

CHAPTER 9 RESILIENCE

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FOR THE GOALS

Material topics covered:

Climate
resilienceGreenhouse gas
emissionsAir
emissionsEnergy
managementSupply chain
management

The 28th Conference of the Parties of the United Nations Framework Convention on Climate Change concluded in December 2023, bringing together global business leaders and country representatives to agree on a roadmap for transitioning away from fossil fuels. Around 100 negotiators at this session pledged to triple global renewable energy use by 2030. As an environmentally and socially responsible corporation, the Company understands the importance of considering the impact of climate change and promoting carbon reduction in its business strategic decision-making. In order to incorporate the philosophy of green port development into supply chain management, the Company has adopted efficient management measures, promoted and maintained responsible procurement practices, and worked with stakeholders to build a more resilient and sustainable future.

PERFORMANCE HIGHLIGHTS IN 2023

The Company has previously set goals for greenhouse gas emissions and energy consumption of its Subsidiaries. As the Company proactively advances the development of green ports, the Subsidiaries continue to implement a number of energy conservation and emission reduction projects in 2023, so as to further promote green and low-carbon transformation. In 2023, the green and low-carbon investment totalled approximately US\$500,000 for the Subsidiaries in China.

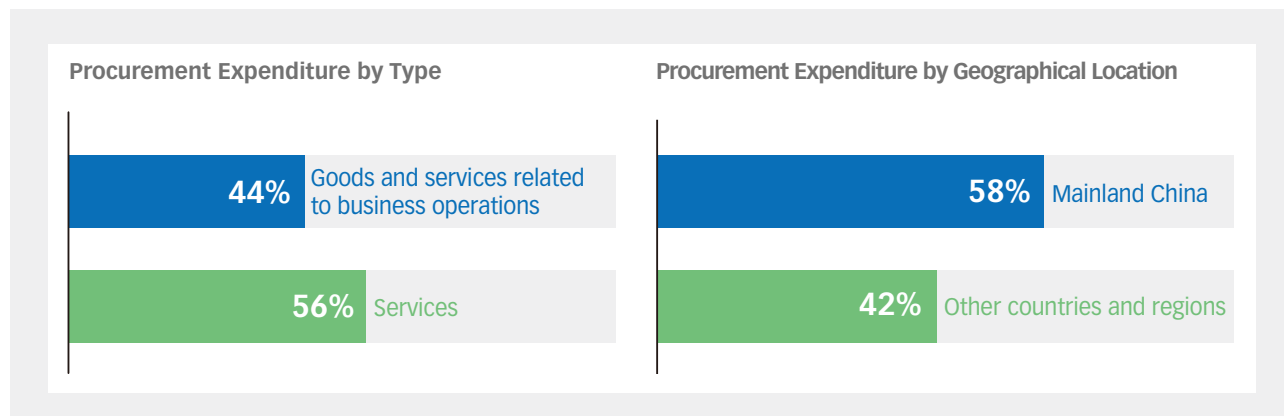
Environmental performance	Target	Performance of the Subsidiaries in 2023 ⁸
Reduction in greenhouse gas emissions	To reduce the greenhouse gas (Scope 1 and Scope 2) emission intensity of the Subsidiaries by 20% in 2030, setting 2020 as the baseline year, and to achieve carbon neutrality no later than 2060.	Greenhouse gas emission intensity ⁹ : 7.41 kg of CO ₂ e per TEU, representing a decrease of 0.9% year-on-year and a decrease of 20.8% as compared to 2020
Reduction in energy consumption	To reduce the energy consumption intensity of the Subsidiaries by 15% in 2030, setting 2020 as the baseline year.	Energy consumption intensity ⁹ : 0.070 GJ per TEU, representing a decrease of 2.5% year-on-year and a decrease of 20.5% as compared to 2020



The Company has been a council member of Hong Kong Business Environment Council (“BEC”) for more than 15 years and showcased its commitment to reducing its carbon footprint by signing BEC Net-zero Carbon Charter in early 2024. The Company also actively participates in advisory groups and seminars organised by BEC to contribute to net zero future.

In terms of supply chain management, the Company and the terminals within the reporting scope completed a dynamic evaluation of 5,379 suppliers in total, of which 48% of them were graded as excellent suppliers and 44% were graded as good suppliers.

During the year, the procurement expenditure of the Company and the terminals within the reporting scope are as follows:



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

MANAGEMENT APPROACH

The Company is dedicated to standardising the operational management of its Subsidiaries based on 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, providing its Subsidiaries in China with specific policies and guidelines in relation to environmental management, such as issuing the Typhoon Prevention and Disaster Relief Work Plan and the Comprehensive Emergency Plan for Safe Production, as well as encouraging the Subsidiaries to formulate the Emergency Plan for Extreme Weather and Emergency Plan for Environmental Emergencies on the basis of the Company's policies, in order to prepare measures to respond to natural disasters caused by climate change such as typhoons, severe convective weather, landslides, and flooding. The energy use of the terminals is managed through policies like Energy Conservation and Emission Reduction Management Policy and various measures are taken to ensure efficient and responsible use of energy, improve energy efficiency and reduce emissions from pollution.

The Company practises corporate social responsibility in the aspect of investment management. It has developed the Investment Management Policy to regulate investment management. Before making any investment decision, the Company conducts feasibility studies on the project to review its environmental protection and energy-saving performance, 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.

