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Port of Hualien
Environmental Report

This environmental report presents Hualien Port's achievements in environmental protection from 2016 to 2018 as well as the environmental policy, commitments and action plans of the Hualien Branch, Taiwan International Ports Corporation, Ltd.

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

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Port of Hualien, Taiwan International Ports Corporation

Environmental Policy

The branch office of the Port of Hualien conducted interviews to communicate with stakeholders regarding their environmental protection policies and objectives. These interviews then served as evaluation guidelines for major issues and relevant procedures were implemented. Major stakeholder concerns were identified through these interviews and were taken into consideration by the office for environmental protection management. Additionally, critical issues were prioritized in addressing and responding to the expectations of the stakeholders. These measures were implemented to ensure positive and effective outcomes from communication with these stakeholders.

The office has committed to the continuous implementation of the following projects:

- Comply with related environmental laws and develop a green port.
- Adopt environmental friendly projects to abate emission and pollutants.
- Implement recycling and reuse policy to ensure resource sustainability.
- Establish audit and review system to ensure the continuous improvement.

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

Lu, Chan-Yu

President of Port of Hualien Taiwan International Ports Corporation, Ltd.

Message from the President of Port of Hualien Taiwan International Ports Corporation ,Ltd

The Port of Hualien is located on the east coast of Taiwan, where the natural environment is pure and clean and the location is suitable for maritime tourism and recreational sector activities. The port was given the Best Tour Experience award by the well-known British cruise industry magazine, Cruise Insight. The Port of Hualien is positioned as "the only international commercial port in Eastern Taiwan" and "a port that functions also as a tourist and recreational site" in its development. In addition to devoting itself to improving the quality and quantity of exports and imports in Hualien and Taitung, the Port of Hualien will actively develop itself into a tourist and recreational port, providing a waterside space accessible to the public.

Due to industrial development, technological progress, and substantial population increase have caused environmental disruption, climate anomalies, and continuous derivative disasters. To solve the problem of imbalanced environmental and economic development, the concept of sustainable development has presently become a crucial ideal worldwide. The Hualien Branch of TIPC actively include port construction into an eco-friendly consideration to create quality port spaces and facilitate local economic development.

The Hualien Branch of TIPC understands the importance of environmental sustainable development is profoundly recognized. In recent years, the geographic features of the port have been utilized to promote innovative environmental protection and energy conservation practices. For example ,water resources bank in Hualien Port ; construction of box culvert outer ring road ; combination of railways and maritime transportation. Experiences pertaining to the Port of Hualien can serve as an example for other ports. These experiences were recorded in the database of the ECO Sustainable Logistic Chain Foundation to serve as a reference for eco-port partners worldwide.

To fulfil corporate social responsibility, the Hualien Branch of TIPC provides 4.6 ha of port land for planning leisure districts. Furthermore, a bicycle pathway connecting the Qixingtan Beach and Liyu Lake was built to facilitate local development as well. These neighborhood-friendly actions show that the port can function as a waterside recreational space in addition to transporting cargo.

To implement the policy for facilitating green ports, the Hualien Branch of TIPC applied to the European Sea Ports Organization for EcoPorts certification in 2016. The Port of Hualien obtained certification from European EcoPorts International. A re-evaluation is scheduled to be completed in 2018. By collaborating with port-related organizations (e.g., shipping lines, businesses, the Maritime Port Bureau, and local governments), this Branch aims to reduce environmental pollution, enhance the quality of life among local communities, and achieve the goal of port sustainability.

Lu, Chan-Yu

President of Port of Hualien Taiwan International Ports Corporation, Ltd.

Stakeholder Analysis

The Hualien Port Branch discloses information through a multi-dimensional communication channel and an open and transparent way to ensure effective and good results in communication with stakeholders. In addition, we also attach importance to the expectations of the various stakeholders to the company, and focus on the issues of communication collected in the communication process, including the company's operations and promoting environmental management strategies, so that the company can implement corporate social responsibility. The company believes that only by establishing a smooth and effective communication channel with stakeholders can we grasp the pulse of the environment and continue to enhance our operations and create value.

Sector	Focus on issues	Corresponding top 10 environmental issues in Hualien Port
Government agencies	Dust; Vehicle emissions ; Ship emissions; Water resources; Hazardous Cargo	■ Abate port fugitive dust emissions ■ Reduce Ship Emissions ■ Transportation Vehicles Control ■ Improve air quality ■ Reclaim and Preserve Water Resources ■ Enforce Bulk Cargo Management
Employee	Environmental quality of life near the port area; Port area environment; Resource use	■ Abate port fugitive dust emissions ■ Reduce Noise Impact ■ Reclaim and Preserve Water Resources ■ Maintain Water Quality within the Port Area ■ Enhance Interactions with Local Communities ■ Clean up after typhoon
Client	Air quality; Vehicle emissions ;Goods spill; Port area safety maintenance; Water resources;	■ Abate port fugitive dust emissions ■ Transportation Vehicles Control ■ Improve air quality ■ Reclaim and Preserve Water Resources ■ Enforce Bulk Cargo Management ■ Maintain Water Quality within the Port Area
Community	Air quality; Noise; Vehicle emissions; Environmental quality of life near the port area	■ Reduce Noise Impact ■ Transportation Vehicles Control ■ Improve air quality ■ Enhance Interactions with Local Communities

Port of Hualien, Taiwan International Ports Corporation
Environmental Objectives and Commitments

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

- Abate port fugitive dust emissions—cut down dust emissions by increasing spraying at port operation area and keeping cargo handling vehicles clean.
- Reduce Noise Impact-Planting green belt as buffers and construct underground connecting roads to reduce noise pollution nearby the port.
- Reduce Ship Emissions-Require all duty vessels to adopt premium diesel and execute the Vessel Speed Reduction Surveillance System
- Transportation Vehicles Control-Install RFID automatic-gates and enforce vehicle emission visual identification inspection.
- Improve air quality—abate air pollution by requiring all port vehicles and machines to use diesel fuels with low sulfur content.
- Reclaim and Preserve Water Resources-Enhance rain water reuse facility and broadly adopt reclaimed water.
- Enforce Bulk Cargo Management-Reinforce the inspection of cargo spillage to avoid pollution from uploading and unloading processes.
- Maintain Water Quality within the Port Area-Develop the runoff water treatment system and execute the long-term ambient quality monitoring plan.
- Enhance Interactions with Local Communities-Disclose relevant information to local communities and provide opportunities for community participation.
- Clean up after typhoon-promptly clean up trash and garbage brought by typhoons.

The President, Port of Hualien, TIPC is responsible for the implementation, maintenance and effectiveness of the environmental issues, and also for reviews the environmental issues on an annual basis and adjusts the action plans based on the condition of the Port, so as to live up to the promises and improvements to achieve the environmental objectives.

Lu, Chan-Yu

President of Port of Hualien Taiwan International Ports Corporation, Ltd.

Port Profile

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History and Development

In early 20th-century of Taiwan, before the development of road and rail network, both trade and transportation were accomplished by sea. Due to the lack of suitable natural harbors on the eastern coast of Taiwan, steamships might lay their anchors at any point between estuary of the Hualien and Meilun Rivers, where Amis laborers would load the cargo onto barges and ferry it upstream. To expedite the shipment process, Japan's Imperial Diet passed a motion in 1930 to construct the Port of Hualien. Construction officially began in October of 1931, with three wharves completed by 1939. These wharves served for the export of sugar to Japan and the transport of goods locally around the island.

Once Taiwan's period of Japanese colonial rule had come to an end, the Taiwanese govern-ment was free to open the Port of Hualien to international trade, which it did on September 1, 1963 in a bid to facilitate economic and industrial development in the region. Over the years, Hualien Harbor has undergone four separate expansion projects to relieve congestion from steadily increasing cargo ship traffic, with the final project completed in December of 1991. The port now boasts 25 wharves, each serving freighters carrying 30,000–100,000 tons – easily enough capacity to support Eastern Taiwan's still-burgeoning industrial economy.

Port Location and Port Area

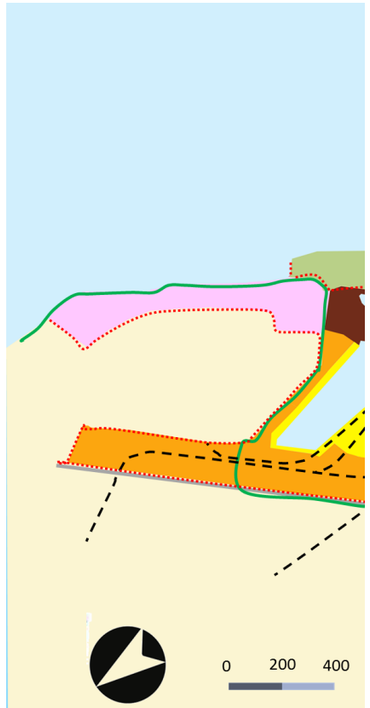
The Port of Hualien situates in northeastern Hualien, Taiwan (23°59'11"N, 121°37'35"E). Embedded by the Pacific Ocean to the east and Meiluen Mountain to the west, the Port of Hualien is the only international commercial port in Eastern Taiwan. The overall area of the port is 309 ha (land area: 172 ha; waterside area: 137 h a)

Ships enter the inner harbor through a northward narrow waterway from the outer harbor. In the inner harbor zone, 16 wharves exist, where the water depth is 6.5–10.5 m and the wharf length is 2.5 km. The outer harbor contains 9 deep-water wharves, with 12–16.5 m deep and 2.3 km of wharf length.

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. In March 2012 the maritime system changed to a "separation of government and corporation" method. Previously publicly managed organization was transformed into state enterprise organizations, which combined port operation originally under Keelung Port Bureau, Taichung Harbor Bureau, Kaohsiung Harbor Bureau, and Hualien Harbor Bureau into a company managed system (Taiwan International Ports Corporation). This solved previous problem of commercial ports being limited by legal and system restrictions, which caused an inability to respond to market changes and decreased competitive strength.

After restructuring of the Hualien Port Bureau, stevedore operation business is now the responsibility of the Port of Hualien, TIPC. Maritime administration, operation items, and public authority within the harbor are handled by the East Taiwan Maritime Affairs Center of the Maritime and Port Bureau (MPB).



▲Master plan of Port of Hualien


Cruise night scene


Installation art


Installation art

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Commercial Activities

Currently, the Port of Hualien consists of 25 wharves, among which some have multiple functions, and others were mainly built for stevedoring bulk cargo and wood. The major commer-cial activities in the port include the transportation of aggregates (sand and gravel), ship building and repair. The incoming and outgoing cargos for stevedoring primarily include dry bulk, petroleum, general cargo, and ores. The commercial activities in the port include tourism, recreation, and the storage and transportation of cement, ores (sand), and stone.

The Hualien Branch of the Taiwan International Ports Corporation (TIPC) has also been actively stimulating tourism by leasing out underutilized facilities for recreational use. Opening such unused wharves to alternate commercial uses enables the tourism industry to capitalize on offshore recreational opportunities, such as conducting sightseeing tours of Hualien's skyline from a cruise ship at night.

*Main Commercial Activities and Cargo Handling of Port of Hualien

Commercial Activities	Cargo Handling
Aggregates (sand, gravel)	Dry bulk
Storage and transportation	Petroleum / Oil products
Ship building and repair	Ores(coal)

*Inbound Main Cargo of Port of Hualien

Cargo type	2016	2017	Difference	%
Minerals products	1,371,418	1,208,429	-162,989	-11.9%
Bamboo , rattan and wood products	892,720	998,741	106,021	11.9%
Base metals & articles of base metal	6,866	157	-6,709	-97.7%
Chemical or related industrial products	830	891	61	7.3%

Main Cargoes

In 2016, the major incoming cargo in the Port of Hualien from other countries included mineral products (60.37%) and wood, bamboo and rattan products (39.30%). In 2017, the major incoming cargo remained the same, including mineral products (54.72%) and wood, bamboo and rattan products (45.23%).

Cruises

In recent years, the international cruise market has seen marked growth in the Asia-Pacific region. In keeping with this trend, the Port of Hualien not only serves the regularly scheduled Lina cruiseliner (traveling the so-called "Blue Highway" between Su'ao and Hualien), but also receives large international cruise ships. The number of international travelers passing through the Port of Hualien surpassed 23,000 in 2016, and again in 2017.

