TAIWAN
INTERNATIONAL PORTS CORPORATION,LTD.
臺灣港務股份有限公司

2014 TAIWAN GREEN PORTS ENVIRONMENTAL REPORT

Editing Principles

This Green Ports Environmental Report summarizes performance data and achievements of the 7 major commercial ports under the management of the Taiwan International Ports Corporation and its four subsidiaries between March 1st 2012 to December 31st 2013.

The boundary of this report covers TIPC and the 7 major international ports that are under TIPC's 4 subsidiaries. All data provided in the report are generated via independent analysis and investigations. Financial data are published information certified by TIPC's CPA.

This Environmental Report was prepared according to the G3.1 guidelines of the Global Reporting Initiative (GRI) currently in use by corporations around the world. This report focuses on environmental protection concerns responding to the global trend of disclosing environmental information. An index of GRI G3.1 environmental (EN) indicators is included at the end of the report for your reference.

Contact information

For any suggestions or inquiries about this Report, please contact us using the following information: Taiwan International Ports Corporation Ltd.
Occupational Safety Department, Address: No 2-2, Jianguo 3rd Road, Sanmin District, Kaohsiung City 80748
Telephone: 07-285-1000
Website http://www.twport.com.tw

Publisher:	Taiwan International Ports Corporation, Ltd.
Information Provider:	Taiwan International Ports Corporation, Ltd.
Editors:	Environmental Science Technology Consultants Corporation and KPMG Sustainability Consulting Co. Ltd.
Translation:	President Translation Service Group International

Should there be any discrepancies between the English and the Chinese version of this report, please refer to the Chinese version.

Table of Contents

About TIPC

Taiwan International Ports Corporation Ltd. (TIPC) was founded in 2012 in response to government reorganization and global trends of division of Administration and Operation. Today, the TIPC administers Taiwan's seven international ports (Keelung, Taichung, Kaohsiung, Hualien, Taipei, Suao, and Anping) and two domestic ports (Budai and Penghu) as a single, integrate and efficiently run business cluster. TIPC's four subsidiaries at the Ports of Keelung, Taichung, Kaosiung and Hualien handle all regular port operations and business relations.

● TIPC scope of operations includes:

(1) All planning, development, and management activities conducted within the jurisdiction of commercial ports.

(2) The management and provision of services related to ocean shipping within the jurisdiction of commercial ports.

(3) The development and management of port free trade zones (FTZs).

(4) The development and management of tourism and recreation businesses.

(5) The investment in, reinvestment in, and management of relevant domestic and foreign enterprises.

(6) Other relevant transportation, construction, and other tasks designated and approved by the competent authority.

1.1 Overview

The TIPC was formally established on March 1st, 2012, and is independently financed and managed by the Ministry of Transportation and Communication, MOTC.

TIPC

The LOGO is designed with natural elements that symbolize changes in the sun, climate, and tides. The changing colors of sunshine and the environment have been incorporated to signify TIPC's 24-hour continuous service that allows us to power business and economic prosperity of the entire nation.

Yellow: infinite strength and vigor

Orange: the desire for continuous improvement

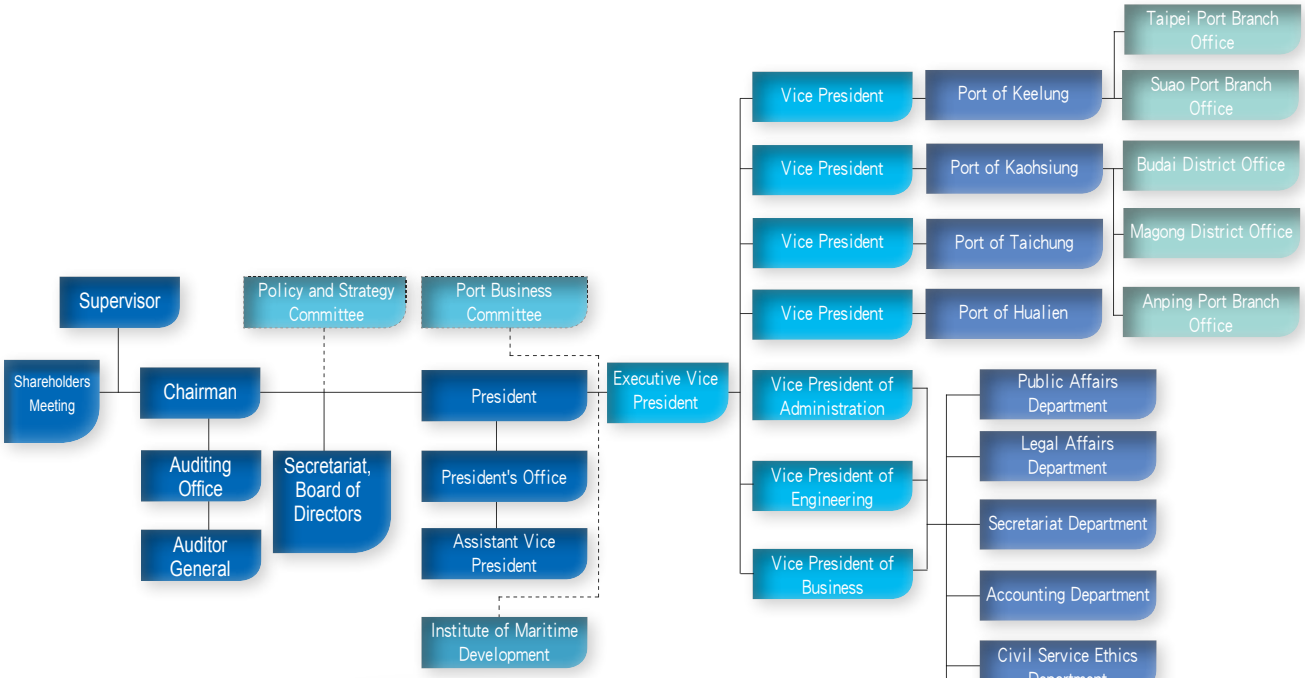
Blue: open attitude and command of negotiation techniques

Purple: calm and decisive judgment and observations

1.2 Organization

TIPC and its four subsidiaries of the Port are managed by one Chairman, one President, and eight Vice Presidents.

This report is compiled by the Occupational Safety Department of the TIPC headquarters. Each of the subsidiaries is responsible for providing the data required.



1.3 TIPC International Ports

TIPC has four subsidiary companies, namely Port of Keelung TIPC, Port of Kaohsiung TIPC, Port of Taichung TIPC, and Port of Hualien TIPC which together manage the seven major commercial ports of Taiwan. The location for each of these ports and a summary of their developments are listed as follows:

Port of Taipei

Transcontinental container handling; Automotive logistic services; Maritime and air transport and logistics terminal.

Port of Keelung

Cross-Strait (Taiwan-China) ferry and international cruise services; Asia regional container shipping.

Port of Taichung

Asia regional container shipping; value-added logistics; Cross-Strait passenger ferry; Coastal industry development base; Energy, heavy machinery, and petrochemical raw materials import-export terminal.

Port of Su-Ao

Terminal port for cement, minerals (sand), and stone; Tourism and recreational services.

Port of Anping

Bulk-goods import-export terminal; Tourism and water recreation services.

Port of Kaohsiung

Container transshipment; Full-spectrum value-added logistics; International tourism and business travel services; Energy, heavy machinery, and petrochemical raw materials import-export terminal.

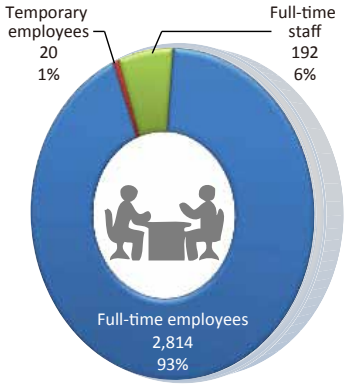
Port of Hualien

Terminal port for cement, minerals (sand), and stone tourism and recreational services.

