CHAPTER 9
GREEN DEVELOPMENT


PORT OF TIANJIN
Q303
XIN HAI KOU

Confronted with the challenges brought by climate change to operations, the Company works closely with stakeholders to actively respond to and mitigate the impact of climate change. The Company is committed to fulfilling the responsibility of protecting the environment and strengthening the management of natural resources and protecting biodiversity with every endeavour made to minimise the impact of its operations on the environment to speed up the development of green ports in a way that promotes sustainability.

The Company's focus areas in Green Development:

Energy saving and emissions reduction	Optimise energy consumption structure and improve energy use efficiency Explore the use of new and clean energy sources at terminals Reduce overall energy consumption, carbon emission and air pollutants
Enhancing resources and waste management	Optimise water resources and sewage management Enhance waste management, encourage reuse and reduce waste
Response to climate change	Identify climate-related risks and explore new opportunities Improve the terminals' ability to cope with climate change
Raising environmental awareness	Enhance employees' environmental awareness

PERFORMANCE HIGHLIGHTS IN 2022

In 2021, the Company set goals for four environmental performance indicators of its Subsidiaries to conduct more systematic review of the effectiveness of energy saving and emission reduction efforts, and monitor and manage environmental performance, thus advancing towards the goal of green ports. During the year, the Company redoubled its efforts in energy saving and emission reduction and resource management, and further promoted green and low-carbon transformation in its Subsidiaries:

Environmental performance	Target	Performance of the Subsidiaries in 2022[7]
Reduction in greenhouse gas emissions	To reduce the greenhouse gas (Scope 1 and Scope 2) emission intensity of the Subsidiaries by 20% in 2030, setting 2020 as the base year, and to achieve carbon neutrality no later than 2060.	Greenhouse gas emission intensity[8]: 7.39 kg of CO_2e per TEU, representing a decrease of 18.5% year-on-year and a decrease of 21.0% as compared to 2020
Improvement in energy use efficiency	To reduce the energy consumption intensity of the Subsidiaries by 15% in 2030, setting 2020 as the base year.	Energy consumption intensity[8]: 0.069 GJ per TEU, representing a decrease of 20.7% year-on-year and a decrease of 22.2% as compared to 2020
Improvement in water efficiency	To enhance the management of water resources and improve water efficiency.	Water consumption intensity[8]: 0.037 m^3 per TEU, representing a decrease of 13.4% year-on-year and a decrease of 18.8% as compared to 2020

7 Among the existing 15 Subsidiaries of the Company, CSP Chancay Terminal in Peru is under construction and its environmental performance was not included in the performance of the Subsidiaries. Tianjin Container Terminal became the Company's subsidiary in December 2021, therefore its environmental performance was included in the performance of the subsidiaries since 2022.

8 The environmental performance data shown in the table are rounded off, while the corresponding percentage changes are derived from unrounded figures.

Environmental performance	Target	Performance of the Subsidiaries in 2022[7]
Reduction in waste	**Hazardous waste:** To maintain 100% hazard-free disposal of waste.	100% of hazardous waste was handled by recycling companies or material suppliers with professional qualifications
	Non-hazardous waste: To reduce domestic waste by terminals and, in the long term, achieve the goal of zero domestic waste sent to the landfill.	No quantitative target is set

MANAGEMENT APPROACH

The Company strictly complies with environmental laws and regulations[9] and ensures compliant and legal operations by the Company and its Subsidiaries. During the year, there were no environmental-related violations by the Company.

The Company integrates the concepts of corporate social responsibility and sustainability into its business operations and developed the Investment Management Policy to regulate investment management. Before making any investment decision, the Company conducts a feasibility study on the project to review its compliance with environmental protection, energy saving and safety regulations and its capacity for sustainable development. In terms of projects approved for implementation, the Company carries out relevant safety and environmental protection work pursuant to the management policy to ensure that such projects are implemented in accordance with requirements under the investment decisions.

To strengthen and standardise project development, the Company has developed the Infrastructure Management Policy to ensure that the environmental protection facilities and safety equipment have passed special inspection and acceptance or filing in accordance with the requirements of relevant authorities. Before commencing all large-scale projects, the Company engages professional environmental assessment agencies to assess the environmental impact caused by such projects, to ensure that local environmental requirements are met prior to construction.

The Company has devoted itself to standardising the operations of its Subsidiaries under the green and low-carbon philosophy. The Company has developed management policies and corresponding contingency plans for energy saving and emission reduction, responding to extreme weather and climate events, environmental emergencies and ecological environment protection, providing its Subsidiaries in China with specific policies and guidelines in relation to environmental management. In an effort to implement more rigorous environmental management, the Company regularly sorts out and investigates environmental pollution sources and ecological risks of its Subsidiaries, and requires them to file relevant reports, such as work summaries on the investigation and control of environmental pollution related risks or information concerning energy saving and emission reduction in accordance with the management policies.