*2016-2017 Business of Port of Hualien

Business item		2016	2017	Comparison between 2016 and 2017	
				Actual number	%
Incoming & outgoing Ships	Total number of ships(vessel)	2,172	1,818	-354	-16.3%
	Total tonnage(tonnes)	22,430,462	19,305,862	-3,124,600	-13.9%
Cargo throughput	Imported cargo(tonnes)	2,271,894	2,208,331	-63,563	-2.8%
	Exported cargo(tonnes)	1,430,013	1,097,573	-332,440	-23.2%
	Domestic cargo(tonnes)	5,987,098	5,359,910	-627,188	-10.5%
	Total (tonnes)	9,689,005	8,665,814	-1,023,191	-10.6%
Number of travelers	Number of domestic line travelers (number of people)	88,876	55,752	-33,124	-37.3%
	Number of international line travelers (number of people)	28,442	23,698	-4,744	-16.7%
	Total number of travelers (number of people)	117,318	79,450	-37,868	-32.3%

Environmental Management

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Organizational Structure

The Hualien Branch of TIPC consists of 9 divisions, including Port Business Division, Harbor Management Division, Construction Management/ Equipment Department, Information Technology Division, Occupational Safety Department, Personnel Division, Civil Service Ethics Division, Accounting Division, Secretariat Division. In the Hualien Branch of TIPC, the department responsible for the operation and management of the environment is the Occupational Safety Department that consists of the Safety and hygiene Section, Environmental Safety Section.
The Safety and Hygiene Management Section is in charge of management of occupational safety and hygiene; the Environment Safety Section deals with pollution control, environmental law, EIA, ambient monitoring, emergency response ,environmental education, plant conservation, waste treatment and recycling.
The Hualien Branch of TIPC is in charge of managing the environment of the Port of Hualien.

However, environmental aspects involve the division of responsibilities among different agencies. In addition to the Hualien Branch of TIPC, agencies responsible for environmental aspects include the East Maritime Affairs Center of Maritime and Port Bureau (MPB), Environmental Protection Bureau of Hualien County Government, Environmental Protection Administration, Ocean Affairs Council ,Coast Guard Administration, Maritime Patrol Directorate General, 6th offshore Flotilla, Coastal Patrol Directorate General, Eastern Coastal Patrol Office 12nd Brigade, Hualien Harbor Police Department of National Police Agency, Hualien Harbor Fire Brigade of National Fire Agency, East Control of Centers for Disease Control.
Based on the Commercial Port Act, the MPB and the Hualien Branch of TIPC are responsible of Hualien Port's environmental management, which the Hualien Branch of TIPC is in charge of port operation related issues and the MPB is in charge of port authority related issues.


Interview with 6th offshore Flotilla 2018-4-23 14:10


Kickoff meeting for eco port application

*Functions of the Divisions of the Hualien Branch of TIPC

Division	Description
Port Business Department	Port development, stevedoring, promotion of private investments and operations in the port, passenger clearance services
Harbor Management Department	Management of port security , navigation safety and berth scheduling
Information Technology Department	Development and maintenance of information systems and equipment
Construction Management/Engineering Department	Port construction project management and repairs; maintenance and management of electrical and mechanical engineering equipment, ship machinery, and other machines.
Occupational Safety Department	ort environmental protection, pollution control, and occupational safety management
General Affairs Department	Management of general affairs ,human resource management , auditing revenues and expenditures in the budget and final accounts for the Hualien Branch of TIPC
Civil Service Ethics	Prevention, inspection, and punishment related to civil service ethics

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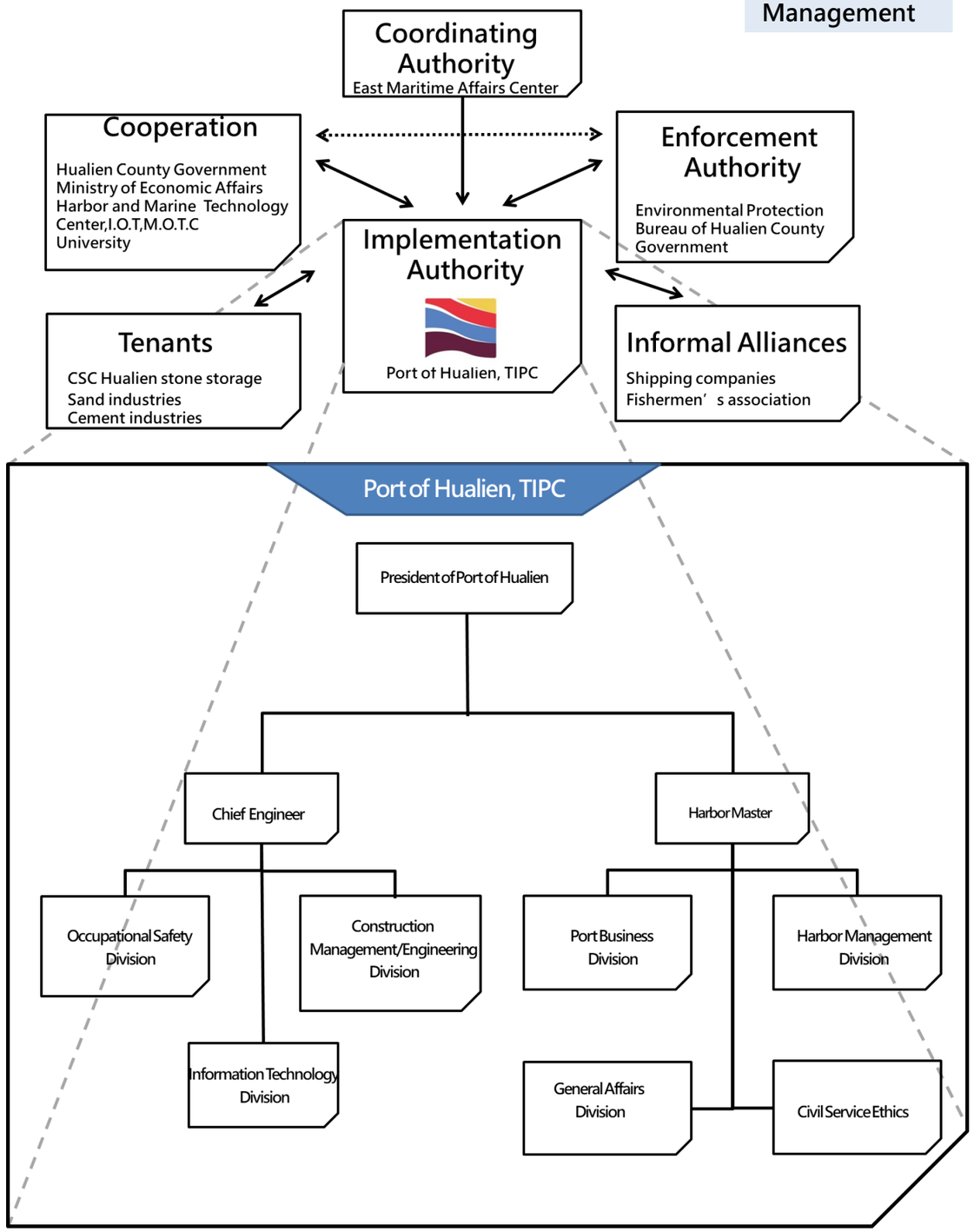

Environmental Regulations

The Hualien Branch of TIPC 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.

The Hualien Branch of TIPC also regularly identifies and updates port environmental issues related to changes in domestic laws and regulations, participates in environmental protection public hearings, and shares pragmatic Port practices; currently applicable regulations are aggregated as follows:

Regulations			Central Competent Authority	Local Law Enforcement Agencies
Sectors in the Ministry of transportation and communications	The Commercial Port Law	2011/12/28	Ministry of Transportation and Communications	East Maritime Affairs Center, Maritime and Port Bureau, MOTC
	The Law Of Ships	2010/12/08		
	Shipping Act	2014/01/22		
Sectors related to agricultural	Wildlife Conservation Act	2013/01/23	Council of Agriculture	Agriculture Bureau, Hualien City Government
Sectors in the Ministry of the Interior	Fire Services Act	2011/12/21	Ministry of the Interior	Hualien Harbor Fire Brigade
Sectors related to environmental protection	Marine Pollution Control Act	2014/06/04	Ocean Affairs Council	Environmental Protection Bureau, Hualien City Government
	Basic Environment Act	2002/12/11	Environmental Protection Administration	
	Air Pollution Control Act	2018/08/01		
	Toxic Chemical Substances Control Act	2013/12/11		
	Indoor Air Quality	2011/11/23		
	Water Pollution Control Act	2018/06/13		
	Waste Disposal Act	2017/06/14		
	Soil and Groundwater Pollution Remediation Act	2010/02/03		
	Noise Control Act	2008/12/03		
	Environmental Impact Assessment Act	2003/01/08		
	Greenhouse Gas Reduction and Management Act	2015/07/01		
	Environmental Education Act	2017/11/29		
	Environmental Agents Control Act	2016/12/07		
	Public Nuisance Dispute Mediation Act	2009/06/17		Public Nuisance Disputes Mediation Committee, Hualien City Government
Intersectoral	Disaster Prevention and Protection Act	2017/11/22	Hualien City Government	

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Environmental Management Documents

To comply with the acts and regulations specified by competent authorities, the TIPC has formulated related plans, management guidelines, and standard operating procedures. In addition to following the aforementioned regulations, the Hualien Branch of TIPC has drawn up environmental management documents according to the current operating system to establish and implement an environmental management system for EcoPorts. By doing so, the Branch aims to effectively manage and continuously improve the environment.

Related regulations are implemented individually by different divisions to reduce the impact of pollution caused by port operations.

TIPC

- Development and Construction Plan for International Commercial Ports in Taiwan (2012~2016)
- Green port action plan of TIPC
- Work management program of dust prevention of TIPC
- Management manual of ships cargo handling industry set up
- Practice Statement of Stevedoring and Warehousing of TIPC
- International Commercial Port handling of dangerous goods storage facilities operating points of TIPC
- Key Points Regarding Public Angling
- Shipwreck Disaster Prevention Business Plan of TIPC
- Major Oil Pollution Disaster response of TIPC
- Toxic Chemical Spills Response Plan of TIPC
- Guidelines for Port Pollution Prevention and Inspection of TIPC
- Management program of environmental pollution and legacy waste cleanup in stevedoring and warehousing of TIPC
- Operation of staying and leavung in the shipyard of TIPC
- Health and Safety Code of Practice of TIPC
- Guidelines for the Inspective and Evaluation Visits of Occupational Safety and Health, Environmental Protection, and Port Safety of TIPC
- Procedure of Pollution Incident Notification and Handling of TIPC
- Regulations on the Management of Occupational Safety and Health for Contractors of TIPC
- Application and instructions of international pot passport
- TIPC Procurement Operations Manual
- TIPC Guidelines for Excavations for Port Roads, Wharves, and Other Facilities
- Guidelines for Handling Public Grievances of TIPC
- Standard Operation Procedure and Response Mechanism for Media Coverage of TIPC
- Implementation Guidelines for Staff Training of TIPC
- Training Program for Talent Development of TIPC
- Advanced Training Program for Talent Development of TIPC
- Annual Education and Training Program of TIPC

Hualian Branch of TIPC

Port Business Division

- Guidelines for Port Pollution Prevention and Inspection, the Hualien Branch of TIPC
- Practice Statement of Stevedoring and Warehousing, the Hualien Branch of TIPC
- Feasibility and Planning Report of the Application for Establishing Free Trade Zones in the Port of Hualien

Harbor Management Division

- The rule on dangerous goods loading
- Application of transporting dangerous goods, the Hualien Branch of TIPC
- Application and instructions of international pot passport, the Hualien Branch of TIPC
- Application of Ship repair in Hualien
- Safety and Application Instructions for Fishing Activities at the Eastern Breakwater in the Port of Hualien
- Regulations on the Scheduling of Harbor Tugboats at International Commercial Ports (Port of Hualien)
- Ship Mooring Operation Guidelines, the Hualien Branch of TIPC
- Guidebook for Ships Entering and Leaving the Port of Hualien
- Operating Procedure for Controlling Ferries Entering and Leaving the Port of Hualien
- TIPC Guidelines for Berthing During Typhoons and the Operational Outline for the Port of Hualien

Occupational Safety Division

- Cleaning and Pollution Control Guidelines for Ships Berthing in the Port, the Hualien Branch of TIPC
- Guidelines for Port Pollution Prevention and Inspection, the Hualien Branch of TIPC
- Management Guidelines for Occupational Safety and Health, the Hualien Branch of TIPC
- Port Area Pollution Prevention and Reduce Measure Project
- Work management program of dust prevention, the Hualien Branch of TIPC
- Emergency Response Plan for Marine Pollution in the Commercial Port Waters, the Hualien Branch of TIPC
- Guidelines for Applying the Collection of Waste from Ship Kitchens and Crew Living Quarters in the Hualian Branch of TIPC
- Working Guidelines for General Waste Recycling in the Hualian Branch of TIPC
- Procedure for Controlling and Cleaning Stevedoring-Induced Environmental Pollution and the Remaining Waste

Continuous Improvement

04/

Environmental Monitoring

The most significant environmental issues affecting the Port of Hualien are air pollution, noise pollution, and sewage runoff, as well as waste management and resource conservation. Importantly, these challenges also create the need for a strong public relations strategy. To understand the environmental changes in the port and surrounding areas over the years, the Hualien Branch of TIPC launched the Hualien Harbor Environmental Quality Monitoring Integration Program in 2015. For the program, the Environmental Protection Administration (EPA) commissioned certain environmental testing organizations to gather data on important indicators in the area surrounding the port, including air quality, noise levels, water quality, sediment composition, and biodiversity.

