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Port of Suao

Environmental Report

2021

This environmental report presents Suao Port's achievements in environmental protection from 2019 to 2020 as well as the environmental policy, commitments and action plans of the Keelung Branch, Taiwan International Ports Corporation, Ltd.

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Port of Suao Environmental Report Work Team

Suao Port Branch Office of Keelung Port, TIPC., Ltd: Chief Secretary CHEN SHI HONG, Senior Director CHEN GUO DONG, Supervise LIN YI MING, Engineer ZHI-YUNG LI, Associate Engineer CHIAN SHEN CHENG

Advised by Taiwan International Port Corporation, Ltd.: Executive Vice President YING FENG CHUNG, Senior Director TSAI SHU HUEI , Manager TSAI TSUNG HSUN, Assistant Engineer , CHANG JING FEN

Chief Editor: CHEN SHI HONG
Executive Editor: CHEN GUO DONG
Layout Design: LIN YI MING, CHANG JING FEN
Examine and Revise: CHEN GUO DONG, LIN YI MING, LIN YI MING, CHIAN SHEN CHENG

Publishers: Taiwan International Ports Corporations, Ltd.
Address: No. 10, Penglai Rd., Gushan Dist., Kaohsiung City 804, Taiwan (R.O.C.)
Tel: +886-7-521-9000

Taiwan International Ports Corporation Environmental Policy

Taiwan International Ports Corporation Environmental Policy

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

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

We commit to:

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

Hsien-Yi Lee

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

Shao-Liang Chen

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

Port of Keelung, TIPC
Environmental Policy

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

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

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

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

We commit to:

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

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

Kao Chwan Kai
President of Port of Keelung, TIPC

Date : 2020.10.16

No. 1, Chung-Cheng Road, Keelung 20202, Taiwan, R.O.C.
Tel: +886-2-24206100 Website: http://kl.twport.com.tw

Port of Suao
Environmental Objectives

Environmental Objectives
Port of Suao

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

Port waste
Avoid unnecessary waste of resources, handle waste properly, and implement resource recovery

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

Vehicle emissions in the port area
Implement fugitive management practices in the port area to control vehicle emissions

Noise in the port area
Implement noise monitoring in the port area and improve the control of transportation noise in the port area

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

Land area development of ports and harbors
Properly use port energy and resources to improve energy efficiency

Port energy efficiency
Properly use port energy and resources to improve energy efficiency

Cargo spillage
Strengthen pier operational control and autonomous management to reduce cargo spillage

Relationships with neighboring communities
Implement information disclosure and enhance public participation and increase opportunities for interaction with local communities

Vessel waste oil and oily water discharge
Establish a vessel waste fuel and oily water recovery mechanism to avoid the spillage

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

President of Port of Keelung,TIPC Kao Chwan Kai

Date 09 / 27 / 2021

Suao Port Branch Office of Port of Keelung Taiwan International Ports Corporation Ltd. No1, Gangcyu, Su ao Township, Yilan County 270011, Taiwan, R.O.C.

01

Message from Port of Suao, TIPC

In keeping with concepts of global sustainable development, enterprises have adopted low carbon emissions and a vision of a sustainable future as core values. Taiwan International Ports Corporation leads the way in developing strategies that foster sustainable development. It is our hope that, even with limited corporate and manpower resources, we can use the concept of sustainable development as a basis for developing a heightened awareness of environmental issues such as green ports, corporate environmental responsibility, and sustainable development. We hope to create sustainable opportunities, enhance the quality of the port environment, provide impetus for the goal of sustainable development of ports and cities, and ultimately become a benchmark enterprise against which other international sustainable ports can be measured.

The blueprint for the development of Suao Port comprised the dual goals of dredging to increase bulk cargo imports and exports in the Yilan area and the development of a passenger transportation hub and tourism/recreation port area. We collaborated with the Yilan County Government to launch the Su Nan Station Plan, integrated the resources of Nanfang'ao and the port, established multifunctional transit stations, and made effective use of the land in the port area by opening up investment opportunities and establishing a modern tourist port terminal. Besides developing freight and passenger transportation, we also strove to mitigate environmental impacts caused by port operations. The management of environmental resources is a vital link in the chain of sustainable green development. We set up ecological ponds to make more efficient use of water resources and engaged in cooperative development with green industries. We anticipate achieving our goal of being an eco-friendly port and participating in global sustainable construction efforts through the green port certification process.

Kao Chwan Kai

President *of Keelung Branch*
Taiwan International Ports Corporations, Ltd.

02

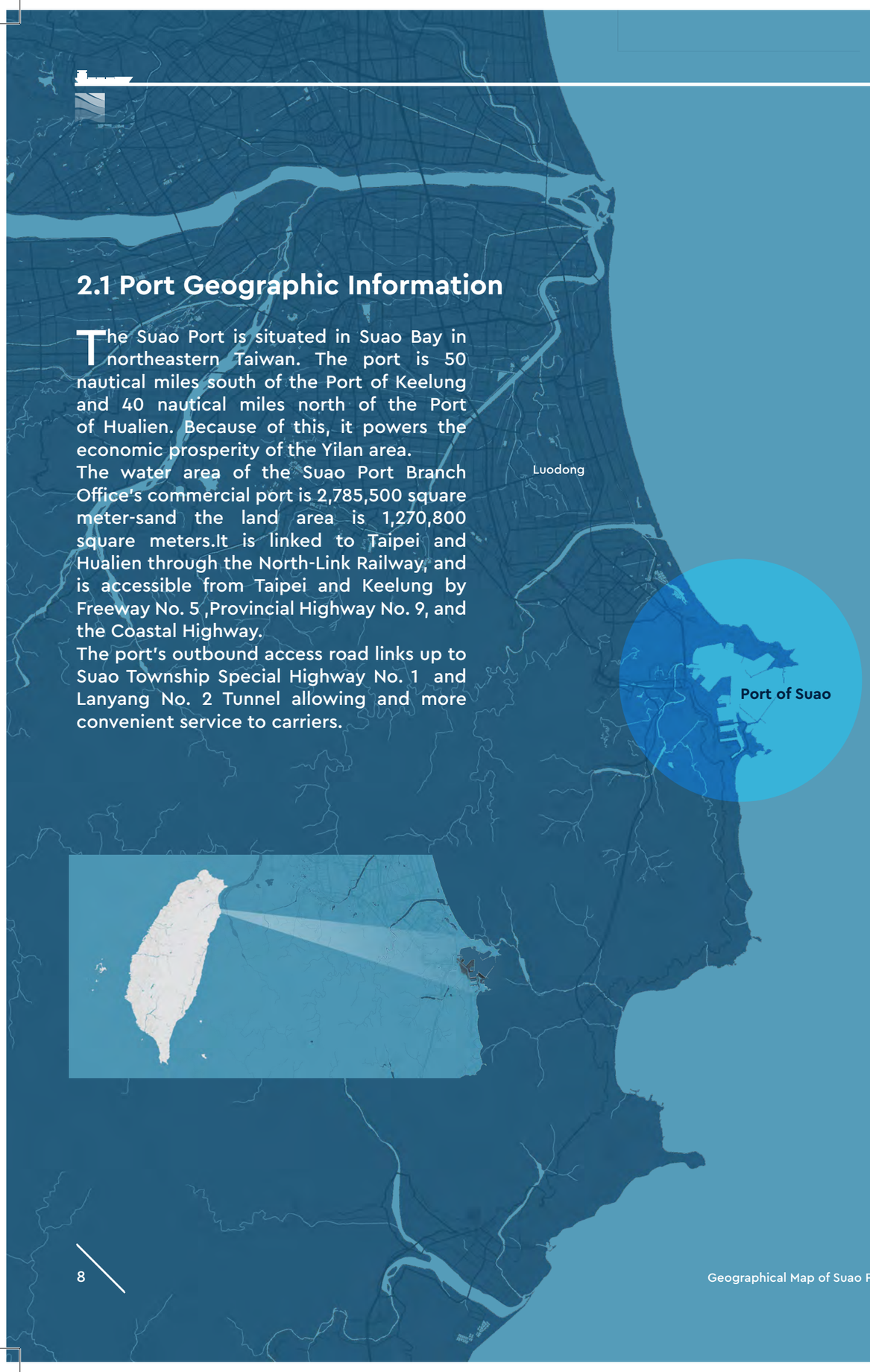
Port Profile

2.1 Port Geographic Information

The Suao Port is situated in Suao Bay in northeastern Taiwan. The port is 50 nautical miles south of the Port of Keelung and 40 nautical miles north of the Port of Hualien. Because of this, it powers the economic prosperity of the Yilan area.

The water area of the Suao Port Branch Office's commercial port is 2,785,500 square meter-sand the land area is 1,270,800 square meters.It is linked to Taipei and Hualien through the North-Link Railway, and is accessible from Taipei and Keelung by Freeway No. 5 ,Provincial Highway No. 9, and the Coastal Highway.

The port's outbound access road links up to Suao Township Special Highway No. 1 and Lanyang No. 2 Tunnel allowing and more convenient service to carriers.



Geographical Map of Suao Port

2.2 Legal Status and Port Operators

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 Keelung Harbor Bureau into a company managed system.

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 Keelung Port Bureau, stevedore operation business is now the responsibility of the Suao Port Branch Office. and the port administration and management of Suao Port was governed by the Suao Branch of the North Taiwan Maritime Affairs Center of the Maritime and Port Bureau under the Ministry of Transportation and Communications.

Master plan of Suao port

2.3 Main Commercial Activities

The Suao port has 13 docks with a total length of 2,610 meters, including 1 port service vessel dock and 12 operations docks (6 bulk cargo docks, 1 coal dock, 1 oil cargo dock, 2 cement docks, and 2 chemical cargo docks).
Suao Port providing cargo consisting of oil products, cement, coal and chemicals bulk cargo services. Bulk and general cargo is the main service target, consisting of dry bulk and liquid bulk cargo, petroleum and general cargo.

Main Commercial Activities

Commercial Activities	
Aggregates (sand, gravel)	Repair
Marinas / Leisure	General manufacturing
Cargo Handling	
Dry bulk	Liquid bulk (non-oil)
Petroleum / Oil products	General cargo

2.4 Main Cargoes

The main import cargo at Suao Port for 2019 and 2020was mineral products, followed by base metal products and chemical or industrial products. Main imports are coal, p-xylene, slag, etc., and exports are cement (pipes), pure p-xylene acid, and bulk mud filling trucks.