The Company continues to improve its environmental management system, conducts regular analysis and review 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 in order to strengthen their environmental management capabilities:

Terminals	Certifications Received
Xiamen Ocean Gate Terminal	GB/T 24001/ISO 14001 Environmental Management System Certification GB/T 23331/ISO 50001 Energy Management System Certification
Lianyungang New Oriental Terminal	GB/T 24001/ISO 14001 Environmental Management System Certification GB/T 23331/ISO 50001 Energy Management System Certification
Nantong Tonghai Terminal	GB/T 24001/ISO 14001 Environmental Management System Certification GB/T 23331/ISO 50001 Energy Management System Certification
Guangzhou South China Oceangate Terminal	GB/T 24001/ISO 14001 Environmental Management System Certification GB/T 23331/ISO 50001 Energy Management System Certification
Guangzhou Nansha Stevedoring Terminal	GB/T 24001/ISO 14001 Environmental Management System Certification GB/T 23331/ISO 50001 Energy Management System Certification
Tianjin Container Terminal	GB/T 24001/ISO 14001 Environmental Management System Certification GB/T 23331/ISO 50001 Energy 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 EMAS EU Eco-Management and Audit Scheme
CSP Bilbao Terminal	ISO 14001 Environmental Management System Certification ISO 50001 Energy Management System Certification EMAS EU Eco-Management and Audit Scheme
Asia Container Terminal	ISO 14001 Environmental Management System Certification
COSCO-HIT Terminal	ISO 14001 Environmental Management System Certification
Ningbo Yuan Dong Terminal	GB/T 24001/ISO 14001 Environmental Management System Certification GB/T 23331/ISO 15001 Energy Management System Certification
Dalian Container Terminal	GB/T 24001/ISO 14001 Environmental Management System Certification
Yantian Terminals	GB/T 24001/ISO 14001 Environmental Management System Certification GB/T 23331/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 ISO 50001 Energy Management System Certification

The Company has formulated stringent policies on procurement management. The Subsidiaries have also established their own procurement management and supplier management policies in accordance with all applicable laws and regulations in China and places in which they operate, enhancing the supervision of procurement matters to ensure consistent supply. The Company conducts regular reviews of the management policies and continues to improve the procurement management system.

In addition, the Company has formulated detailed management policies on supplier admission, selection, evaluation and rewards and punishments. It continues to optimise the supplier structure and proactively cooperates with outstanding suppliers to prevent procurement and supply risks. The Company endeavours to explore more cooperation opportunities with suppliers to establish strong and long-term business partnerships, thereby assisting the Company in implementing its business development strategies.

CLIMATE RESILIENCE

The Company has been disclosing climate change-related information in accordance with the TCFD recommendations in the early years and is continuously enhancing the relevant disclosures to further comply with the newly revised disclosure requirements on climate-related matters in the ESG Reporting Guide issued by the SEHK. This report discloses information related to climate change in four areas in accordance with the TCFD recommendations: Governance, Strategy, Risk Management, Metrics and Targets:

TCFD Recommendations		Relevant Chapters in this Report
Governance	Board's oversight	Chapter 2 – Statement of the Board (pages 6-7) Chapter 8 – Governance – Corporate Governance (pages 31-32)
	Management's role	Chapter 2 – Statement of the Board (pages 6-7) Chapter 8 – Governance – Corporate Governance (pages 31-32)
Strategy	Identification of climate-related risks and opportunities	Chapter 9 – Resilience – Climate Resilience (pages 42-49)
	Impact of climate-related risks and opportunities	Chapter 9 – Resilience – Climate Resilience (pages 42-49)
	Climate scenarios	The Company will conduct a scenario analysis in 2024 and plans to disclose the results in the 2024 Sustainability Report.
	Climate-related resilience strategy	Chapter 9 – Resilience – Climate Resilience, Greenhouse Gas and Air Emissions, Energy Management (pages 42-59)
Risk Management	Processes for identifying and assessing climate-related risks	Chapter 8 – Governance – Risk Management (pages 32-34) Chapter 9 – Resilience – Climate Resilience (pages 42-49)
	Processes for managing climate-related risks	Chapter 8 – Governance – Risk Management (pages 32-34) Chapter 9 – Resilience – Climate Resilience (pages 42-49)
	Climate-related topics are integrated into the organisation's overall risk management	Chapter 8 – Governance – Risk Management (pages 32-34) Chapter 9 – Resilience – Climate Resilience (pages 42-49)
Metrics and Targets	Scope 1, 2 and 3 greenhouse gas emissions	Chapter 9 – Resilience – Greenhouse Gas and Air Emissions (pages 49-52) Chapter 13 – Appendices – Key Performance Indicators – Environmental Performance (pages 104-107)
	Targets and performances of climate-related risks and opportunities	Chapter 9 – Resilience – Performance Highlights in 2023 (page 39)

CLIMATE-RELATED RISKS AND OPPORTUNITIES

With reference to the recommendations from TCFD, the Company identified climate-related physical and transition risks, 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 to have the most significant impacts to our business operation.

