

# SUSTAINABILITY 2023 AT PSA SINGAPORE

Green Horizons: Going The Distance

# Content Structure

## PSA Corporation Ltd

1 Harbour Drive, #03-00  
PSA Horizons,  
Singapore 117352  
Tel +65 62747111  
[www.singaporepsa.com](http://www.singaporepsa.com)

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# About This Report

## Sustainability at the Heart of Progress

PSA Corporation Limited (PSA SG) stands at the forefront of sustainability, marking our 7th year of reporting progress and dedication to a more sustainable future. We are delighted to present Sustainability 2023 @ PSA SG, showcasing our advancements in meeting our sustainability goals and paving the way for a greener tomorrow.

In line with PSA SG's sustainability framework, we continue to focus on key aspects that are integral in shaping our business and fostering a more sustainable future for our port services and value-chain activities.

Consistent with our dedication to accountability, transparency, and integrity, this report has been prepared in accordance with the internationally recognised reporting framework, GRI 2021 Universal Standards. This report provides insights into PSA SG's ESG (Environmental, Social, and Governance) performance during our fiscal year from 1 January to 31 December 2023. Underlining our commitment to collective progress to the group's sustainability vision, this report also features key ESG milestones and initiatives undertaken by our business units across Southeast Asia.

To accurately demonstrate our ESG progress, we have gathered relevant data and information from our business unit representatives and incorporated them wherever applicable in this report. Any restated data or information from previous fiscal years will be identified in the respective sections of the report. We have employed standard units of measurement to ensure data comparability, accompanied by relevant conversion factors where necessary.

The data and information featured in this report has undergone a thorough internal review process. Information on greenhouse gas (GHG) emissions featured in this report has been externally assured, in line with PSA International's pursuit of external assurance for their report. In the coming years, PSA SG intends to incorporate external assurance for our forthcoming reports to enhance confidence in our reporting principles.

For feedback, you can reach us at [sg.psa.contact@globalpsa.com](mailto:sg.psa.contact@globalpsa.com)



## Regional CEO, Southeast Asia Message

Welcome to Sustainability 2023 @ PSA SG, our seventh edition. This annual report presents a holistic PSA Singapore (PSA SG) effort towards sustainability and is aligned with our understanding that progress to a more sustainable future begins with transparent and responsible reporting. This report is a testament to our collective commitment to achieve net zero in 2050, with 2019 as the baseline year.

### **PSA SG Handled Record 38.8 million TEUs**

This is a 4.8% increase from 2022. The throughput growth is remarkable amidst a challenging and constantly evolving business environment, and against the backdrop of global trade uncertainty and geopolitical tensions. Worldwide economic recovery remains scattered with disruptors such as inflation, rising interest rates and tight labour markets.

### **Purpose-Driven Green Transition**

2023 is the warmest year since global records began in 1850 and the 10 warmest years have all occurred during the last decade. In Singapore, the highest daily temperature of 37 degrees celsius was recorded on 13 May 2023, a tie with a record in 1983.

The Centre for Climate Research Singapore released the findings of the Third National Climate Change Study which projects higher temperatures, more wet and dry extremes, and an accelerating increase in mean sea levels for Singapore and Southeast Asia by the end of the century. Climate change is a permanent crisis and everyone from individuals, communities and corporates, has a role to help fight the climate crisis.

PSA SG aims to reduce 50% of port greenhouse gas (GHG) emissions by 2030, with 2019 as the baseline year, and achieve net zero emissions by 2050. We are on a dual pathway roadmap to accomplish this, through transitioning to low-carbon fuels and electrification.

We believe in leveraging smart and sustainable technology to reduce our carbon footprint. This is reflected in our commitment to invest in both our workforce and technology, including green and automation projects to enhance productivity.