9 Including, but not limited to, the Environmental Protection Law of the People's Republic of China, the Marine Environmental Protection Law of the People's Republic of China, the Law of the People's Republic of China on Prevention and Control of Environmental Pollution by Solid Waste, the Law of the People's Republic of China on Prevention and Control of Water Pollution, the Law of the People's Republic of China on Prevention and Control of Atmospheric Pollution, the Energy Conservation Law of the People's Republic of China, the Interim Measures for the Supervision and Administration of Energy Conservation and Emission Reduction at Central Enterprises.

The Company continues to improve the environmental management system, conducts regular analysis and review of the effectiveness of environmental management based on the environmental performance of its Subsidiaries, and promotes the terminals to seek third-party audit agencies for evaluation and certification to strengthen their environmental management capabilities:

Terminals	Certifications Received
Xiamen Ocean Gate Terminal	ISO 14001 Environmental Management System Certification ISO 50001 Energy Management System Certification
Guangzhou South China Oceangate Terminal	ISO 14001 Environmental Management System Certification
Guangzhou Nansha Stevedoring Terminal	ISO 14001 Environmental Management System Certification
Nantong Tonghai Terminal	ISO 14001 Environmental Management System Certification ISO 50001 Energy Management System Certification GBT 23331 Energy Management System Certification GBT 24001 Environmental Management System Certification RBT 104 Energy Management System Certification
Tianjin Container Terminal	ISO 14001 Environmental Management System Certification ISO 50001 Energy Management System Certification GBT 24001 Environmental Management System Certification
CSP Abu Dhabi Terminal	ISO 14001 Environmental Management System Certification
CSP Valencia Terminal	ISO 14001 Environmental Management System Certification ISO 14064 Greenhouse Gas Accounting and Verification Certification ISO 50001 Energy Management System Certification EU Eco-Management and Audit Scheme (EMAS)
CSP Bilbao Terminal	ISO 14001 Environmental Management System Certification ISO 50001 Energy Management System Certification EU Eco-Management and Audit Scheme (EMAS)
Ningbo Yuan Dong Terminal	ISO 14001 Environmental Management System Certification ISO 50001 Energy Management System Certification
Dalian Container Terminal	ISO 14001 Environmental Management System Certification GBT 24001 Environmental Management System Certification
Yantian Terminals	ISO 14001 Environmental Management System Certification ISO 50001 Energy Management System Certification
Kumport Terminal	ISO 14001 Environmental Management System Certification ISO 14064 Greenhouse Gas Accounting and Verification Certification ISO 14046 Water Footprint Management Certification Green Port Certificate

ENERGY SAVING AND EMISSIONS REDUCTION

The Company is committed to driving energy saving and emission reduction to support China's goals in achieving "carbon peaking" and "carbon neutrality", respond to the initial strategy of the International Maritime Organization (IMO) and international initiatives to reduce greenhouse gas emissions, and meet customers' plans to cut carbon emissions. The Company has established a steering team for energy saving and emission reduction and an energy saving and emission reduction management centre to monitor the efforts and performance related to the greenhouse gas emission reduction of the Company and its Subsidiaries in China with the aim of achieving carbon neutrality no later than 2060.

During the year, the Company proactively implemented the five initiatives below to further promote energy saving and emission reduction. The energy consumption intensity of the Subsidiaries recorded a year-on-year decrease of 20.7% from 0.087 GJ per TEU[10] in 2021 to 0.069 GJ per TEU, representing a decrease of 22.2% as compared with 0.088 GJ per TEU in 2020; their greenhouse gas (Scope 1 and Scope 2) emission intensity recorded a year-on-year decrease of 18.5% from 9.06 kg of CO_2e per TEU[10] in 2021 to 7.39 kg of CO_2e per TEU, representing a decrease of 21.0% as compared with 9.36 kg of CO_2e per TEU in 2020.

INITIATIVE 1: INSTALLATION AND USE OF SHORE POWER

The Company is committed to promoting green shipping and green port development by supplying electricity to vessels at berth through shore power facilities at the terminals, replacing the use of vessels' engines, which can effectively reduce fuel consumption and relevant exhaust emissions and noise pollution by vessels, thereby creating a comfortable and safe working environment for sailors and terminal workers.

During the year, the Company made active efforts to increase the coverage of shore power facilities of its Subsidiaries in China. Among them, Jinzhou New Age Terminal, Lianyungang New Oriental Terminal, Nantong Tonghai Terminal, CSP Wuhan Terminal, Xiamen Ocean Gate Terminal, Quan Zhou Pacific Terminal, Jinjiang Pacific Terminal and Tianjin Container Terminal have all achieved full coverage of shore power for container berths. The Company also proactively promoted to customers, assisted the terminals in establishing a sound shore power use and management system, and increased the shore power connection rate, supplying electricity to ships at berth and replacing the ships' own engine to generate electricity with an objective to help shipping companies reduce fuel consumption, carbon emissions and noise pollution, and to put the low-carbon development strategy of green ports into practice.

Jinzhou New Age Terminal achieved full coverage of shore power for container berths, providing electricity to vessels when they are at berth.

Lianyungang New Oriental Terminal completed the construction of two sets of 5MVA high-voltage shore power supply systems and supporting shore power socket boxes, and upgraded five sets of low-voltage shore power boxes to meet the needs of shore power connections for various vessels.