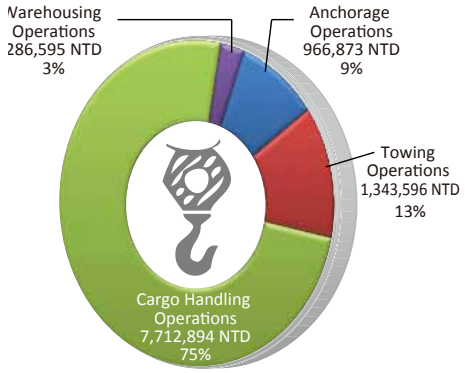
1.4 Business Overview

TIPC began business operations on March 1st, 2012 with a registered capital of 65 billion NTD. The following lists the relevant business figures since TIPC's establishment to the conclusion of 2013:

Number of employees, 2013



Revenue 2013



Actual business income and expenses (in 1,000 NTD)

	2012	2013
Income	15,860,526	18,845,953
Operating Revenue	14,300,310	17,384,812
Non-operating Revenue	1,560,216	1,461,141
Expenses	10,299,958	12,249,653
Operating Expenses	10,036,238	11,519,005
Non-operating Expenses	263,720	730,648
Net Profit (before tax)	5,560,568	6,596,300

Key business indicators and figures

Item	Total from January to December, 2013	Year over Year	
		Increase	Ratio %
Cargo loaded and unloaded (revenue tons)	705,754,006	14,951,734	2.16
Containers loaded and unloaded (TEU)	14,046,868	165,512	1.19
Cross-Strait container volume (TEU)	2,266,026	128,202	6.00
Number of passengers (person)	991,507	292,374	41.82
Trade Volume in Free Trade Zone (tons)	14,092,822	3,935,522	38.75
Trade Volume in Free Trade Zone (1000 NTD)	501,748,032	11,1798,725	28.67

1.5 Vision and Mission

Strategic targets

1. Strengthen the core businesses
2. Develop Free Trade Zones
3. Create Metropolitan Ports

Mission

Create exceptional port facilities that will successfully redirect and channel global human resource, logistics and financial flows toward Taiwan.

Vision

Leverage innovation effectively to connect and communicate with global trade flows; Mature into a world-class port management group.

Environmental Management

By taking the initiative to investigate and interview all managed ports, TIPC has identified major environmental concerns, complied with environmental policies stipulated by our company, and actively promoted environmentally friendly measures. TIPC took upon the conservation and improvement of the port environment as our task.

2.1 Environmental Management Policy

Our Chairman and President of TIPC have announced the TIPC Environmental Policy as the highest levels of environmental protection guidelines.

TIPC 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 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 pursuing business growth, TIPC is 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, TIPC will proactively identify environmental risks that may be associated with our activities and manage the risks accordingly to minimize the environmental impacts.

TIPC commits to:

1. Implement and follow through with the Green Port Programme 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; and
5. Strengthen the communication with local communities, and pursue sustainable development for both the ports and the cities where TIPC is operating.

2.2 Environmental Concerns

TIPC has identified stakeholders through face-to-face interviews as well as questionnaire investigations with our seven commercial ports. At the same time, TIPC has referenced port pollution control strategies implemented by the Environmental Protection Administration (EPA) and local Environment Protection Bureaus in order to identify major environmental aspects associated with port activities and management.

These methods provided accurate understanding of major environmental concerns amongst our stakeholders and allowed us to formulate corresponding management guidelines and activities in response to stakeholder needs and expectations.

Stakeholder communication

Through physical interviews at the harbor and past experience in dealing with other stakeholders, TIPC has identified seven different types of stakeholders as well as the environmental concerns that they may have, and established corresponding communication channels to address these concerns and provide them with feedback.

Stakeholders' environmental concerns and communication channels

Stakeholders	Environmental issues of concerns	Feedback and communication channels
Competent authority (MOTC, EPA, etc)	Air pollution	• Communication by a designated team • Official notices and documents • Meetings
	Wastewater pollution	
	Waste processing	
	Ecological conservation	
	Energy and resource management	
	Runoff wastewater	
	Noise control	
Local government agencies (county and township governments and EPBs)	Air pollution	• Communication by a designated team • Official notices and documents • Meetings
	Wastewater pollution	
	Waste processing	
	Ecological conservation	
	Energy and resource management	
	Runoff wastewater	
	Noise control	
Employees	Work environment	• Environment education and training • Promotion programs
	Noise control	
	Air pollution	
Residents near the port	Noise control	• Seminars / dialogs • Sponsorship and collaborative projects • Public Forum webpage
	Greenery and waterfront recreational facilities	
	Air pollution	
	Runoff wastewater processing	
	Waste processing	
Subcontractors and leasees	Air pollution	• Education and training • Official documents • Lease regulations • Advocacy activities / seminar meetings
	Energy saving and carbon reduction	
	Waste processing	
Shipping companies and shipowners	Energy saving and carbon reduction	• Advocacy activities / seminar meetings • Official notices and documents • Website
	Waste processing	
	Air pollution	
	Ballast Water	
Media	Air pollution	• Press release / press conference • Communication by a designated team
	Runoff wastewater	
	Ecological conservation	

Response to key environmental concerns

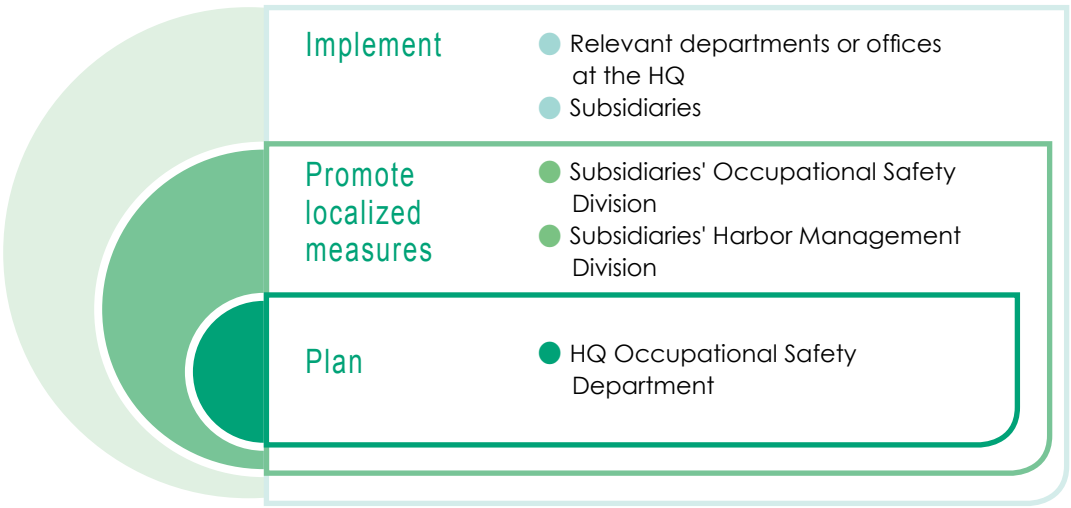
Key environmental concerns were identified by reviewing stakeholder concerns through internal interview. Interview results were evaluated by our colleagues in the Occupational Safety Department based on the two axes of "Frequency for Mentioning the Issue" and "Degree of Impact of the Issue". For TIPC, the major environmental concerns were air pollution, water pollution, waste management, and consumption of energy at resources.

In Chapter 3, TIPC will provide additional details on the current status and implementation of response measures with regards to these major environmental concerns.

2.3 Environmental Management Strategies

Environmental management responsibilities

"The TIPC Environmental Policy" serves as the highest guiding principle for environmental protection. The TIPC Occupational Safety Department advises on strategies and policies for promoting environmental management. Environmental management strategies are then provided to the four subsidiaries. The HQ and the subsidiaries ensure that responsibilities necessary for achieving policy objectives have been delegated to the relevant departments for their daily operations such as harbor service ,employee training, environment maintenance, and office management.



Environmental regulatory compliance

TIPC constantly keeps track of statutory and regulatory requirements associated with shipping pollution management such as MARPOL 73 / 78 International Convention for the Prevention of Pollution From Ships, the London Convention (Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter), International Convention for the Safe and Environmentally Sound Recycling of Ships, International Convention on the Control of Harmful Anti-fouling Systems on Ships, and the International Convention for the Control and Management of Ships Ballast Water & Sediments. This allows TIPC to examine and improve how we respond.

List of domestic laws that TIPC complies to

Category	Title	Competent authority
Transport	The Commercial Port Law	MOTC
	The Law Of Ships	
Environment	Basic Environment Act	EPA
	Marine Pollution Control Act	
	Air Pollution Control Act	
	Water Pollution Control Act	
	Waste Disposal Act	
	Soil and Groundwater Pollution Remediation Act	
	Toxic Chemical Substances Control Act	
	Resource Recycling Act	
	Noise Control Act	
	Environmental Impact Assessment Act	
	Public Nuisance Dispute Mediation Act	
	Environmental Education Act	

Residential areas are found in close proximity to a number of commercial ports, thus in order to prevent the environmental impact caused by port operation, TIPC has expended significant resources in pollution control and environmental protection facilities.

Moreover, routine port activities also include subcontracted operations, especially for various construction projects. Hence, TIPC not only makes sure that we are compliant to environmental regulations, but also uses contract agreements to encourage our subcontractors and leasees to do the same.

Green Procurement

TIPC is dedicated to promoting green procurement and encourages purchasing processes that prioritize environmental concerns, and also incorporates this into the KPIs (Key Performance Indicators, KPIs) of its subsidiaries.

