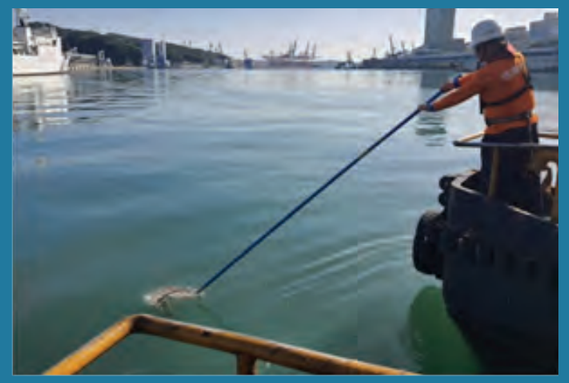
TIPC Keelung Port Branch.

H.Relevant group

Port operators, Shipping Business.

I.Involving the 17 Sustainable Development Goals (SDGs) of the United Nations: (SDGs)

SDGs Goal 14: Conserve and sustainably use the oceans, seas and marine resources
SDGs Goal 15: Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss.



Photos of environment cleaning work

6.3 Involvement and Collaboration

The Keelung Port 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, and academic seminar etc.

International Associations

Association of Pacific Ports (APP)

The APP aims to gather port authorities along the Pacific coast to discuss Pacific marine transporta- tion development, seeking solutions for problems.

The International Association of Ports and Harbors(IAPH)

The IAPH is a NGO with tre- mendous influence on global port authorities, IAPH also provide the advisory to the main bodies of UN (eg. ECOSOC, IMO , UNCTAD , UNEP , ILO, WCO). The IAPH holds biennial conferences alternately in America, Asian Pacific, and European and African regions.

Ports

Port of Dover

In 2011, the Port of Keelung, TIPC signed a memorandum of cooperation with the Port of Dover, which established a long-term relationship between the two parties in the areas of port risk management system deployment, risk management equipment development, safety management system development and audits, technical training, support, and environmental management systems.

Port of Hakata

The port of Hakata has been actively improving port affairs, IT systems, and relevant environ- mental protection measures in partnership with TIPC since 2014. For example, the ports have exchanged information on electrical RTG cranes, sunshades for mobile refrigerated containers, and hybrid straddle carriers.

Port of Yatsushiro

On August 10, 2015, Port of Keelung began sister port relations with Yatsushiro Port, becoming port partners. Together, they developed new shipping lines for container ships and cruise ships and mutually exchanged and cooperated in various areas, such as economies related to the development of the two ports

Academic Institutions

National Taiwan Ocean University

National Sun Yet-Sen University

National Cheng Kung 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.

Government

North Maritime Affairs Center

The Port of Keelung, TIPC and the Bureau of Environmental Protection of Keelung City collaborate in regular joint audits and drills in the port areas, and together assist the EPA in organizing relevant meetings and drafting proposals.

Environmental Protection Administration

The EPA, Executive Yuan collaborates with the US EPA in accordance with the "Agreement between the American Institute in Taiwan and the Taipei Economic and Cultural Representative Office in the United States for Technical Cooperation in the Field of Environ- mental Protection (1993)," and this partnership has led to development of a series of strategies relating to port environmental issues.

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 Keelung, TIPC worked with the Institute of Transportation on many projects such as "How factors of port areas services in Keelung harbor affect cruise passengers' satisfaction " and " The real-time acoustic wave and current profile monitoring system," etc.

Ocean Affairs Council

To promote multilateral negotiation between Central and Local Governments, Ocean Affairs Council was inaugurated in 2018 and , serving as the official governing body in charge of the planning("Smart Monitoring System in Harbor Establishment Project"), coordination and implementation of marine-related policies.

Wild Bird Society of Keelung

The Port of Keelung, TIPC has allowed the Wild Bird Society of Keelung to conduct an observation plan in the port's aquatic areas as part of a project to reconstruct black kite ecology at Keelung port.

Bureau of Environmental Protection, Keelung City

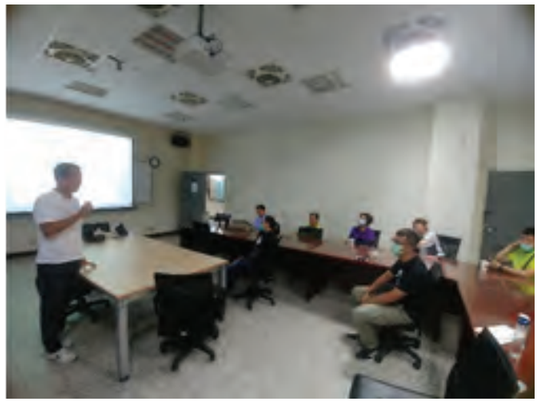
North Maritime Affairs Center, Maritime and Port Bureau, MOTC is in charge of Port safety, disaster rescue, pollution prevention services, responsible of decree execution, evidence collection, conducts joint spot check and pollution prevention drills.