10 The figure is restated after data review.

INITIATIVE 2: DIESEL-TO-ELECTRICITY CONVERSION OF TERMINAL EQUIPMENT

The Company provides active assistance to its Subsidiaries to accelerate their green and low-carbon transformation through diesel-to-electricity conversion to reduce the energy consumption of terminal equipment and optimise the energy consumption structure of the terminals. The diesel-to-electricity conversion allows cranes to be electric-powered instead of diesel-powered, reducing energy loss from conversion of diesel to electricity, improving energy use efficiency, and effectively reducing noise, carbon emissions and exhaust emissions from diesel generators. The electric-powered cranes use power from the electricity grid in the port area. which is in significantly better quality compared with diesel generators, effectively reducing the failure rate of the cranes, improving the operational efficiency of equipment, and extending the lifecycle of the equipment, thus saving resources and costs for equipment maintenance. During the year, the completion rate of the Subsidiaries in China in terms of gantry crane diesel-to-electricity conversion reached 97.7%.

During the year, CSP Wuhan Terminal adopted all electric-powered loading and unloading equipment in the port areas, combined with electric driverless container vehicles and intelligent dispatching system, which could greatly reduce carbon emissions and production costs. Guangzhou South China Oceangate Terminal and Guangzhou Nansha Stevedoring Terminal also completed the transformation of lithium batteries for 5 diesel engines, enabling a total of 46 gantry cranes in the port area to realise fully electrified operations. For overseas terminals, CSP Spain Related Companies entered into a purchase agreement of hybrid gantry cranes with suppliers during the year, and they are expected to be delivered by the end of October 2023. At that time, CSP Spain Related Companies will become the first terminal in Europe that adopts hybrid gantry cranes. In 2022, Guangzhou South China Oceangate Terminal completed transformation of 20 electric tractors, replacing the original diesel generators with battery-powered generators, effectively reducing carbon emissions.

Guangzhou South China Oceangate Terminal and Guangzhou Nansha Stevedoring Terminal completed the transformation of lithium batteries for diesel engines.

During the year, CSP Spain Related Companies entered into a purchase agreement of hybrid cranes with suppliers.

INITIATIVE 3: EXPLORING THE APPLICATION OF NEW AND CLEAN ENERGY

The Company proactively speeds up the application of new and clean energy to reduce greenhouse gas emissions with the aim of mitigating climate change. During the year, CSP Wuhan Terminal implemented a photovoltaic power generation project by building a distributed photovoltaic power station on the roof of the buildings at the terminal to supply power for electric equipment. Without consumption of fossil fuels, it will not generate carbon emissions and exhaust emissions, as well as noise pollution, making it an important technical initiative for green and low-carbon transformation.

In order to accelerate the realisation of the goal towards carbon neutrality, the Company will continue to proactively explore the application of clean energy such as distributed photovoltaics and wind power in terminals, to reduce dependence on regional power grids, thereby facilitating the development of green ports.

CSP Wuhan Terminal has installed 1,063 pieces of 545WP monocrystalline silicon solar photovoltaic modules on the roof of 5,768 square meters in the port area, with a designed capacity of 0.578MWP, providing clean power for the production in the port.

Lianyungang New Oriental Terminal has installed a distributed photovoltaic grid-connected power generation system on the roof of its office building, with an installed capacity of 100kWp and an annual power generation of 110,000 kWh.

INITIATIVE 4: DEVELOPMENT OF SMART, AUTOMATED AND DIGITALISED TERMINALS

The Company actively endeavours to bring in smart tallying technology and automated driving technology to improve the accuracy and operational efficiency of terminals through the digital and intelligent development of ports, assisting the Subsidiaries in achieving energy saving and emission reduction.

Tallying is an important step in the exchange of containers between the terminals and shipping companies. Traditional container tallying relies on manual operations. Tally clerks independently record the number, type, location and quantity of containers, and transmit the information to the back end operating system in real time through handheld terminal. Errors sometimes occur. The Company's smart tallying technology uses artificial intelligence to automatically identify the number, type and door direction of containers in the process of loading and unloading, enabling more real-time and accurate tallying at the terminal, and effectively improving the operational efficiency of terminals.

In addition, the Company has been proactively cooperating with various parties to promote the research and development and launch of 5G driverless container vehicles in ports. The 5G autonomous container vehicles have pure electric chassis, and are equipped with laser radar and high-precision positioning inertial navigation technology, which can effectively achieve remote monitoring and intelligent management of vehicles, and resolve the problem of busy traffic routes within ports. It not only improves the operational efficiency of ports, but also reduces the safety risks from the operation of container vehicles. Currently, Xiamen Ocean Gate Terminal, CSP Wuhan Terminal, Tianjin Container Terminal and CSP Abu Dhabi Terminal have all implemented driverless container vehicles. The Company will leverage its experience and consider replicating it in other Subsidiaries as and when appropriate.