Green procurement budget

Unit: NTD

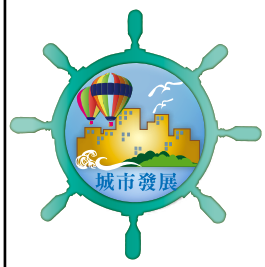
	Headquarters	Port of Keelung TIPC	Port of Taichung TIPC	Port of Kaohsiong TIPC	Port of Hualian TIPC
2012	727,952	2,275,758	4,070,700	11,274,225	1,278,567
2013	3,657,816	3,758,412	3,279,929	6,598,310	1,748,728

Taiwan Greening the Ports Action Plan - Four Aspects

TIPC supports international green ports and ecological harbor movements, and pledges to the "Greening the Ports Action Plan" approved by the MOTC on January 29th, 2013. TIPC shall formulate action plans to improve port environment in the four aspects of "Cruise terminal", "Cargo operation", "Port environment", and "Community outreach".

TIPC has compiled the preliminary measures completed by the seven major ports and leverage their respective advantages to help formulate future development prospects.

Greening the Ports Action Plan

	Cruise terminal	Cargo operation	Port environment	Community outreach
Icon				
Actions	• Reduce environmental impact caused by cruise ships such as wastewater and waste generated by passengers • Construct a port terminal compliant to Green Building standards as well as energy saving and carbon reduction requirements.	• Reduce environmental pollution (air and noise) caused by marine and land transport • Replace old cargo handling equipment with electric models	• Improve the quality of port environment (air, water, and green spaces) • Reinforce the sustainability aspect in TIPC's corporate image	• Develop waterfront recreational areas in the water-land interfaces for the harbor cities • Promote port operations and construction works that support developments by local governments

Green Ports Inauguration Ceremony

TIPC held a press conference on December, 13th to announce Taiwan Greening the Port Action Plan. By promoting green practices, TIPC hopes to nurture the beautiful blue ocean in harbor area to welcome visitors.

At this ceremony event, Mr.Lee, Tai-Hsin, the President of TIPC, stated that "Year 2012 was the Year One of TIPC. Considering the company's goal of achieving sustainability and socially responsible, TIPC developed sustainable development plans to pursue a sustaining growth, spur local economy, protect the environment, and maximize local community's welfare."Follwing Lee's opening, TIPC launched its green port initiative and addressed future planning for seven main ports in Taiwan, while presenting current status and performance of TIPC's green practices.

Representatives from Minister of Transportation and Communication, Environmental Protection Administration, Keelung City Government and shipping industry participated in this ceremony to witness TIPC's move toward the new century of Green Ports.

Green Ports advantages

(1) Green Ports are more compliant to environmental protection requirements than conventional harbors.

Port constructions and operations inevitably cause environmental impact and damage through waste oil and ballast water discharge from the ships as well as producing dust, noise, and other wastes. Green Ports would minimize the environmental impact caused by normal operations in order to satisfy environmental protection requirements.

(2) Green Ports promote the sustainable development of marine transport

To achieve sustainable development of the ports, considerations must include economic, social, and environmental benefits. Conventional port management focuses solely on economic benefits, while the new approach requires additional communication with neighboring communities, cities, and other stakeholders. The Greening the Ports Action Plan achieves balanced development for human, social, and port environments in order to promote sustainable marine transport developments.

(3) Green Ports are more competitive than conventional ports

Terms of operation, services provided, overall environment, facilities and equipment, modernized management practices and port's overall image are all key parameters that affect a port's competitiveness. However, these parameters also overlap with indicators for green port and eco-port internationally as to ensure that the port's environmental impacts are lower than that of a traditional port while being deemed as a modernized port that is aligned with the concept of sustainable development. Therefore, green port or eco-port certification can demonstrate the port's competitiveness thus increase its international exposure and appeal to potential clients.

Emergency response

TIPC has established the "Emergency Response Plan for Marine Pollution in Commercial Ports" in response to oil or chemical spills and leaks in the port areas. For routine operations, TIPC has applied various measures for promoting awareness amongst subcontractors and business owners that oil spill containment booms must be laid out before handling oil or other designated chemical substances. Internally, TIPC has improved personnel training, provided an extensive set of disaster response equipment, and reviewed and revised disaster response plans in order to strengthen TIPC's emergency preparedness.

In addition to emergency response drills, TIPC also works with authorized agencies and local governments for periodic exercises. Each port is required to organize and perform these exercises, with at least 50 participants, at least once a year.

Integrated exercises

TIPC has implemented integrated exercises such as the Marine Pollution Emergency Response Exercise in 2012 and 2013 with relevant agencies. TIPC also worked with port safety, international shipping and port security to carry out maritime disaster rescue operations as well as oil spill and toxic chemical disaster exercises so that each participating agency is able to effectively perform disaster prevention and rescue operations according to the characteristics of the local port. TIPC is able to effectively utilize vertical and horizontal resources and use our overall influence to strengthen the marine oil spill response capabilities of every participating agency.

Response to Environmental Concerns

Refering to the Taiwan Greening the Ports Action Plan as the major guidelines, a series of measures have been proposed in response to the four major environmental concerns.

3.1 Air Quality

Vessel Speed Reduction (VSR)

Vessel speed reduction when entering or leaving the port is the most direct and effective measure to control air pollution as it lowers fuel consumption and further reduces Nitrogen Oxides (NOx) emissions.

TIPC requires vessels traveling within 20 nautical miles of the port area to reduce their speed to below 12 knots. On average, a 14% reduction in main engine emissions can be achieved, and ships with more powerful engines can even reach up to 73% reduction.

VSR calculations are based upon the Automatic Identification System (AIS) navigational equipment currently used by ships making international journeys. The AIS provides dynamic realtime data. After excluding the

record of ships that cannot travel faster than 12 knots, the data retrieved from AIS can be analyzed and the number and percentage of ships that have performed VSR can be obtained. The actual number of vessels carring out VSR covered 10% to 37% of the total number of vessels arriving different ports from October to December 2013.

The signal tower at Port of Taichung

VSR statistics for ocean-going vessels, October to December 2013

	Number of vessels arriving to port	Actual number of vessels carrying out VSR
Port of Keelung	1,212	378
Port of Taichung	1,514	566
Port of Kaohsiung	3,600	579
Port of Hualien	181	62
Port of Taipei	646	236
Port of Su-Ao	108	27
Port of Anping	61	6

TIPC commissioned the Harbor and Marine Technology Center, Institute of Transportation, MOTC, to establish a Vessel Speed Reduction Surveillance System (VSRSS) to ensure the capability of instantaneous feedback from vessels entering and leaving major ports in Taiwan. Port of Kaohsiung was chosen as the pilot port and has VSRSS installed.

Concept diagram showing speed reduction zones around the port

Port of Kaohsiung
–VSRSS demonstration port

The Port of Kaohsiung has been designated as the port demonstrating the use of the Vessel Speed Reduction Surveillance System (VSRSS). The system has been installed on the second entrance of the Port of Kaohsiung on October 2013.

Various promotion and awareness programs such as letter delivery, shipping company conferences, berth scheduling meetings, and announcement meetings were carried out by each port to encourage shipping companies to participate in the VSR program. The Port of Kaohsiung Vessel Traffic Service (VTS) center would use the AIS system to automatically deliver text notifications once every 2 hours, asking the vessel to reduce its speed to below 12 knots. The Port of Taichung would send notifications once every hour.

Together with AIS, the VSRSS will be utilized at all TIPC subsidiaries in the future and VSR will be promoted based on each port's specific conditions.

3 Response to Environmental Concerns

Low sulfur fuel

Sulfur Oxides (SO_x) is a colorless gas with a irritating odor and the major precursors of acid rain. Hence, in addition to being air pollutants, Sulfur Oxides cause ocean acidification as well.

In order to reduce the environmental damage caused by Sulfur Oxides, the International Maritime Organization (IMO) has stipulated the "International Convention for the Prevention of Pollution From Ships" (abbreviated as MARPOL for marine pollution) in 1978. The annex requires that sulfur content in ship fuel may not exceed 3.5% m/m between 2012 to 2020 and may not exceed 0.5% m/m after 2020.

To reduce air pollution in the port areas, TIPC began to use low sulfur fuel (sulfur content lower than 1.5% m/m) in self-owned tag boats and harbor crafts and half of these vessels have already switched to superdiesel (with sulfur content lower than 0.001% m/m) . TIPC will continue to reduce air polluting emissions through wise fuel choices.

Additionally, Port of Kaohsiung also notifies all vessels within 5 nautical miles of the port area to switch their fuel. An automatic voice message is broadcasted every two hours to encourage the replacement of highly polluting fuel to cleaner fuel.

Shore power

Emissions from ocean-going vessels auxiliary engines at-berth are the majore sources of air pollutants at the port areas. A solution is to encourage ocean-going vessels to use Alternative Maritime Power at berth for services such as lighting cargo handling, pumping and ventilation while in port. This solution will effectively reduce the generation of air pollutants such as particulate material (PM), SOx and NOx from vessels while at berth. The use of Alternative Maritime Power can help reduce PM, SOx and NOx pollution by 79% to 98% in cargo ships. Hence, international Green Ports development has included the installation of Alternative Maritime Power systems as a major development.