At Pasir Panjang Terminal, we are progressively replacing our diesel-fueled prime movers with clean energy ones. As of the end of 2023, we increased our LNG prime mover fleet size to 210 units. Compared to diesel prime movers, LNG prime movers emit 20% to 30% less carbon emissions while electric prime movers are expected to emit up to 50% less carbon emissions.

We have six electric prime movers on trial within the terminal and another two on trial for inter-gateway trucking. These electric prime movers are designed to be interoperable and will be integrated with a common and automated battery charging and swapping station (BCSS) at the terminal. The BCSS, with the capacity to hold up to ten batteries, will support our scale-up for electric prime movers after the successful conclusion of the trials.

In 2024, a hydrogen fuel cell electric prime mover will be on trial at Pasir Panjang Terminal. This truck has zero emissions and a Hydrogen Refuelling Station has been built to support this vehicle.

In addition, more than 90% of our diesel yard cranes will be progressively replaced with electric or hybrid variants by 2030. The electric automated and hybrid yard cranes reduce carbon emissions by up to 60% compared to diesel ones.

In February 2023, PSA SG celebrated the milestone of Tuas Port handling its first millionth TEU since the start of operations in September 2022. By the end of 2023, there were eight berths operational. This future-ready port, powered by smart technology and green energy, is at the forefront of sustainability and innovation. As we ramp up capacity and capability at Tuas Port, our overall emissions will

reduce as the port equipment is fully electric and more energy efficient.

A trailblazer in our civil construction standard, the use of green concrete in the construction of Tuas Port's berths and yards is estimated to save 1.4 million tonnes of carbon emissions.

Not resting on our laurels, we went a step further to adopt the CarbonCure Technology, a carbon removal technique by chemically mineralising recycled carbon dioxide into fresh concrete during the manufacturing process. This process is estimated to save an additional 35,000 tonnes of carbon emissions by the time Tuas Port is fully completed in the 2040s.

Taking this further, we are collaborating with a local Institute of Higher Learning on a joint study to explore flexible green concrete which may potentially reduce construction-related emissions by a bigger measure.

All PSA SG new buildings are designed and built to be smart and green. We are planning for our second super low energy building in Tuas Port – PSA Supply Chain Hub @ Tuas. This next-generation hub will offer container freight stations, warehousing and flow centre services and when completed, it is expected to consume up to 80% less electricity annually compared to other similar-sized buildings.

## **Taking Collective Climate Action**

Climate change is a global challenge and one of the most pressing global issues of the present time. It requires immediate action and concerted efforts from governments, businesses, communities, and individuals worldwide. No country or business is immune. To achieve our 2050 net zero emissions goal, it is imperative to collaborate and partner with like-minded industry players to decarbonise across the entire maritime value chain.



PSA Tuas Port.

PSA SG joined 'The Silk Alliance', a cross-supply-chain maritime partnership initiated by Lloyd's Register Maritime Decarbonisation Hub and 18 other top industry leaders dedicated to the development of a fleet-specific fuel transition strategy for the intra-Asia container trade, based on the Hub's First Movers Framework.

In 2023, PSA SG joined Singapore's Ministry of Transport and Japan's Ministry of Land, Infrastructure, Transport and Tourism as a port partner to establish the Singapore-Japan Green and Digital Shipping Corridor.

PSA SG is humbled to be recognised as a best-in-class port operator, achieving the 'Container Terminal Operator of the Year' award for the 54th time at the Supply Chain Asia Awards 2023. Our commitment to sustainability has also earned us the 'Best Green Container Terminal Award' at the 2023 Asian Freight, Logistics & Supply Chain (AFLAS) Awards for the first time.

We also bagged two awards for the development of Tuas Port Maintenance Base – The Institution of Engineers, Singapore (IES) Sustainability Award and the ASEAN Outstanding Engineering Achievement Award. These awards underline our commitment to sustainability in engineering and construction efforts.

PSA SG recognises that digitalisation and decarbonisation go hand-in-hand and our suite of digital products supports our partners and stakeholders in streamlining their work processes, reducing paperwork and enhancing operational efficiency. One of the innovative digital products making a significant impact is OptETruck.