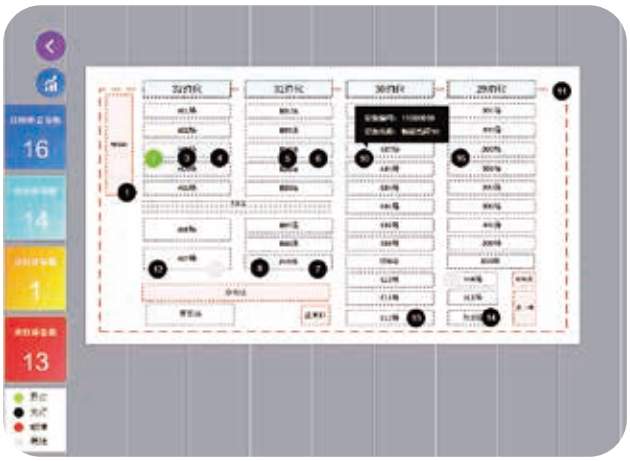
Xiamen Ocean Gate Terminal uses high-definition video real-time backhaul and artificial intelligence to realise smart tallying, reducing energy consumption caused by manual operation errors.

The Company's Subsidiaries have implemented driverless container vehicles to boost operational efficiency and save energy and reduce greenhouse gas emissions.

INITIATIVE 5: RETROFITTING ENVIRONMENTALLY-FRIENDLY LIGHTINGS FOR ENERGY-SAVING

Container yards operate 24 hours a day, requiring large scale high-mast lights to support the operations at night. The traditional time-controlled lighting mode has a fixed on-off period, resulting in huge power consumption due to overnight lighting. From time to time, terminal operators were required to be on site at any time to adjust the lighting time of each lamp tower in response to different weather and season, leading to waste of manpower and resources. The Company promotes the use of smart lighting systems in its Subsidiaries by using intelligent terminals to remotely monitor the lighting of the sites in real time and switching on or off individual or a large number of smart lights, effectively facilitates energy consumption analysis and troubleshooting.

Through independent innovation, Jinzhou New Age Terminal optimised the heat dissipation function of the floodlights on the beams of the yard cranes, and improved the installation layout of the floodlights by splitting from four 250-watt floodlights on one side into twelve 60-watt lighting units, maintaining high brightness and three-dimensional lighting and creating a comfortable working environment. After the transformation, the lifespan of the floodlights on the yard cranes has been extended, saving power consumption. It is estimated that each device can save 151.2 kWh per month. In June 2022, the "three-dimensional lighting study as a solution for the layout of the floodlights on the yard cranes" of Jinzhou New Age Terminal was awarded the Second-Class Award in the Technical Category of National Equipment Management and Technology Innovation Achievements by China Association of Plant Engineering.



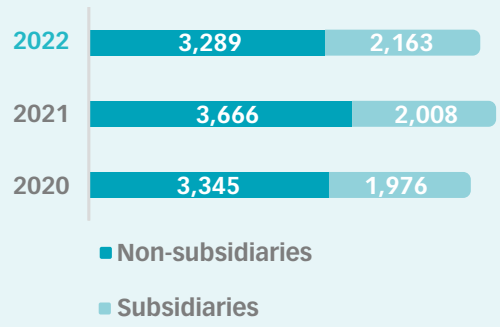
Lianyungang New Oriental Terminal has fully implemented the smart lighting system in the yard, and optimised the operation mode of each lamp tower to reduce power consumption.

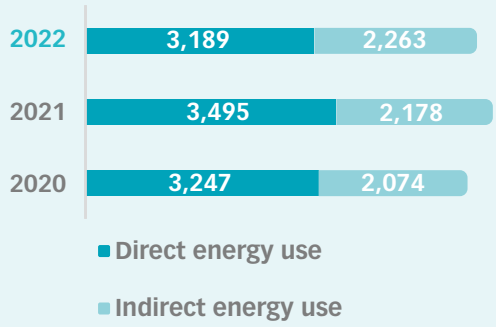
In June 2022, the "three-dimensional lighting study as a solution for the layout of the floodlights on the yard cranes" of Jinzhou New Age Terminal was awarded the Second Class Award in the Technical Category of National Equipment Management and Technology Innovation Achievements.

PERFORMANCE SUMMARY OF ENERGY CONSUMPTION AND GREENHOUSE GAS EMISSIONS[11]

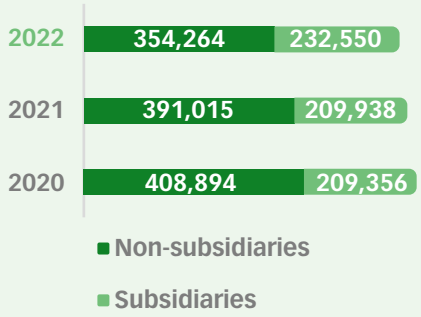
The energy consumption and greenhouse gas emissions of the Subsidiaries and Non-subsidiaries within the reporting scope during the year are as follows:

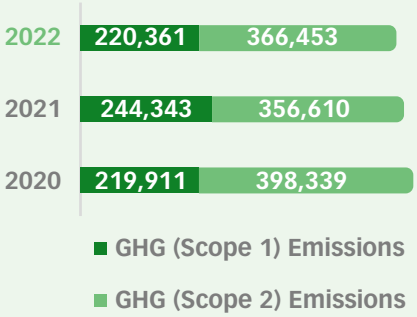
Energy Consumption (TJ)