Currently, TIPC provided berths for port service vessels and smaller ships with low voltage shore power facilities (110 V to 440 V) and shore power usage of port service ship is 90%. Thus far, five high voltage shore power facilities (higher than 6.6 kV) are completed and three are still under construction. New docks or dock upgrades, such as the first phase of the passenger and cargo terminal in Keelung and the new passenger port terminal being built in Taichung, also have designated space set aside for shore power facilities in the future.

Existing shore power facilities in each port

	Low voltage	High voltage
Port of Keelung	11	-
Port of Taichung	3	-
Port of Kaohsiung	4	5 (with 3 under construction)
Port of Hualien	3	-
Port of Taipei	3	-
Port of Su-Ao	2	-
Port of Anping	7	-

Shore power facilities of Berth 19, Port of Taichung

Shore power facilities, Port of Anping

Shore power facilities, Port of Taipei

3 Response to Environmental Concerns

Dust control

Bulk materials are important cargo handling at ports. Lack of dust control measures during loading, unloading and even land transport of materials (such as sand, stone, cement, coal, or cereal grains) will generate dust that significantly affects air quality around the port area.

Dust control measures and facilities include dust nets, water sprays, car washes, and dust covers. However, the best dust controls would be specially designed sealed bulk material handling facilities. Sealed storage covers the entire handling facility, such as extension pipes connected to the vessel's holds that allow materials and goods to move into the storage tanks through completely sealed channels. Such facilities can eliminate dust generation and improve handling efficiency at the same time.

TIPC continues to work with various companies, using collaborative models to encourage businesses to invest in and construct sealed storage facilities. These investors will be entitled to discounts in dockyard rents and other expenses, such as that implemented for Berth No. 29 and 30 of Port of Anping for coal unloading. TIPC will use innovative operation models and work with businesses at ports to create a green ports.

Car wash

High pressure water jet

Enclosed storage of Port of Taipei and Port of Taichung

Port of Taichung has provided reserve land at Berth 104 to jointly construct a 100,000 ton Enclosed storage facility with our partners. Total investments include facilities (620 million NTD) and automated machinery (210 million NTD). The integrated and automated loading, unloading, and transfer machinery as well as pollution prevention equipment not only improves the unloading efficiency, it could also reduce pollution generated at the unloading berths.

Berth E14 and E16 at the Bulk & General Cargo Terminal No.1 of Taipei Port has automated spiral coal and gravel unloader and conveyor system to mitigate dust concerns.

Sealed outgoing warehouse

Sealed coal storage

Inside the enclosed coal storage

Enclosed coal unloading system

Replacement of old equipment with electric models

The diesel engines at ports for cargo-handling equipment generate vast amounts of air pollution and noise. Replacing diesel engines with electric equipment would effectively reduce pollution. In addition to using electrical cargo handling equipment and incorporating smart technologies, efficient and adjustable loaders and unloaders would further improve energy saving and carbon reduction. Currently, all cargo handling equipment in Port of Taipei has been completely converted to electric machinery with automated container handling. The Port of Kaohsiung, on the other hand, has been promoting equipment replacement among the shipping companies to improve the proportion of automated machinery and replacing loaders and unloaders with fuel-electric hybrid equipment.

Current status of fuel-powered cargo handling equipment replacement

	Electric equipment	Fuel-powered equipment	Percentage of electric models
Port of Keelung	32	124	21%
Port of Taichung	186	197	49%
Port of Kaohsiung	251	415	38%
Port of Hualien	7	51	12%
Port of Taipei	40	77	34%
Port of Su-Ao	2	15	12%
Port of Anping	-	14	0%

TIPC shall replace selfowned port machinery with newer models and prioritize the selection of electric equipment. Additionally, TIPC will continue to evaluate the use of contractual agreements to require container terminal owners to gradually replace their aging diesel powered handling equipment and achieve complete electrification.

Port of Kaohsiung - Green Terminal

In response to environmental protection trends around the world, Container Terminal No.6 at the Port of Kaohsiung employs the latest, cutting-edge, energy saving and recycling technologies in terms of infrastructure, various rigs, facilities and SOPs from the berth to the container yard etc. The port's administration building makes the Port of Kaohsiung the first professional container berth to receive the green building certificate.

Dock operations utilize the state-of-the-art Dual-Hoist Quayside Gantry Crane capable of lifting up to 100 tons and could simultaneously handle two 40 feet containers or four 20 feet containers, improving handling efficiency to 200 containers per hour, greatly shortening vessel docking time. Shore power systems have been installed along the pier to provide electricity to new cargo ships docking in port, reducing the consumption of diesel fuel as well as pollution emissions during cargo handling operations. The container terminal also utilizes electric traffic cars within the port to reduce air pollution and to achieve energy saving and carbon reduction.

Rail-type gantry cranes with automated processing systems, remote control, and RFID technologies are used to achieve unmanned operations in the container storage areas to achieve increased operator safety. At the same time, automatic gate system were used to accelerate handling rates and effectively shorten trailer truck idle time by eliminating various procedures of manually operated

stations.

Solar power panels have been installed on the rooftops of the Administrations Building and Control Station. Solar- and wind-powered lighting have also been installed in the administrations area. Total power output can reach a maximum pf 139 kWp and 170,000 kWh per year, reducing annual CO_2 emissions by 108,120 kg.

Wastewater recycling and processing facilities have been installed at the container terminal and administration area. Recycling capacity is 100% of industrial wastewater and 80% for domestic sewage. A green buffer area has been reserved, with trees native to Hongmaogang planted within this green belt. Technologies such as permeable pavements are also used to recycle water and other resources in order to achieve the long-term objectives of sustainable development of a green harbor bay.

Low emission trucks

Trucks operating within the port areas are one of the leading sources of air pollution in the ports. Many ports around the world have used both incentives and penalties to promote the use of clean trucks and improve the air quality within and around the port areas. TIPC also observed from these cases that the promotion of clean trucks would require collaboration and support from the local government and port management agencies.

Promotion programs for low emission trucks

Port of Keelung and Port of Taipei	TIPC has continued to encourage truck drivers to turn off the engines if they stop for more than 3 minutes in the port area in order to promote awareness for energy saving and carbon reduction.
Port of Su-Ao	TIPC has worked with the Yilan County Environment Protection Bureau to send a notification requiring improvement for trucks that fail to pass emission standards.
Port of Taichung	In 2013, TIPC has worked with the Taichung City Government Environment Protection Bureau to hold a Communication Meeting on the Control of Fixed Pollution Sources in the Port of Taichung, and promoted the new policies with the relevant companies.
Port of Kaohsiung	● TIPC has conducted collaborative audits with the Kaohsiung City Government Environment Protection Bureau and jointly organized awareness programs. A total of 11 events were held in 2013. ● When organizing port operations conferences, the TIPC would encourage shipping companies to include trucks in the self-management program as well as the need to meet vehicle exhaust standards. A total of 4 such events were held in 2013.

TIPC will continue to work with local government and promote self-management of diesel-powered vehicles amongst transport and logistics promoting the use of legal fuels to vehicles entering and leaving the port areas, port operations companies, and transport company operators. Maintenance and repairs initiatives, periodic inspection, and emission standard certifications must be either carried out or obtained as well.

Automatic gate system

Conventionally, cars entering and leaving the port area would be inspected manually before being allowed to pass. During inspection, truck drivers must alight the vehicle to submit the transport order and release the approval form to the port police for inspection. This action poses many safety concerns as personnel walking along the roads are exposed to danger during heavy traffic. These gate inspections also waste time and fuel, leading to air pollution that negatively impacts upon the environmental quality of the dock area. In order to improve gate inspection efficiency and air quality, TIPC will gradually introduce automatic gate security systems. The automatic gate security system mainly uses radio frequency identification (RFID) technologies and optical character recognition (OCR) to verify the identity of the trucks, containers, and drivers.

Automatic gate system performance:

- Shortening gate inspection time from 120 seconds to 20 seconds.
- Reduce 24.6 g of diesel fuel consumption and 0.152 kg of CO_2 emissions / vehicle

Statistics on the automation of port lanes

	Total number of vehicle lanes (entry and exit)	Automated vehicle lanes (entry and exit)	Degree of automation
Port of Keelung	40	27	68%
Port of Taichung	43	15	35%
Port of Kaohsiung	53	30	57%
Port of Hualien	6	6	100%
Port of Taipei	18	10	56%
Port of Su-Ao	5	2	40%
Port of Anping	8	4	50%

In addition to environmental benefits, the automatic gate system is able to provide more effective control of personnel, vehicles, and goods entering and leaving the port areas.

TIPC continues to promote the use of automatic lanes with shipping companies and export associations and constructs relevant facilities. This includes the OCR and RFID systems for 8 entry and 8 exit lanes construction project in the Port of Keelung which will be completed in 2015.

At the same time, TIPC develops the Free Trade Zone with completely automated gate systems, automated lanes with RFID personnel pass systems, port area RFID personnel passes, RFID electronic sealing tapes and OCR technologies for the newly developed port areas for comprehensive and automated security coverage of the port areas. For example, newly established Free Trade Areas in the Port of Anping has been furbished with automated lanes.