Environmental monitoring is conducted to determine the effects of various pollution sources, providing crucial information for environmental management and pollution prevention and mitigation.
The harbor close to Hualien City presents potential noise generated by vehicular traffic. To monitor this traffic, the Hualien Branch of TIPC has set up around-the-clock surveillance cameras on the main road and along restricted areas, as well as noise monitoring stations at Sentry Posts No. 17 and 24. The Hualien Branch of TIPC has invited environmental professionals and researchers to review the project and provide suggestions. As part of its ongoing commitment to transparency, TIPC publishes its annual environmental monitoring report on its website.

***Hualien Port Environmental Monitoring Program**

	Monitoring item	Monitoring frequency
Air Quality	TSP(Total suspended particulates) ,PM_{10} , $PM_{2.5}$,SO_2 , CO , O_3 , No_x , NO , NO_2 , temperature , humidity , wind speed , wind direction , rainfall	Monthly , 24-hr duration
Noise	Environmental sound volume criteria (Daytime $L_{eq,}$, Evening L_{eq}, Nighttime L_{eq} , Full Range L_{eq}), Low frequency noise *Equivalent Energy Sound Level (L_{eq})：It refers to a specific period within the measured volume of the average energy	Monthly , 24-hr duration (weekday and weekend) Using 2 sets of 24-hr automated and continuous monitoring systems
Water Quality	<General item> Velocity of flow, Flow direction , Water temperature , pH ,DO,BOD,E-coli , NH_3-N,TP, cyanide, Phenols, Mineral oils ,SS , salinity, Nitrite , Nitrate , Detergents(Anionic surfactant interface) Etc. <Heavy meatal item> Cd , Pb ,Cr^{6+},As , Hg , Se , Cu , Zn , Mn , Ag..etc.	Quarterly
Sediment	<General item> Particle size analysis、Water Content、specific weight、Fixity solids ,Volatile solids、pH、TN、TP、Total lipid、Phenols, Total organic Etc. <Heavy meatal item> Cu , Cd , Pb , Cr , Zn , As , Hg , Se, Mn , Ag , Al etc.	Quarterly
Ecology	Concentrations of heavy metal in phytoplankton, zooplankton,, benthos（Cu , Pb , Cd , Zn ,Ni , Cr, Hg , As）	Quarterly


Air quality monitoring


Noise monitoring


Water quality/Sediment sampling

04/ Continuous Improvement

Improvement Strategy of Air Quality

A series of pollution control measures have been introduced to improve air quality in the Port. These measures include a campaign to reduce vessel speeds, a shore-side electric power supply system, the use of low-sulfur fuels, and an automatic gate control system. To prevent suspended particles emissions, the port now requires all operators to use dust control meshes, dust suppression sprinklers, car washing stations, water lanes, enclosed conveyors, and unloading facilities.

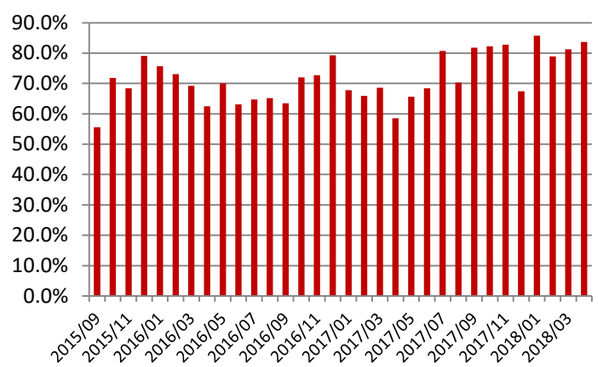
The Port offers its full cooperation with other government **agencies at both the local and national level – such as Ministry of Transportation's Maritime Port Bureau or the Hualien County Environmental Protection Bureau (EPB) – especially with regard to pollution prevention and auditing measures. The Port also collaborates with the EPA in evaluating the efficacy of air and marine pollution control programs.**

Vessel Speed Reduction

To reduce air pollution and greenhouse gas emissions from ships, the Port of Hualien has been actively promoting its Vessel Speed Reduction (VSR) Policy and established an automatic identification system (AIS) in 2015 to record the speed of inbound and outbound ships. With the AIS system, the Port of Hualien can receive real-time data to monitor the speed of ships that are approaching the port's 20nm radius and notify the ships for speed reduction through either text messages or port's broadcasting system. The Port of Hualien also makes use of the Port Affairs Meetings and Berth Allocation Meetings to promote the VSR Policy.

The Port of Hualien VSR Policy requires ships within 20nm radius to reduce speed to under 12knots. This policy began in September 2015, and the VSR achievement rate has reached an average of 72% by April 2018.

* Results of vessel speed reduction program



Reduce Vehicle Emissions

Vehicle air pollutants come from vehicle fuel combustion or evaporation. Approximately 400,000 vehicles enter and leave the Port of Hualien annually(2016-2017). Therefore, the port has installed an automatic gate control system at the inbound and outbound to save time and fuel. The system reduces the passing time of each vehicle by 70 sec (7,700 hours in total). Moreover, approximately NTD 1.23 million of fuel can be saved. Reduce about 120 tonnes of carbon dioxide emissions annual

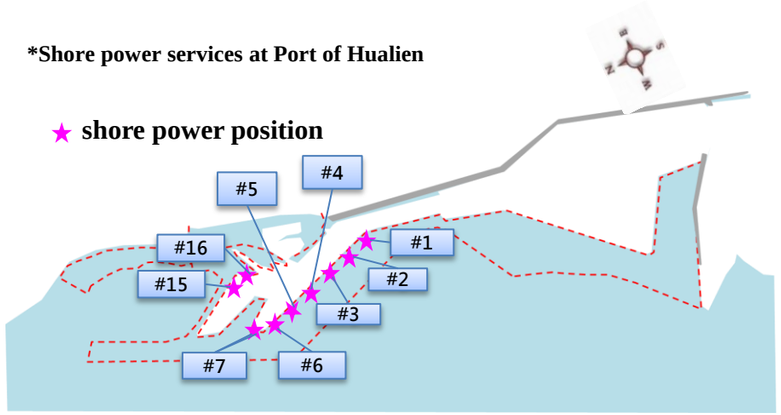
***Note: If the fuel consumed during idling is calculated at 6 L per hour and one liter of diesel costs NTD 19; for every vehicle passing the sentry post, 0.1167 liter of gasoline and 304.4g of carbon emissions are saved, which considerably decreases environmental pollution and port operators' idling time for accessing the port.**


Automatic gate control system

Low-sulfur Fuel and Shore Power

Low-sulfur fuel and shore power have been comprehensively implemented among harbor crafts in the Port of Hualien. All Wharves No. 1–4 are already equipped with shore power systems for harbor crafts. In addition, Wharves No. 5–7 have been installed with shore power systems along with the relocation of the Coast Guard Administration. Ships docking at the wharves can turn off their diesel engines to reduce carbon emissions. There are currently 6 seats in No. 1–4 Wharves of the shore power, 7 in the No. 5-7 , and 6 in the No. 15-16 , for a total of 19.

*Shore power services at Port of Hualien



Reducing Leakage of Cargo Stevedoring

The Hualien Branch of TIPC takes a number of steps to ensure safety on port grounds and support its environmental management efforts, including: monitoring surveillance cameras placed throughout the Port; assigning personnel to conduct regular environmental inspections; and requiring and enforcing written agreements with tenants to observe all environmental laws and regulations.
To control dust emissions and reduce air pollution, grab operators shall not open the grabs highly.

Conveyor operators shall install a cover at the output opening. The output opening shall be within 1 meter above the upper edge of the truck beds. Dust covers should be firmly wrapped and fastened to the vehicle, with a margin of at least 15 cm extending down below the upper edge of the carton. In addition to the loading and unloading operations anti-blanking separator shall be installed to avoid the discharge of contaminated waters from entering the basin .


Vehicles covered with dust-control fabric


Environmental inspections

* Inspection and Jointly Supervised Safety Drills

Item	2016	2017
Number of harbor inspections	246	243
Number of joint safety supervision	12	12


Dust-control mesh

04/ Continuous Improvement

Dust Reduction

All the stevedoring operators in the Port of Hualien have installed concealed warehousing and conveyor systems. For example, Asia Cement Corporation has set up a enclosed conveyor belt at Wharves No. 10 and 18 and a concealed warehousing facility at Wharf No. 19. Taiwan Cement Corporation has installed a concealed fixed conveyor rack at Wharf No. 13 . China Steel Corporation has installed a enclosed conveyor belt in the rear area of Wharf No. 11. At Wharves No. 17, 20, 21, and 22, sand industries have installed concealed ship lifts, which are effective in abating pollution from cargo handling operations.
To reduce dust generated by the sand and gravel storage site and traffic in the port, the Port of Hualien has installed mobile anti-dust sprinklers in the sand and gravel storage area, regularly sprinkling the site to continuously moisten the materials and requiring that cargo handled on site be moistened by automatic sprinkling and water screens. The sand and gravel storage site of the port is equipped with its own truck washing facilities.
Statistics show that approximately 2,164,000 &1,630,000 tonnes of sand and gravel in total were stacked at the site in 2016 & 2017, indicating a decrease of 91 tonnes of discharged particulate pollutants. In addition, the Hualien gravel site of China Steel Corporation handles approximately 835,000 & 737,000 tonnes of gavel in 2016 & 2017. A sprinkling system with a ground net is used to keep the ground surface moist, and approximately 38 tonnes of particulate pollutants are reduced totally.