2019–2020 Main Import Cargoes of Port of Suao

Type	2019	2020	Comparison between 2019 and 2020	
			Actual Number	%
Coal	1,038,237	818,901	-219,336	-21.13
p-Xylene	418,967	355,619	-63,348	-15.12
Slag	284,985	316,284	31,299	10.98

Unit:MT

2019–2020 Main Export Cargoes of Port of Suao

Type	2019	2020	Comparison between 2019 and 2020	
			Actual Number	%
Cement	983,497	1,017,745	34,248	3.48
Terephthalic acid	119,393	125,420	6,027	5.05
Cement mixer truck	18,060	280	-17,780	-98.45

Unit:MT

Business statistics 2019–2020

Business item		2019	2020	Comparison of changes in 2019 & 2020	
				Difference	%
Incoming and outgoing ships	Total number of ships (vessel)	1,045	932	-113	-10.81
	Total tonnage (ton)	12,376,903	11,490,145	-886,758	-7.16
Cargo throughput	Imported cargo (metric ton)	2,308,024	2,279,388	-28,636	-1.24
	Exported cargo (metric ton)	200,590	264,676	64,086	31.95
	Domestic cargo (metric ton)	1,741,101	1,630,258	-110,843	-6.37
	Total (metric ton)	4,249,715	4,174,322	-75,393	-1.77
Number of travelers	Total number of travelers (number of people)	16,575	2,811	-13,764	-83.04

03

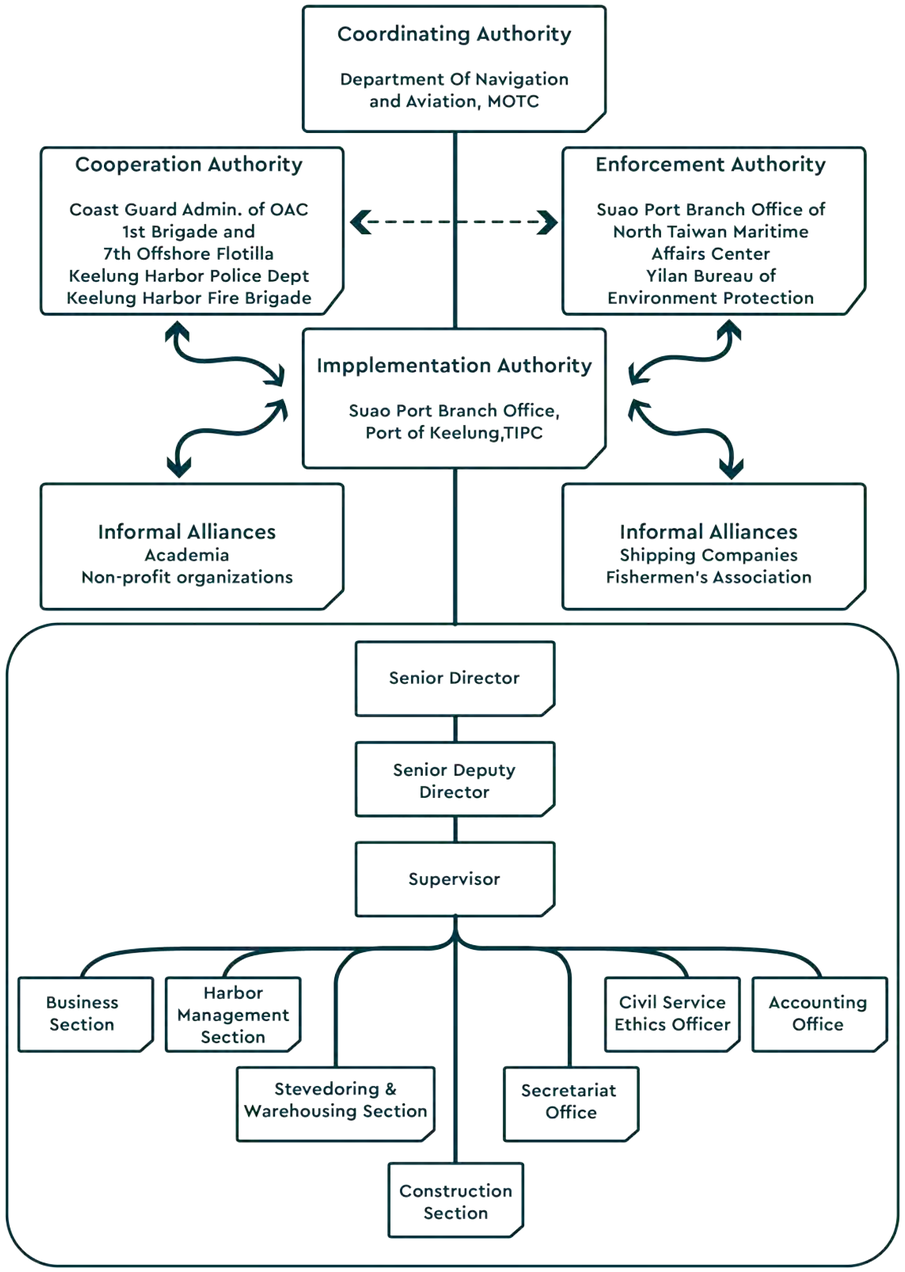
Environmental Management

3.1 Organization Structure

The Suao Port Branch Office is in charge of managing the environment of the Port of Suao. However, environmental aspects involve the division of responsibilities among differ-ent agencies. In addition to the Suao Port Branch Office, the Suao Port Branch Office of the Northern Maritime Affairs Center of Maritime and Port Bureau of MOTC, Environ-mental Protection Department of Yilan county Government, Environmental Protection Administration of Executive Yuan, Ocean Conservation Administration, Keelung Harbor Police Department Suao Unit of National Police Agency, Ministry of The Interior, Suao Harbor Subsection of Keelung Harbor Fire Brigade of National Fire Agency, Ministry of The Interior , Offshore Flotilla 7,Maritime Patrol Directorate General Of Coast Guard Administration, Executive Yuan.

The Suao Port Branch Office has 7 internal divisions, Duties of the sections/offices of Suao Port Branch Office are listed in the table below.

Department	Functions of the divisions at Taichung Port
Business Section	Customer service operation and management, invest-ment attraction, and port service and profit develop-ment
Construction Section	Port construction planning, design, commission, procurement, and supervision, and commercial port service maintenance
Harbor Management Section	Berth allocation, in-port ship traffic management, envi-ronmental protection, contamination prevention, labor safety and health ,port operation and management, and disaster prevention and rescue
Stevedoring and Warehousing Section	Stevedoring and weighing, passenger liner service, labor safety and health, and port service maintenance and management
Accounting Office	Budget, income, and expenditure administration, income and expenditure auditing, and annual and monthly report examinations
Secretariat Office	Branch office human resources and property manage-ment, public relations, cashiers, personnel affairs, and employee benefits
Civil Service Ethics Office	Service ethics formulation and promotion, corruption prevention and investigation, service ethics examina-tion and reward, confidential information protection, and security system maintenance



Authorization of environmental management units

3.2 Relevant International Regulations

The Suao Port Branch Office follows relevant international specifications, such as International Convention for the Prevention of Pollution From (MARPOL73/78), London Dumping Convention, International Convention on the Control of Harmful Anti-fouling Systems on Ships etc.

In addition to the international environmental specifications and conventions, the Suao Port Branch Office collaborates with local authorities to manage the environment in the Port in compliance with relevant environmental laws and regulations in Taiwan. The follow table lists the relevant environmental laws and regulations related to ports in Taiwan.

Competent Authority		Laws Title		Central Competent Authority	Local Law Enforcement Agencies
Sectors in the Ministry of transportation and communications		The Commercial Port Law	2021/04/28	Ministry of Transporation and Communications	Suao Port Division of North Maritime Affairs Center, Maritime and Port Bureau, MOTC
		Shipping Act	2014/01/22		
		The Law Of Ships	2018/11/28		
		Act for the Establishment and Management of Free trade zones	2019/01/16		
Sectors related to agricultural		Wildlife Conservation Act	2013/01/23	Council of Agriculture	Yilan county Agriculatture Departmant
Sectors in the Ministry of the Interior		Fire Services Act	2019/11/13	Ministry of the Interior National Police Agency	Yilan county Fire Bureau
Sectors related to environmental protection		Marine Pollution Control Act	2014/06/04	Ocean Affairs Council	Ocean Conservation Administration
		Air Pollution Control Act	2018/08/01	Environmental Protection Administration	Environmental Protection Bureau, Yilan county Government
		Water Pollution Control Act	2018/06/13		
		Waste Disposal Act	2017/06/14		
		Environmental Impact Assessment Act	2003/01/08		
		Environmental Education Act	2017/11/29		
		Noise Control Act	2021/01/20		
		Indoor Air Quality Management Act	2011/11/23		
		Toxic and Concerned Chemical Substances Control Act	2019/01/16		
		Soil and Groundwater Pollution Remediation Act	2010/02/03		
		Greenhouse Gas Reduction and Management Act	2015/07/01		
		Environmental Agents Control Act	2016/12/07		
		Public Nuisance Dispute Mediation Act	2009/06/17		Public nuisance in Yilan County Government Dispute Mediation Committee
Intersectoral		Disaster Prevention and Protection Act	2019/05/22	Ministry of Interior	Yilan county Government

3.2 Stakeholders

As an important enterprise in Suao Towhship, the Suao Branch Office of TIPC uses a variety of methods to communicate with stakeholders. Their needs and expectations are gathered and incorporated into the company's policy.
The Port of Suao believes that good communications with the stakeholders help identify key environmental issues and create value. Therefore, it collected surveys to help formulate the Port's Environmental Objectives.

Sector	Environmental Concerns	Relevant Environmental Objectives
Government	Port surroundings, Dust emissions, Noise, vehicle pollution, Collaboration with local government	II. Dust III. Vehicle exhaust gas emissions IV. Noise VI. Port development (land area)
Employee	Living quality for local community, Resource management	I. Port waste VI. Port development (land area) VII. Energy consumption
Clients	Air quality, Cargo handling, Dust emissions, Pollutions from vehicles and vessels	II. Dust III. Vehicle exhaust gas emissions V. Air quality VIII. Cargo spillage X. Vessel sewage discharge
Community	Air quality, vehicle pollution, Port surroundings	I. Port waste II. Dust III. Vehicle exhaust gas emissions IV. Noise V. Air quality VI. Port development (land area)

Port of Suao

Environmental Issues

Top 10

1. Port waste

Indicator

- Recycling rate (Iron, paper, glass, metal, plastic)

2. Dust

Indicator

- Number of pollution prevention device for cargo handling and mobile indoor cargo handling and pollution control effectiveness
- Require cargo trucks routes to go through car wash stations

3. Vehicle exhaust gas emissions

Indicator

- Ratio of trucks deployed with dust proof netting before leaving the port
- Automated door sentry to reduce vehicle downtime and reduce truck emissions and paper usage through automated door sentry system

4. Noise

Indicator

- Detailed regulations: (The port belongs to the fourth category control area of the factory (field) noise control standard, daytime)

5. Air quality

Indicator

- The ratio of using low-sulfur fuel or biodiesel
- The ratio of using shore power among harbor crafts
- The rate of Inbound vessels reducing speed to under 12 knots within 20 nautical miles.
- Air quality pass rate ($PM_{2.5}$,PM_{10}, SO_2, NO_2)

6. Port development (land area)

Indicator

- Maintain port green area

7. Energy consumption

Indicator

- Fuel, electricity, Water and paper consumption
- Replacement of efficient lightings in the port area
- Water reuse system
- Install renewable energy

8. Cargo spillage

Indicator

- Percentage of vessels carrying chemical- and oil- cargo equipped with oil containment booms

9. Relationship with Local Communities

Indicator

- Provide venues such as parking lots to rent for public parades
- Number of participants and events
- Environmental public grievances