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	<ul style="list-style-type: none"> • 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, affecting the terminal’s service capacity and direct berthing rate • Affect the capacity of waterways, thus requiring more dredging works • Drought leads to a drop in water levels, affecting the passage and berthing of vessels • A decrease in the volume of cargo due to crop failure, eventually affecting terminal throughput
	Chronic risks: rising sea levels, continuous high temperatures, etc.	<ul style="list-style-type: none"> • 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 of shipping services and lower the 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	<ul style="list-style-type: none"> • Carbon neutrality target and policies announced by the IMO • The European Union's Carbon Border Adjustment Mechanism • China's Emission Trading System 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	<ul style="list-style-type: none"> • Increase in investments in renewable energy, and energy saving and emissions reduction technology
	Market risks	<ul style="list-style-type: none"> • Increasing demand for low-carbon services and green ports from customers
	Reputational risks	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 kilometre-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
Energy	<ul style="list-style-type: none"> • Sources of low-emission energy • Incentive from supportive policies • Rise of new technology • Participate in carbon trading market • Energy safety 	<ul style="list-style-type: none"> • 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)
Products and services	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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
Market	<ul style="list-style-type: none"> • Green Shipping Corridor (a pioneer advantage in providing green fuels to customers) • Entry to new markets • Motivation from authorities • Demands and initiatives from communities 	
Adaptability	<ul style="list-style-type: none"> • Participate in renewable energy projects and adopt energy-saving measures • Alternatives/diversification of energy 	

MEASURES TO RESPOND TO CLIMATE-RELATED RISK

The Company analyses the risks caused by climate change, formulates strategies to mitigate and respond to climate change, and strives to reduce the negative impacts posed by climate change.

Preventive Measures against Typhoons

The Company has formulated the Guidelines for Standard Container Operations to regulate the works of the Subsidiaries related to shipside operations, gate operations, yard levelling, container area reinforcement and machinery reinforcement, ensuring that terminal personnel respond to extreme weather and climate events in a stable and orderly manner.

The relevant terminals proactively implement various prevention measures against typhoons and floods, such as locking anchor chains for vehicles in the port area, plugging wedges to the tyres of mobile machinery, lowering and reinforcing containers in the yard, evacuating workers, closing the port area, as well as strengthening the inspection of equipment and facilities in major ports in accordance with the guidelines, building a strong safety line against typhoons and floods. When the areas where the Subsidiaries are located are 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, as well as 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. After the typhoon, terminals will check and summarise the disaster situation, organise equipment repairs, and resume production and operation as soon as possible.



In May 2023, Quan Zhou Pacific Terminal organised a drill on typhoon response, and held a review meeting after the drill to analyse the deficiencies during the drill and implement rectification measures.



In July 2023, in response to the super typhoon Doksuri, Xiamen Ocean Gate Terminal urgently held a special meeting on typhoon response to deploy typhoon prevention work, including vessel departure, container collection and pick-up operations, equipment lashing, etc., and continued to grasp the typhoon dynamics and strictly implement various operation precautions.

Measures against Summer Heatwaves

In recent years, the summer has become hotter, and many countries around the world have been hit by high temperature and heat waves, posing a threat to the health of front-line workers at terminals. To prevent accidents caused by high temperature, the Company facilitated its 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. In addition, the Subsidiaries proactively organise employee caring programs such as sending heat relief packages and road supervisor rotation program during summer, committing to create a decent working environment for workers and ensuring their safety.



In August 2023, the management of Jinjiang Pacific Terminal gave out heat relief packages to their front-line workers.



In June 2023, Jinjiang Pacific Terminal was conducting a heatstroke prevention training drill.

Measures against Cold Weather

Affected by climate change, there can be cold waves with possible rain and snowfall, resulting in roads covered with snow and ice, bringing challenges to the Company's safety and production. To ensure safe operations, 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 encountering heavy snowfall or extreme cold weather, the Subsidiaries will activate the emergency response mechanism to enhance cold protection of outdoor equipment and skid resistance of vehicles and prevent sudden gusts of wind. The Company also provides employees with cold prevention and warm-keeping supplies, such as coats, commonly used winter medicines, improved insulation for on-site delivered meals and hot water supply to ensure the safety of terminal workers and facilities.



In December 2023, Tianjin Container Terminal put into use the snow-clearing machinery and snow-melting agents to clear snow in the port area.



In December 2023, Lianyungang New Oriental Terminal ushered in the largest snowfall for the first time since the beginning of winter, and the production staff on duty carried out a comprehensive clean-up of the port roads, gantry crane yard operation line, empty container yard, entry and exit gate area and main roads.

MEASURES TO RESPOND TO CLIMATE-RELATED OPPORTUNITIES

The Company analyses the potential opportunities driven by climate change, formulates strategies to address climate change, and improves its ability to adapt to climate change.

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 since 2018, and the two terminals have carried out carbon emission monitoring, reporting, and settling since 2019. In addition, Yantian Terminals are included in the carbon trading scheme in Shenzhen and are committed to the carbon emission settling work every year.

The Company will continue to closely monitor the latest developments in 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 the low-carbon transition accelerates, enterprises around the world continue to increase their investment demand for renewable energy and low-carbon products, resulting in more new types of goods and transportation demand. The Company proactively promotes the exploration of new business opportunities for its Subsidiaries, such as new energy vehicles, solar photovoltaic projects, and wind power projects.

GREENHOUSE GAS AND AIR EMISSIONS

To support China's goals of achieving "carbon peaking" and "carbon neutrality", and respond to international initiatives such as 2023 IMO Strategy on Reduction of GHG Emissions from Ships, the Company is committed to promoting energy conservation and emission reduction, and meeting customers' targets 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.