OptETruck is a cloud-based transport management solution that uses AI to facilitate smarter trip planning and eliminate operational inefficiencies for Singapore's haulier community.

OptETruck has received multiple accolades, including the 'Best in Future of Industry Ecosystems' award at the IDC AP Events Future Enterprise Awards and the 'Logistics Solutions of the Year' award at the annual Seatrade Maritime Awards 2023. With OptETruck's capabilities, PSA SG has helped reduce empty truck trips by over 50%. This translates to an annual reduction of about 10 million kg of CO<sub>2</sub> emissions, equivalent to 300,000 trees planted annually.

### **Nurturing a Thriving and Future-Ready Workforce**

People remain the heart of our business and are our biggest asset. When we take care of our people, we take care of our business. At PSA SG, we conduct regular mental health and caregiver wellness talks and workshops, covering topics such as psychological first aid, work-life balance and end-of-life care. Collaborating with Singapore's Health Promotion Board, we also encourage healthy lifestyles through a customised health programme. Peer support training equips employees with the skills to support colleagues facing stress and daily challenges.

Automation and digitalisation will continue to be crucial enablers in transforming our port and supply chain business. As our people are the drivers of this transformation, we have upskilled and reskilled them with future-ready capabilities such as data analytics and automation.

In Singapore, we are committed to a strong labour management relationship. We partner closely with the Singapore Port Workers Union (SPWU) and the Port Officers' Union (POU) to implement initiatives and targeted programmes to steer career development and to build a future-ready workforce. Discussions and get-togethers with PSA senior management are also held regularly to keep union leaders abreast of the business outlook and

future developments and strengthen the X-Factor between unions and management.

### **Navigating the Journey Ahead**

The business climate of 2024 will continue to be challenging with prevailing volatility and uncertainties. As economies strive towards stability and recovery, some may buckle under the weight of escalating economic turbulence, evolving geopolitical tensions, global trade slowdowns and climate crisis.

PSA SG will continue to strengthen our Node to Network strategy and enhance our competitiveness as a premier hub port as we work together as One PSA. We have come a long way since the first container vessel arrived at Tanjong Pagar Terminal in 1972, and with our next-generation port at Tuas, we are well positioned for the future – one that is resilient, sustainable and brings value for future generations.

We thank every individual, including our employees, unions and stakeholders, for their dedication, support and hard work on our journey to greater sustainability. While the achievements highlighted in this report are a testament to PSA SG's steadfast commitment to sustainability, your continued support motivates and drives us forward. We take our role and your trust seriously and with great humility as we go the distance to align our efforts in combating climate change.



**Nelson Quek**

Regional CEO, Southeast Asia  
PSA International

# About PSA Singapore





PSA Pasir Panjang Terminal

## About The Company

PSA SG is a wholly-owned subsidiary of PSA International Pte Ltd (PSA), a leading port group and trusted partner to cargo stakeholders.

PSA's global portfolio comprises over 60 deepsea, rail and inland terminals, across more than 170 locations in 45 countries – including two flagship port operations in Singapore and Belgium.

PSA harnesses the deep expertise and global experience of our diverse and global team to cultivate meaningful partnerships with customers and partners alike. We excel in delivering world-class port ecosystems and deliver innovative supply chain solutions to accelerate the shift towards

sustainable trade. PSA SG operates the world's largest container transshipment hub in Singapore, facilitating container movements across the world 24/7 all year round. PSA SG handled a record 38.8 million TEUs in 2023.

Beyond port operations, PSA SG also offers port adjacency services, our distinctive offering in mid-mile logistics, tailored to meet our customers' evolving requirements. This value-adding service, supported by our bespoke port adjacency digital solutions, will provide shared visibility of the end-to-end supply chain. As the partner of choice in the port and supply chain operations, PSA is 'The World's Port of Call'.