10. Vessel sewage discharge

Indicator

- Performance of commissioned qualified operators on cleaning oily bilge water

04

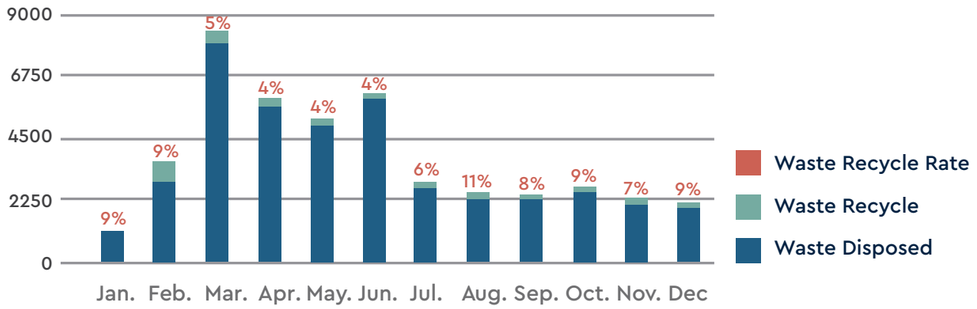
State of the Environment

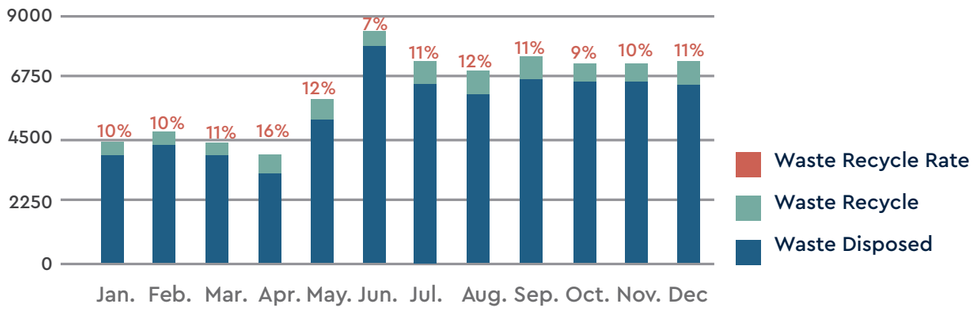
Reduce Port-generated Waste

To reduce port waste, the Branch Office has promoted waste reduction, implemented recycling and reuse, promoted the 4-in-1 recycling program initiated by the EPA in 1997 (to recycle and reduce waste), and in 2005 promoted the concept of mandatory garbage recycling to recycle items mainly consisting of paper, glass containers, and plastic products.
To reduce port waste, the Branch Office has promoted waste reduction, implemented recycling and reuse, promoted the 4-in-1 recycling program initiated by the EPA in 1997 (to recycle and reduce waste), and in 2005 promoted the concept of mandatory garbage recycling to recycle items mainly consisting of paper, glass containers, and plastic products.

Amount of waste recycle & disposal at the Port of Suao

Item	2019	2020
Total waste generated (ton)	24,676	21,167
Disposal (ton)	22,910	19,072
Recycle (ton)	1,766	2,095
Recycle Rate (%)	7.16%	9.90%





Fugitive Dust Emission Control

Suao Port's main business is cargo importing and exporting in Taiwan. The primary cargoes are raw materials such as coal, fuel oil, slag, steel billets, and cement, as well as gravel and other bulk cargo stevedoring operations that generate large amounts of dust.

A dust management strategy was adopted to reduce dust pollution and maintain a good working environment and quality of life in the port and downtown area.
The port took measures to improve its dust-proofing facilities, including creating additional locations for weigh stations and vehicle washing stations, shortening vehicle driving distances, improving the efficiency of the spray jets at vehicle washing stations, and achieve the goal of reducing dust levels outside of the
port.

Suao Port Fugitive Dust Control Measures

Aspects	Dust Control Measures	
Cargo Handling	• No dust emissions, no landing, and tight sealing • Utilize automated coal unloading machines to increase operational efficiency and reduces emissions. • Encourage cargo handling industries to implement dust-control meshes • Deploy mobile sprinkling system	Dust Suppressing Devices: • Water Spray: 15 units • Dust-control meshes: 24 units • Automatic Coal Cargo Handler
Vehicle Control	• Create additional weigh stations and vehicle washing stations • Install automated gates to enhance car wash station effectiveness • Sweep inner and neighboring roads on a daily basis	

Port of Suao uses automatic coal unloading machine to reduce one of its main air pollution sources.

Port of Suao combines vehicle scales with car washing stations to make pollution control more efficient and effective.

Air Quality Improvement Strategies

Environmental Friendly Vessels

The main pollution sources of Suao Port include particulates resulting from stevedoring, smog caused by vessel fuel, and dust emitted by construction sites. Moreover, Suao Port has designated "preventing dust emission in port areas" and "reducing vehicular pollution in port areas" as independent environmental issues, and environmental friendly vessel policies, and shore power systems to achieve the goal of improving air quality in port areas.
One example is the use of onshore power systems when port service vessels are berthed at the government terminal. Two additional sets will be added at the official wharf and pier 11 in 2019, and one set will be added in 2020, for a total of 19 shore power systems. In 2019 and 2020, 92,577 kWh and 77,092 kWh of electricity will be used respectively.

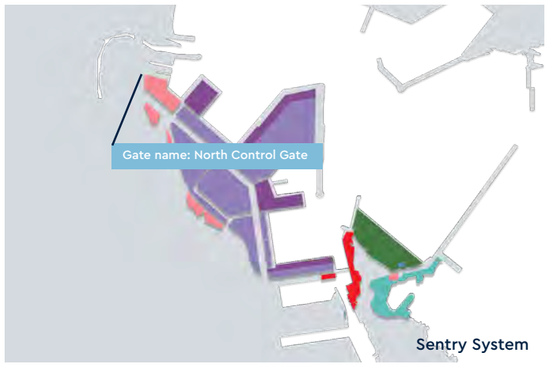
In addition, the Suao Port encourages vessel speed reduction (VSR), which is to reduce speed of vessels within 20 nmi to the port to under 12 knots to abate air pollution.

Shore Power Services at Suao Port

Operating enterprise	TIPC Marine Corp.	CPC	Customs Office	Coast guard	Dancewood Yacht	Natchan Rera	Rikulau Blue Magpie
Wharf	Barge wharf	Timber storage wharf				pier 11	pier 1
# of units	5	1	2	7	2	1	2

Sentry System

Sentry System is used in the automated baggage system for cargo (container) trucks and bulk cargo transportation. It can automatically obtain license plates, container numbers and RFID personnel passes, and instantly compare the information sheet data to assist the port police in the verification of people and cabinets. Provide the customs to grasp container dynamics and handle inspection work, speed up the clearance of drivers in and out of the area, and fatally improve the efficiency of port and port operations.
Since its establishment in 2013, the Suao Port aSentry System has achieved air pollution reduction benefits, including shortening vehicle parking time, greatly reducing exhaust emissions while waiting, and improving air quality; electronic forms make paper resources energy-saving Benefits have increased substantially.



Sentry System


Sentry System

Sentry System energy saving efficiency

item	Actual energy saving efficiency
Reduce vehicle pollution	• Originally it took 4 minutes (approximately 240 seconds) to deliver the order to the port police by manual paper delivery. However, after actual measurement and statistics on the spot and using the gate guard system, the induction travel time is only 20 seconds, which is reduced by about 220 seconds in total, effectively reducing truck waiting Hourly exhaust gas emissions 91.6%
Improve energy efficiency	• Electronic forms are used for trucks entering and leaving the port to carry goods • Automatic identification of license plates, human IDs, and vehicle IDs for trucks entering and leaving the port • Use electronic kanban to confirm the type and quantity of goods transported by truck • The total number of trips using automated door sentry system in 2019 was 150,997, which meant the reduction in paper usage was 150,997 million sheets • The total number of trips using automated door sentry system in 2020 was 180,052, which meant the reduction in paper usage was 180,052 million sheets

Indoor Air Quality

The main air pollution sources of Suao Port include particulates resulting from stevedoring, smog caused by vessel fuel, and dust emitted by construction sites.
Suao Port has designated pre-venting dust emission and reducing vehicular pollution in port areas as independent environmental issues, and environ-mental friendly vessel policies and shore power systems to achieve the goal of improving air quality in port areas. The Suao Port conducts air quality monitoring in 5 location. The monitoring items include fine suspended particles ($PM_{2.5}$ & PM_{10}), sulfur dioxides (SO_2), nitrogen dioxide (NO_2), etc. In 2019 and 2020, all monitored items meet the air quality monitoring requirements announced by the Environmental Protection Administration.

Air Quality Monitoring Sites

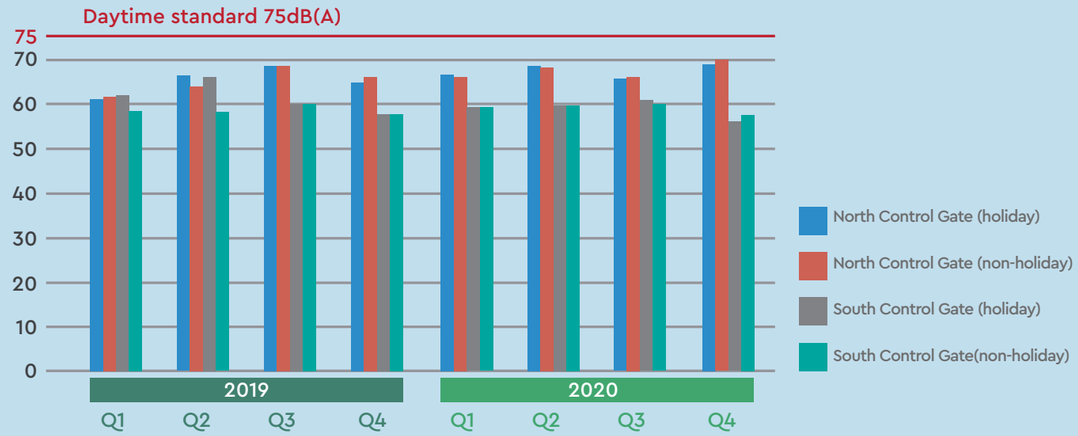
Noise

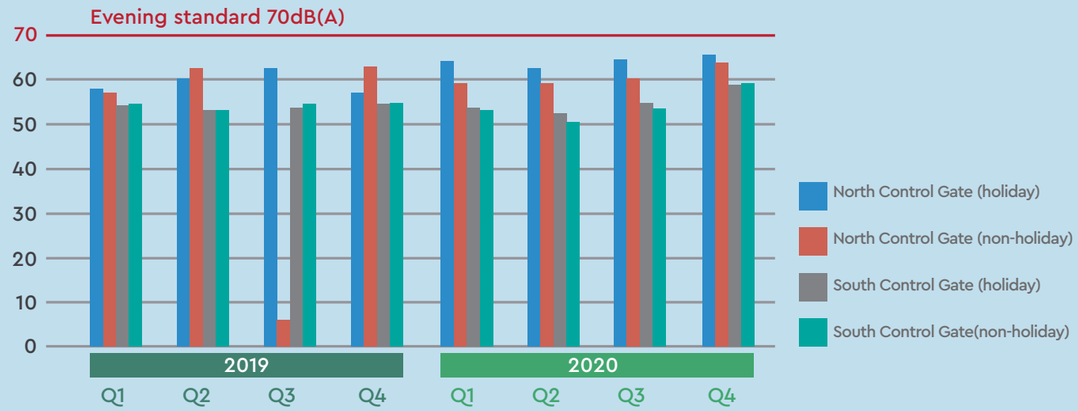
Since stevedoring and dispatching work at the Suao Port Branch Office is continuous and truck traffic volume is enormous, the noise pollution problem is one of the top environmental topics of concern among neigh-boring residents.