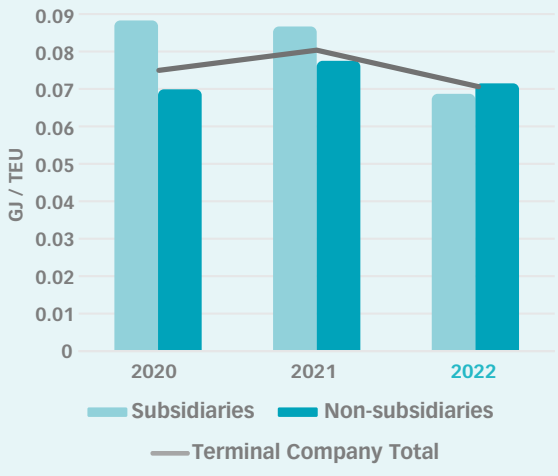


Greenhouse Gas (Scope 1 & Scope 2) Emissions (tonnes of CO_2e)

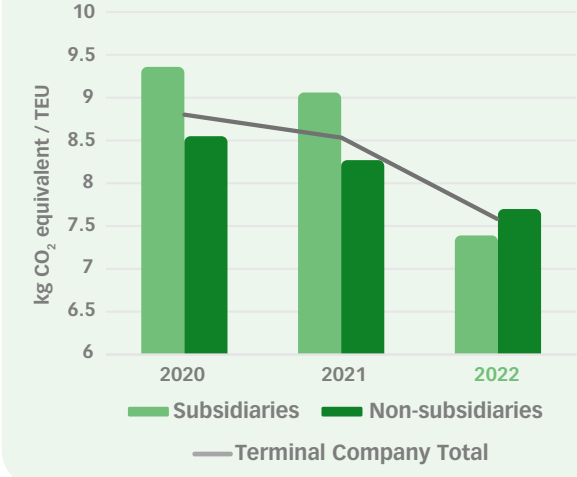




Energy Consumption Intensity



Greenhouse Gas Emission Intensity



11 Excluding the energy consumption and greenhouse gas emissions of the Company. For details on our environmental performance, please refer to the section headed "Appendices – Key Performance Indicators" set out in Chapter 12 of this report.

ENHANCING RESOURCES AND WASTE MANAGEMENT

The Company strictly abides by laws and regulations related to natural resource management in the places where it operates, and uses natural resources appropriately and reasonably with reference to good management practices in the industry, making every endeavour to minimise the consumption of natural resources and the impact of business operations on the environment.

The Company has developed the Supervision and Inspection Management Policy on Ecological and Environmental Protection to standardise risk prevention methods of its Subsidiaries in China in areas of water pollution, solid waste, hazardous waste, food and domestic waste pollution, and conduct investigation and treatment of hidden hazards of environmental incidents that may cause toxic and harmful substances to enter water, air and soil. The Company conducts quarterly comprehensive inspections and special inspections of its Subsidiaries in China to ensure that sewage discharge and waste treatment are legally compliant with local standards. Terminals are subject to performance assessment on an annual basis. Any failure to effectively perform the supervision and inspection of ecological and environmental protection, or violation of relevant laws and regulations that causes environmental pollution accidents, will be handled by the Company in accordance with the management policy.

WATER RESOURCES AND SEWAGE MANAGEMENT

Water used by the Company and its Subsidiaries is sourced from municipal supplies. Production water consumption is mainly used for maintenance and repair of operational facilities and berth and yard cleaning, while domestic water consumption is used for office buildings and canteens.

The Company proactively promotes the management of water resources in its Subsidiaries, conducts regular inspections of water supply networks, water-saving equipment and systems, and monitors the level of water consumption, with prompt repair of leakages to avoid unnecessary waste of resources. The Subsidiaries also carry out publicity and education campaigns on natural resource management for employees to enhance their staff's awareness of water saving. During the year, the water consumption intensity of the Subsidiaries recorded a decrease of 13.4% year-on-year from 0.043 m^3 per TEU in 2021 to 0.037 m^3 per TEU, representing a decrease of 18.8% as compared to 0.046 m^3 per TEU in 2020.

In terms of sewage discharge management, the Company strictly follows the sewage treatment requirements under the Wastewater Quality Standards for Discharge to Municipal Sewers (GB/T31962-2015) in China to regulate proper use and operation of sewage treatment systems at the Subsidiaries in China and ensure that wastewater discharge meets the standards. The sewage at terminals will be treated using a sewage oil-water separation technology, while the oily wastewater will be recycled by professional companies. After passing water quality monitoring, the remaining oil-free wastewater will be reused for irrigation and site cleaning.

WASTE MANAGEMENT

The Company practices the 3R principle of environmental protection, i.e. reduce, reuse and recycle.

During the year, in response to the needs of the steel import business, Jinjiang Pacific Terminal, leveraging the characteristic of long lifespan of hoisting belts, replaced conveyor belts by using scrapped hoisting belts due to damage to the edges and soft rings and installed them on the saddles of steel coils, making good use of scrapped materials. The hoisting belt can withhold high strength and is wear resistant, capable of providing better protection to the steel coils as compared with the original conveyor belt.