*Dust Control Efficiency of Sand and Gravel

Unit : tonne/year

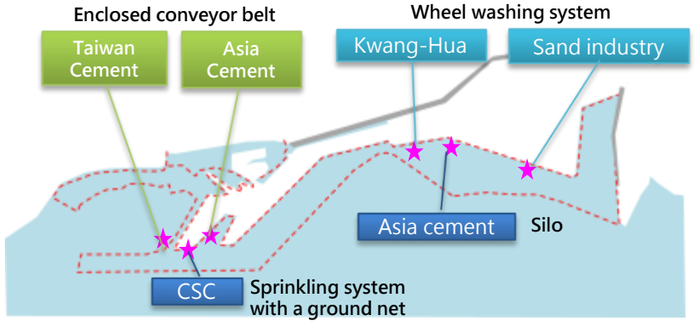
Type	Amount of sand	Amount of suspended particles emissions*	Amount of suspended particles controlled **
Sand industries	3,794,000	227.6	91.1
Hualien sand site of China Steel	1,572,000	94.3	37.7
Total	5,366,000	321.9	128.8

* Emission factor(0.06kg/tonne) :EPA gravel acquisition and processing industry suspended particles pollutants Prevention Technical Manual (P9)
** Dust-proof efficiency40% :Large exposed to suspended particles matter emission characteristics and technical feasibility study of control


Enclosed conveyor belt


Automatic watering system

★ Tenants

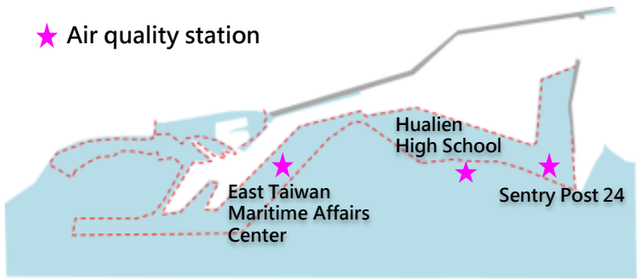



Car washing lane

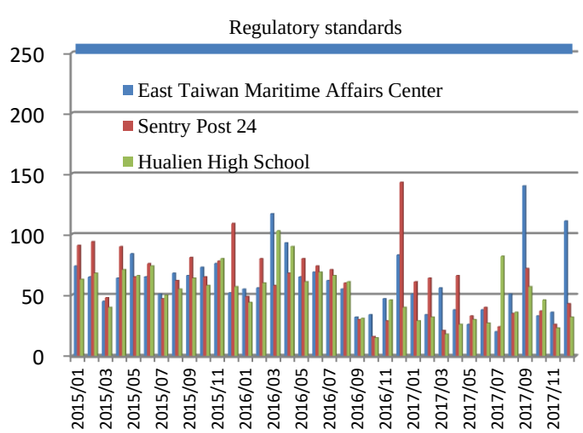
Air Quality Monitoring

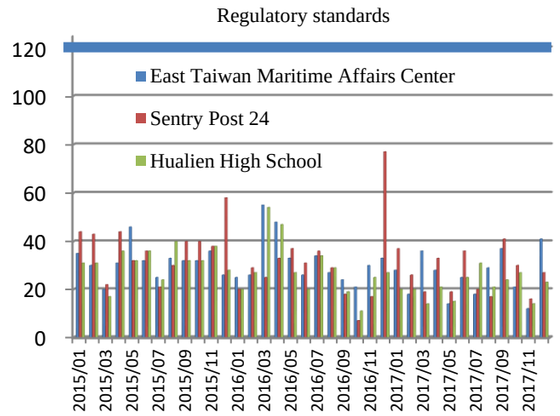
The air pollution in the Port of Hualien mainly derives from vessel, as well as exhaust discharge and suspended particles from vehicles used by port operators. Longterm scientific environmental monitoring data should be established to examine and maintain local air quality. The Hualien Branch of TIPC monitors air quality to review the improvement of pollution reduction. From 2015, Hualien has been set up 3 monitoring station at Sentry Post 24, Hualien High School, and East Taiwan Maritime Affairs Center to monitor items of TSP、PM_{10}、$PM_{2.5}$、SO_2、NO_2、CO and O_3. It shows that all results are in compliance with air quality standards.

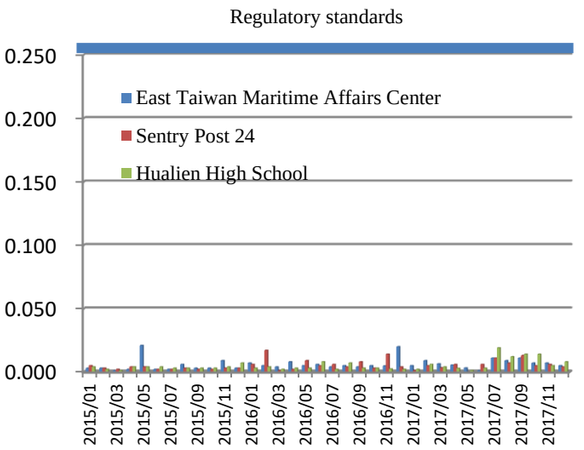
*Air quality monitoring station

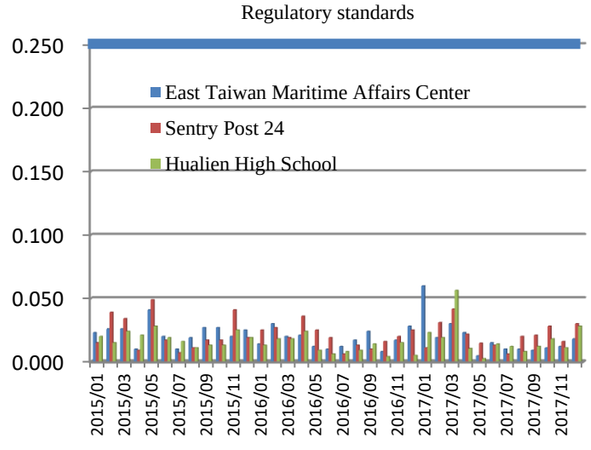


*Air quality monitoring results









04/ Continuous Improvement

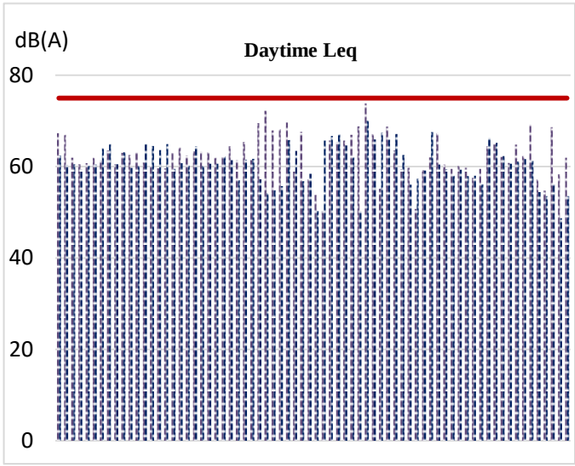
Noise Reduction Improvement Strategy

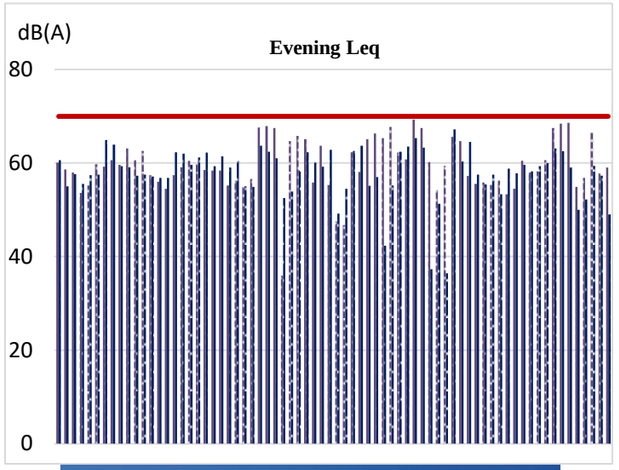
After the outer ring road along the northern coast was built, vehicles change their route to the underground road, thus reducing the air and noise pollution suffered by communities along the northern coast, ensuring the safety of people and vehicles, and quality of life of the community.
In addition, access roads to the Port of Hualien have been built to separate port traffic from the commuting routes of nearby residents. A green belt, railings, bicycle pathway, promenade, and jogging trail have been built upon the box-culvert road.
In addition to its extensive, ongoing environmental monitoring and management work, the Port is also deeply invested in the surrounding community. To mitigate the impact of the commercial and industrial activity it generates, the Port has constructed an 11-acre green belt between it and the neighboring residential community. This green belt serves as a noise barrier and, more importantly, as a green buffer zone between the Port and the local residents.

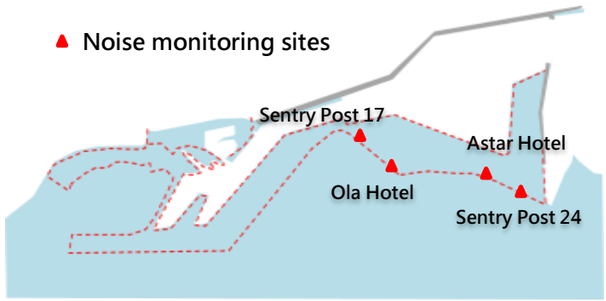

Outer ring road along the northern coast

Noise Monitoring

The Port of Hualien is adjacent to Hualien City, consequently the noise generated by cargo transportation tends to affect the living quality of nearby residents. In addition, public grievances from neighboring residents about noise pollution have been frequent. The Port of Hualien is classified into the Regulated Area of Category D, and four monitoring stations have been established around the port. All results of the Port of Hualien in 2016 & 2017 met the noise control standards as well.





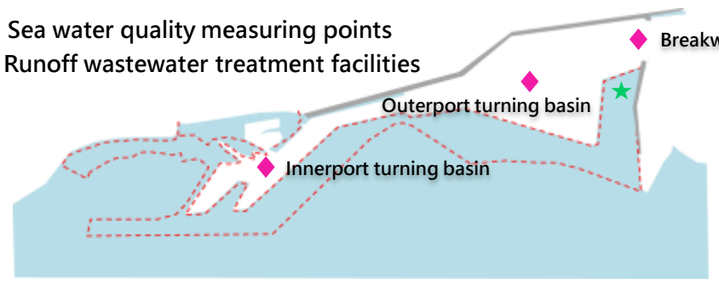


Water Quality Improvement Strategy

Water in the port may be contaminated by ship discharge or upstream municipal pollutants. The Hualien Branch of TIPC will continue to abide the Hualien EPB's wastewater policy and discharge its municipal wastewater to the public sewage system . In accordance with the EPA's Port Pollution Prevention and Reduction Measures, the Hualien Branch of TIPC has planned to build a runoff wastewater interception and treatment system to reduce runoff wastewater-induced pollution during rain gusts. In 2015, the Branch completed the runoff wastewater collection system at Wharf No. 25 in the outer harbor. The system can treat 500 CMD of water and reduce 90% of suspended solids. Another runoff collection system is scheduled to be built at Wharves No. 23 and 24 in 2016.

During oil unloading operations, ships in the Port of Hualien are required to place oil booms around them to effectively prevent oil leaks and pollution caused by operational accidents. The Port of Hualien has not experienced any vessel fuel leaks in the past 3 years, and the water in the port has been maintained clean.
The Hualien Branch of TIPC regularly organizes marine pollution emergency response drills every year, continuously promotes the commissioning of wastewater and sewage treatment, and improves the control over ship waste disposal and the treatment of waste oil and sewage . The management of all ship waste, waste oil in the port is commissioned to qualified service providers.

* Locations of water quality monitoring sites and runoff wastewater interception and treatment system

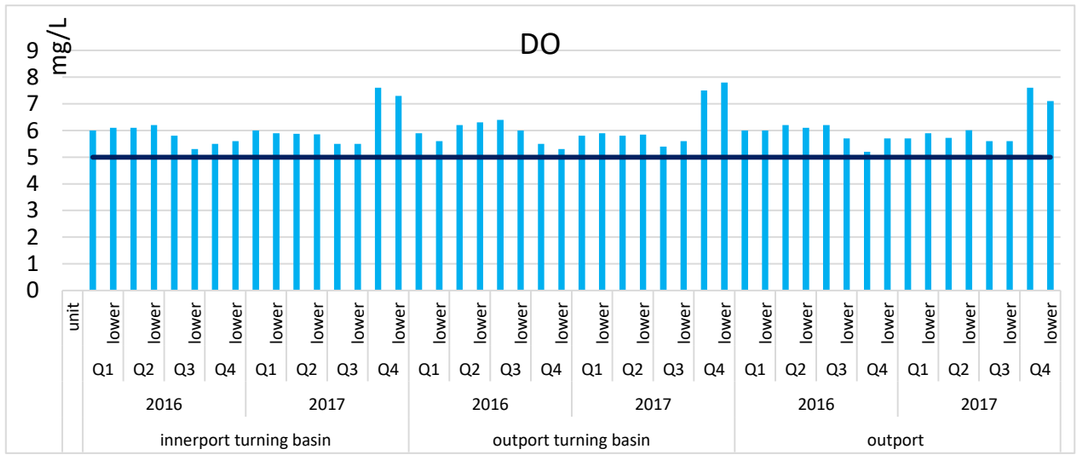


Water Quality Monitoring

The Hualien Branch of TIPC quarterly monitors effluents, marine water quality, and sediment. In accordance with the "Port Area Pollution Prevention and Reduction plan," monitoring reports are sent to the EPA every six months.

There are a total of 3 sampling sites in 2015. The result shows that all pH, dissolved oxygen, suspended solids and biochemical oxygen demand, monitoring data in each station are in compliance with Category B marine environment quality standards.