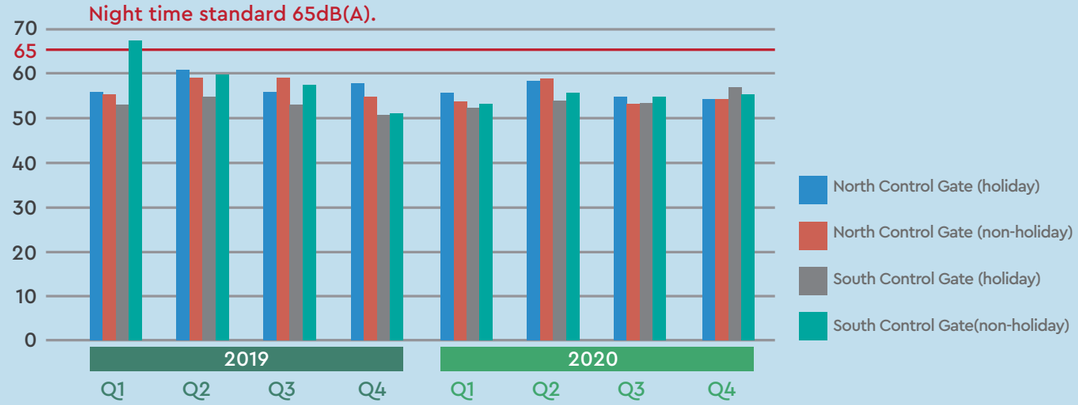
The Suao Port Branch Office requires that all commercial operations, vessels, and vehicles must comply with noise control standards.

The Suao Port Branch Office created an access road buffer zone to reduce crossover be-tween port district and residential traffic, reduce vehicle noise, and ensure safe traffic and a peaceful community.

According to port environmental quality monitoring results, the rate of compliance with noise control standards stood at 96% for both 2019 and 2020.







Strengthen Hazardous Cargo Management

Suao Port's dangerous goods storage and transportation businesses could potentially be the source of a large number of environmental hazards. Leakages would pose grave dangers, both to the ecosystem and to neighboring residents. Therefore, the strengthening of port district safety has been one of the important environ-mental issues of Suao Port. Therefore, improving cargo management and port security has become a crucial task for Suao Port. Companies operating in the port shall devise corresponding emergency response plans and organize joint disaster drills to increase their capability of addressing emergency events.
In accordance to current regulations, the Suao Port Branch Office stipulates a set of operating procedures for a variety of dangerous cargo. For instance, radio-active stevedoring requires import and export permits from the Atomic Energy Commission under the Executive Yuan, and explosive stevedoring requires import and export permits from the Bureau of Foreign Trade and transportation certificates from the Bureau of Mines under the Ministry of Economic Affairs.
The Branch Office inspects stevedoring in the port more than spot checks of discharge pipes and manages dangerous cargo in the port.

In addition, the Branch Office contacts each port unit on a regular basis to develop emergency response plans for cargo leakage and improve the response capacity for responding to such events.

The Branch Office stipulated that emergency response drills shall be organized at least once per year and a joint safety promotion at least once per year.

Inspections and Drills Conducted in 2019–2020

Year	2019	2020
Inspections	377	378
Cross Agency Inspections	13	15


Disaster rescue drill


Disaster rescue drill


Spot check cargo transfer pipes


Spot check cargo transfer pipes

Land Use Optimization

According to the overall review of the overall development of Suao Port approved by the Executive Yuan and the implementation of the national development key plan, the long-range goal of Suao Port should be diversified, creating a high-value, low-polluting business environment, and driving regional prosperity and improvement quality living environment.

Therefore, in addition to port expansion and improvements in commercial performance, Suao Port values greenspace and development of recreational areas in the port, diversifying it business goal.

Suao Port development strategy is to utilize the port's two main sections for different purposes: the south section is designated a tourist/recreation area while the north section is dedicated to cargo operations. The Office opened up 4.5 hectares of land in the south section at transit sheds 10 and 11 and docks 12 and 13 to investors and established this area as the Suao Port Branch Office Tourism and Transit Zone, coordinating it with the Yilan County Government's Su Nan Station plan and integrating the tourism resources of the nearby village of Nanfangao.

Expected benefits	Description
Enhance industrial development	The construction of four major modern tourist areas, including the sea gate, the fishing village core living area, and the Peninsula seascape scenic area, will provide local businesses with a blueprint for hotels, recreation areas for children, and a shopping area, set up a multi-functional composite transfer station, combining functions such as catering, rest, national highway transfer, green connection, cruise shipping, etc. to promote the development of tourism and create local employment opportunities.
Improve traffic	Through integration with Yilan County Government's road safty conference, the southern control gate traffic route and parking lot were re-planned.
Enhance asset efficiency	The lease and development method was employed and a portion of the signal station was leased out to revitalize the old building and develop tourism.

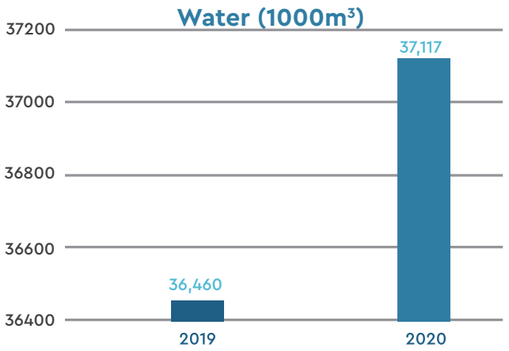
Suao Port Tourism and Transit Zone


Suao Port Tourism and Transit Zone

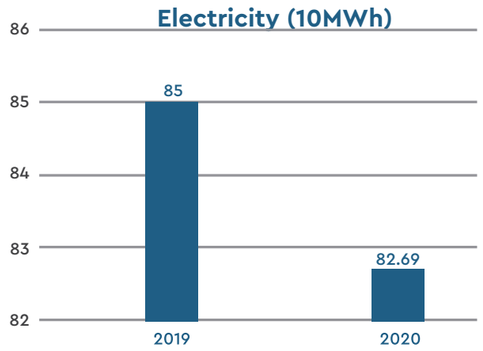
Reduce Port-generated Waste

The port monitors its consumption of energy and re-sources in accordance with the "Energy and Resources Saving Project". As the export volume of the port increases, there is also the operation of dredging and other improvement projects in the port.
Suao Port conducted water, electric, oil, and paper savings management, and formulated strategies for improvements in water resources utilization in 2016. The port plans to build a 500-ton ecological pond to improve water usage efficiency.

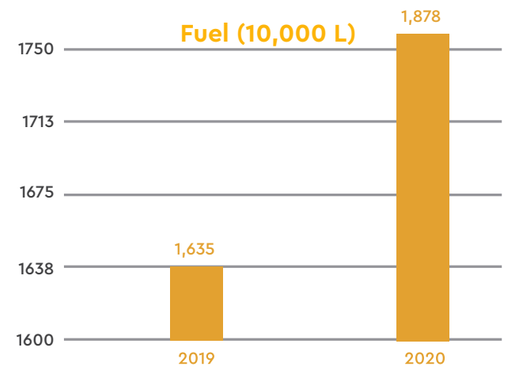
In 2019, the overall gasoline consumption is 1,635 liters, the overall electricity consumption is 850,047 kWh, the overall water consumption is 36,460 kWh, and the overall paper consumption is about 118.8 packs (500 sheets per pack).
In 2020, the overall gasoline consumption is 1,878 liters, the overall electricity consumption is 826,985 kWh, the overall water consumption is 37,117 kWh, and the overall paper consumption is about 114.2 packs (500 sheets per pack).



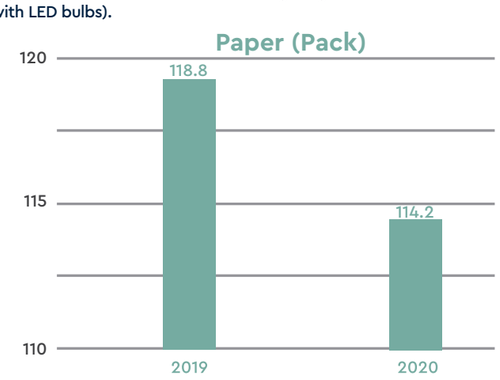
Reduce water consumption by -22% in 2019 and 2020 (reduction of sporadic construction in the port area and improvement of pipeline leakage).



Electricity consumption increased by 0.18% in 2019 and 2020 and decreased by -2.7% in 2020 (for the aftermath of the Nanfang'ao Bridge breakage incident and the replacement of lighting equipment in the port area with LED bulbs).



In 2019 and 2020, fuel consumption will increase by 21% and 12% (for the aftermath of the Nanfang'ao Bridge breakage incident, the number of official vehicle trips increased).



Paper consumption increased by 2% in 2019 (due to an increase in paperwork for the aftermath of the Nanfang'ao Bridge breakage incident). Reduce paper consumption by -4% in 2020 (the unit uses old paper to recycle and photocopy to avoid waste).

In order to reduce resource consumption, Suao Port has been keeping records of water, electricity, fuel, and paper usage to actualize green accounting.

Resource Savings Strategies of Suao Port

Category	Strategies
Water	A 500-ton ecological pond to draw water to the port's three 200-ton reservoirs was established
Electricity	Turn off unnecessary lights in hall waysGradually replace traditional lightings to energy saving onceDo not use AC under 28°C, and keep office above 26°C Turn off office lightings during lunch breakThe three elevators in the administrative building are utilized in rotation to conserve energy.
Fuel	Promote ride sharingLimited idle speed duration to less than 3 min-Regularly recorded the fuel consumption of official vehicles
Paper	Encouraging online administrative service and online document sign-ingPrint documents on both sides and reuse used paper


Use rain harvest water for dust suppression

Greenhouse Gas Emissions

In order to achieve carbon reduction, sources of green house gases (GHGs) emissions must be identified first.

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

Carbon Emissions from Ships

The Taiwan air pollution emission [TEDS 8.1] line source manual calculation formula was adopted to estimate carbon emissions by ocean-going vessels:

Ocean-going ship carbon emissions($kgCO_{2e}$) =
Fuel consumption (L)× Emissions factor ($KgCO_{2e}$/L)× Control factor

Note:
Fuel consumption (L) = Cargo throughput (ton)× Energy density (L/ton-km)× Harbor travel distance (km)×1,000 (kg/ton)

A ship entering the harbor may switch to marine diesel oil, the properties of which are similar to those of regular diesel fuel. Therefore, the 2018 diesel fuel carbon emission factor in the EPA carbon factor database is used as a reference for the emissions factor.