## Infinite Possibilities to Shape the Future

As we navigate the uncertainties of today, marked by ever-evolving trends in geopolitics, resources, economy, technology, climate change, and talent, we will work closely with our customers, partners, and stakeholders to create new and better possibilities for the future of trade. PSA SG remains steadfast in our commitment to the following regional strategy:

### 1. Synergise our Node to Network Strategy

We will continue to enhance our port ecosystem capabilities through the development of a comprehensive suite of digital solutions across the Southeast Asia region. Our collaboration with CrimsonLogic, PSA Marine and PSA BDP has enabled us to establish a robust network connecting the various nodes in Singapore. This growth strategy has been extended to our business units in Indonesia, Vietnam and Thailand, where our port operations are augmented with inland container depots, warehouses, rail capabilities and digital solutions. A strong connectivity network across the region will be forged as we strengthen synergies between the various nodes.

### 2. Digitalisation & Sustainability

We will leverage these two enablers to bridge connections across data platforms by spearheading the design and delivery of new value-added products that boost productivity, deliver efficiency, and promote green energy transformations for both internal and external stakeholders. We continue to invest in both technology and our workforce, including automation projects, to enhance productivity.

### 3. Talent

We recognise the vital role our people play in all our endeavours. We seek to empower our staff to continuously enhance their skills, expand their expertise to adapt to the evolving business landscape and challenge new frontiers both in Singapore and the SEA region.

### Building a Sustainable and Connected Supply Chain

Resiliency, agility, and sustainability are the hallmarks of PSA SG's transformation and success. We go beyond traditional port operations to support shippers and cargo owners, ensuring efficient and sustainable movement of goods across the entire supply chain.

By upholding our port's value proposition as a reliable and robust hub within the global network, PSA SG strengthens its market position. We leverage digital technologies to become a facilitator of global trade and to co-create a fabric of port networks and supply chain services. This commitment fuels our vision of co-creating an ecosystem where all stakeholders are seamlessly connected.

## MISSION

To be the port operator of choice in the world's gateway hubs, renowned for best-in-class services and successful partnerships.





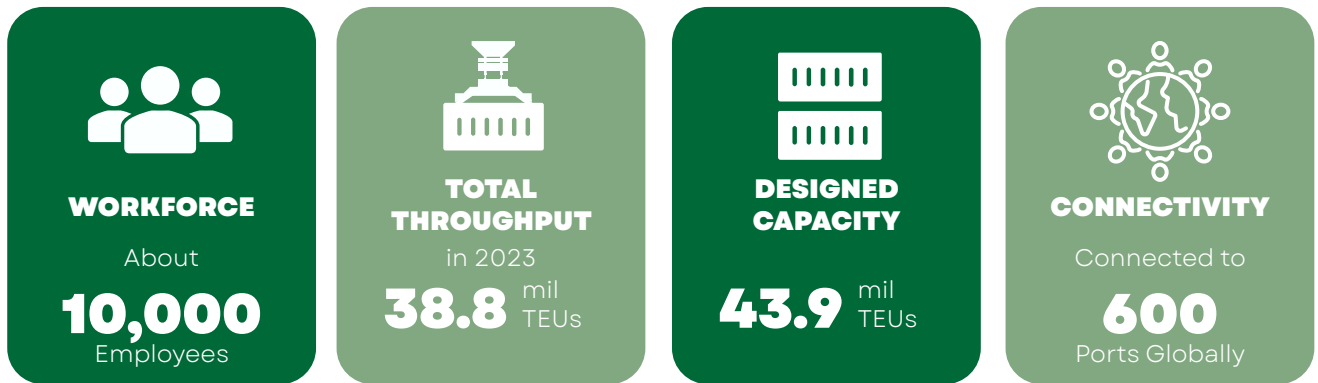
# Our **Terminals**



- PSA SG Container Terminals
- PSA SG Automobile Terminal and Sembawang Wharves



# Key Figures of **PSA Singapore**



## Our **Core Values**



### **Committed to Excellence**

We set new standards by continuously improving results and innovating in every aspect of our business.