* Water quality monitoring results



04/ Continuous Improvement

Resource Conservation

Taiwan has scarce water resources. The Hualien Branch of TIPC adjacent to the Meilun Mountain is favorable for collecting and filtering surface runoff because it is low-lying and has gravel at the surface layer and mudstone at the bottom layer. According to the concept of water resource banks, the Branch built 12 water storage facilities in the port to provide nondomestic water in replacement of tap water for flushing toilets in the administrative building, greening, containing dust at the sand and gravel storage site, and washing vehicles. ◦
The surface water recycling and reuse system can save approximately 600,000 tonnes of water per year. Surface water is collected according to the concept of "Taking resources from the nature, using them with environmental protection concerns, and returning them to the nature" to protect and conserve water resources.
Plans are also currently underway for the Hualien Branch of TIPC to establish an EPA-certified eco-learning center, where local university students and staff may volunteer as guides to educate the public about the importance of their role environmental stewardship and water conservation.

Water tank

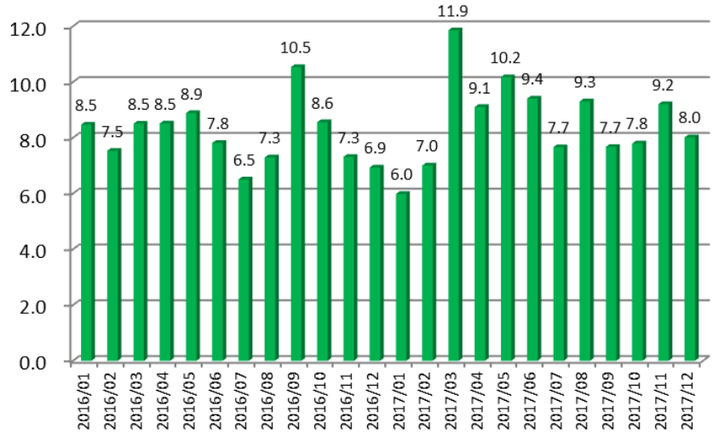

Outbound vehicle cleaning

Solid Waste

In the Port of Hualien, the amount of waste produced on land in 2016 was 98.8 tonnes, with approximately 6.6 tonnes recycled (7.66%); the amount of waste produced in 2017 was 103.1 tonnes, among which 4.3 tonnes were recycled (4.2%).

The amount of ship wastewater and waste oil cleaned by the Hualien Branch of TIPC is 148.37 tonnes in 2016 , 58.03 tonnes in 2017.

* Solid waste disposal (2016-2017)




Garbage from ships

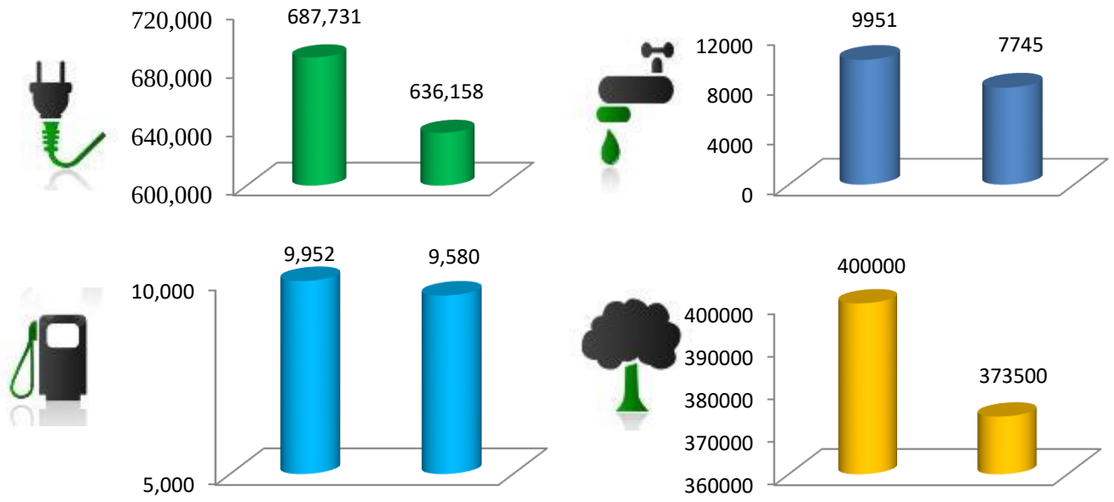
Reduction Garbage/ Port Waste

To conserve energy and reduce carbon emissions, the Hualien Branch of TIPC has launched the Four-Saving Project to monitor the energy, water, oil, and paper consumed by offices and operating areas, examine and improve the use of resources, and increase the ratio of conservation annually.

Compared with 2016, the year the project was launched, the total consumption in 2017 was reduced by 7.3%, which was equivalent to 29,955 kg of carbon emissions.

*Carbon Footprint of Resource Consumption at the Port of Hualien

Item	Emission factor ($kgCO_{2e}$)		2016 The actual amount	2016 carbon emission (kg)	2017 The actual amount	2017 carbon emission (kg)	Saving carbon emissions	Savings ratio
Electricity consumption (kWh)	0.528	2017 National electricity emission factors	687,731	381,003	636,158	352,432	28571	7.5%
Water consumption (m^3)	0.155	2016 Taiwan Water Supply Co.	9951	1612.1	7745	1254.69	357	22.2%
Fuel consumption (Liter)	2.36	2017 EPA	9,952	23,487	9,580	22,609	878	3.7%
Paper consumption (Sheet)	0.0056	Paper Star A4	400,000	2,240	373,500	2,092	148	6.6%
	總計			408,342		378,387	29955	7.3%



04/ Continuous Improvement

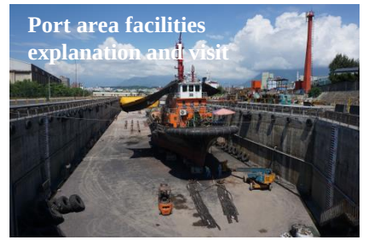
Relationship with Local Community

Every year, the Port of Hualien Taiwan International Ports Corporation calls on its employees and related departments in the harbor area to undertake a beach-cleaning activity and to collect beach trash in the harbor area. This activity helps participating units and employees understand the importance of protecting the marine environment. In 2017, approximately 965 kg of trash was collected. It is hoped that the beach-cleaning activity can help the Port of Hualien and related units collaboratively maintain their working environment and keep the harbor comfortable and beautiful. By building team and community cohesion in the Port of Hualien, a healthy, quality, and sustainable environment in the region can be developed.

To promote marine education and teach children how commercial ships enter and exit from the harbor and load and unload and how tourists enter and exit from the harbor, in 2017, the Port of Hualien Taiwan International Ports Corporation organized two harbor summer camps for children and their parents. Overall, 120 people attended the camps. For this activity, the Port of Hualien Taiwan International Ports Corporation collaborated with the Hualien Harbor Police Department of the National Police Agency, the Hualien Harbor Fire Brigade, the 6th Offshore Flotilla of the Maritime Patrol Directorate General of the Coast Guard Administration at the Ocean Affairs Council, the 12nd Brigade of Eastern Coastal Patrol Office at the Coastal Patrol Directorate General in the Ocean Affairs Council, and the Hualien Branch of TIPC Marine Co. Ltd to arrange activities such as introducing the harbor, a tugboat activity, 1-day harbor policeperson and firefighter, and tetrapod painting. By providing entertaining courses, the children and adults developed a profound understanding of the harbor area.


Camp team photo


Camp activity


Port area facilities explanation and visit

Port Landscaping

The Port of Hualien is adjacent to the Meilun community. A 4.6-ha leisure park was established between the port and the community as a green belt to prevent dust, noise, and wind.

Mean while, the park also creates a positive image for the port for providing recreational space. This project is estimated to reduce 437 tonnes of carbon emission annually.

*Estimates of Carbon Abatement from Port Landscaping

Planting area	Total tree planted	Shaded area per arbor tree	Ratio of arbor tree*	Carbon reduction**
46,000m^2	5,806 plants	0.1256m^2/plant	1.59%	437,460kg-CO_2e/yr

*Arbor area ratio:0.1256m^2/plant X 5806 plant/46000m^2 X 100% =1.59%
**Reducing the amount of carbon=600kg-CO_2/m^2 X 46000m^2X1.59%
Source : Arbor green space beautification calculated estimate of Architecture and Building Research Institute


Bicycle lane


Port green landscape

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Environmental Performance Indicators of Hualien Port

Significant environmental issues of the Hualien Port	Index item	Calculation method	指標目標值	指標呈現(計算說明)	
				2016年	2017年
Dust	Number of prevention stevedoring and stacking devices	Number of prevention stevedoring and stacking devices in port	Review number and worth use of prevention devices every 2 years	• 4 stevedoring machines with prevention • 3 stevedoring machines with closed devices • 2 stevedoring machines with dust-collecting devices	• 4 stevedoring machines with prevention • 3 stevedoring machines with closed devices • 2 stevedoring machines with dust-collecting devices
	Ratio of installing sprinklers in the sand and gravel storage site	Number of installing sprinklers in the sand and gravel storage site/ Number of the sand and gravel storage site×100%	Ratio of installing 100%	• 4/4×100%=100%	•3/3×100%=100%
Noise	Quarterly ratio of noise levels satisfying related regulations	Daily ratio of noise levels (measured at the noise monitoring station in the port) that satisfy related regulations The port is classified into the Regulated Areas of Category D in general area Noise Control Criteria: Detailed regulations: 75 dB during the day (7 am–8 pm); 70 dB during the evening (8–11 pm); 65 dB during the night (11 pm to 7 am of the following day)	• Daytime equivalent energy sound levels: quarterly achievement rate of 100% • Evening Leq: quarterly achievement rate of 100% Nighttime Leq: quarterly achievement rate of 100%	•Daytime Leq 100% •Evening Leq 100% •Nighttime Leq 100%	• Daytime Leq 100% • Evening Leq 100% • Nighttime Leq 100%
Ship exhaust gas emissions	The ratio of using low-sufer fuel or biodiesel and the consumption of low-sufer fuel among harbor crafts	• Number of harbor crafts using low-sufer fuel (marine diesel oil or super diesel) ÷ Total number of harbor crafts × 100% • Consumption of low-sufer fuel among harbor crafts	The ratio of using low-sufer fuel or biodiesel reaches 100% among harbor crafts	• Among the 5 harbor crafts, 5 use low-sufer fuel. 5 ÷ 5 × 100% = 100% •Low-sufer fuel for work vessels: Consumption of marine gas oil: 280 KL	• Among the 5 harbor crafts, 5 use low-sufer fuel. 5 ÷ 5 × 100% = 100% • Low-sufer fuel for work vessels: Consumption of marine gas oil: 218.72 KL
	• Promot Vessel Speed Reduction	Reduce speed to under 12 knots	Ratio of vessel speed reduction 70%	Ratio of vessel speed reduction 68%	Rratio of vessel speed reduction 71%
	Number of service vessels using shore power ÷ total number of service vessels × 100%	All service vessels using shore power	Number of service vessels using shore power ÷ total number of service vessels × 100%	4÷4x100%=100% Number of service vessels: 4; number of service vessels using shore power: 4	4÷4x100%=100% Number of service vessels: 4; number of service vessels using shore power: 4
	Number of ship inspections	• Number of ship inspections • Number of ship pollution violations	• Number of ship inspections • Number of pollution violations	• Number of ship inspections :39 • Number of pollution violations :0	• Number of ship inspections :36 • Number of pollution violations :0
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. • Number of passes：200/yr	• The ratio of incoming roadways installed with an automatic gate control system: 3 ÷ 4 × 100% =75% • The ratio of outgoing roadways installed with an automatic gate control system: 3 ÷ 4 × 100% =75% • Number of passes: 236	• The ratio of incoming roadways installed with an automatic gate control system: 3 ÷ 4 × 100% =75% • The ratio of outgoing roadways installed with an automatic gate control system: 3 ÷ 4 × 100% =75% • Number of passes: 209

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Environmental Performance Indicators of Hualien Port