2019–2020 Ocean-Going Ship Carbon Emissions

Year	Total Cargo Throughput (ton)	Energy Density (L/ton-km)	Harbor Travel Distance (km)	Fuel Consumption (L)	Emissions Factor ($kgCO_{2e}$/L)	Carbon Emissions (ton)
2019	4,191,916	0.003	2	25.15	2.60	65.39
2020	4,490,105	0.003	2	26.94	2.60	70.04

Carbon Emissions from Resource Consumption

Resource consumption and greenhouse gas emissions of Suao Port

Resource	Emission Coefficient $kgCO_{2e}$		2019		2020	
	2019	2020	Amount of ResourceConsumed	Carbon Emissions(ton)	Amount of ResourceConsumed	Carbon Emissions(ton)
Water (m^3)	0.152	0.162	1,730	0.26	1,703	0.27
	Tai-Water Company					
Electricity (kWh)	0.554	0.533	360,205	199.6	372,045	198.3
	National Ave Emission					
Fuel (L)	2.263		1,335	3.0	1,878	4.2
	EPA 2019					
Paper (Pack)	2.8		112	0.31	126	0.35
	Paper Star A4 photocopying paper (500 sheets)					
Total				203.17		203.12

Note: Resource consumption carbon emission = [actual usage x emission factor]

Strengthen the relationship with the community

The Suao Port Branch Office issues regular news releases regarding operations on the TIPC website. It creates public awareness of the port's operational status and makes an effort to elicit the opinions of local residents regarding the Suao Port , and strives to address their concerns.
The Office also works with local businesses, cooperates with local stevedoring, mooring, and ballast control operators to promote the economic of the local community.

In order to promote environmentally friendly and development objectives. The Suao Port Environmental Cleanup Day as a form of environmental education ,and the public to join in the cleanup activities, thus maintaining the surrounding environment, increasing exchange between the port and the local community, and promoting a harmonious relationship between the local community and the Suao Port.

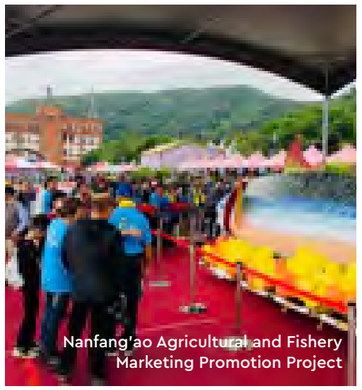
Environmental public grievances in 2019–2020

Item	2019	2020
Total no. of public grievances	5	0
Number of handling environmental public grievances	0	0

Activities for renting venues

Year	Event	Organizer	Time
Annual	Spring Festival Nanfangao Parking Grooming	Suao Township Office	• 5 days
	Nanfang'ao Agricultural and Fishery Marketing Promotion Project (Mackerel Festival)	Marine and Fishery Development Institute ,Yilan County	• 3days
	Suhua Road Marathon Carnival	Suao Township Sports Association	• 2days
	Lanyang Mazu Cultural Festival Activities	Yilan County Government	• 3days
	Suao Ocean Carnival	Suao Township Office	• 2days
	Nanfang'ao Seafood Carnival Road Run	Yilan County Government	• 2days
	Dragon Boat Festival, Ching Ming Festival, Mid-Autumn Festival holidays	Suao Township Office	• 3days
2019	Blessing ceremony for Nanfang'ao Bridge breakage incident	Weiyong Shipping Agency Co., Ltd.	108/12/05-109/01/04
2020	• Rebuilding blessing ceremony for Nanfang'ao Bridge breakage incident • 2020 Nanfang'ao Agricultural and Fishery Marketing Promotion Project (Mackerel Festival) • 2020 Suao welcomes the Golden Rat Good Luck Market	• Suhua Highway Improvement Engineering Office, General Administration of Highways • Marine and Fishery Development Institute ,Yilan County • Suao Township Office	10/05 9/26-9/27 1/25-1/29

Suao port port clean-up


Nanfang'ao Agricultural and Fishery Marketing Promotion Project

Yueming Elementary School ``Happy Sailors 2020 Dream Sailing Ceremony''


Suhua Road Marathon Carnival


2020 Suao welcomes the Golden Rat Good Luck Market


Rebuilding blessing ceremony

Water Quality

The Suao Port Branch Office proposed the Port Area Pollution Prevention and Reduction Measures plan to monitor port water quality; control domestic sewage, wastewater from port operations, and runoff waste-water; monitor water temperature, pH, DO, BOD_5, mineral oil, and E. coli levels.

Suao Port carry out quarterly sample testing for Type B ocean environment quality standards. The compliance rate for 2019 and 2020 was 100% for all categories.

Suao Port water quality

Indicators	Standards	Measurements	Pass rate(%)
water temperature(°C)	-	21.9~30.9	-
pH	7.5~8.5	7.5~8.2	100
DO(mg/L)	≧ 5.0	5.0~7.6	100
BOD_5(mg/L)	<3	<1.0~1.7	100
mineral oil(mg/L)	<2	<1.0	100
E. coli(CFU/100mL)	-	10~22,000	-

Note: Environmental quality standards for class II marine water bodies are referenced when examining the port's water quality

Taking Water Sample

Water Quality Improvement Strategies

The Suao Port water quality improvement strategies

Type	Area	Improvement Strategies
Domestic wastewater	Port office building	• ''Office domestic sewage and port operation runoff wastewater treatment and interception system'' has been completed in 2019. • The sewage system was integrated with the Suao Town, Yilan County Sewer System.
Wastewater from port operations	General Cargo Wharf	• A grit chamber is used to recycle and reuse wastewater from vehicle washing stations. • Port traffic routes were reformulated to reduce emissions of pollutants.
Runoff wastewater	Container Yard and Storage facility	• A dedicated runoff wastewater drainage system has been installed in the wharf area.
	Road and open space	• Drainage ditches have been installed at the roadsides • Regular cleaning of road surfaces is conducted. • ''Office domestic sewage and port operation runoff wastewater treatment and interception system'' has been completed in 2019.

Water Quality Monitoring Station

Environmental Performance Indicators

Significant environmental issues of Suao Port		Indicator	Calculation method		Target value	Indicator presentation (calculation details)		
						2019		2020
1	Port waste	Recycling rate (Iron, paper, glass, metal, plastic)	Port waste recycling rate in the harbor land area		10% port waste recycling rate in the harbor land area based on general waste removed	• Waste recycled: 1,766 kg • Total production: 24,676 kg • Annual recycling rate 1,766kg÷24,676kg×100%=7.16%		• Waste recycled: 2,094 kg • Total production: 21,167 kg • Annual recycling rate 2,094 kg÷21,167 kg×100%=9.90%
2	Dust	Number of pollution prevention device for cargo handling and mobile indoor cargo handling and pollution control effectiveness	Number of dust prevention devices implemented annually Pollution control effectiveness		Increase/update or maintain the number of dust prevention devices and their pollution control effectiveness	Coal	Automatic conveyer: 3	Effectiveness: 90%
						Cement	Enclosed negative pressure pipeline	Effectiveness: 99%
						Cement clinker	Each grabber must accompany with sprinklers and dust nets. There are currently 15 sprinklers and 24 dust nets	Effectiveness: 72%
		Require cargo trucks routes to go through car wash stations	The ratio of cargo truck that goes through car wash stations		The ratio of cargo truck that goes through car wash stations reaches 100%	Ratio of cargo truck that goes through car wash stations: 100%		Ratio of cargo truck that goes through car wash stations: 100%
3	Vehicle exhaust gas emissions (including cargo handling)	Ratio of trucks deployed with dust proof netting before leaving the port	Number fo trucks deployed with dust proof netting before leaving the port÷ Total number of trucks leaving port × 100% Note: Empty vehicles have been deducted.		Ratio of trucks deployed with dust proof netting before leaving the port: 95%	• Number of trucks with dust proof netting installed under containers before leaving port: 59,991(The total number of outbound trucks is 150,997 × the loading ratio of fugitive cargo is 39.73%) • Total number of trucks leaving port : 59,986(5 fines) • 59,986÷59,991x 100%= 99.9%		• Number of trucks with dust proof netting installed under containers before leaving port: 125,406(Total number of outbound trucks 180,052 × Fugitive cargo load ratio 69.65%) • Total number of trucks leaving port : 125,401 • 125,401÷125,406x 100%= 99.9%
		Automated door sentry to reduce vehicle downtime and reduce truck emissions and paper usage through automated door sentry system	Difference in stopping time and emission reduction in stopping time between manual clearance and automated door sentry system		Reduced downtime by up to 60% Reduced paper usage by 70%	• The original manual paper delivery to the port police takes 4 minutes (about 240 seconds), but after the measurement and statistics of the use of the door sentry system, the passage time is only 20 seconds, a total reduction of about 220 seconds, effectively reducing truck emissions while waiting for a stop by 91.6%. • The total number of trips using automated door sentry system in 2019 was 150,997, which meant the reduction in paper usage was 150,997 million sheet, reduced paper usage by 100%		• The original manual paper delivery to the port police takes 4 minutes (about 240 seconds), but after the measurement and statistics of the use of the door sentry system, the passage time is only 20 seconds, a total reduction of about 220 seconds, effectively reducing truck emissions while waiting for a stop by 91.6%. • The total number of trips using automated door sentry system in 2020 was 180,052, which meant the reduction in paper usage was 180,052 million sheets
4	Noise	Daily pass rate of port noise quality	Number of noise detection passes (times) ÷ total number of noise detection × 100%		• Daytime Leq: 76dB • Evening Leq: 75dB • Nighttime Leq: 72dB	• Daytime Leq 100% • Evening Leq 100% • Nighttime Leq 100%		• Daytime Leq 100% • Evening Leq 100% • Nighttime Leq 100%
		Noise-related petition cases	Noise-related petition cases received by the port and the Environmental Protection Bureau		Decrease year by year	Noise-related petition cases: 0		Noise-related petition cases: 0