### **Dedicated to Customers**

We help our customers, external and internal, succeed by anticipating and meeting their needs.



### **Focused on People**

We win as a team by respecting, nurturing and supporting one another.



### **Integrated Globally**

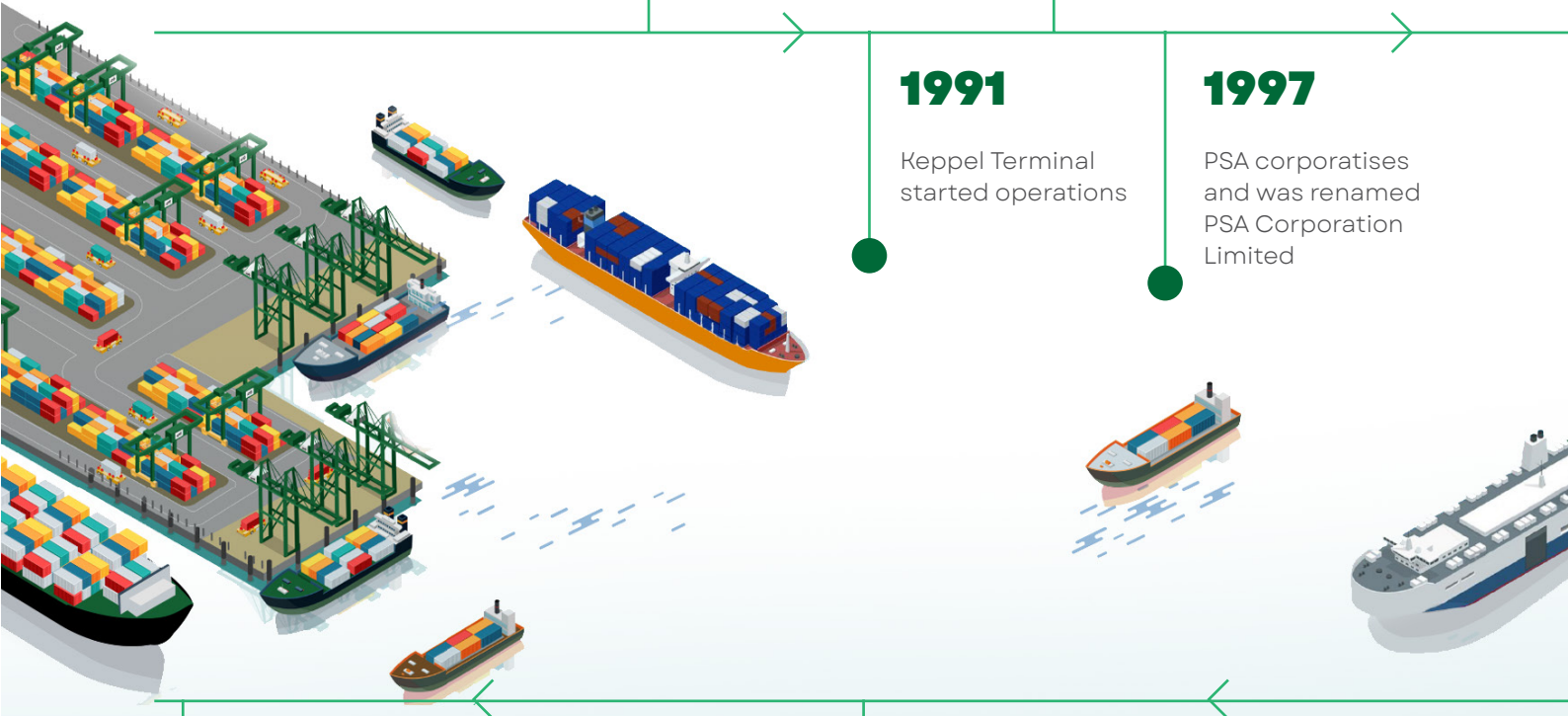
We build our strength globally by embracing diversity and optimising operations locally.