Significant environmental issues of the Hualien Port	Index item	Calculation method	Index target	Description of calculation	
				2016年	2017年
Air Quality	Air quality pass rate (TSP、PM_{10}、$PM_{2.5}$、SO_2、NO_2、CO、O_3)	The ratio of the measurements in the air quality monitoring station of the port that meet the "Air Quality Standards"	• PM_{10} of the daily mean measurem- ents satisfy the standard (<125μg／m3): 100% • $PM_{2.5}$ of the daily mean measurem- ents satisfy the standard (<35μg／m3): 60% • SO_2 of the daily mean measurem- ents satisfy the standard: 100% • NO_2 of the daily mean measurem- ents satisfy the standard: 100% • CO of the daily mean measurem- ents satisfy the standard: 100% • O_3 of the hourly mean measurem- ents satisfy the standard: 100%	• PM_{10} of the daily mean measurem- ents satisfy the standard (<125μg／m3): 100% • $PM_{2.5}$ of the daily mean measurem- ents satisfy the standard (<35μg／m3): 60% • SO_2 of the daily mean measurem- ents satisfy the standard: 100% • NO_2 of the daily mean measurem- ents satisfy the standard: 100% • CO of the daily mean measurem- ents satisfy the standard: 100% • O_3 of the hourly mean measurem- ents satisfy the standard: 100%	• PM_{10} of the daily mean measurem- ents satisfy the standard (<125μg／m3): 100% • $PM_{2.5}$ of the daily mean measurem- ents satisfy the standard (<35μg／m3): 60% • SO_2 of the daily mean measurem- ents satisfy the standard: 100% • NO_2 of the daily mean measurem- ents satisfy the standard: 100% • CO of the daily mean measurem- ents satisfy the standard: 100% • O_3 of the hourly mean measurem- ents satisfy the standard: 100%
Water resource reuse	• The ratio of saving water usage	• Number of saving water usage	The ratio of saving water usage is 98%	• The ratio of saving water usage is 88%	The ratio of saving water usage is 88%
Cargo spillage	• Number of harbor inspections,cargo spillage emergency response drills,and jointly supervised harbor safety drills	• Number of harbor inspections,cargo spillage emergency response drills,and jointly supervised harbor safety drills	• 200 harbor inspections • At least one cargo spillage emergency response drill per year • At least 12 jointly supervised harbor safety drills per year	• 246 harbor inspections • One cargo spillage emergency response drill • 12 jointly supervised harbor safety drills	• 243 harbor inspections • One cargo spillage emergency response drill • 12 jointly supervised harbor safety drills
Harbor Water Quality	Marine water quality pass rate (pH, DO, BOD_5, cyanide, phenols, mineral oils)	The ratio of port water quality measurements (obtained at the water quality monitoring station in the port) satisfying the Marine Environment Classification and Quality Criteria	Marine water quality: 100% of the quarterly pH, DO, BOD_5, cyanide, phenols, mineral and oils measurements satisfy the criteria.	Marine water quality criteria for Category B pH 100% DO 100% BOD_5 100% Cyanide 100% Phenols 100% mineral oils 100%	Marine water quality criteria for Category B pH 100% DO 100% BOD_5 100% Cyanide 100% Phenols 100% mineral oils 100%
Relationship with Local Communities	Number of activities and participants	Calculate the actual number of occurrence	• Number of activities and events • Number of participants	• 16 activities held • Total of 165 people participated	• 25 activities held • Total of 225 people participated
Port and harbor waste	• General waste removed and recycling rate in the harbor land area • The amount of cleaning ship oily wastewater	• General waste removed from the harbor land area • General waste recycling rate in the harbor land area • The amount of cleaning ship oily wastewater	• 3% general waste recycling rate in the harbor land area based on general waste removed • The amount of cleaning ship oily wastewater is 50 tonnes	• General waste removed from the harbor land area; 98.8ton • General waste recycling rate in the harbor land area: 6.6/ 98.8 = 6.8% • The amount of cleaning ship oily wastewater is 148.37 tonnes	•General waste removed from the harbor land area; 103.1 ton •General waste recycling rate in the harbor land area: 4.3/ 103.1 =4.2% •The amount of cleaning ship oily wastewater is 58.028 tonnes
	Number of harbor inspections	• Number of harbor inspections	• Number of harbor inspections per year: 200	•Number of harbor inspections : 246	• Number of harbor inspections :243

Emergency Response

05/

Port Emergency Notification and Drills

Because of Hualien port's geographical position, its land and sea areas are exposed to various disasters such as earthquake, wind storms, floods, tsunami, general shipwrecks, marine oil pollution, air pollution, leaks of toxic and nontoxic materials, severe traffic events and industrial safety accidents, etc. We have stipulated 21 notification and response procedures to mitigate the impact, ensuring the emergency events can be informed and response in the fastest time. Meanwhile, we cooperate with harbor police and harbor fire brigade for periodical drills to practice and improve emergency operation skills.

As far as the port pollution and disaster events are concerned, general public, ship owners or port business units can liaise with Hualien Branch of TIPC via our communication channels or mail box. Every year, Hualien Branch of TIPC works with EPA of Hualien County Government for non-prewarning drill of pollution and chemicals and other hazardous substances spill response . This drill includes preventing the spill from reaching shore, removing spilled oil from the water and clean-up residual oil from sea surface, event investigation and pollution claim, etc.

In all cases, the Hualien Branch of TIPC tries to cooperate and work closely with all parties involved in an incident and ensure the cross-department emergency response center can be set up promptly and run smoothly. In case the event arises, prompt notifications , and appropriate emergency measures are taken to mitigate the impact on the environment and minimize loss.


A class protective clothing


Oil boom on the dock


Deploying oil boom

Typhoon Disaster Preparedness and Post-disaster Clean-up Work

Hualien is frequently hit by typhoons. The Hualien Branch of TIPC run port facility daily check and generally examines and implements preparedness of the drainage system before typhoon season. As soon as a sea alert for a typhoon is declared, the emergency response center will be set up to run promptly to respond to any incident . After the alert is lifted, the port roads and surroundings will be cleaned at soonest possible time. On June 16, 2017, the control and monitoring center detected a large amount of drift waste. The occupational safety department activated the response procedure immediately after receiving the report and notified the commissioned company to have grab trucks on standby. After conducting an on-site inspection, the occupational safety department promptly requested the commissioned company to send the grab trucks to remove the drift waste close to the harbor basin. Operational rafts were sent and oil fences were applied to gather all drift waste toward the wharf to facilitate the grabbing operation. A total of 120 tons of drift waste was removed from the sea.


Garbage piled up after typhoon


Clean-up


Water surface after clean-up

05/ Emergency Response

*Number of Accidents in Hualien Port

Accidents\Year	2014	2015
Ship collision, sinking, capsizing, fires, oil pollution, and leaks of other chemicals.	0	0
Ship mechanical failure, operational failure, tilting, and stranding	0	0
Major warehouse and storage tank fires or explosions	0	0
Minor pollution, fires, and chemical leaks in the port	0	0
Man overboard, industrial safety accidents, flotsam, and others	0	0

*Records of Joint Drills (2014–2015) by the Hualien Branch of TIPC

Year	Name of drill	content	date
2016	**2016 Hualien Oil Depot Area Response Drill**	**In the simulated scenario of this drill, an earthquake with a magnitude of 6.0 hypothetically occurred in Hualien's outer sea while an oil tanker was unloading at the wharf. A pretended substantial tear hypothetically caused the 6-inch oil loading hose to rupture and oil to spill on the land and into the sea. The emergency response protocol for oil pollution was therefore implemented.**	2016/ 8/3日
2016	**2017 Marine Salvage Drill at the Port of Hualien**	**This drill aimed to improve the overall marine salvage capabilities in the Hualien port area and enhance the emergency rescue mechanism. As such, damages and losses would be mitigated when such incidents occur in the future.**	2017/ 3/2
2017	**2017 Port Safety and Disaster Prevention and Protection exercise at the Port of Hualien**	**Port safety exercises and disaster prevention and protection exercises were conducted by harbor police departments nationwide. Experiences were shared to optimize crisis management operations and responses.**	2017/ 7/25


Marine Salvage Drill at the Port of Hualien


Port Safety and Disaster Prevention and Protection exercise at the Port of Hualien

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05/ Emergency Response

Hualien Harbor Police Division, Habor Command Center

Hualien Harbor Fire Brigade

Ocean Affairs Council, Coast Guard Administration, Maritime Patrol Directorate General, 6th offshore Flotilla
Coast Guard Administration, Coastal Patrol Directorate General, Eastern Coastal Patrol Office 12nd Brigade

Environmental Protection Bureau, Hualien County Government

Minister of MOTC compound and auxiliary contact

TIPC Chairman President

TIPC Occupational Safety Division, Emergency Response Center

Maritime and Port Bureau, MOTC shipwreck and port disaster contact
East Maritime Affairs Center, Maritime and Port Bureau, MOTC

President of Hualien Branch of TIPC

Harbor Master of Hualien Branch of TIPC

Emergency Response Center of Hualien Branch of TIPC

Hualien Branch of TIPC
Contact Center of Harbor Management Division

Competent authorities for various disaster rescue

Office of Disaster Management, Executive Yuan
National Rescue Command Center
Taipei Mission Control Center
Taipei Operations and Intelligence Center, Navy Command Headquarters
Duty Command Center, Coast Guard Administration
Maritime Patrol Directorate General, Coast Guard Administration, Ocean Affairs Council,
National Airborne Service Corps, Ministry of the Interior
Atomic Energy Council
Environmental Protection Administration Northern Environmental Incidents Specialist Team – Yilan Branch
Eastern Center, Centers for Disease Control
Air Crash Emergency Response center of the Civil Aeronautics Administration
Response Center of the Hualien Airport
Hualien county fire Division

Other sectors

Hualien Depot Area of Hualien Oil Support Service Center , CPC
Hualien Fishery Radio Station
Hualien Fishermen's Association
Hualien Port Station, Taiwan Railway Administration
Ships or shipping agents

Relevant Divisions of Hualien Branch of TIPC and Civil Service Ethics

Disaster or event notifier

Shipwreck	Highjacks, sabotage, or terrorist attacks	Fire and explosion	Oil pollution or toxic pollution incidents	Natural Disasters	Industrial accidents disaste	safety and rs	Damage to port facilities	Damage to stevedoring facilities and stevedoring accidents	Damage to navigational auxiliary aids (AIS、VTS)	Damage to information facilities and security	Compound disaster and others
Harbor Management Division	Harbor Management Division	Harbor Management Division	Occupational Safety Division	Harbor Management Division	Occupati Safety Dep	onal artment	Construction Management/Engineering Division、Harbor Management Division	Construction Management/Engineer-ing Division、Port Business Division	Harbor Management Division	Information Technology Division	Harbor Management Division

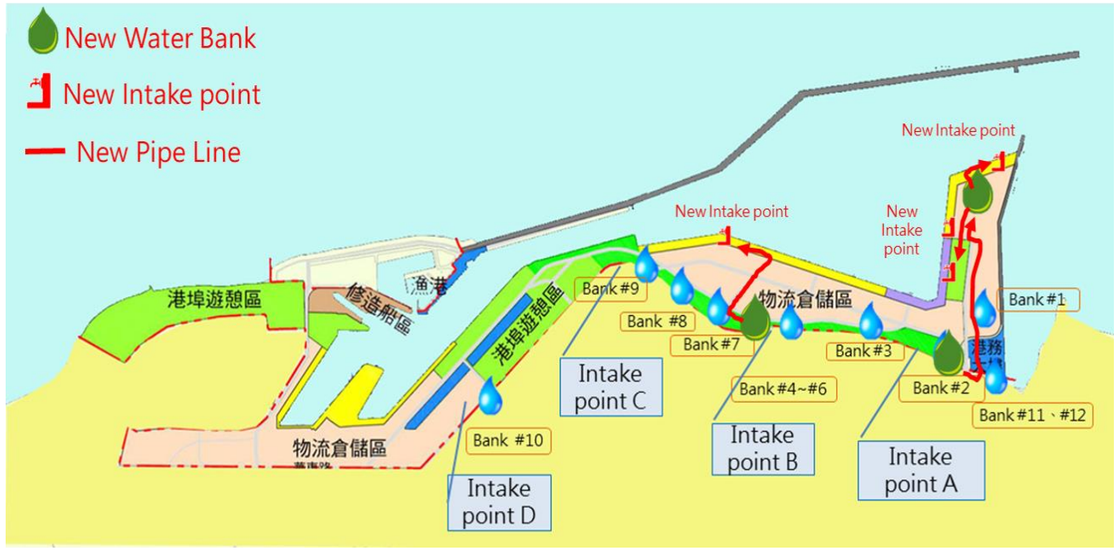
Innovation & Cooperation

06/

The best practices proposed by the Hualien Branch of TIPC indicate the organization's ability to manage port environment. Hualien Port's best practice examples includes (1)Water Resources Bank in Hualien PortV3.0; (2)Environmental Education Site Certification.