Environmental monitoring

TIPC has gradually established a port environmental monitoring system to control environmental quality in and around the port areas, track possible pollution sources, understand long-term environmental quality, and evaluate the effectiveness of environmental management. The information could be used for background analysis for environmental impact assessment that may contribute to new developmental projects and show TIPC's commitment to corporate social responsibility. Environmental monitoring frequencies and items in each port would differ by geographical locations and operational capacity. Currently, the Taichung, Kaohsiung, and Keelung subsidiaries have provided monitoring data on their official websites.

1 Air quality monitoring items

Carbon dioxide, sulfur dioxide, ozone, nitrogen oxides, nitric oxide, nitrogen dioxide, total hydrocarbons, methane, non-methane, particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), temperature, air pressure, humidity, wind speed, wind direction.

2 Noise monitoring items

Maximum noise level, equivalent noise level, percentile noise level, noise level at daytime, evening and nighttime, as well as low frequency noise level in the daytime, evening and nighttime.

Liquefied natural gas (LNG)

According to the Pathways to low carbon shipping – abatement potential towards 2030 by DNV GL, liquefied natural gas (LNG) can benefit both environment and economy. LNG can reduce Sulfur Oxides (SOx) emissions by 100%, nitrogen oxides (NOx) by 85%, and carbon dioxide (CO_2) by 25%. Although Asia is not placed within the emission control areas of the MARPOL international convention, many Asian countries have been planning to switch to LNG in anticipation of future trends. Taiwan should also plan to develop LNG supply facilities and provide LNG fueling capabilities for docking ships in the future.

In 2014, TIPC has organized preliminary research for the establishment of LNG vessel refueling systems, and will then evaluate the installation plans after understanding global trends and requirements.

3.2 Water Quality

Stormwater runoff

Stormwater runoff here refers to runoff from various surfaces or operational wastewater produced when carrying out spraying, scrubbing, and car washing. Untreated runoff wastewater that enters the natural ecosystem may result in significant environmental impact.

TIPC has full control of run-off wastewater sources and effluent events, and has completed Port Area Pollution Prevention and Reduction Procedure Plan (Draft) with proposed short-, mid-, and long-term prevention and reduction measures in each port. In order to truly assess the effectiveness of the improvement measures, each port will carry out seasonal water quality monitoring. At the same time, TIPC would continue to report upstream pollution sources to local governments and seek consultation and collaboration with governments to improve port water quality.

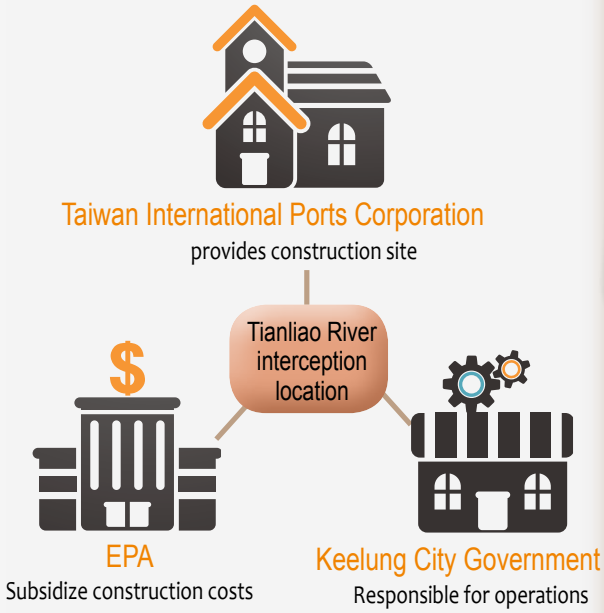
Port of Keelung–

Tianliao River Interception Station

Water in the Port of Keelung have been effluent destination of residential sewage as well as drainage canal runoff from Tianliao River and Xuchuan River, resulting in significantly elevated levels of nutrient salts in the port water. Vessel oils, runoff, garbage, and other suspended matters add to the pollution, which has gradually reduced the water quality and attractiveness of the port areas and drainage canals.

Working hand in hand with the EPA and Keelung City Government, Port of Keelung TIPC has strived to dredge the Tianliao and Xuchuan Rivers in Keelung by providing venues to build interception stations in order to improve water quality.

● Tripartite collaboration in the Port of Keelung Tianliao River interception station



Construction of the Tianliao River Interception station of Keelung took over 4 years and was completed on June 30th, 2013. This facility shall provide the residents of Keelung city and visitors with a cleaner Tianliao River and Port of Keelung.

3.3 Waste Management

Waste sorting (domestic and vessel wastes)

TIPC implements waste management procedures in accordance to the TIPC Berth Cleanliness and Pollution Prevention Notice in order to strengthen monitoring for the proper categorization of ship waste.

According to the servicing principles, TIPC processes domestic waste produced from berthing vessels. However,waste from cruise shall be regarded as operational wastes. The cruise ship owner shall independently delegate waste handling businesses approved by the authorized environment protection agencies to process and recycle the waste.

In order to promote waste reduction for cruise ships, TIPC has listed a series of requirements for shipowners. Kitchen and crew cabin wastes shall be sorted (into either recyclable waste and non-recyclable waste) and properly packed in accordance to environmental protection regulations. Any unsorted waste found during collection and transport will be rejected from processing.

Bilge water

Vessel bilge water have been treated by a subcontractor independently designated by the shipowner. TIPC complies with environmental protection laws and provides the shipowner with a list of EPA-approved cleaners for vessels requesting waste oil and wastewater treatment. The shipowner will then select and contact the desired cleaner for further processing.

3.4 Energy & Resources

Four Aspects of Reduction Project

TIPC is a transport agency and must comply with "Four Aspects of Reduction Project in Authorities and School " in order to achieve usage reductions in water, fuel, electricity, and paper.

Electricity

- Reduce annual electricity usage by 1% of the previous year by principle. Review action effectiveness and revise annual electricity usage reduction targets every year.

Water

- Reduce annual water usage by 2% of the previous year by principle. Review action effectiveness and revise annual electricity usage reduction targets every year.

Fuel

- Reduce annual fuel usage by 3% of the previous year by principle. Review action effectiveness and revise annual electricity usage reduction targets every year.

Paper

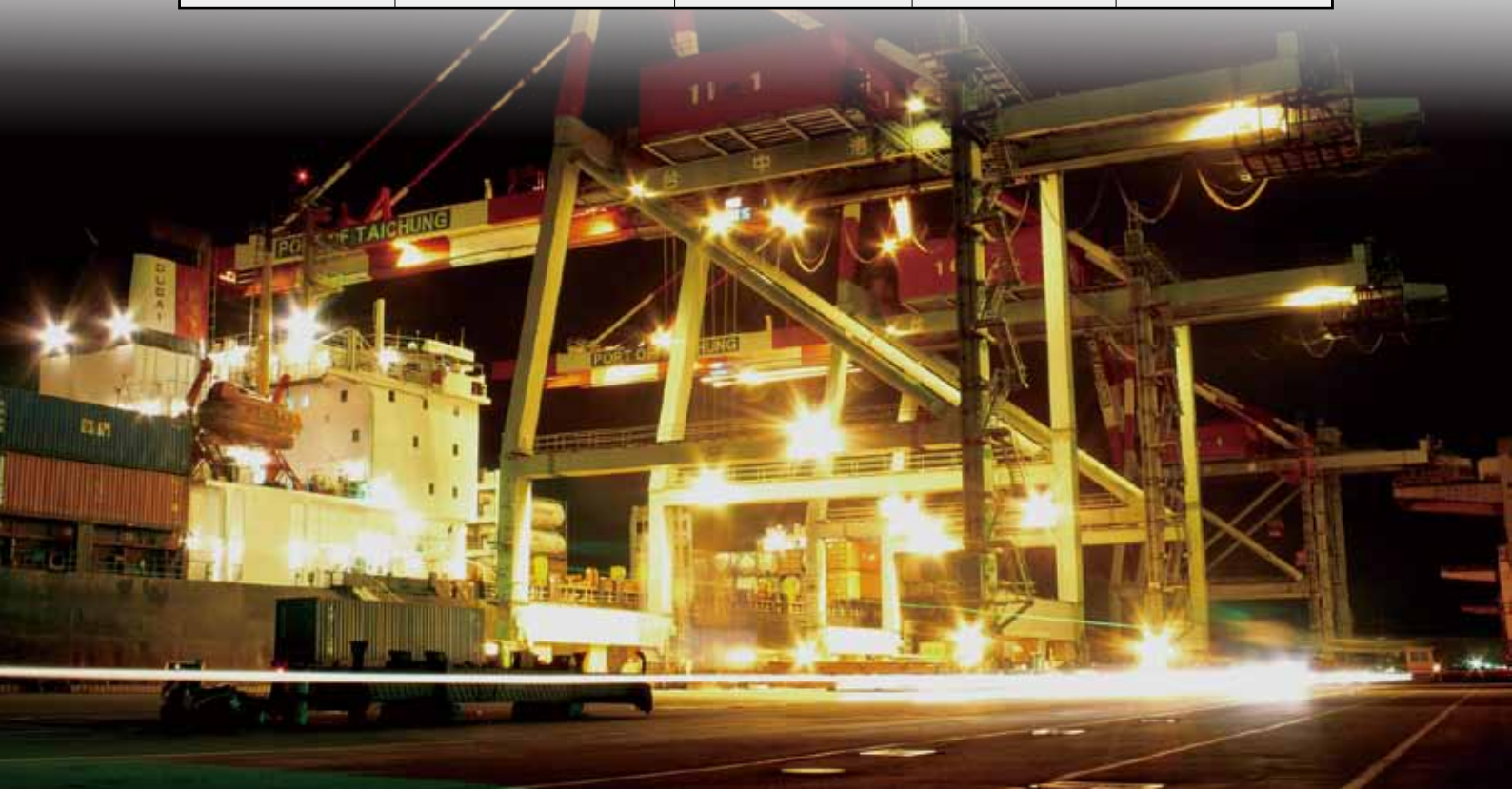
- Implement digitalization for official document handling and reduce paper usage for official documents as well as paper procurement every year.
- Achieve 30% online signing and approval of official documents by 2012 and 40% by 2015, and to review the targets on an annual basis.