### **Responsible Corporate Citizenship**

We work sustainably and with the environment in mind, to hand over a better world to future generations.

# Key Development Sustainability Journey



**1972**

Arrival of first containership in Singapore. Tanjong Pagar Terminal started operations

**1992**

Brani Terminal opens

**1991**

Keppel Terminal started operations

**1997**

PSA corporatises and was renamed PSA Corporation Limited

**2023**

- Tuas Port handled its first million TEUs in February 2023
- PSA SG began trial of battery-powered electric prime movers (ePM) in PPT. Six units are onboarded
- Delivery of two units of on-road electric inter-gateway hauliers (eIGH)
- Started ecosystem testing for a fleet of Autonomous Prime Movers (aPM) in mixed traffic conditions
- PSA SG won the “Best Green Container Terminal” for the first time at the Asian Freight, Logistics and Supply Chain Awards
- PSA SG was awarded the Agency for Integrated Care’s Friends of Community Care (FOCC) Award, recognising our longstanding contributions to Singapore’s community care sector

**2022**

- Official opening of Tuas Port, Singapore’s next-generation port with automated equipment and integrated operations systems
- Launch of OptETruck – a proprietary cloud-based transport management solution for Singapore’s haulier sector. Its AI features enable fleet optimisation and a greener footprint
- PSA SG won the SGBC-BCA Business Leadership in Sustainability Transformation Award
- PSA Horizons, our corporate headquarters, achieved carbon neutrality for the second year
- PSA SG was awarded the “Champions of Good” Award by the National Volunteer & Philanthropy Centre

**2000**

- Pasir Panjang Terminal (PPT) opens
- Use of electric-based yard cranes for the first time

**2014**

PSA SG was the first port in the world to have handled 500 million TEUs cumulatively

**2017**

PSA SG introduces Prime Mover Telematics technology which optimises operational safety by monitoring fleet management and truck locations through data-driven technology

**2003**

PSA International Pte Ltd became the main holding company for PSA Group

**2015**

Official opening of PPT4-6. Adoption of 200 new electric automated yard cranes at these terminals

**2021**

- First 2 berths at Tuas Port Phase 1 began operations. Tuas Port Maintenance Base – the world's first Super Low Energy Building in a port facility – was opened.
- Adoption of new electric automated RMG cranes and battery-powered Automated Guided Vehicles at Tuas Port
- Adoption of LNG fuelled prime movers to replace diesel fuelled PMs at PPT 4-6
- PSA SG was awarded the President's Award for the Environment - the highest environmental accolade to recognise organisations that have made outstanding contributions towards environment and sustainability

**2019**

- The process of replacing diesel RTG cranes with electric RTG cranes began at PPT1-3 and is targeted to complete by 2027
- Official groundbreaking for Tuas Port
- Opening of first food garden at PATIO@PPT Building 3

**2018**

- PSA SG produces our first sustainability report
- PSA SG received the Singapore Environmental Achievement Award (Maritime Category) awarded by the Singapore Environment Council
- PSA SG received the APSN Green Port Award by APEC Port Services Network (APSN)

# Our Approach to Sustainability



PSA SG strives to develop a strong sustainability strategy that can seamlessly integrate into every facet of our business operations.

To ensure a thriving future for our company, partners, and customers, we have aligned our objectives with six key United Nations Sustainable Development Goals. This commitment guides our actions and propels us towards a more sustainable future for all.

Furthermore, PSA SG also seeks to actively contribute to shaping a greener future for the nation by solidifying our commitment to national sustainability goals. In 2023, PSA SG joined the Green Nation Pledge, under the Champion category. This nationwide initiative, supported by Singapore's Ministry of Sustainability and the Environment, aims to create a sustainable, resource-efficient, and climate-resilient Singapore..