COSCO SHIPPING PORTS' 2060 CARBON NEUTRALITY ROADMAP

CARBON REDUCTION MEASURES FOR OWN OPERATIONS

ONGOING CARBON REDUCTION MEASURES:

- Build digital and smart terminals to improve overall operational efficiency
- Energy regeneration technology from cranes
- Gradually increase the total installed capacity of renewable energy



2020-2023

2025

2030

- Gantry cranes "diesel-to-electricity" conversion reached **97.7%** in the Subsidiaries in China
- Container vehicles powered by new and clean energy reached **46%** in the Subsidiaries in China
- Distributed photovoltaic projects reached a total installed capacity of **10 MW** in the Subsidiaries in China
- Retrofitting environmentally-friendly lightings reached **78%** in the Subsidiaries in China

- Container vehicles powered by new and clean energy reached **60%** in the Subsidiaries in China
- Distributed photovoltaic projects reached a total installed capacity of **14 MW** in the Subsidiaries in China

- To reduce its Subsidiaries' greenhouse gas (Scope 1 and Scope 2) emission intensity by **20%**, and the energy consumption intensity by **15%** (baseline year 2020)
- Container vehicles powered by new and clean energy reached **100%** for all qualified terminals in the Subsidiaries in China
- Distributed photovoltaic projects reached a total installed capacity of **19 MW** in the Subsidiaries in China

CO₂
**2060
Carbon
Neutral**

CARBON REDUCTION MEASURES FOR VALUE CHAIN

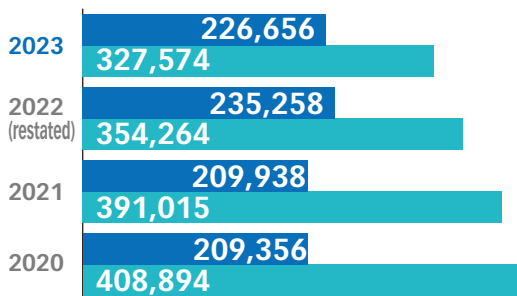
- Achieved full coverage of shore power for container berths in the Subsidiaries in China (gradually increase shore power coverage at more berths)
- Support the development of green shipping corridors

The greenhouse gas (Scope 1 and Scope 2) emissions intensity of the Subsidiaries recorded year-on-year reduction of 0.9% from 7.47 kg of CO₂e per TEU¹⁰ in 2022 to 7.41 kg of CO₂e per TEU in 2023, and a decrease of 20.8% as compared with 9.36 kg of CO₂e per TEU in the baseline year 2020.

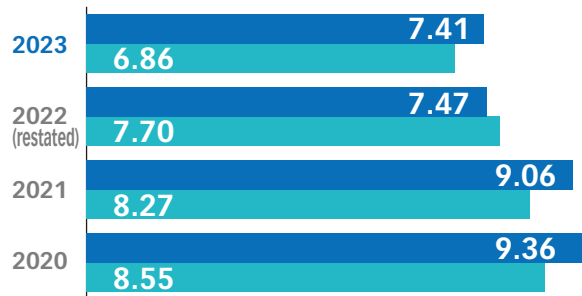
The greenhouse gas and air emissions¹¹ of the Subsidiaries and Non-subsidiaries within the reporting scope from 2020 to 2023 are as follows:

Greenhouse Gas (Scope 1 and Scope 2) Emission

EMISSIONS (TONNES of CO₂e)



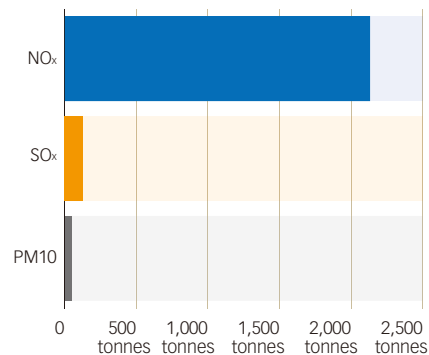
EMISSION INTENSITY (KG CO₂e/TEU)



■ Subsidiaries
■ Non-subsidiaries

Air Emissions (Subsidiaries)

■ Nitrogen Oxides (NO_x) **2,133 tonnes**
 ■ Sulphur Oxides (SO_x) **129 tonnes**
 ■ Particulate Matter 10 (PM10) **26 tonnes**



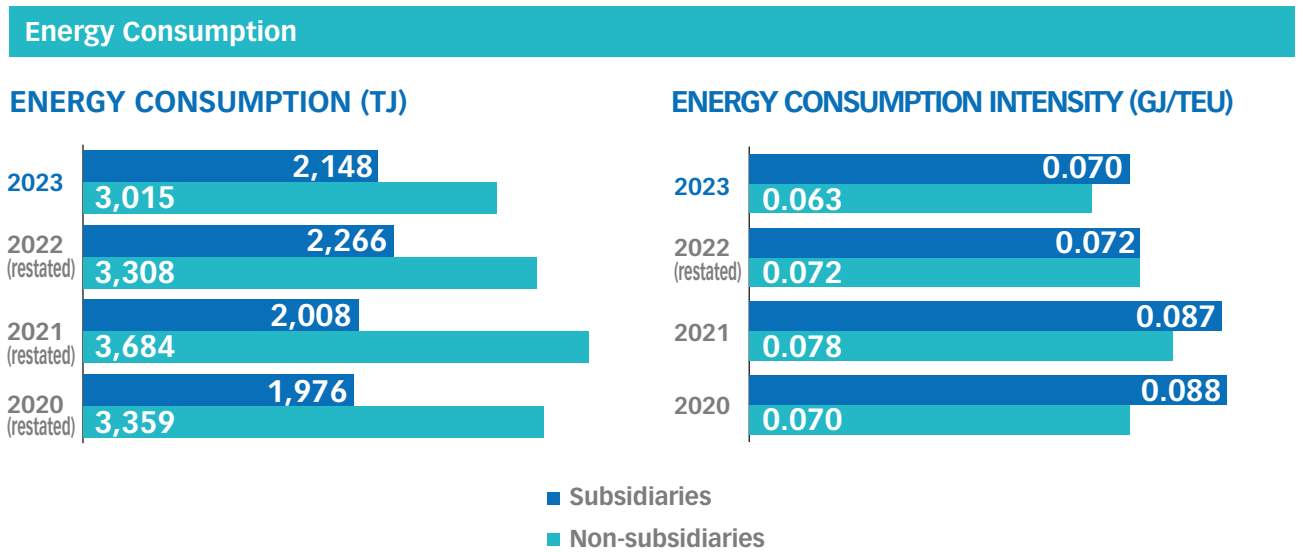
¹⁰ Data in 2022 is restated after data review.