Best practice Ⅰ、Water Resources Bank in Hualien PortV3.0

Distribution of Water Bank New Pipe Line



Content

Water at the Port of Hualien can be categorized into water for operation area and office water usage:

(a)Water usage at the operation area accounts for 97% of total water usage for the entire port. The water is used for dust suppression, car wash, road sweeping, ship domestic water, harbor vessel cleaning, ship repair, and port landscape.
(b)Office water accounts for 3% of the total port water usage. Its usages span from office building, custom check point, public toilet, and ship repair yard toilet.

In order to optimize water usage, the Port of Hualien replaced the port area tap water with harvested ground water. It harnesses the gravity from the height difference in landscape and pulls the water from the water harvest reservoir.

Project Goal

- **2007 Water Bank V1.0 (Incentive) Project: Water costs for quarries were reduced, incentives to attract investment increased, and the water saving rate was approximately 53%.**
- **2015 Water Bank V2.0 (Stability) Project: To respond to water depletion and to ensure reliable water supply; the water saving rate increased to approximately 88%.**
- **(c) 2018 Water Bank V3.0 (Profitability) Project: To expand the use of the water bank and to increase revenues; the water saving rate increased to approximately 95%.**

* The implementation timeline

Time	Item
2006	Started construction of the water harvest system.
2007	Version 1.0 completed. Provides water usage for dust prevention, public toilet, and landscape.
2015	Version 2.0 completed. Expand overall water harvest system providing water service for both inner and outer port and compensating water shortage during the summer.
2018	To further expand the water harvest system, a version 3.0 was proposed to extend the water supply from the sand and gravel stack yard to the dock area, providing water for vessel dust suppression, harbor vessel cleaning and general dock area usages.

*Water Tank

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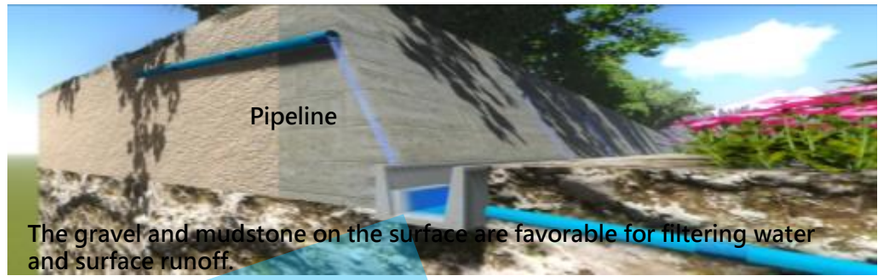

Use

Effect/Benefits

- **The water harvest system Version 3.0 will provide water for dust suppression, vessel cleaning and ship rust removal. The estimated benefit of the version upgrade is 6% increase in water efficiency, amounting a total of 95% water saving. It also extends the water supply line from the sand and gravel stacking yard to the dock area for vessel dust suppression, harbor vessel cleaning and general dock area usages.**
- **Savings in water also help save carbon emissions reducing an estimated 3,850 kg of CO_2 annually. This demonstrates that the water harvest system is a prominent green port strategy. It also aided the establishment of the green walkway which started from the inner port Red Bridge to the waterfront. The realization of the Green Belt Water Way at the Port of Hualien has successfully turned the Port into an environmental education and leisure tourist hot spot. The Port will apply to become an environmental education institute officially recognized by the EPA to actualize port sustainable tourism.**

Stakeholders

Sand industries, Stevedoring companies, Warehouse operators, Local residents

Investment amount

Total investment ：3,000,000 NTD

Participants

Hualien Branch of TIPC, Sand industries, Ocean Affairs Council ,Coast Guard Administration, Maritime Patrol Directorate General, 6th offshore Flotilla, Coastal Patrol Directorate General, Eastern Coastal Patrol Office 12nd Brigade

Implementation/Timeline

Jan-Feb	2018	Designing a water pipeline
Mar	2018	Specifying production and bidding procedures
Aug-Oct	2018	Construction processes
Dec	2018	Phase 3 of the construction was completed and the water supply was tested

Environmental Issues

Water quality ,Dust ,Rainwater treatment

Contact
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Best practice II、Environmental Education Site Certification

Content

Overall, 163 places nationwide have been equipped with facilities to deliver environmental education. In Hualien County, only four places are equipped with such facilities. These facilities focus on nature conservation and do not cover other areas of environmental education. The Port of Hualien have the facilities to become the fifth branch for environmental education.

By rejuvenating the unused space in this branch, utilizing existing eco-resources of the harbor, integrating the lively harbor and the eco-resources of the water bank, and obtaining certification for the branch with related facilities, the Port of Hualien will become the fifth education center with related facilities for providing environmental education to various groups, enterprises, government agencies, and schools.

The Hualien Branch of TIPC has been holding camps for kids and parents since 2017. The event was held twice in 2017 with 120 total attendances. The course packages used in 2017 is reviewed and adjusted to formulate the 2018 event, which was held 4 times. Different from 2017, camps may provide the ground work for future educational programs. TIPC Hualien collaborated with Fish Bar and the TIPC Marine Corp. to provide environmental education through entertaining activities on topics such as "dietary fish" and "tug boat." Children and participants were left with strong impressions on how fishermen live their daily lives through these activities. The Control Center staff from the Hualien Branch gave a presentation on the function of the control center and taught a lesson on Marine English through live demonstration, providing marine knowledge to school age children.

Implementation/Timeline

2018 Feb-May	Planning and registration for the Marine Summer Camp
2018 June-Jul y	"Migration" Marine Summer Camp
2018 Aug-Sep	Summer Camp course review and adjustment
2018 Aug-Dec	Maintenance of port water harvest system and ecological pond using ecological engineering methods.
2019 Jan-June	Preparation of 2019 Marine Environmental Educational Activities.

***Hualien Environmental Education Site Map**

***Environmental education staff training**

***Harbour summer camp**

Stakeholders

Nearby residents, Port industry

Environmental Issues

Relationship with Local Communities, Land Related Port Development

Participants

Hualien Branch of TIPC, Hualien City Government

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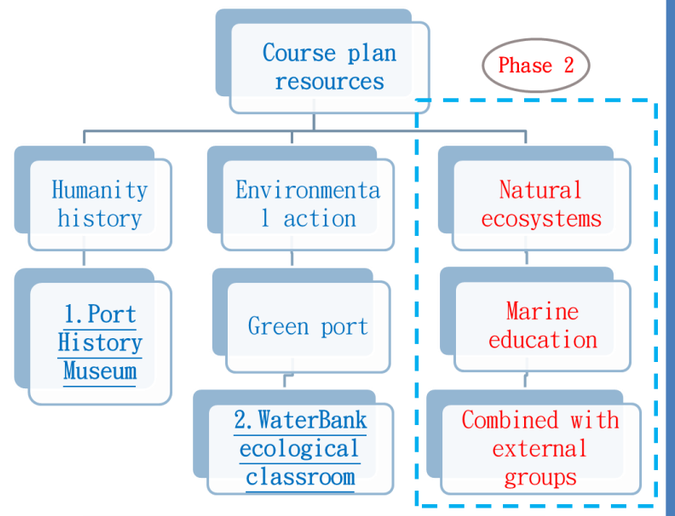
Environmental education curriculum planning

- **The initial lesson plan is based on environmental action and human history. The theme of the lesson plan is the water bank ecological classroom and the Port History Museum.**
- **The follow-up planning is geared towards natural ecology and will be developed in conjunction with external groups to develop marine environmental education plans.**

Environmental Education Certification Trilogy

- **Application for Certification - The relevant documents for the inspection tool are submitted to the Environmental Protection Agency.**
- **Writing a Management Plan - Environmental Education Curriculum Program (through the EPA to guide the jumping port and water bank teaching plan), and the environmental education professional manpower allocation (should be equipped with a full-time environmental education professional).**
- **Documents related to environmental education and safety maintenance in the past three years.**



Investment amount

Total investment amount： 8,373 EUR In the future, by charging for guided tours and applying for subsidies, funds can be obtained to achieve the sustainable development of environmental education.

Effect/Benefits

- **Transform and revise environmental curriculums to give all environmental educators who visited the Port an one of a kind experience.**
- **Integrate the Port's resource with other organization to enhance the amiability of the Port and provide recreational opportunities to local residents.**
- **By promoting a green harbor and expanding the business operations in the harbor area, marine education and natural ecosystems can be integrated to provide a place for environmental education and professional services.**

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Involvement and Collaborating Organizations

The Hualien Branch of TIPC has been very active in collaborating with the private sector, public sector and academia in Taiwan and abroad on issues related to the environment. In addition to understanding environmental development trends in the international arena, the Port of Hualien also works to achieve the goal of becoming a sustainable green port through technological cooperation, joint inspection, lecture and practice.

Association

The International Association of Ports and Harbors (IAPH)

The IAPH is a NGO with a tremendous 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.

Association of Taiwan Port

The industrial, official, and academic knowledge platforms in Taiwan are integrated for domestic marine industries to coordinate internally and collaborate externally to implement affiliate marketing, call for investment, seek membership of international organizations, host crucial conferences, and facilitate cross-strait cooperation.

The Taiwan Marble Association

The Taiwan Marble Association regularly assign representatives to participate in the association congress.

Academic institution

National Taiwan Ocean University

National Taiwan Ocean University and the TIPC signed a MOU for studying marine meteorology and sediments of drift sand from the ocean, working together to further the international ports, academic development, international competitiveness, and shipping quality of Taiwan.

National Cheng Kung University

National Cheng Kung University and the TIPC signed a memorandum of cooperation for personnel training and development of the Port. Working together to further the international ports and competitiveness.

National Sun Yat-sen University

NSYU signs a memorandum of cooperation with the TIPC to cooperate in terms of personnel training, student internships, and the management of seminars and lectures.

Cooperation

China Steel Corporation (CSC)

An automatic material transporting device has been installed at Wharf No.11 in the Port of Hualien. In addition, the Hualien Branch of TIPC provided land for the CSC to invest in improving related transportation equipment, changing the means of gravel transportation in Hualien from highways to railways.

Taiwan Cement Corporation

An automatic material transporting device has been installed in Wharf No. 11 in the Port of Hualien.

Asia Cement Corporation

An automatic material transporting device has been installed in Wharf No. 10 & 18 in the Port of Hualien.

Public sector

Environmental Protection Bureau of Hualien County

The Hualien Branch of TIPC cooperates with the Environmental Protection Bureau of Hualien County to conduct unscheduled joint inspections and marine pollution prevention drills in the port.

East Maritime Affairs Center of MPB, MOTC

The East Maritime Affairs Center of the MPB under the MOTC is in charge of the affairs related to port security, disaster relief, and pollution control in the Port of Hualien, as well as the implementation of laws and regulations, gathering of evidence, and penalty consideration

Hualien City Office

The Hualien Branch of TIPC and the Hualien City Office jointly organize EcoPorts promotion activities.

Training

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Training

The Hualien Branch of TIPC provides its staff with suitable environmental education training programs according to Environmental Education Act. These programs not only develop trainee's environ-mental awareness and environmental protection knowledge, but also improve the Branch's competitiveness. The Branch has organized five and eight environmental education courses for its employees in 2016 and 2017, respectively. The total participants are 730 .The curriculum consisted of video watching, practicing, experiential learning, outdoor learning, lectures, and other activities. The contents included disaster prevention and relief, nature conservation, environmental and resource management, and environmental education for schools and society.

There are oil containment devices such as oil booms, oil skimmers, and oil sorbents are prepared and installed according to the major marine oil pollution emergency response plan devised by the Branch. The Hualien Branch of TIPC annually maintains and checks equipment and devices required in emergency responses to ensure their normal functioning. The training and on-site practice for operating oil pollution response equipment are offered.

Internally, the Port of Hualien holds environmental meetings on a regular basis to improve the quality of its services and its success in mitigating pollution. The focus of the meetings changes each year according to the needs of the different industries that comprise the Port's traffic – including the sand-and-gravel industry, cargo shipping, and construction. At these meetings, the Port of Hualien uses constructive dialogue to clarify environmental regulation and resolve issues of non-compliance, creating win-win outcomes.
To further facilitate on-site environmental compliance inspections, the Hualien Branch of TIPC attends training sessions held by various agencies, including the EPA, the EPB, the Environmental Professional Training Institute, the Ministry of Transportation's Harbor and Marine Technology Center, the National Sun Yat-sen University, and TIPC Headquarters. Currently, the Occupation and Safety Division holds several professional licenses, including a Visual Assessment of Smoke License, a Dedicated Air Pollution Control Specialist Class A License, a Dedicated Wastewater and Sewage Treatment Specialists Class A License, and more.