## Our Sustainability Strategy Framework

Developed in 2020, PSA's Sustainability Strategy Framework sets the course for sustainable operations across the globe. Here at PSA SG, we are firmly committed to translating these group-level goals and visions into actionable plans for our local operations, contributing to the broader sustainability objectives of PSA.

### Strategic Growth Drivers

#### Creating Sustainable Value

- Taking Climate Action
- Transforming Supply Chains
- Nurturing a Future-Ready Workforce



### Underpinned by Business Fundamentals Stewarding Responsible Business

- Ensuring Responsible Operations
- Supporting Our Communities
- Protecting Our People
- Keeping Our Operations Safe & Secure
- Acting with Integrity

## Material Sustainability Topics

To identify and assess critical environmental, social, economic and governance topics that have the most impact and influence on PSA's operations and stakeholders, the group conducts regular materiality reviews, with the last assessment conducted in 2022. The exercise included an in-depth engagement with key stakeholders, including board members, employees, unions, investors, customers, suppliers and regulatory authorities. Once validated and approved by PSA Group's Board of Directors and Senior Management Council, these material topics become the guiding principles for PSA's operations across the globe.

To ensure a truly localised sustainability focus at PSA SG, we have conducted an internal review and made minor adjustments to the material issues identified\*. By including our goals, objectives, and achievements concerning these matters in our sustainability strategy and reporting, we seek to showcase our dedication to advancing sustainability throughout our business operations in Singapore.

\* PSA SG aligns our material topics closely to PSA's with exception of the following: Topics not included: Marine Protection and Conservation, Additional topics: Environmental Protection and Green Port Culture.



Volunteers from PSA SG and Fridge Restock Community SG rescuing 'ugly' fresh supplies.



Indoor gardening workshop with our PSA SG employees.

## Environmental Material Topics

### 1. Climate Change Adaptation

Strengthening our resilience and managing the physical and transition impacts of climate risks on our infrastructure, operations, surrounding communities, and ecosystems, as well as our readiness to leverage opportunities in a low-carbon economy.

### 2. Energy and Emissions

Reducing GHG emissions across our businesses and supporting the decarbonisation of the shipping and logistics industry. Reducing our energy consumption and intensity by harnessing energy-saving and efficiency technology, and increasing the use and generation of renewable energy.

### 3. Environmental Protection

Protecting our people by implementing safety measures in the workplace and environment they are around by ensuring that the air quality and boundary noise level are within healthy limits with good haze response management in place.

### 4. Green Port Culture

Cultivating a generative culture where our people are green-minded, green-skilled, and green-motivated.

### 5. Waste Management and Recycling

Adopting more circular approaches to optimise resource use, minimise the waste generated in our operations and increase recycling. Examples include refrigerant reclamation, materials upcycling, and reuse.

### 6. Water Use and Pollution

Ensuring efficient use of water, water conservation efforts and responsible management of wastewater discharge.



Plogging hike at Windsor Park, good for health and the environment.

## Social Material Topics

### 1. Community Relations

Contributing meaningfully to the lives and wellbeing of the communities where we operate, and engaging community stakeholders to address the social and environmental impact of our operations.

### 2. Employee Diversity & Inclusion

Creating a workplace environment that respects and promotes diversity and inclusion.

### 3. Labour Relations & Worker Well-being

Maintaining strong relationships and engagement with labour unions, establishing best practice labour standards, that include respecting human rights, having zero tolerance of modern slavery, and ensuring worker wellbeing.

### 4. Occupational Health & Safety

Ensuring the highest standards of health and safety for workers across our operations.

### 5. People Development

Building a future-ready organisation by attracting and retaining an engaged workforce, providing learning and development opportunities, and cultivating a purpose-driven organisational culture that is aligned with our values and supports our people to do their best work.