Electricity

In order to achieve energy saving and carbon reduction, TIPC will gradually replace low energy efficiency lighting. Lighting along the roads and cargo handling areas will be controlled by computers. At the same time, equipment such as servers and air conditioners that have passed their effective usage life would be gradually replaced. Replacements shall be electric equipment with energy conservation and environmental protection labels or models with improved performance, such as central air conditioning servers or air conditioners with dual-channel control. The following lists the actual energy conservation implemented in the Administrations Building of Port of Taipei:

- All emergency evacuation indicator lights have been replaced with LED lighting.
- Restroom ventilation fans have been switched from non-stop operations to intermittent operations every 3-5 minutes.
- Building air conditioning has been switched from being turned on in every area to zone-by-zone operations. Fans are automatically turned off everyday at 5 PM.

	Electricity usage (kWh) in 2012	Electricity usage (kWh) in 2013	Increase in 2013	Targets in 2013
Headquarters	388,323	462,060	19%	
Port of Keelung	8,918,915	9,083,172	2%	
Port of Taichung	6,163,505	6,366,607	3%	
Port of Kaohsiung	6,817,305	6,574,646	-4%	☺
Port of Hualien	1,031,199	973,016	-6%	☺
Port of Taipei	2,198,631	1,717,604	-22%	☺
Port of Su-Ao	948,547	791,226	-17%	☺
Port of Anping	770,712	732,827	-5%	☺



Fuel

Fuel saving measures include using the carpool for any section, office, or department patrol of the port areas. TIPC also encourages personnel on official business trips to take public transport, promotes green driving habits, such as not warming up the engine, turning off the engine if the vehicle will remain idle for over 3 minutes, avoiding unnecessary loads, and sending the vehicle for maintenance periodically.

Water

Improvements to water conservation in various ports include using water saving equipment such as water-efficient toilets. TIPC has also increased the utilization of gray water such as recycled water from water dispensers for irrigation and tightening water usage controls for fine spraying irrigation to increase performance and reduce waste.

Fuel

	2012 fuel use (liters)	2013 fuel use (liters)	Increase in 2013	Targets in 2013 (-1%)
Headquarters	3,818	7,621	100%	
Port of Keelung	1,411,934	1,413,244	0%	
Port of Taichung	47,719	51,851	9%	
Port of Kaohsiung	26,258	21,577	-18%	☺
Port of Hualien	3,068	2,672	-13%	☺
Port of Taipei	6,082	5,822	-4%	☺
Port of Su-Ao	157,296	150,317	-4%	☺
Port of Anping	1,829	1,873	2%	

Water

	2012 water use (m^3)	2013 water use (m^3)	Increase in 2013	Targets in 2013 (-2%)
Headquarters	2,030	4,180	106%	
Port of Keelung	141,388	139,203	-2%	☺
Port of Taichung	33,670	30,738	-9%	☺
Port of Kaohsiung	18,926	19,657	4%	
Port of Hualien	6730	7532	12%	
Port of Taipei	144,830	123,430	-15%	☺
Port of Su-Ao	7,948	6,782	-15%	☺
Port of Anping	59,710	38,964	-35%	☺

Water conservation measures

	Measures
Port of Keelung	Recycling of washing water at the car wash station (24,300 tons of water was recycled in both 2012 and 2013)
Port of Taipei	Establish rainwater recycling facilities to recycle ground surface runoff in the port area A4 administration zone and Jiaxin cement storage area .
Port of Taichung	The multi-story parking lot collects rainwater for flushing toilets and watering plants.

Port of Hualien

Water-bank for efficient water usage

The Port of Hualien processes large quantities of gravel and bulk materials, often cause significant negative impact on the environmental and social aspects of the port areas. In order to reduce air pollution, the Port of Hualien made use of spraying systems for the uncovered storage lots and port areas as well as car wash stations to reduce dust generation. However, these facilities consume thousands of kiloliters of water a day, making port water management extremely important. Fortunately, due to its lower profile and dark mineral layer (non-permeable), the port has plenty of ground surface runoff. TIPC thus made use of these topographical features and constructed small interception tanks, making use of water level differences and pipelines to conduct ground surface runoff to port reservoirs. This innovative water interception equipment would reduce the port's consumption of public water. This concept of using natural resources for natural conservation was applied to collect and utilize ground surface water in order to preserve our valuable water resources and achieve effective water conservation. The recycling and reuse of ground surface water provides an annual reduction in water consumption by about 600,000 tons. Twelve reservoirs with a storage volume of 1,868 tons were built that for spraying, dust control, temperature reduction, irrigation, washing, and flushing of toilets.

Water-bank

Economic benefits

- A water consumption reduction of about 10 million NTD per year.
- Merely 6 month payback period of the investment in system.
- Savings in air pollution control expenses.

Environmental benefits

- Significant improvement on air quality in terms of less particulate.
- Improvement of local biodiversity.

Social benefits

- Improvement of local air quality and quality of life of neighboring residents.
- Reduced residents complaints, improving the relationship between the port and neighboring residents.
- Increasing awareness for water conservation.

Port of Anping

–wastewater treatment as well as recycling and reuse of water resources

Domestic wastewater treatment facilities in the Port of Anping treats all domestic wastewater produced in the port area (with a maximum daily processing volume of 80 kiloliters). Domestic wastewater goes through bio-film treatment and sterilization before being released to the sea. Wastewater treatment tanks are all installed under grass field. Tank covers on the grass field would indicate the type of tank underneath (such as sedimentation tank, effluent tank, exposure tank, etc.).

The Port of Anping is also participating in Anping Water Recycling Center's pilot program on the reuse of RO (reverse osmosis) treated water. The Anping Water Recycling Center will process 100,000 tons of domestic wastewater every day. Wastewater is subject to secondary (biological) treatment before going through fiber filtration and RO membranes to provide 10 tons of RO water that could be used by other agencies. The Port of Anping would use this recycled water to irrigate plants in the port area and for washing vehicles.

Domestic wastewater treatment facility in the port area

Green belts in the port area

Recycled water pipelines

Greenery in the port area

Paper

To reduce the usage of paper, TIPC avoids using printed copies and only provids soft copies at meetings. When printing is necessary, employees are encouraged to print on poth sides of the paper or use recycled papers. TIPC also uses electronic signature and approval systems extensively.

Paper

	Paper (sheet) purchased / used in 2012	Paper (sheet) purchased / used in 2013	Increase in 2013
Headquarters	657,000	959,000	46%
Port of Keelung TIPC	2,736,500	2,419,755	-12%
Port of Taichung TIPC	1,126,000	824,500	-26.8%
Port of Kaohsiung TIPC	3,403,500	3,037,000	-11%
Port of Hualien TIPC	930 packets	920 packets	-1.08%

Digitalization of official documents

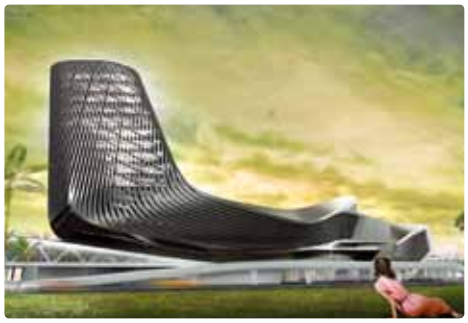
	Digitalization of official documents in 2012	Digitalization of official documents in 2013
Headquarters	91%	95%
Port of Keelung TIPC	93%	95%
Port of Taichung TIPC	-	92%
Port of Hualien TIPC	97%	91%
Port of Kaohsiung TIPC	92%	93%
Port of Anping	92%	94%

Green Building

Green Buildings are buildings that minimize environmental impacts during construction and operation phases. The goal of green buildings is to achieve a harmonious coexistence with the local ecology. The Ministry of the Interior (MOI) has established a green building evaluation system called EEWH, which stands for " ecology, energy saving, waste reduction and health". EEWH certificates buildings with different awards depending on their levels of achievement, namely, from low to high, Certified, Bronze, Silver, Gold or Diamond. Since the MOI requires all new public buildings to be green buildings, TIPC will assure future buildings to be EEWH certified.