Environmental Performance Indicators

Significant environmental issues of Suao Port		Indicator	Calculation method		Target value	Indicator presentation (calculation details)	
						2019	2020
5	Air quality	The ratio of using low-sulfur fuel or biodiesel and the consumption of low-sulfur fuel among harbor crafts Low-sulfur fuel: Fuel with sulfur content less than 10ppm.	Number of harbor crafts using low-sulfur fuel (marine diesel oil or super diesel) ÷ Total number of harbor crafts × 100%		The ratio of using low-sulfur fuel or biodiesel reaches 100% among harbor crafts	• 4÷4×100%=100% • Number of harbor crafts:4 • Number of harbor crafts using low-sulfur fuel • Amount of low-sulfur fuel used by harbor crafts: 178,591 liter	• 4÷4×100%=100% • Number of harbor crafts:4 • Number of harbor crafts using low-sulfur fuel • Amount of low-sulfur fuel used by harbor crafts: 144,360 liter
		The ratio of using shore power among harbor crafts	Number of harbor crafts using shore power ÷ Total number of harbor crafts × 100%		The ratio of using shore power reaches 100% among harbor crafts	• 4÷4×100%=100% • All the harbor craft use shore power during berthing operations • Electricity consumption of harbor crafts: 92,577 kWh	• 4÷4×100%=100% • All the harbor craft use shore power during berthing operations • Electricity consumption of harbor crafts: 77,092 kWh
		The rate of Inbound vessels reducing speed to under 12 knots within 20 nautical miles.	The number of Inbound vessels reducing speed to under 12 knots within 20 nautical miles of the port ÷ the number of inbound vessels × 100%		Vessel speed reduction rate: 2019: 70% 2020: 75%	Vessel speed reduction rate:78%	Vessel speed reduction rate:86%
		Air quality pass rate ($PM_{2.5}$,PM_{10}, SO_2, NO_2) Note: background envi- ronmental values have been considered and substrated	Ratio of the measurements in the air quality monitoring station of the port that meet the "Air Quality Standards		The qualified percentage of the daily average is 100%,	Qualified percentage of daily average • $PM_{2.5}$:100% • PM_{10}: 100% • SO_2 100% • NO_2: 100%	Qualified percentage of daily average • $PM_{2.5}$:100% • PM_{10}: 100% • SO_2: 100% • NO_2: 100%
6	Port development (land area)	Maintain port green area	Calculate annual port green area		Maintain port green area	In 2019, the port green area was about 8 hectares	In 2020, the port green area was about 8 hectares
7	Energy consumption	Fuel, electricity, Water and paper consumption	Difference of fuel, electricity, water and paper consumption (the year before and the year after)		Save 1% of fuel usage, 1% of electricity usage, 2% of water usage, and 3% of paper usage	The fuel was 1,335 liter; total electricity usage was 360,205kWh; total water usage was 1,730m³; total paper consumption was 112 packages.	The fuel was 1,878 liter; total electricity usage was 37,204kWh; total water usage was1,703 m³; total paper consumption was 126 packages.
						Fuel Use: 21% (due to the increase in the number of engineering vehicle trips in the aftermath of the Nanfang'ao Bridge breakage) Electricity Use:0.18 % (Due to the increase in the consumption in the aftermath of the Nanfang'ao Bridge) Water Use: -22% (the reduction in construction projects in the port area) Paper Use: -2% (Increased paperwork for the aftermath of the Nanfang'ao Bridge breakage)	Fuel Use: 12% (due to the increase in the number of engineering vehicle trips in the aftermath of the Nanfang'ao Bridge breakage) Electricity Use:-2.7 % (Lighting equipment in the port area was replace to be the LED bulbs) Water Use: -22% (the reduction in construction projects in the port area, and Pipeline leakage improvement) Paper Use: -4% (Units use used papers for recycling and photocopying to avoid waste)
		Replacement of efficient lightings in the port area	Proportion of energy-saving streetlights replaced in the port area(number of energy-saving lamps replaced ÷ total number) and power saving rate[(- original electricity consumption – electricity consumption after replacement) ÷ original electricity consumption × 100%].		Replacement rate in 2019: 70%; power saving efficiency: 40% Replacement rate in 2020: 80%; power saving efficiency 50%	Replacement rate in 2019: 73.4%; (312 streetlights replaced ÷ 425 total streetlights) Power saving rate: 40% [(Original power consumption 86,400W - power consumption after replacement 47,200W) ÷ Original power consumption 86,400W × 100%]	Replacement rate in 2020: 88.4%; (375 streetlights replaced ÷ 425 total streetlights) Power saving rate: 55.1% [(Original power consumption 52,000W - power consumption after replacement 23,340W) ÷ Original power consumption 52,000W × 100%]

Environmental Performance Indicators

Significant environmental issues of Suao Port		Indicator	Calculation method		Target value	Indicator presentation (calculation details)	
						2019	2020
7	Energy consumption	Water reuse system	Statistics		Water withdrawal up to 2 million cubic meters	Total water withdrawal from January to December: 286,8152 cubic meters	Total water withdrawal from January to December: 248,830 cubic meters (less in rainy days)
		Install renewable energy	Capacity and usage		The original capacity : 2,500kWp and additional photovoltaic system device reaches 300kWp	• The photovoltaic system capacity of warehouse No.4 rooftop is 500kWp and the average annual generation capacity is 44,320kWh. • Pihsiang Electric Vehicle Rooftop Photovoltaic System Installation Capacity is 1,996.4kWp and the average anuual generation capacity is 2,098,488 kWh. • Total electricity generation is 2,142,808 kWh. • Estimated annual carbon reduction is 1,091 metric tons of CO_2 emissions (Based on the carbon emission coefficient of 0.509 kg CO_2/kWh in 2019 announced by the Bureau of Energy,Ministry of Economic Affairs).	• The photovoltaic system capacity of warehouse No.4 rooftop is 500kWp and the average annual generation capacity is 524,535kWh. • Pihsiang Electric Vehicle Rooftop Photovoltaic System Installation Capacity is 1,996.4kWp and the average anuual generation capacity is 2,073,807 kWh. • The photovoltaic system capacity of warehouse No.15 rooftop is 332kWp. • The average annual generation capacity is 29,496 kWh (started to be parallel circuits in 6/30/2020). • Total electricity generation is 2,627,838 kWh. • Estimated annual carbon reduction is 1,091 metric tons of CO_2 emissions (Based on the carbon emission coefficient of 0.509 kg CO_2/kWh in 2019 announced by the Bureau of Energy,Ministry of Economic Affairs).
8	Cargo spillage	Percentage of vessels carrying chemical- and oil- cargo equipped with oil containment booms	Number of vessels carrying chemical- and oil-cargo equipped with oil containment booms÷ Number of vessels carrying chemical- and oil-cargo equipped×100%		Number of vessels carrying chemical- and oil- cargo equipped with oil containment booms×100%	• Number of vessels carrying chemical- and oil- cargo equipped with oil containment booms: 108 • Number of vessels carrying chemical- and oil- cargo equipped: 108 108 ÷108X100%=100% The ratio of vessels carrying chemical- and oil- cargo equipped with oil containment booms: 100%	• Number of vessels carrying chemical- and oil- cargo equipped with oil containment booms: 104 • Number of vessels carrying chemical- and oil- cargo equipped: 104 104 ÷104X100%=100% The ratio of vessels carrying chemical- and oil- cargo equipped with oil containment booms: 100%
9	Relationship with Local Communities	Provide venues such as parking lots to rent for public parades	Renting venues and organizing events		Annual target handling activities and renting venues 5 times	Handling activities and renting venues:10 times	Handling activities and renting venues:11 times
		Number of participants and events,	Count of participants and event		Annual target 2 events 50 participants	• Total number of participants: 56 • 3 activities held	• Total number of participants: 102 • 4 activities held
		Environmental public grievances	Number of environmental public grievances		Number of handling environmental public grievances <6	Number of handling environmental public grievances: 0	Number of handling environmental public grievances: 0
10	Vessel sewage discharge	Performance of commissioned qualified operators on cleaning oily bilge water	Number of cleanups conducted by relevant vessels÷ number of vessels that collected oily bilge water × 100%		100% oily bilge water cleanup	• Cleanups conducted by relevant vessels (oily bilge water): 5 5÷5×100%=100% • Total oily bilge water collected: 51.07t	• Cleanups conducted by relevant vessels (oily bilge water): 5 5÷5×100%=100% • Total oily bilge water collected: 15t

05

Emergency Response

Port of Suao Emergency Response

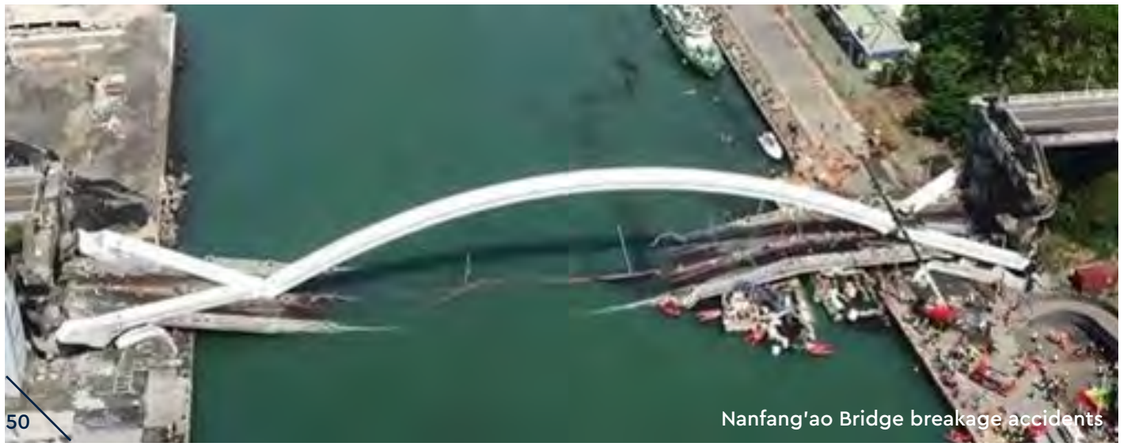
In order to maintain port safety, the Suao Port Branch Office conducts daily land and marine environment inspection. When any suspicious behavior was identified, the inspection personnel will immediately notify for correction or inform competent legal authorities for legal enforcement. In 2019 and 2020 major port accidents were Nanfang'ao Bridge breakage accidents.

For port pollution and disaster, Suao Port Branch Office, Yilan County Environmental Protection Department, and the Suao Port Branch Office of the Northern Mari-time Affairs Center of Maritime and Port Bureau of MOTC each accepts Public Nuisance Petitions.

Regarding catastrophic events such as vessel or fire explosions, the Port triggers emergency response procedure to cope with disastrous incidence.

Suao Port 2019–2020 Accidental Incidents

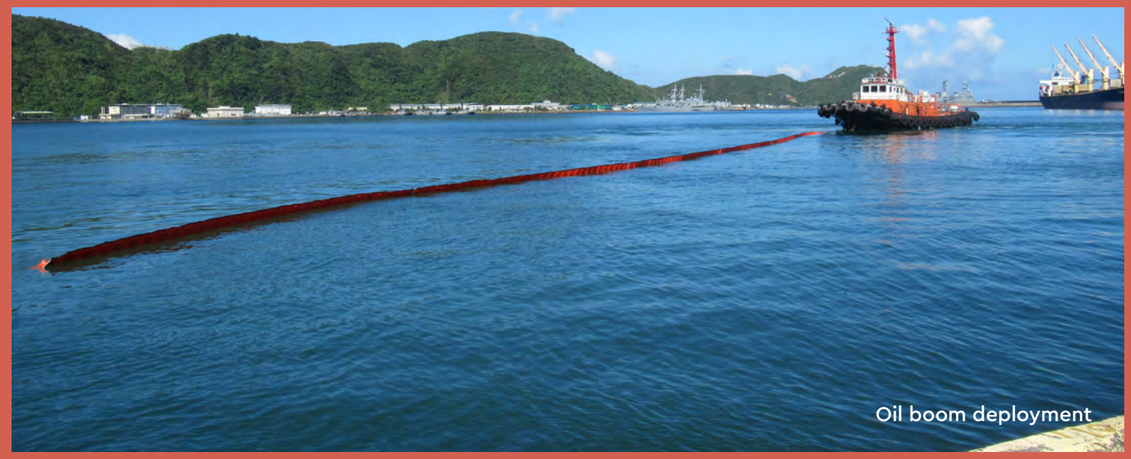
Accident type/Year	2019	2020
Vessel collision, shipwreck, fire, oil and other chemical spillage	0	0
Ship machinery breakdown, tilt, strand	0	0
Major warehouse, storage tank explosion	0	0
Port minor pollution, fire, chemical spillage	0	0
Man overboard, occupational accident, flotsam	0	0
Other major accidents (Nanfang'ao Bridge breakage accidents)	1	0



Nanfang'ao Bridge breakage accidents

Port of Taichung Conducted Drills in 2019–2020

Year	Drill name	Content	Date
2019	Yilan County Marine Pollution Emergency Response Drill	In order to strengthen familiarity with the notification process and the division of responsibilities when an incident occurs, and to strengthen the ability to respond quickly, Suao Port and the Environmental Protection Bureau jointly organized a marine pollution emergency response drill.	3/15
2020	The Executive Yuan's 109 National Critical Infrastructure Protection Exercise-Suao Port and Nanao Fishing Port	In order to strengthen the prevention and control measures of disaster pollution in business districts and fishing ports, Suao Port and the Fisheries Association jointly organized fire and heavy oil pollution prevention exercises	9/08



Oil boom deployment

Oil boom retrival

Port safety drill

Port of Suao Emergency Response

Nanfang'ao Bridge collapsed at 9:34 p.m. on October 1, 2008. The bridge fell and hit three fishing boats waiting for refueling under the bridge, sinking in the channel. In addition, a tanker truck of CPC Corporation driving on the bridge fell down with the bridge structure, causing smoke and fire.