¹¹ Excluding the greenhouse gas and air emissions of the Company's headquarters. In addition, since Non-subsidiaries are investment projects of the Company, the greenhouse gas (Scope 1 and Scope 2) emissions from Non-subsidiaries were included in the Company's greenhouse gas (Scope 3) emissions Category 15 – Investments from 2023 onwards. Whereas for previous years, the greenhouse gas (Scope 1 and Scope 2) emissions from Non-subsidiaries were included in the Company's total greenhouse gas (Scope 1 and 2) emissions. For details on environmental performance, please refer to the section headed "Appendices – Key Performance Indicators" set out in Chapter 13 of this report.

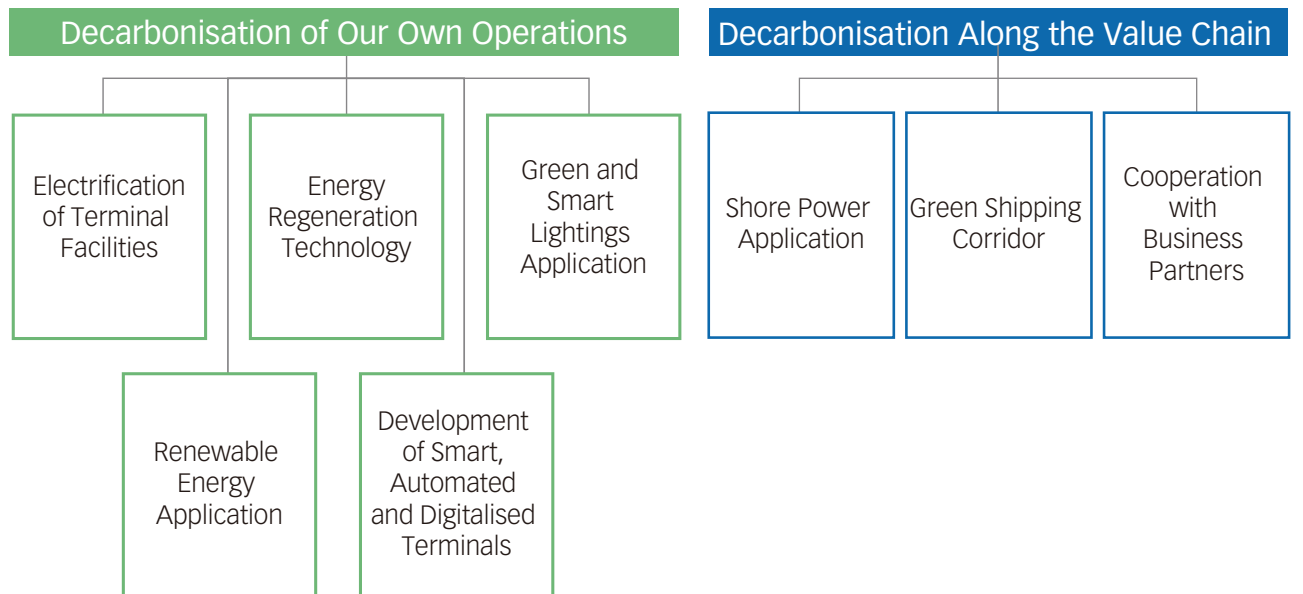
ENERGY MANAGEMENT

The energy consumption intensity of the Subsidiaries recorded a year-on-year reduction of 2.5% from 0.072 GJ per TEU¹⁰ in 2022 to 0.070 GJ per TEU in 2023, and a decrease of 20.5% as compared with 0.088 GJ per TEU in the baseline year 2020.

The energy consumption¹² of the Subsidiaries and Non-subsidiaries within the reporting scope from 2020 to 2023 are as follows:



In order to further promote energy conservation and emission reduction, the Company has proactively implemented sustainable development in its own operations and along the value chain and has achieved remarkable results.



12 Excluding the energy consumption of the Company’s headquarters. For details on environmental performance, please refer to the section headed “Appendices – Key Performance Indicators” set out in Chapter 13 of this report.

1. DECARBONISATION OF OUR OWN OPERATIONS

ELECTRIFICATION OF TERMINAL FACILITIES

“Diesel-to-Electricity” Conversion Low-carbon Transition

The Company proactively assists its Subsidiaries to advance green and low-carbon transformation through diesel-to-electricity conversion of gantry cranes. Cranes are now powered by electricity instead of diesel to improve energy efficiency, and effectively reducing noise, carbon emissions and air emissions.