In the face of repeated pandemic outbreaks, the Subsidiaries of the Company were required to disinfect the hulls of foreign trade ships and the goods on board. During the year, Quan Zhou Pacific Terminal took the initiative to transform the previously eliminated idle refueling trucks into disinfection trucks, and disinfected the goods at the terminal apron, yards and warehouses, which not only avoided idle waste, but also saved the cost and latency time of renting the disinfection trucks.

The employees of Jinjiang Pacific Terminal installed scrapped hoisting belts on the saddles of steel coils to recycle the waste in a reasonable way.

Quan Zhou Pacific Terminal took the initiative to transform idle refueling trucks into disinfection trucks.

During the year, the types of hazardous and non-hazardous waste generated from the Company and the terminals within the reporting scope[12] during operations and respective treatment measures are as follows:

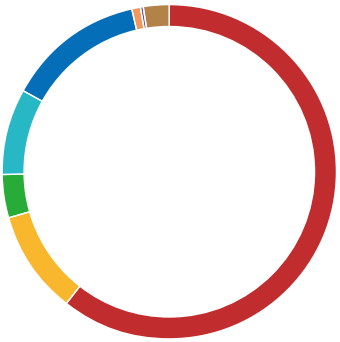
Types	Proportion of the overall waste[13]	Treatment measures
Hazardous waste		
Solid chemical waste (such as waste oil contaminated rag, waste wire rope, scrap metal, waste oil drum and waste oil sludge)	67.1%	Waste is collected and properly stored and handled by companies with professional qualifications or material suppliers. For waste oil, the terminals strengthen daily maintenance of machinery and equipment, and continue "diesel-to-electricity" conversion to reduce waste oil generation.
Liquid chemical waste (such as waste lead acid battery and waste oil)	7.6%	
Others	6.8%	
Non-hazardous waste		
Wooden pallets	3.8%	Companies with professional qualifications or material suppliers are engaged.
Others (such as municipal waste from ports)	14.7%	Waste is stored in collection zones before being transferred to designated locations by the environmental hygiene department for daily treatment in sealed containers.

12 For details on the materials used and the waste generated and recycled, please refer to the section headed "Appendices – Key Performance Indicators" set out in Chapter 12 of this report.

13 Add-ups may not be equal to 100% due to rounding.

During the year, the types of waste recycled by the Company and the terminals within the reporting scope are as follows:

Waste Recycled by Category[14]



60.6%	Solid chemical waste
10.1%	Liquid chemical waste
4.2%	Other hazardous waste
8.3%	Wooden pallets
13.4%	Tyres
0.7%	Paper
0.2%	IT equipment
2.5%	Other non-hazardous waste

RESPONSE TO CLIMATE CHANGE

The Company is proactively expanding its global terminal network and operates terminals worldwide, including areas which are more sensitive to climate change. The intensifying climate change undoubtedly makes an impact on business operations and the places where it operates in, therefore the Company appointed an external consultant to conduct climate risk and opportunity assessment to enhance its capability to respond to and transparency towards climate change. On the one hand, the Company proactively implements energy saving and emission reduction initiatives (please refer to the section headed "Energy Saving and Emissions Reduction" in this chapter) to reduce greenhouse gas emissions and to decelerate climate change. On the other hand, the Company enhances the management of climate change (please refer to the section headed "Measures to Respond to Climate Change" in this chapter) to adapt to climate change.

RISKS AND OPPORTUNITIES IN RELATION TO CLIMATE CHANGE

With reference to the recommendations from the Task Force on Climate-related Financial Disclosures (TCFD), the Company identified climate-related risks and opportunities, categorised the risks into physical risks and risks related to the transition towards a low carbon economy, and prioritised them according to their impact on business operations. Extreme weather and climate events, carbon trading system and the IMO sustainable development strategies are identified as the most significant climate-related risks to business operations.

14 Add-ups may not be equal to 100% due to rounding.

Types of risks	Scope	Risk description
Physical risks Risks arising from more frequent extreme weather or changes in climate patterns	Acute risks: extreme weather and climate events such as typhoons, storms, droughts, floods	• Damage to terminals and relevant facilities, vessels or cargo, resulting in loss of assets • Extreme weather affects the arrival time of vessels and results in simultaneous berthing of vessels at a later stage, making it not enough berths for stevedoring at the same time • Affect the capacity of waterways, thus requiring more dredging works • A decrease in the volume of cargo due to crop failure, eventually affecting terminal throughput
	Chronic risks: rising sea levels, continuous high temperatures, etc.	• Rising sea levels change wave and tidal patterns, affecting the schedules of shipping companies • Terminals need to be equipped with more refrigeration facilities due to rising temperatures to meet the demand from customers; employees may not be able to work long hours outdoors during hot season, hampering operational efficiency • Terminal infrastructure deteriorates faster due to rising temperature and ocean acidification, increasing maintenance costs • The polar ice layer is melted to form a shorter distance and lower cost route at a particular period each year, affecting terminal throughput