Kaohsiung Port Terminal

The Port of Kaohsiung, working in tandem with the Kaohsiung City Government on " Asia's New Bay Area Project", has begun work for a new international tourism gateway, the Kaohsiung Port Terminal. Green Building concepts have been adopted in the building designs to achieve environmental protection through energy saving and carbon reduction. Construction for the Kaohsiung Port Terminal began in November 2013 and is expected to be completed in 2017.



A model of the Kaohsiung Port Terminal during daytime.

Renewable energy

Port of Long Beach's renewable energy task force has continued to assess opportunities for developing solar and wind power for various port areas. Since TIPC is a state-owned enterprise, applying renewable energies would also serve a demonstrative purpose. In response to the two major renewable energy initiatives implemented by the Ministry of Economic Affairs (MOEA), "A Million Solar-Powered Rooftops" and "A Thousand Wind Power Generators", the Port of Taichung TIPC has provided the Taiwan Power Company with land for installing 18 wind power generators and signed an agreement with Chung Kang Logistics Company. Berth No. 2 of the Port of Taichung TIPC will serve as a hub for the assembly of offshore wind power generators, bringing in 6 businesses to the area, thus creating a cluster effect for offshore wind power industry within the Port of Taichung. TIPC will continue to promote demonstrative development of renewable energy in various ports in the future.

TIPC will continue to work with governmental agencies in promoting renewable energy. Each port will propose suitable land areas for renewable energy installations based on its geographical circumstances.

Communication and Interaction

In addition to achieving operation excellence and supporting the nation's economy, TIPC also values its relationship with neighboring residents. For TIPC, ports must take the initiative to interact with the general public and to create a friendly environment for all.

4.1 Community Support and Activities

In order to improve the relationship between the ports and their surrounding communities, each TIPC subsidiary has organized events to interact with local communities. Through these efforts, TIPC wishes that the community will not regard the port simply a place for ships to dock or a collection of building, but an important place of collective community memories.

Key

festivals and community events

The Port of Keelung has sponsored several Taiwanese folk festivals throughout the year for its surrounding neighbors. These opportunities allowed the Port of Keelung to play a role in shaping community identity.

Maritime Festival and Green Ports Festival

- The Maritime Festival is a series of activities with an atmosphere of marine culture, bringing the port closer to the neighboring residents.

- The Maritime Festival 2013 began with the Star Cruises onboard experience followed by a "Summer Love Boat Party" for single men and women of Keelung. Besides these events, the Navy also allowed a public visit of the Chi Yang class frigate.

- A wonderful display of marine music festival and a screening of Life of Pi provided physical and spiritual healing and relaxation to the audience. All attendants are looking forward to the next Maritime Festival.

- TIPC has also held events for environmental education. For example, the Green Ports Festival at the Port of Kaohsiung was jointly held by the TIPC, the Institute of Trasportation of MOTC, and National Sun Yat-sen University.

- In this event, a range of creative activities were provided, including second hand goods sales for charity, etc. Through these activities, participants were able to learn about various ways to help make the environment more sustainable.

In 2013, the number of visitors of the northern Maritime Festival reached 419,000.

2013 Highlight

Hofman's Rubber Duck was one of the highlights for Taiwanese ports in 2013. In its first appearance at Kaohiung's Guang Rong Pier, the Rubber Duck brought 3.9 million visitors and 1.3 billion NTD in revenue for the local business within a month.

TIPC worked with the City Government of Kaohsiung and Keelung and helped plan the Rubber Duck exhibits at ports. These ports are chosen not only for their great vicinity, but also because they are leading development areas of the cities. Overall, the exhibit helped draw tourism to these areas and brought local comunities closer to the ports. The Rubber Duck not only boosted tourism in Kaohsiung, it also helped to showcase the city's unique features. The last stop of the Rubber Duck's tour was the Port of Keelung. Five viewing areas were provided. The Rubber Duck was exhibited for 50 days at the Marine Plaza, allowing the Rubber Duck to accompany the visitors through Christmas, New Year, and Chinese New Year. During the exhibit, a photography competition with the Rubber Duck was held as well. On the last day of the exhibition, TIPC's Port of Keelung TIPC and the Coast Guard Administration dispatched 4 vessels to sound their sirens, sprayed water, and sang songs with the people to bid the Rubber Duck farewell.

4.2 Environmental Education

In 2013, TIPC has organized courses for staff and general public on the importance of environmental protection as well as energy saving and carbon reduction. These courses include film screening on the importance of environmental protection as well as outdoor tours, activities and ecological habitats visits. TIPC hopes that these courses could strenghten our collective commitment towards environmental protection.

Environmental education	Total number of events	Participants
Port of Keelung	21	2,027
Port of Taichung	18	1,553
Port of Kaohsiung	37	2,788
Port of Hualien	6	542
Port of Taipei	4	132
Port of Su-Ao	2	83
Port of Anping	3	59

Statistics shown are the total from 2012 to 2013.

4.3 Environmental Awareness and Training Programs

The Port of Taichung TIPC has organized a conference for the "Provision of Treated Effluent from Futian Water Recycling Center for Port of Taichung Industrial Areas."At this conference, TIPC promoted the importance of recycling and re-using natural resources. TIPC also encouraged companies in the port to work together in shaping corporate social responsibility.

2013 Port of Taichung Ports Operations Conference

In order to help each port in Taiwan to be Port Environmental Review System (PERS) certified, TIPC sent fifteen staff to participate in the PERS certification workshop. Four of our staff members are now certified PERS trainers.

Pollution Prevention Auditing

Achieving Green Ports require a great deal of support. TIPC holds itself to the highest standards and hope to encourage companies and businesses within the port to carry out environmental protection measures and implement relevant self management. In June 2013, TIPC has stipulated the "Pollution Prevention Auditing Guidelines among Leasees within International Commercial Port Areas". The aim is to audit actual operations and operational sites to assess achievements in various aspects of environmental protection. By using a scoring system, we hope to select businesses with excellent performance and publicly commend and award them for their efforts.

Items to be audited under the guidelines include:

- air pollution,
- water pollution,
- noise,
- waste, and
- others

Over 600 audits were carried out between Dec 2012 and Dec 2013.

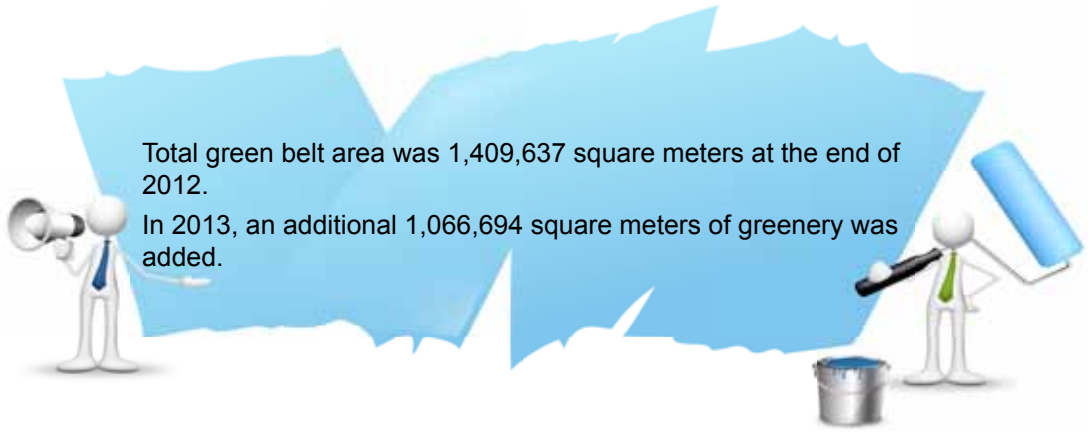
4.4 Green Business at Ports

Port of Su-Ao — Terminal for Green Energy Industry

In 2011, an electric vehicle company was established in the Port of Su-Ao and became the first free trade zone company in the port . The company is a green business that produces high performance and non-polluting lithium iron phosphate batteries as well as electric vehicles.

Components that were manufactured in-house, domestically, and oversea were assembled into environmentally friendly electric vehicles which were then sold domestically or exported by ship. About 200 jobs were created, helping with local development.

4.5 Creating a Friendly Environment



TIPC places great importance on our relationship with neighboring residents and maintains green buffer zone with existing water front areas and initiated restoration projects of old port area to create new port-city interfaces.