During the year, the completion rate of the Subsidiaries in China in terms of gantry crane diesel-to-electricity conversion reached 97.7%.

In 2023, Guangzhou South China Oceangate Terminal continues to promote the “Research and Application of Intelligent Dispatching System for Electric Tractors”. Compared with the traditional fuel tractor, the intelligent dispatching management system of electric tractor is used as the core system of real-time monitoring, automatic balancing, and intelligent scheduling of charging and discharging of electric tractors, resulting in improved functions such as energy conservation and emission reduction, enhanced safety and extended equipment service life.

In addition, Lianyungang New Oriental Terminal replaced all gas trailers in the port with electric trailers during the year, with a battery swapping station built at the same time, enabling fully automatic battery swapping process in 5 minutes. The energy consumption cost is estimated to be 50% less; Quan Zhou Pacific Terminal has introduced electric port driverless container vehicles in the port and achieved all-day and full process driverless operation, improving port operation efficiency, reducing energy consumption by more than 25% and carbon emissions by more than 50% compared with fuel container vehicles to help achieve zero emissions in the port area.



Lianyungang New Oriental Terminal replaced all gas trailers in the port with electric trailers.



Electric driverless container vehicle technology is an important part of the Company's development of green and smart ports, helping to accelerate the process of port intelligence and achieve energy saving and emission reduction.

New and Clean Energy Container Vehicles

The Company proactively promotes the digitalisation and intelligent development of ports by introducing intelligent tallying technology and automated driving technology and leveraging 5G driverless container vehicles research technology in the port to improve the accuracy and efficiency of terminal operations, and help the Subsidiaries achieve energy conservation and emission reduction.

The 5G driverless container vehicles adopt a pure electric chassis and are equipped with technologies such as lidar and high-precision positioning inertial navigation, which can effectively monitor and manage the vehicles remotely and intelligently. This can improve the efficiency of port operations, as well as reduces the safety risk of container vehicles operations.

During the year, the proportion of container vehicles powered by new and clean energy in the Subsidiaries in China reached 46%.

ENERGY REGENERATION TECHNOLOGY

When the cranes lift during loading process, the motor consumes energy, converting electric energy into potential energy. During unloading process, the motor acts as a generator, converting the potential energy back into electric energy, which can be fed back into the power grid or stored in the battery system.

Most of the main production equipment of the Company's Subsidiaries, such as quay cranes and gantry cranes and other large-scale port equipment, are equipped with frequency convertor systems and energy regeneration technology, which can reduce the overall energy consumption by approximately 15%. In the future, according to the production demand of the terminals, the Company will appropriately configure the newly added large equipment with frequency converter energy regeneration systems.

GREEN AND SMART LIGHTINGS APPLICATION

Container yards operate 24 hours a day in large scale high-mast lights to support the operations at night, leading to huge power consumption. In order to reduce electricity consumption, the Company renovates and upgrades the green lightings of the terminals, using smart technology to remotely monitor the lightings in real-time, switching on or off individual or a large number of smart lamps, effectively facilitating energy consumption analysis and troubleshooting.

During the year, Jinzhou New Age Terminal optimised the overhead lights on the gantry crane beams of the Curtain Wall Lighting System Project. The terminal redesigned the installation layout of these lights to optimise the heat dissipation function and reduce energy consumption. To maintain the overall area bright enough, with good lighting uniformity and a wide exposure range to form a comfortable working environment.

During the design and construction phase, CSP Abu Dhabi Terminal proactively implemented energy-saving renovation, such as replacing with LED and solar streetlights. At the same time, the Company is expected to save 1.3 million kWh of electricity annually, and reduce carbon dioxide emissions by approximately 1,299 tonnes through smart lighting control system.



Curtain Wall Lighting System Project in Jinzhou New Age Terminal.



During the design and construction phase, CSP Abu Dhabi Terminal proactively implemented energy-saving renovation and smart control of lighting, replaced lighting fixtures with energy-saving ones.

RENEWABLE ENERGY APPLICATION

The Company proactively introduces and promotes the exploration and application of new and clean energy to optimise the energy mix of the port, and reduce fossil fuel consumption and greenhouse gas emissions.

In 2023, the Company expanded the clean energy coverage in its Subsidiaries and the electricity generated from distributed photovoltaic projects totalled approximately 750,000 kWh. During the year, the Company deployed four new distributed photovoltaic projects at CSP Wuhan Terminal, Nantong Tonghai Terminal, Xiamen Ocean Gate Terminal, and Guangzhou South China Oceangate Terminal, together with the existing project of Lianyungang New Oriental Terminal, a total of 10 MW installed capacity has achieved. It is expected to generate approximately 9 million kWh annually, and a reduction of approximately 5,000 tonnes of carbon dioxide equivalent.



The distributed rooftop photovoltaic power station in Nantong Tonghai Terminal stated generating electricity since November 2023. It is estimated to generate more than 1.7 million kWh of clean electricity per year.

In addition, Piraeus Terminal in Greece plans to invest and build a 1.2 MW distributed photovoltaic project in 2024.

In terms of wind energy, Tianjin Container Terminal plans to complete the installation of a wind turbine with 6 MW installed capacity in 2024. It is expected to generate approximately 15 million kWh of electricity annually.