Types of risks	Scope	Risk description
Transition risks Risks resulting from changes in policies, laws, technologies and market needs during the transition to low-carbon economy	Policies and legal risks	• Policies issued by the IMO to reduce greenhouse gas emissions by vessels • China's Emission Trading System (ETS) has enforced a carbon pricing mechanism • China's development strategy and approach to green shipping and green ports • Emissions Trading System of the European Union • Industry framework of the Poseidon Principles • Litigation claims in relation to climate-related risks
	Technology risks	• Increase in investments in renewable energy, and energy saving and emissions reduction technology
	Market risks	• Increasing demand for low carbon services and green ports from customers
	Reputational risks	• Customers' preference to partner with companies with better performance in sustainable development

Climate change may also bring potential business opportunities:

Types of opportunities	Scope	Opportunity description
Efficiency of resources	• Adopt more efficient means of transportation • Implement a more efficient process of production and distribution • Apply recycling technology • Build buildings and facilities with higher efficiency • Reduce water discharge and water consumption	• Supply of shore power to vessels • Compared with other modes of transportation (such as air, road and rail), the amount of carbon dioxide emissions per kilometer-tonne of shipping is lower. It is expected that an increasing number of customers may change transportation methods and choose shipping in accordance with their own low-carbon strategies • National/local subsidy policies (such as the development of green ports and shore power facilities) • Increase in transportation volume of green products (such as photovoltaic equipment, wind power equipment or electric vehicles) • Global warming accelerates glacial meltdown and shortens the time for ice-freezing in the Arctic region, bringing development opportunities to the logistics and transportation business (including shipping services and ports) in the regions of open water
Energy	• Sources of low-emission energy • Incentive from supportive policies • Rise of new technology • Participate in carbon trading market • Energy safety	
Products and services	• Develop and/or expand low emission goods and services • Solutions to climate adaption and insurance risks • Research and development and innovation • Diversification of business activities • Change in consumers' preferences	
Market	• Entry to new markets • Motivation from authorities • Demands and initiatives from communities	
Adaptability	• Participate in renewable energy projects and adopt energy-saving measures • Alternatives/diversification of energy	

MEASURES TO RESPOND TO CLIMATE CHANGE

The Company has conducted analysis of climate-related risks and potential opportunities, and developed strategies for mitigating and responding to climate change to improve its adaptability to climate change, thus minimising the impact.

Preventive Measures against Typhoons

During the year, the Company issued the Guidelines for the Standardisation of Container Operations, which specified operation procedures for typhoon and storm response, and regulated the works of the Subsidiaries related to shipside operations, gate operations, yard leveling, container area reinforcement and machinery reinforcement, ensuring that terminal personnel respond to extreme weather and climate events in a stable and orderly manner.

The typhoon response work focuses on keeping information unblocked and implementing typhoon and flood prevention measures. When the areas where the Subsidiaries are located are expected to be hit by a typhoon or affected by a storm, the Company will release a typhoon warning to the relevant terminal, activate contingency plans and put emergency hotlines into operation, and maintain close contact and coordination with various parties including local meteorological department, berthed vessels, maritime pilotage, and the anti-typhoon departments of local governments, to maintain unimpeded access to information. In terms of typhoon and flood responses, relevant terminals will strengthen the inspection of major port equipment and facilities pursuant to the guidelines to eliminate potential safety hazards, and examine large equipment and implement wind-proof measures, such as locking anchor chains for vehicles in the port area, and plugging wedges to the tyres of mobile machinery, lowering and reinforcing containers in the yard, evacuating workers and closing the port area. After the typhoon, terminals will check and summarise the disaster situation, organise repairs of equipment, and resume production and operation as soon as possible.

In September 2022, the force 7 gale of typhoon "Muifa" directly affected normal operations. Nantong Tonghai Terminal reinforced the containers in the yard and terminal equipment in accordance with the Company's typhoon preparedness guidelines to ensure the safety of life and property.

Quan Zhou Pacific Terminal carried out drills on typhoon response by inspecting the safety precautions of various departments in response to sudden extreme weather and climate events in the form of tabletop exercise, and summed up experience in the drills to further improve the emergency response mechanism.

Measures against Summer Heatwaves

This summer was extremely hot, with successive extreme heat and heavy rainstorms. The highest temperature in Southern China and other regions exceeded 40°C, posing a threat to the health of front-line workers at terminals. To prevent accidents caused by high temperature, the Company facilitated the Subsidiaries to adjust working hours by not operating during high temperature periods; set up a special fund to continuously provide cooling materials for its Subsidiaries, such as heatstroke-related medicines, refreshing drinks and fruits. During the year, the management of the Subsidiaries, including CSP Wuhan Terminal, Xiamen Ocean Gate Terminal, Lianyungang New Oriental Terminal and Nantong Tonghai Terminal, paid site visits to the operational areas of respective terminals to understand the working conditions and needs of employees, and strictly required relevant departments of the terminals to strengthen the awareness of heatstroke prevention and safeguard measures to ensure the health of terminal workers.

Given that in the United Arab Emirates the highest temperature in summer may rise to 50°C, CSP Abu Dhabi Terminal has implemented a heat stress index and warning system. Relevant personnel check the heat index at hourly intervals and alert terminal workers regarding the risk of dehydration. When the heat index is greater than 50, the terminal will implement a "20:10" operation arrangement for workers who are exposed to direct sunlight; they are required to take a 10-minute rest in a shaded place with drinking water provided after 20 minutes of work to ensure their safety. In addition, CSP Abu Dhabi Terminal provides occupational safety and health training to new recruits, including the impacts of hot weather, and rest and hydration guidelines.