07

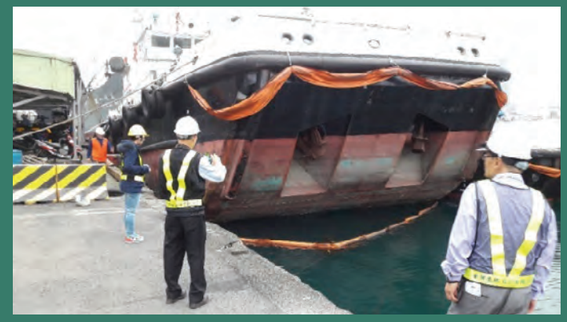
Training

7. Training

In order to enable employees to increase their awareness of environmental protection and enhance work safety to achieve lifelong learning, Keelung Port regularly organizes environmental education and training. The Environmental Education Law was promulgated in 2010 and will be implemented one year after it is promulgated. Public institutions and other relevant units should formulate environmental education plans each year, and each employee needs to participate in environmental education for more than four hours. Keelung Port will hold environmental education courses for internal and external personnel in 2019 and 2020. The total number of learning hours for all personnel exceeds 5,000 hours. The course includes video viewing, school and social environmental education, disaster prevention and rescue, nature conservation, pollution prevention, environmental and resource management, and carbon inventory.



Environmental Education / National Taiwan Ocean University Rainwater Park Environmental Education Activity



The drill in precaution against typhoon

Safety and health week activities

National Disaster Prevention Day Exercise

08

Communication and Publication

8. Communication & Publication

Promotion activities, seminars, workshops, publication, websites, and exhibitions have been organized to align Keelung Port with contractors and potential partners. Therefore, publishing relevant information of the port is helpful to the public, port companies, academic institutions, and subsidiary units.

Folk traditional belief festival donation activities

2020 Love You Love You Charity Parent-Child Drawing Competition

Held the launch ceremony of the "Discover Dream Cruise Island Hopping Tour"

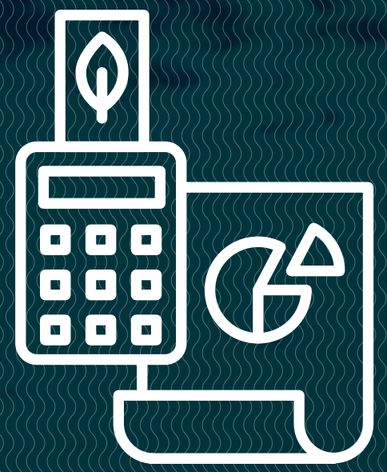
Cooperate with Earth Day to organize the Pure Mountain Hiking Activity

Joint stalls to promote ocean education concepts and port knowledge

Donate invoices charity event

110 Charity Sale for Caring Children, Love Garden Party in Keelung Area

Fish for everyone Charity Activities



09

Green Accounting

9.1 Environmental investment and cost

The investments made by the Port of Keelung, 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. The total cost expended by the Port of Keelung, TIPC for the environmental issues was € 1,167,679 and € 1,501,003 in 2017 and 2018, respectively.

Costs related to environmental issues at Keelung Port (Unit: €)

Items of Expenses	2019	2020
Personnel	607,354	661,665
Environmental Maintenance & Management	1,131,957	1.101
Environmental Monitoring	95,434	116,956
Pollution removal tools	5,772	13,654
Communication & Publication	580	3,940
Total	1,841,097	796,216

Costs related to Environmental Issues, Anping Port Branch Office in 2020 (Unit: €)

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

9.2 Environmental assets

Port of Keelung, TIPC has implemented a series of harbor development projects for Keelung Port to develop into a hub for cross-strait cargo ships and international cruises, Pan-Pacific logistics and distribution center and an environment-friendly green port. These projects can be further divided into development plan and plan for general construction and equipment purchase. In 2017 and 2018, the respective amounts of fixed-asset investment toward environmental issues made by Port of Keelung TIPC were €10,126,561 and € 8,579,541, as following:

Costs related to environmental issues at Keelung Port (Unit: €)

Year	Project name	Cost
2019	Keelung Harbor E3 & E4 Wharves Port Terminal construction project	10,246,735
	The Historical Building Restoration and Re-use Construction Project of Keelung Harbor West2 and West3 warehouses Terminal	218,122
	Port of Keelung W27 Warf Warehouse Construction Project	20,096
	No.737 cleanning vessel purchase	58,363
	Total	3,251,820
2020	Port of Keelung Navigation&Harbor Incubation Center Construction Project	106,358
	Dredging Works on Navigation Channel and Turning Basin and Construction Works of Dyke by Disposal of Dredged Material in Port of Keelung	1,396
	No.739 cleanning vessel purchase	58,350
	Total	13,901,494

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Improvement Recommendations

Sustainable operation is vital to Port of Keelung. Because the port adjoins Keelung City, Port of Keelung commits itself to cooperating with the local government and building a solid relationship with the locals to reshape the city into a world-class, ecofriendly port city and promote the development of tourism in Keelung by home port for international cruise.

Port of Keelung seeks to emulate the manner in which global ports are operated by diversifying its business based on its core port services while ensuring economic and environmental sustainability and undertaking social responsibility. By cooperating with the local government, Port of Keelung improves harbor environment and integrates the waterfront and the surrounding urban development in Keelung. Port of Keelung hopes to reshape Keelung into a more hospitable port city, enhance the port's reputation, and create a win-win situation for itself and the local government, businesses, and residents.

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

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