DEVELOPMENT OF SMART, AUTOMATED AND DIGITALISED TERMINALS

The Company leverages digitalisation to empower the green and low-carbon transition of ports, optimises the operation processes through digitalisation and intelligence, applies Global Shipping Business Network (GSBN), Terminal Operating System (TOS) high-level module and other systems to improve the efficiency of the whole terminal operation process, continuously reduces the container shift ratio, optimises the port resource allocation capacity, assists by the Maritime Information System (MIS) to improve management and the operation efficiency of terminals, as well as reduce port energy consumption and carbon emissions.

The Company leverages key technology such as big data, Internet of Things and visualisation to build a panoramic visual digital platform for port energy efficiency, and to visually monitor the implementation roadmap of the "dual carbon" targets. Based on the informatisation, digitalisation, intelligence and other technical tactics of energy management, the Company has built a green port energy efficiency management platform and a port energy management system, comprehensively improving the intelligent management capability of port energy consumption.

The Company is developing an energy efficiency management platform for terminals based on the deployed Enterprise Asset Management (EAM) system. The platform utilises the energy efficiency management module in the EAM system to collect, analyse, compare and display real-time energy consumption data of the terminals, including diesel, gasoline, water and electricity, and calculates the comprehensive carbon emission data of the terminal operation based on the energy consumption data, so as to achieve online supervision of the Subsidiaries' carbon emission data by the Company's headquarters, understand the effectiveness of the relevant green and low-carbon measures implemented at the terminals, and propose targeted port energy optimisation plans. In August 2023, the platform has been put into pilot operation at Xiamen Ocean Gate Terminal, and will be gradually rolled out to other Subsidiaries.

2. DECARBONISATION ALONG THE VALUE CHAIN

SHORE POWER APPLICATION

The Company is committed to supplying electricity to vessels at berth through shore power facilities at the terminals. It can effectively reduce fuel consumption and relevant air emissions and noise pollution by vessels. The Company also proactively promotes to customers and assists the terminals in establishing a sound shore power use and management system, so as to increase the shore power connection rate and put the low-carbon development strategy into practice.

The Company made active efforts to increase the coverage of shore power facilities of its Subsidiaries in China, and full coverage of shore power for container berths has been achieved. In 2023, the Company's Subsidiaries has accumulated 4,060 times of shore power connection by vessels, marking a 42% year-on-year increase, while the electricity use reached approximately 3.69 million kWh, reflecting a 214% year-on-year increase, which is equivalent to a reduction of 3,319 tonnes of carbon dioxide.



During the year, Guangzhou South China Oceangate Terminal promoted the use of shore power by vessels in port and took the lead in connecting barges at berths to shore power.



During the year, Jinjiang Pacific Terminal conducted training related to shore power for vessels to enhance the understanding the operation for connecting and disconnecting between the vessel and the shore power system.

During the year, in order to support the "dual carbon" goal, and to fulfil the new requirements from the carbon intensity of international shipping of the IMO International Convention for the Prevention of Pollution from Ships (MARPOL), the Company jointly issued the Initiative to Promote the Use of Shore Power by Vessels at Berth with COSCO SHIPPING Lines and Orient Overseas Container Line Limited to domestic and international peers in the port and shipping industry, aiming to reduce greenhouse gas emissions from vessels while berthing.

GREEN SHIPPING CORRIDORS

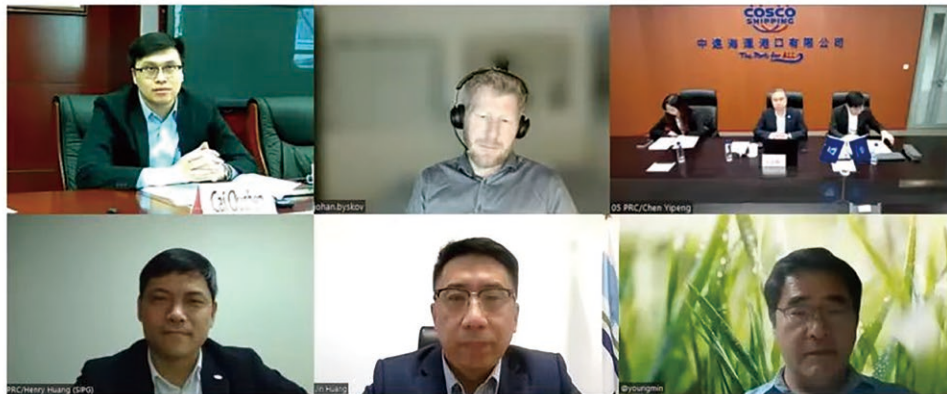
The green shipping corridor serves as a bridge for cooperation between the shipping industry, ports and terminals, and government departments. The industry has been focusing on low-carbon transition, continuously developing and transforming the establishment of green shipping corridors, as well as driving the transformation of the entire industrial chain to new energy and new low-carbon technologies, playing a key role in achieving zero carbon emissions from vessels and promoting relevant emission reduction plans.

In November 2023, the Company was invited to participate in the Asia-Pacific Economic Cooperation (“APEC”) Webinar on Establishing Green Shipping Corridor among Ports in APEC Economies which was guided by the Department of International Cooperation of the Ministry of Transport of the People’s Republic of China and hosted by China Waterborne Transport Research Institute. The Company discussed with port and shipping authorities from other government, ship owners, port operators, fuel suppliers, classification societies and academic representatives from 13 Asia-Pacific economies and 2 European economies on how to address the challenges in developing green shipping corridors in terms of management, technology and mechanism, and shared relevant experiences and best practices, provided suggestions for promoting the establishment of green shipping corridors among the ports from APEC economies.