The management of CSP Wuhan Terminal visited the front-line workers in the operation area of the terminal, and delivered heatstroke prevention and cooling materials.

In May 2022, Lianyungang New Oriental Terminal organised occupational health examinations to check the blood pressure, blood routine and electrocardiograms for employees exposed to high temperature, such as loading and unloading services, based on different types of work and positions.

Measures against Cold Weather

Affected by climate change, there can be cold waves with possible snowfall. The Company proactively urges its Subsidiaries to strengthen the tracking and early warning of strong winds, rain, snow and freezing weather in winter, and be well prepared to take countermeasures at any time. When the Subsidiaries encounter heavy snowfall or extreme cold weather, relevant terminals will activate the emergency response mechanism according to the severe weather conditions, remind employees to keep warm, enhance cold protection of outdoor equipment and skid resistance of vehicles, and prevent sudden gusts of wind, so as to ensure the safety of terminal workers and facilities.

Tianjin Container Terminal cleared the snow in the port area to ensure traffic safety at the terminal apron, the main road, the yard and the rear operating area, thus minimising the adverse impact of snowfall on the safety production of the terminal.

CSP Wuhan Terminal strictly implemented the regulations on safety operation in snowy weather. Before the extreme cold weather came, it conducted a test run on the quay cranes and other machinery, and installed iron wedges to ensure safe operation of the equipment.

Carbon Trading

Before China launched the national carbon emissions trading system, Shanghai Pudong Terminal and Shanghai Mingdong Terminal had already been included in the carbon trading scheme in accordance with the requirements under the Interim Measures on Carbon Emissions Management of Shanghai Municipality starting from 2018. Since 2019, the two terminals have carried out carbon emission monitoring, reporting and settling, respectively. The Company will continue to closely monitor the latest development of carbon trading, follow the technical specifications of carbon trading and related management in various regions, and cooperate with local governments in emissions reduction.

New Types of Cargo

As enterprises around the world continue to invest in renewable energy and low-carbon products, resulting in new types of goods and increased demand for transportation, the Company proactively encourages its Subsidiaries to explore new business opportunities, such as new energy vehicles, solar photovoltaic projects and wind power projects.

In September 2022, Xiamen Ocean Gate Terminal proactively explored the possibility of transporting new energy vehicles by ship. With the guidance and coordination of various port units and under the support of its business partners, it managed to overcome technical difficulties of storing vehicles in containers and accomplish tasks such as cutting off power supply and fastening before the vehicles are loaded onto the vessel, successfully shipping 300 new energy vehicles to CSP Zeebrugge Terminal.

Xiamen Ocean Gate Terminal successfully shipped new energy vehicles to CSP Zeebrugge Terminal, which also marked the first time of Fujian Province of China exported new energy vehicles inside containers.

RAISING ENVIRONMENTAL AWARENESS

The Company has been working with stakeholders to promote environmental protection awareness and implement various environmental protection initiatives in its daily operations. The Company has signed letters of responsibility for operational safety and ecological and environmental protection with its Subsidiaries in China, and established a safety and environmental protection responsibility system, with the aim of building "green ports".

In an effort to enhance governance in respect of ecological and environmental protection, the Company has developed the Management Policy on Ecological and Environmental Protection to regulate the daily management of ecological and environmental protection, environmental monitoring, environmental management of construction projects, management of environmental protection facilities, and emergency treatment and management of environmental pollution accidents in its Subsidiaries in China. The Subsidiaries conduct potential hazard inspection of the ecological environment at least once every month, and comprehensive inspection at least once every year to carry out rectification tasks and identify risks. They have also developed corresponding preventive measures and emergency plans to strengthen ecological and environmental management. The Company has established a sound reward and punishment system to commend terminals with advanced ecological and environmental protection management, as well as terminals and personnel with outstanding performance in the development, promotion and application of ecological and environmental protection technologies. In the event of serious environmental emergencies that endanger public safety or cause considerable losses and adverse impacts on society and the environment, the Company will hold relevant personnel accountable in accordance with the management policy.

The Company requires its Subsidiaries to organise training sessions on ecological and environmental protection, and to incorporate it into the employee training and education scheme, enabling employees to be familiar with laws, regulations, standards and management policies related to environmental protection, and understand the influence and the critical factors on environment of their roles. The Subsidiaries also carry out promotion and education campaigns on ecological and environmental protection, make use of official WeChat accounts to spread knowledge of ecological and environmental protection guidelines, policies, laws, regulations, industry standards and relevant scientific knowledge, and introduce successful case studies to encourage their employees to save energy and natural resources, and improve environmental awareness of all staff.

Tianjin Container Terminal issued a proposal for energy saving and consumption reduction on its official WeChat account to encourage all employees to save energy and natural resources.

Guangzhou Nansha Stevedoring Terminal and Guangzhou South China Oceangate Terminal carried out knowledge sharing activities on ecological and environmental protection.