Suao port immediately notified the relevant units in accordance with the Disaster Prevention and Rescue Act and also notified the MOTC to activate the emergency response mechanism that the Ministry of Defense, the Ministry of the Interior, and the Yilan County Government were actively engaged in notification and search and rescue operations. After the disaster, the Taiwan International Ports Corporation, Ltd. urgently handled the emergency disposal of marine oil pollution, hull removal of crushed fishing boats, and completed the bridge dismantling operation and opened the fishing boat channel in 28 days.

The impact and disposal of the environmental disaster caused by the accident included cleaning up oil pollution on the sea surface, removing the wreckage of the broken bridge in the channel, cleaning up the wreckage of the crushed fishing boat hull and waste, etc. A total of 75 packs of environmental protection oil-absorbing materials and 25 packs of oil barrier were deployed, with a total of 9,655 liters of oil removed and a total of 22.95 tons of waste salvaged and disposed of, including the wreckage of the crushed vessel hull and waste fishing nets. A total of 930.5 metric tons of waste fishing nets were crushed.

In order to restore the overall environment and ecology of Su'Ao Harbor, the new bridge has been constructed by New Asia Construction Consultants Ltd. and is still under construction and is expected to be completed in October 2022.

Demolition of the broken bridge completes the restoration of the navigation channel

Invest in environmental disaster relief projects and funds

Environment emergency response	Disaster loss relief expenses(新臺幣千元)
Dismantling of the Nanfang'ao Bridge breakage disaster area	2,812
Nanfang'ao Bridge on-site waste collection	328
Nanfang'ao Bridge emergency repair project	8,866
Oil contamination response (including grease remover, oil barrier, oil absorbent cotton, etc.)	1,373
Fishing boat wreck cleaning and salvage work	30,632
總計	44,011

Investment in environmental clean-up projects and situations

Oil pollution response	amount
Environmentally friendly oil-absorbing material	75
oil barrier	25
oil absorbent cotton	59
total	9,655
Waste Disposal	**amount**
Nanfang'ao Bridge on-site waste collection	22.95 ton
Fishing boat wreck cleaning and salvage work	930.5 ton
total	953.45 ton

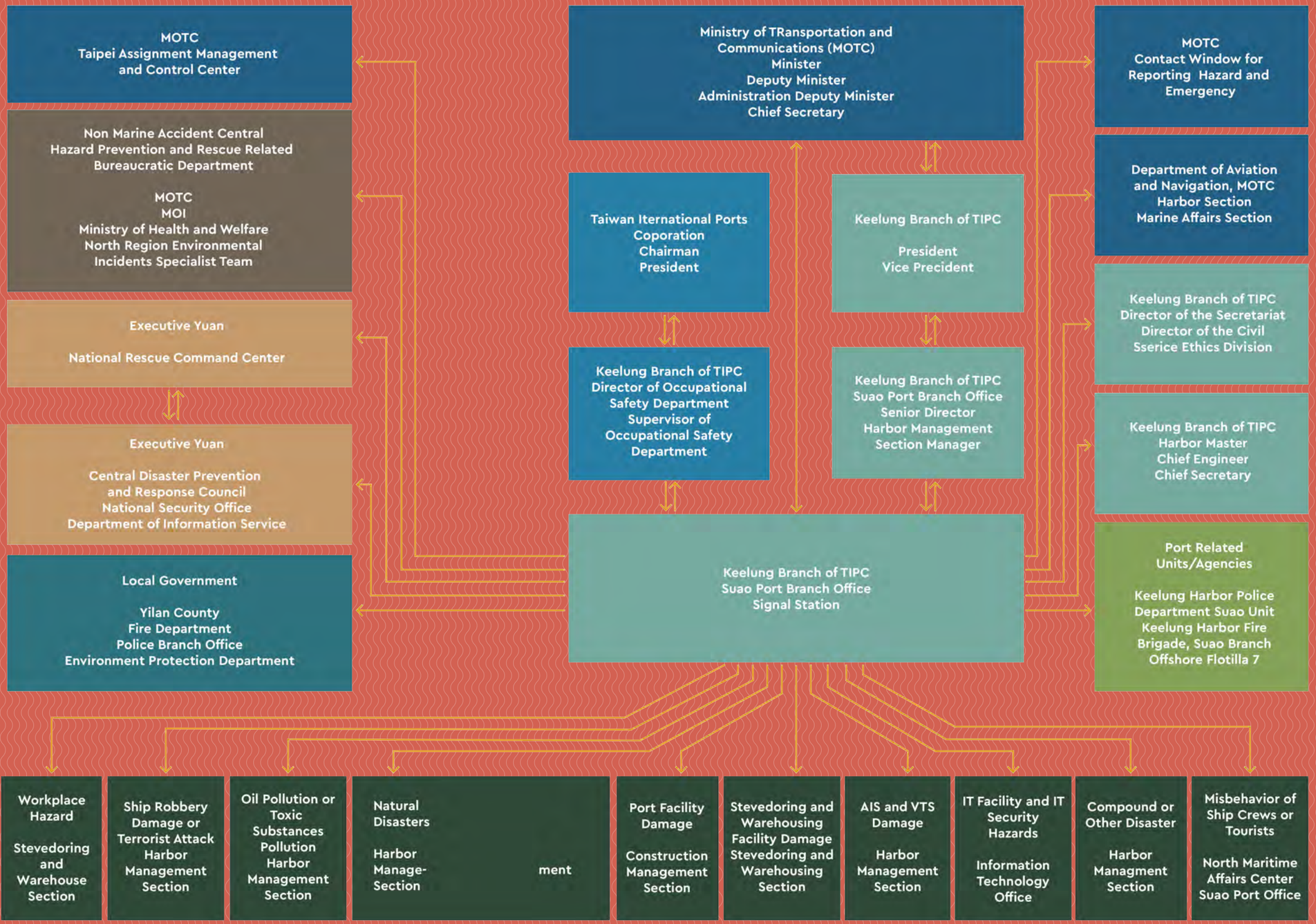
Xintaisheng No. 266

Disaster Relief Records of Rescue Workers

On-site water area oil pollution removal operation

Bridge demolition work

Port of Suao Emergency Response



06

Involvement and Cooperation

Office domestic sewage and port operational runoff waste (sewage) water treatment and interception system

Attention/Motives

In line with the Executive Yuan's policies dealing with the sea and its determination to protect the sea, the Su'ao Harbor, in cooperation with the Environmental Protection Administration, has proposed the "Port Area Pollution Prevention and Reduction Management Plan" to improve the domestic sewage and operational wastewater in the port area, using the "Su'Ao Harbor Wastewater (Sewage) System Plan" as a blueprint for future construction, and adopting a phased approach (long-term, medium-term, and short-term) to prepare a budget for the collection and treatment of wastewater in the port area to work toward the goal of a green harbor.

Solution

1. Domestic sewage

The main source is domestic sewage discharged from various buildings in the port area, and the treatment facilities are conventional septic tanks, etc. In order to reduce pollution and improve the overall quality of the operating space in the port area, the first phase (domestic sewage) wastewater system project was completed in 2019, collecting wastewater from the main personnel activities in the port area (such as the administration building, the port police station, the fire brigade, and the coast guard station) and constructing a 30CMD wastewater treatment facility with a plan of connecting manholes cover to facilitate the subsequent development and construction of the sewage system in the Su'ao area to avoid secondary construction of overruns; the medium- and long-term plan is to install NE, NW and SE branch pipes to send domestic sewage to the future Yishan Road Sewerage Link.

2. Operational wastewater

Su'ao Harbor is mainly used for bulk and general cargoes, and has a number of policies to reduce pollution, such as the use of closed automatic coal unloaders, dust nets, water mist and enhanced cleaning of operating areas, etc., which significantly reduce air and fugitive dust pollution. However, there are still a small amount of residual particles scattered on the ground during the handling process, which are washed into the existing drainage system and enter the sea, causing pollution. In order to minimize the pollution in the port area, the operational wastewater improvement project will be contracted in 2021 to clean up the existing gutters in the port area and to discharge the surface clean water into the sea after precipitating the particles and suspended matter from the flushing into the gutters by targeting the five sand sedimentation tanks at wharf #6 and #7, which have the highest operation utilization rate.

Investment Amount

A total of €614,692 has been invested to reduce the overall waste water pollution

Number and expenditure for fugitive pollution prevention devices (€,ERU)

Items	Budget	Budget Investor
Domestic sewage improvement project	225,199	Port Construction Fund (Maritime Port Bureau. MOTC)
Operational wastewater improvement project	389,493	Port Construction Fund (Maritime Port Bureau. MOTC)

Office domestic sewage and port operational runoff waste (sewage) water treatment and interception system

Implementation/Timeline

1. For domestic sewage, the short-term wastewater project has been completed at this stage, and the medium-term and long-term projects will be carried out after the development of the urban plan for the Su'ao area.