Mountain clean-up activities

Beach clean-up activities

Pollution control improvement meeting for the Stevedoring Companies in the Port of Hualien

Hualien Port "International ship and port facility security (ISPS)" inspection

Oil boom of usage training

Marine pollution equipment exercises regularly

2017 Hualien Port Area Workplace Disaster Prevention and Disaster Mitigation Education Training

Environmental education and training for New staff

Communication & Publication

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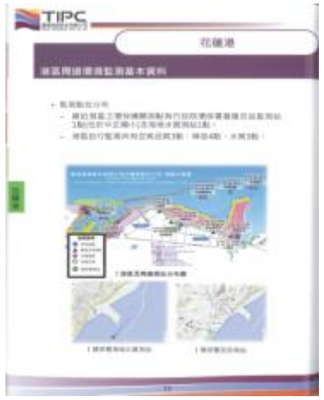
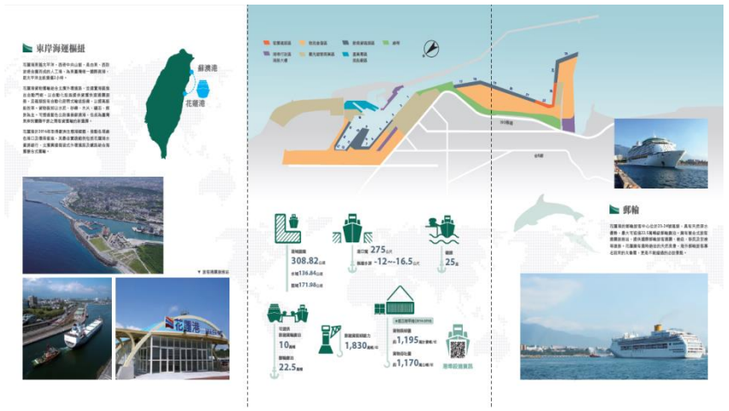
Publication



Report of environmental monitoring TIPC



Hualien Harbor Brochure

Exhibit Space

「History of Hualien」, Introduce the past development and future prospects of the Port of Hualien, as well as major events in the past years, to improve visitors' understanding of and connection with the port.

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Communication & Publication

Internet Web

Green port action plan of TIPC Web (http://www.twport.com.tw/GP/)

TIPC presented outcome of Green port in the international arena. Set up " Green port policy of TIPC Web " to communicate with other countries.

The Hualien Branch of TIPC World Wide Web - (http://hl.twport.com.tw/chinese/)

The Hualien Branch of TIPC World Wide Web on which global public opinion with a contact-mail, provide the general public to express views and opinions of online .

Publications about service measures

Videos for marketing the port (https://www.youtube.com/watch?v=9jH0yjS0G3I&feature=player_embedded)

The public can watch the port marketing video "Ports in Taiwan" to experience the features of each port through real scenes.

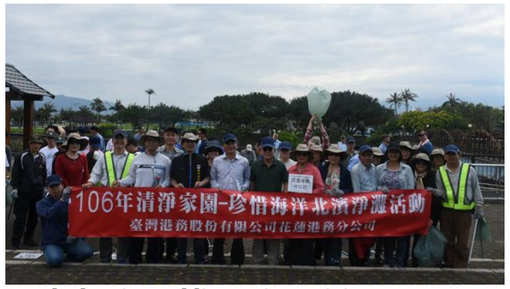
Facebook fan page (https://www.facebook.com/hualientwport)

Each units of the port occasionally release news about public calls for investment, cruise schedules, and promotion activities for the public to know the business of the Hualien Branch of TIPC.

Public Welfare / Neighborhood Activities

“Pan-car” food truck festival

The Port of Hualien branch office organized the “Pan-car” food truck festival. The festival was held under the landscape bridge at the waterfront recreational areas of the Port of Hualien, where a variety of food trucks with different features were gathered. Street artists were invited to sing together under the starry sky and attendees could enjoy the traditional Taiwanese snack, gua bao.



Beach cleaning public service activity

The Port of Hualien branch office organized the “Green Port, Clean Home—North Shore Beach Cleansing and Environmental Education” event on April 14, 2017. The event was held at the north shore beach between the port and the Jinghua Bridge trail near the Meilun estuary. Approximately 1,000 kg of waste can be collected in each beach cleaning activity.

Whale’s Exclamation at the Port of Hualien

The Hualien Branch of TIPC fulfils social responsibility, this activity aimed to promote the truth, goodness, and beauty of port management. As such, the chairman personally conducted a tour of the Port of Hualien for children from disadvantaged families from the Keelung area.

Visit of the double Cruises

Cruises sailing into the Port of Hualien have brought a great number of tourists to Hualien. People fond of cruises can view them from the outdoor spaces of the Hualien Branch of TIPC.

Sending warmth to the needy in winter

The Hualien Branch of TIPC organizes the activities of Sending Warmth to the Needy in Winter, donating money and goods to the New Dawn Education and Nursing Institute, Bethesda Home for Challenged Children and Adults, and Meilun Center for Challenged Children and Adults for residents to pass the cold winter without worries.

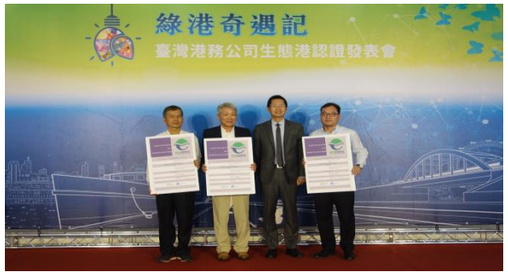
Blood donation activity

In line with its spirit of social responsibility, the Hualien Branch of TIPC occasionally even invites employees of cooperation departments to participate in blood drives as part of a broader effort to promote blood donation among the public at large.

Meeting /Visit Activities

Harbor Engineering session of the Sino–Japanese Modern Engineering and Technology symposium

The harbor engineering session of the Sino–Japanese Modern Engineering and Technology symposium was held at Parkview Hotel & Resorts in Hualien on November 22, 2017. In response to the green energy policies of the government, a discussion on engineering techniques and the setup of offshore wind power installations was held.



Outcome of the EcoPort certification

The TIPC held a presentation for Ecoport certification at the passengers’ wharf at the Port of Kaohsiung on December 26, 2017. At the same time, the port area air-pollution reduction project was initiated and the Green Port Adventure activity was held.

Visit of Ji'an Junior High School students

Teachers and students, of the first grade from Ji’an Junior High School of Hualien County, comprising a group of 120 people, visited the Port of Hualien branch office. During the visit, the group visited the signal station, control and monitoring center, tug boats, and the harbor police station.

Remodeling of the landscape bridge at the Port of Hualien

A rainbow-colored LED projection map of the bridge structure at night was programmed to enhance nighttime oceanic views. The bridge deck was modified from steel plates to faux-wood materials to improve the level of comfort for walking.

Forum for shipping lines

To serve for shipping lines and determine marketing strategies, the Hualien Branch of TIPC regularly convenes forums for shipping lines, inviting port investors and administrative agencies to attend the forum in the expectation of creating a win-win future.

Oceanic General Mobilization Parent–Child Activity

The Oceanic General Mobilization Parent–Child Activity was held. Numerous activities were offered by the harbor police department, fire brigade, and Eastern Coastal Patrol Office of the Coast Guard Administration. Such activities included gun shooting, fire-fighting experience, visiting the 1000-gross-tonnage Taitung Ship, and a port-operational tug boat presentation.

Green Accounting

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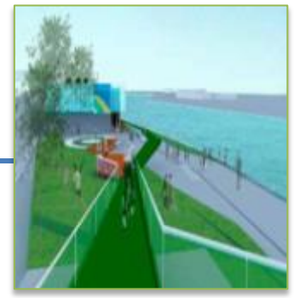
Environmental Investments and Cost

The cost that have been invested by the Hualien Branch of TIPC in the environmental aspects are mainly divided into the categories of staff, environmental maintenance and management, environmental monitoring, and emergency responses and communication. The purpose of these investments is to improve the environmental awareness among staff, environmental maintenance, environmental quality, emergency response abilities, and public understanding of the port.

Cost invested by the investments of the Hualien Branch of TIPC in the Environmental aspects in 2016-2017 is 11,616,000 NTD (approx. 324,198 Euro) & 13,109,000 NTD (approx. 368,867 Euro).



The cost in each category are as follows

- ✓ **Staff: Cost for environment-related staff and training.**
- ✓ **Environmental maintenance and management: Port greening and beautification, waste disposal, and dredging.**
- ✓ **Environmental monitoring: Environmental monitoring and inspection of air, noise, water quality, sediments, and dredging.**
- ✓ **Emergency response: Charges for handling accidents, materials for pollution in the port, and charges for testing dangerous goods.**
- ✓ **Communication and publications: Website maintenance, promotional activities, and environmental publications.**

***Total Expenditures on Environmental Issues Made by the Port of Hualien, TIPC in 2016-2017**

(Unit: Thousand in NTD)

Cost items	2016	2017
Staff(environment training)	5,580	5,760
Environmental maintenance and management	3,040	4,340
Environmental monitoring	2,268	2,303
Emergency response	250	256
Communication and publications	478	450
Total	11,616	13,109

Landscape bridge schematic

Environmental Assets

The Hualien Branch of TIPC has launched a series of port development projects to improve the efficient use of property by the Port of Hualien, promote local economic prosperity, and develop the port into an eco-friendly green port capable of energy conservation and carbon reduction. Several projects concern environmental aspects. For example, the infrastructure of the Cruise Terminal in the Port of Hualien has been built to increase public access to the port. Moreover, scenic restrooms have been built. A monitoring system has been established at the security check point and harbor power, lighting, and water supply equipment has been installed. have been updated to increase operational effectiveness and reduce possible pollution caused by construction projects.Cost invested by the investments of the Hualien Branch of TIPC in the Environmental aspects in 2016-2017 is 89,939 thousand NTD & 86,920 thousand NTD, which is approximately €2,510,159 and €2,425,900, respectively.

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Green Accounting

***Environmentally-related Fixed Asset Expenditures in 2016**

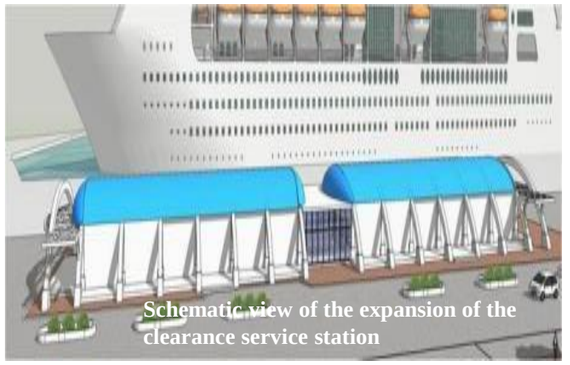
(Unit: Thousand in NTD)

Items	Land Improvements	Houses and Buildings	Machinery and Equipment	Transportation Equipment	Other Equipment	Total
General Construction and Equipment Purchase Project	20,000	49,500	18,760	1,619	60	89,939
Total	20,000	49,500	18,760	1,619	60	89,939

*** Environmentally-related Fixed Asset Expenditures in 2017**

(Unit: Thousand in NTD)

Items	Land Improvements	Houses and Buildings	Machinery and Equipment	Transportation Equipment	Other Equipment	Total
General Construction and Equipment Purchase Project	45,000	27,500	3,450	10,520	450	86,920
Total	45,000	27,500	3,450	10,520	450	86,920



Schematic view of the expansion of the clearance service station

Water recreation Merchants

Improvement Recommendations

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To protect marine environment and facilitate sustainable development, the Hualien Branch of TIPC is committed to protecting port environment, conserving resources and the ecology, and continuously implementing on-site inspection to ensure favorable air quality in the port. These actions are taken according to the environmental protection policies of the Environmental Protection Administration and the Ministry of Transportation and Communications, as well as the TIPC's goal and implementation plan of promoting green ports in Taiwan.

The Hualien Branch of TIPC will actively develop the cruise economy and tourism, obtain the EcoPorts certification issued by the European Sea Ports Organization, and become both a green and a tourist port to achieve both the goals of economic development and environmental protection.