Port of Hualien–
Green beautification and waterfront facilities

The Port Line Coastal Bicycle Path stretches a distance of 16 km from Nanbin Park to Cisingtan. The parkway is a green belt that allows public recreation, cycling, and walking. The beautiful greenery not only improves the quality of air in the areas around the port, it also helps to bolster people's spiritual health.

In support of Hualien County Government's tourism policy, the Port of Hualien has also begun to restructure and construct waterfront recreational areas. The portside waterfront recreational park will provide residents with a place to have fun and improve the emotional connection between the general public and the port.

Port of Taichung–
Blue Belt Project

In order to foster coastal tourism development, the Port of Taichung has established an 11km bicycle path that starts from the Port of Taichung Visitor Service Center, goes across the Binhai Bridge, and connects with the Gaomei Wetlands. Visitors can enjoy various landscapes and sceneries along the way, such as taking pictures of the wind generators, or take a relaxing walk in the wetland ecological park and Taichung Banyan Park.

Taichung Banyan Park

Gaomei Wetlands

Green beautification and waterfront facilities at ports

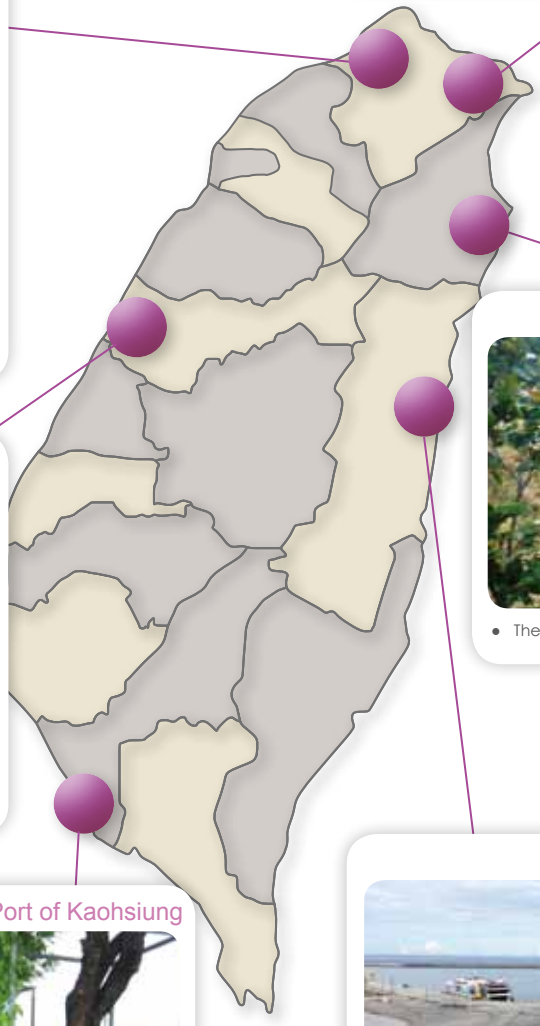
Green beautification is one of the key projects being actively implemented by TIPC. Improvements made to the overall aesthetics and ecological richness provide direct and positive influences that improve the physical and spiritual health of neighboring residents and even promote tourism.

Port of Keelung

- The Port of Keelung created wall frescoes and replanted trees.

Port of Taipei

- The Port of Taipei is creating an off-shore green wind buffer at the logistics area. Land reclamation is currently being conducted.
- Plans are currently being made for a waterfront recreational area.



Port of Su-Ao

- The Port of Su-Ao planted 5 hectares of land with trees.

Port of Taichung

- 300 hectares of green zone, of which 168 hectares are wind buffering forests for the coastal areas.

Port of Hualien

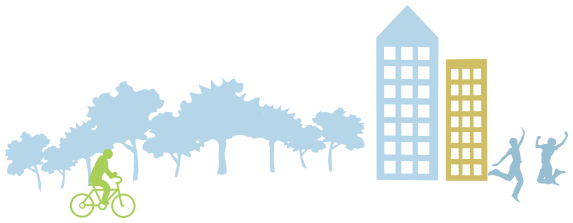
- A waterfront area is established in Port of Hualien

Port of Kaohsiung

- An additional 25,000 trees is planted in port area in Kaohsiung

Waterfront areas

Waterfront areas are important facilities that help protect natural ecology while serving as an interface connecting the public with the port. It is hoped that activities held in waterfront areas could help build emotional connections between the people and these areas. Such areas provide important interactive opportunities between Green Ports and residents in surrounding communities. Currently, each subsidiary has continued to maintain and improve existing waterfront areas.



- Existing waterfront areas in Port of Taichung TIPC and Port of Kaohsiung TIPC have reached 35.9 hectares.
- Port of Taichung TIPC has 20.9 hectares of waterfront areas, including fishing area, scenic routes and viewing platform in visitor service center.
- In 2013, the Port of Kaohsiung TIPC has expanded the waterfront area by 1 hectare for the Rubber Duck event.

Prospects

In the future, TIPC will integrate the Green Port concepts listed below in our Green Ports Program to become an exemplary Green Ports model in the world

As a port management agency, TIPC regards Green Port as a modern approach for improving port management and operational efficiency, international competitiveness as well as providing sustainable urban and local development strategies. Through benchmarking other Green Ports and carrying out various actions, TIPC hopes to reduce pollution, restore natural environments and ecology, bolster port operational performances, and achieve mutually beneficial developments for both our ports and the surrounding communities.

- Pursue low emission
- Promote ecological protection
- Implement environmental monitoring
- Capacity building for sustainable development
- Energy management
- Harbor and city harmonization
- Bonding with communities

Index of GRI G3.1 Environmental Indicators

	GRI environmental indicators	Section revealed	Corresponding page
DMA	Disclosure of management approach	2.1 Environmental Management Policy 2.3 Environmental Management Strategies	10,13
EN1	Materials used by weight or volume.	Not applicable for non-manufacturing	
EN2	Percentage of materials used that are recycled input materials.	Not applicable for non-manufacturing	
EN3	Direct energy consumption by primary energy source.	3.4 Consumption of energy resources	33
EN4	Indirect energy consumption by primary source.	3.4 Consumption of energy resources	33
EN5	Energy saved due to conservation and efficiency improvements.	3.1 Air pollution 3.4 Consumption of energy resources	19,33
EN6	Initiatives to provide energy-efficient or renewable energy based products and services, and reductions in energy requirements as a result of these initiatives.	3.1 Air pollution 3.2 Water pollution 3.4 Consumption of energy resources	19,31,33
EN7	Initiatives to reduce indirect energy consumption and reductions achieved.	3.1 Air pollution 3.4 Consumption of energy resources	19,33
EN8	Total water withdrawal by source.	3.4 Consumption of energy resources	33
EN9	Water sources significantly affected by withdrawal of water.	None related	
EN10	Percentage and total volume of water recycled and reused.	3.4 Consumption of energy resources	33
EN11	Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas.	Not applicable for commercial ports	
EN12	Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas.	4.5 Creating a Friendly Environment	45
EN13	Habitats protected or restored.	Not applicable for commercial ports	
EN14	Strategies, current actions, and future plans for managing impacts on biodiversity.	None revealed	
EN15	Number of IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk.	None related	
EN16	Total direct and indirect greenhouse gas emissions by weight.	Greenhouse gas inventory not yet performed.	
EN17	Other relevant indirect greenhouse gas emissions by weight.	Greenhouse gas inventory not yet performed.	
EN18	Initiatives to reduce greenhouse gas emissions and reductions achieved.	Greenhouse gas inventory checks not yet performed.	
EN19	Emissions of ozone-depleting substances by weight.	Ozone-depleting substances inventory not yet performed.	
EN20	NO, SO, and other significant air emissions by type and weight.	3.1 Air pollution	19
EN21	Total water discharge by quality and destination.	3.4 Consumption of energy resources	33
EN22	Total weight of waste by type and disposal method.	3.3 Waste	32
EN23	Total number and volume of significant spills.	No significant spills to date.	
EN24	Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel Convention Annex I, II, III, and VIII, and percentage of transported waste shipped internationally.	None related	
EN25	Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the reporting organization's discharges of water and runoff.	None related	
EN26	Initiatives to mitigate environmental impacts of products and services, and extent of impact mitigation.	3.1 Air pollution 3.2 Water pollution 3.4 Consumption of energy resources 4.4 Green Businesses at Ports 4.5 Creating a Friendly Environment	19,31,33, 44,45
EN27	Percentage of products sold and their packaging materials that are reclaimed by category.	Not applicable.	
EN28	Monetary value of significant fines and total number of non-monetary sanctions for noncompliance with environmental laws and regulations.	2.3 Environmental Management Strategies	13
EN29	Significant environmental impacts of transporting products and other goods and materials used for the organization's operations, and transporting members of the workforce.	3.1 Air pollution	19
EN30	Total environmental protection expenditures and investments by type.	2.3 Environmental Management Strategies	13

Taiwan International Ports Corporation, Ltd.

Address：No.2-2, Jianguo 3rd Rd., Sanmin Dist., Kaohsiung City 80748,Taiwan (ROC) TEL：886-7-2851000