Long-term plan for domestic sewage

Location	Land use zoning	Sewage collection area	Building	Short-term projects	Mid-term projects	Long-term projects
North District	Agency	A1	Administration Building	Reference running water consumption Merge and set up one 30CMD	Maintenance management	Set up branch network of pipes 300mm;L=72m
		A2	Port Police station			
			Port Fire brigade			
			Marine Patrol			
		A3	North Gate			
	Business	A4	Chii Lih Coral Co Ltd	Current one 80CMD has been set up	Maintenance management	Set up branch network of pipes 300mm;L=7m
Central District	Industry	A7	#4 transit shed	Maintain the status without improving the plan	Set up by tenant	Maintenance management
		A5	Taiwan Cement Co. Ltd	In accordance with regulations set up one 6CMD	Maintenance management	Maintenance management
		A6	Pihsiang Machinery MFG. Co. Ltd.	set up one 20CMD	Maintenance management	Maintenance management
		A8	wharf Management Office	In accordance with regulations set up one 12.5CMD	Maintenance management	Maintenance management
			Substation	Maintain the status without improving the plan	Set up by tenant	Maintenance management
	Business	A12	Yishan Road	Maintain the status without improving the plan	Set up by tenant	Maintenance management
	Industry	-	Other	Maintain the status without improving the plan	Set up by tenant	Maintenance management
South District	Business	A9	#10 transit shed	Maintain the status without improving the plan	Set up by tenant	Set up branch network of pipes 300mm;L=876m
			#11 transit shed	Maintain the status without improving the plan	Set up by tenant	
		A11	Machine Maintenance Plant	Maintain the status without improving the plan	In accordance with regulations set up one 3CMD	
			Material room	Maintain the status without improving the plan	In accordance with regulations set up one 3CMD	
			Waiting room	Current one 7.5CMD has been set up	Maintenance management	
			South Gate	Maintain the status without improving the plan	In accordance with regulations set up one 3CMD	
		A10	Pier#12,#13	Maintain the status without improving the plan	Set up by tenant	
Out of area	Business	-	Signal station	In accordance with regulations set up one 35CMD	Maintenance man-agement	Maintenance management

Long-term plan for domestic sewage

Strategies: Water Pollution Control

Port: Port of Suao
Phone Number: +886 3-9965121
Website: http://kl.twport.com.tw/su/

Effect/Benefit

The domestic sewage treatment capacity reaches 30CMD, which can be used to treat the wastewater discharged from the administration building, the port police station, fire brigade and coast guard station, etc. The current wastewater collection area of the Wharf No.6 and No.7 operation area reaches 14,535M², reaching 12% of the total Su'ao Harbor operation area (about 120,000M²).

Environmental Issue

Domestic sewage discharge, operational waste water runoff

Stakeholders

- Port leasing industry
- Port operators
- Environmental Protection
- Administration

Participating Units

- Suao Port Branch Office
- Maritime Port Bureau. MOTC

Warehouse No.15 green building accreditation

Strategies: Energy saving, Carbon reduction, Green environment

Attention/Motives

In response to the increased attention to energy saving in buildings in various countries, the "energy conservation" green buildings are promoted in the port construction. We adhere to the sustainable development in the environmental aspect as our core. From the overall planning and design of the warehouse to the completion of construction and subsequent operation and maintenance, we not only pursue operational quality and efficiency, but also aim at sustainable environmental development to achieve the green building goal of "Energy Efficiency. Renewable Energy Generation. Water Efficiency."

Structure/Investment

Warehouse No. 15 at Su'ao Harbor was completed and opened at the end of 2020. The warehouse has the total floor area of 3,427.59 square meters, the building height of 13.8 meters, and the floor height of 4.2 meters. The interior is a single-story high-rise design with a square layout, a safe and stable steel structure, and a complete fire-fighting equipment system, making it suitable for the operation of warehousing, logistics, and simple processing factories (factory registration is available). The warehouse has a spacious area in front and back for temporary storage and access of cargoes and vehicles. It can also be adjusted according to the needs of investors and it is undergoing fund attraction procedure.

Implementation/Timeline

The energy efficiency indicators of the building is assessed to be 50% for the building envelope, 20% for the air conditioning system, 54% for the lighting system, 26% for CO_2 reduction, 3.5% for waste reduction, and 18.7% for water saving. Currently, the rooftop of warehouse No. 15 is leased by ECOVE Solar Energy Co., Ltd. and was integrated on June 30, 2020. 1,053 solar panels with an area of 2,410 m^2 were installed and the installation capacity was 332 kWp. The actual solar power generation capacity as of April 15, 2021 is about 204,793 kWh (original total wattage – new total wattage)*8 hours per day*365 days=(539,616-326,028) kWh=213,598 kWh.

Environmental Issue

- Green Energy, Energy saving and carbon reduction

Stakeholders

- Suao Port Branch Office
- Port tenants

Participating Units

- Suao Port Branch Office


Warehouse No.15


Warehouse No.15

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Involvement and Collaboration

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

Association

Association of Pacific Ports (APP)

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

The International Association of Ports and Harbors

The IAPH is a NGO with 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.

Port unit

LUNG TEH Shipbuilding CO.,LTD.

The Lung Teh Shipbuilding Co., Ltd.,The office has established an environmental policy to reach its goal of being a sustainable port through energy conservation and carbon reductions; pollution control and prevention; optimum utilization of materials and equipment.

Chii Lih Coral

Suao Port leased its old dormitory building to the Chii Lih Coral Company for development. The company opened a museum for tourists, a shopping mall, and a restaurant to create a new tourist venue in Yilan.

Pihsiang Machinery MFG. Co. Ltd.

Pihsiang Electric Vehicle MFG. Co., Ltd. The company introduced fully automated production facilities and adopted a zero-pollution electric vehicle production process that generates no industrial exhaust emissions or wastewater while providing a green traffic development opportunity.

National Taiwan Ocean University

National Sun Yat-Sen University

National Cheng Kung University

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

Environment Protection Bureau

The Institute of Transportation at the MOTC has served as a think tank that assists the ministry with formulating policies, integrating and coordinating transportation related decisions, and establishing a communication network for industrial, governmental, and academic transportation organizations.

Environmental Protection Administration

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

Ocean Affairs Council

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

Central Maritime Affairs Center, Maritime and Port Bureau

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

Yilan county Environmental Protection Department

Suao Port cooperated with the Yilan County Environmental Protection Bureau to conduct periodic port district joint inspections and drills, and assisted the Environmental Protection Bureau in implementing related meetings and plans.

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Training

Employee Education

In compliance with its environmental policies, the Suao Port provides suitable environmental education and training programs to raise environ-mental awareness, and improve the competitiveness of the Port of Suao.

In 2019 and 2020, the Suao Port Branch Office organized in total 5 environmental education and occupational safety courses for its staff members. Course topics cover pollution prevention, natural disaster, contagious disease control, environmental impact assessment, etc.

2019–2020 Environmental Education Training

Year	Content	stage	Number of participants
2019	Environmental education training at Toucheng Leisure Farm	3	56
2020	Environmental education training at Artemis Garden Suao port clean-up	4	158

Environmental education training at Toucheng Leisure Farm

Environmental education training at Toucheng Leisure Farm

Environmental education training at Artemis Garden

Clean Harbor Activities in 2019

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Communication and Publication

Communication & Publication

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

Websites

Front Page of Suao Port Website

TIPC Green Policy Website

Annual environmental monitoring reports

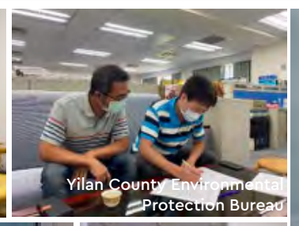
Publications

Port of Suao publications in 2019–2020

Port tenants events & Stakeholder visits

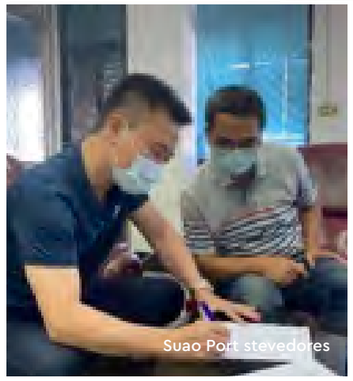
Lung Teh Shipbuilding Co., Ltd Tuo River class corvette ceremony

Maritime and Port Bureau



Yilan County Environmental Protection Bureau

Tuo River class corvette



Suao Port stevedores

Suao Port Shipping Agency

Suao Port stevedores

Suao Port Safety Consultation Meeting

09

Green Accounting

Environmental Investment and Cost

The costs that have been invested by the Suao Port Branch Office in the environmental aspects are mainly divided into the categories of staff, environ-mental maintenance and management, environmental monitoring. 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.

The Summation of Costs invested by the Investments of the Suao Port Branch Office in the Environmental Aspects is 431,524 EUR in 2019 and 1,612,845 EUR in 2020. (Rate of exchange 34.1)

- **Employees:** Personnel expenses for those involved in environmental operations education, employee education.
- **Environmental maintenance and management:** Port area landscaping, removing wastes, dredging port berths.
- **Environmental monitoring:** aspects such as air, nose, water quality, sediment and environmental inspections
- **Nanfang'ao Bridge breakage accidents:** Dismantling of the Nanfang'ao Bridge breakage disaster area, on-site waste collection and water pollution response, etc.

Costs related to Environmental Issues at Suao Port (Unit: EUR)

Items	2019	2020
Employees	63,871	66,364
Environmental Maintenance and Management	336,774	134,310
Environmental Monitoring	1,788	18,650
Nanfang'ao Bridge breakage accidents	29,091	1,393,519
Total	431,524	1,612,845

Environmental Assets

In addition to developing Suao Port into a bulk cargo importing and exporting port for the Yilan area, another goal was to develop it as a passenger transportation and tourism/ recreation hub. Therefore, the Suao Port Branch Office formulated a succession of port development plans, which can be divided into procedural planning and general construction and facilities planning.

The Suao Port Branch Office invested in fixed assets for EUR €5,007,735 and EUR €1,517,403 in 2017 and 2018, respectively. (Rate of exchange 34.1)

Assets invested in Environmental Issues in 2019 (Unit: EUR)

Project		Cost
Continuing Project	Suao Port Reclamation Area (I) Blocking, Seawall Rehabilitation and Official Ship Canal Dredging Project	4,787,742
General building and equipment plan	Dock Work Light and Street Light Replacement Project	143,167
Total		4,930,909

Assets invested in Environmental Issues in 2020 (Unit: EUR)

Project		Cost
Continuing Project	Suao Port Channel Breaking Wave Breaking Block Adding and Throwing Maintenance Project	149,824
	2020Suao Port Port Channel, Turning Basin.and Harbor Basin Dredging Project	512,551
General building and equipment plan	Suao Port #6, #7 and #13 pier repair project	3,196,275
	Suao Port #4, #10, #11 Transit shed night work lighting equipment renovation project	96,392
Total		3,955,043

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Improvement Recommendations

In line with global sustainable development trends, Suao Port will examine and improve its development strategies while meeting the needs of passenger ship tourism and the local economy. The port is keeping up with the latest trends by transitioning to port tourism and a commercial viable waterfront. We will carve out a green, sustainable port using corporate social responsibility as a blueprint.Due to global economic development trends, the global energy landscape has changed in recent years. Suao Port has been at the forefront of that trend, building ecological ponds to recycle and reuse water resources, winning acclaim as a green energy value-added distribution port, carrying out backfilling engineering works with dredged soils and becoming an important link for promoting green port policies. Furthermore, Suao Port cooperates in the development of passenger transportation and tourism/recreation, and collaborates with the local government, businesses, and the community to provide an impetus for sustainable port development, and sets sustainability targets for an all-round win-win situation.

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

Suao Port Branch Office
Keelung Port, TIPC
Taiwan International Ports Corporation, Ltd.

Address: 3F., No.1, Gangqu, Su'ao Township, Yilan County 270, Taiwan (R.O.C.)
Website: https://kl.twport.com.tw/su/
E-mail: agii258@twport.com.tw