APEC Webinar on Establishing Green Shipping Corridors among Ports in APEC Economies

Panel Discussion Strengthening cooperation on the establishment of green shipping corridors among APEC ports



During the seminar, the representatives of the Company highlighted the expectations and suggestions for strengthening cooperation on green shipping corridors in the APEC region, and shared the efforts made by COSCO SHIPPING Ports in building green ports.

COOPERATION WITH BUSINESS PARTNERS TO PROMOTE CARBON REDUCTION

In 2023, the Company participated in the “14th Five-Year” Plan scientific research project of COSCO SHIPPING, and collaborated with Tongji University and Shanghai Maritime University in the “Roadmap for Establishing Green and Low-carbon Port Research” project. The project aimed to provide technical recommendation for carbon emission inventory and prediction model, evaluation indicator system and construction guidelines for green and low-carbon ports, facilitating top-level design research on the transition of green and low-carbon ports.

SUPPLY CHAIN MANAGEMENT

In 2023, the Company and the terminals within the reporting scope had a total of 10,413 suppliers in the database, of which 6,440 were based in Mainland China and 3,973 were based in countries and regions other than Mainland China.

STRINGENT POLICIES

The Company has developed a set of basic rules and policies, and management procedure for procurement management to specify the procurement standards of the Company and its Subsidiaries, strengthen centralised management, and establish a sound internal control process for procurement business and a response plan for major procurement risks. All aspects of the procurement process are under supervision and management, and the procurement department keeps complete records to ensure the traceability of the procurement process. The Company also encourages business partners, suppliers and contractors to comply with the requirements of the Company's Anti-corruption Policy. The supervision and audit departments of the Company and its Subsidiaries carry out regular or special audits on the procurement work. In case of non-compliance, the Company will hold the responsible personnel accountable.

SUPPLIER ADMISSION AND MANAGEMENT

At the supplier admission stage, the Company carries out research on suppliers from the market according to its procurement needs, requires potential suppliers to submit basic information for review, requires all suppliers to complete the Questionnaire of the Vendors for Self Assessment for Compliance with Social Norms and sign the Vendors' Commitment of Anti-Business Bribery to ensure that they clearly understand and comply with the Company's business ethics requirements and forbid any illegal and unethical business activities. The Company strictly requires all interested suppliers to conduct a self-assessment in the areas of legal compliance, safe production and occupational health, environmental management, prohibition of child labour and forced labour, remuneration and working hours, anti-discrimination, employees' rights, and their management of upstream suppliers.

The Company formed an assessment panel to strictly review the qualifications of suppliers, comprehensively considering their legal compliance and performance records, business reputation, taxation records, technical capabilities, and ability to deliver on an on-going basis, quality control and assurance measures, as well as their commitment to product or service safety guarantees, in order to select suppliers with excellent performance. For products with a major impact on production and construction safety, the assessment panel will conduct on-site inspections to confirm the actual situation of the interested suppliers.

REGULAR EVALUATION AND ASSESSMENT

The Company and its Subsidiaries carry out annual dynamic evaluations on suppliers who have been engaged in the year to evaluate their basic qualifications, cost competitiveness, delivery and performance, quality control, customer service, business innovation and safety and environmental performance. For suppliers who have not been engaged in the year, the Company conducts an annual qualification review to verify their business registration certificates, special industry certifications and license documents and ISO quality certification system documents, among others. Suppliers who fail to participate in or pass the annual review as required, and suppliers who have not been engaged for a long time, will be removed from the supplier database.

The Company has established a sound supplier reward and punishment system. Those who are evaluated as excellent suppliers can be given priority for partnership under the same contractual conditions, and standard business partnerships will be maintained with good suppliers, while the Company also provides environmental and social training to suppliers or subcontractors. Suppliers who violate laws and regulations, fail to meet professional qualifications, fail to properly perform contractual obligations, are exposed to major quality and service risks, cause safety and environmental incidents, or engage in commercial fraud or bribery will be blacklisted and prohibited from commercial transactions.

GREEN PROCUREMENT PRACTICES

In addition to screening and evaluation of suppliers, the Company proactively promotes green procurement at terminals. When conducting project construction and equipment procurement, the Company proactively adopts the principle of green procurement, requiring suppliers to ensure that the materials and products used meet local environmental protection requirements with an objective to consistently implement the sustainable development philosophy of the Company.

In 2023, CSP Spain Related Companies put into operation a total of 11 hybrid rubber-tyred gantry (RTG) cranes. They saved approximately 45% of fuel costs compared to the original equipment, while reducing carbon and air emissions to better protect the environment. CSP Zeebrugge Terminal installed a total of 8 hybrid straddle carriers, which reduced fuel consumption by approximately 30% compared to conventional fuel vehicles.

In addition, Quan Zhou Pacific Terminal, Jinzhou New Age Terminal, Lianyungang New Oriental Terminal, Xiamen Ocean Gate Terminal, and Nantong Tonghai Terminal all selected electric reach stackers, electric stackers, and electric forklifts when purchasing mobile loading and unloading equipment, which saves approximately 58%, 70% and 70% of energy respectively compared with traditional diesel machinery, greatly reducing carbon dioxide and sulphur dioxide emissions.

As for the new equipment, the Company proactively increases the proportion of environmentally friendly materials through the use of new and green materials. For example, in the process of painting quay cranes and mounted gantry cranes, the Company uses water-based paint instead of oil-based paint for equipment spraying. This can reduce approximately 90% of harmful volatile compounds compared with traditional paints.