Installation of solar photovoltaic systems in Tuas Port.

## Governance Material Topics

### 1. Cybersecurity and Data Privacy

Protecting our business systems and ensuring data privacy through the adoption of robust cybersecurity measures.

### 2. Ethical Business Conduct

Upholding high standards of ethics and regulatory compliance, to go beyond minimum legal requirements, reflecting our long-term commitment to building a business that is successful, honest, and responsible.

### 3. Innovation & Technology

Innovating and harnessing technology to drive digitalisation and create more efficient and sustainable operations.

### 4. Optimisation of Global Supply Chains

Driving sustainability improvements in shipping and logistics supply chains by working with suppliers, partners and customers on route optimisation and alternative transport options for better efficiency and safety.

### 5. Port Security

Ensuring safety and security of port operations, including ensuring responsible handling of dangerous goods, as well as working with relevant authorities and partners to put in place adequate controls to safeguard against terrorism and illicit trade.

### 6. Sustainable Port Development

Ensuring that the planning, design and development of port infrastructure and operations consider and address the environmental impacts from land development and reclamation.

### 7. Sustainable Procurement

Minimising environmental impacts and creating positive social impacts through our procurement of goods and services, by integrating sustainability criteria in the selection, monitoring, and evaluation of suppliers, including ethical behaviours, environmental protection and upholding human rights.

# Stakeholder Engagement

## 01 EMPLOYEES

### BASIS OF IDENTIFICATION & SELECTION

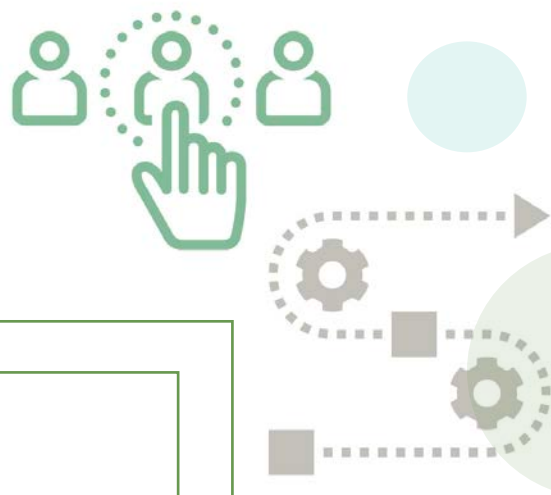
Employees are the heart of our organisation and are essential in creating value and bringing success.

### FREQUENCY & MODE(S) OF ENGAGEMENT

1. Employee Opinion Poll
2. Volunteering Opportunities (e.g. H@H Initiatives)
3. Workshops (e.g. Starfish Safety Workshop)

### TOPICS OF CONCERN

1. Equal opportunities for growth and development
2. Health, safety and wellbeing
3. Supportive work environment
4. Doing good for the community



## 02 CUSTOMERS

### BASIS OF IDENTIFICATION & SELECTION

We strive to provide world-class port services for our customers and establish meaningful collaborations to meet their changing needs.

### FREQUENCY & MODE(S) OF ENGAGEMENT

1. Annual celebratory dinners (e.g. Lunar New Year)
2. Annual recreational events (e.g. Golf Invitational, Chill Out event)
3. Go Green CSR activities (e.g. beach cleanups)

### TOPICS OF CONCERN

1. Sustainability enhancements in shipping and logistics supply chains
2. Innovative end-to-end supply chain solutions





### 03 SUPPLIERS

#### **BASIS OF IDENTIFICATION & SELECTION**

We work with our suppliers to drive ecosystem-wide changes in the shipping and logistic supply chains.

#### **FREQUENCY & MODE(S) OF ENGAGEMENT**

1. Annual Circularity Survey
2. Suppliers' Code of Conduct (SCC)
3. ESG and GHG Emissions Questionnaires
4. Data and information collection platform for new suppliers and tenders

#### **TOPICS OF CONCERN**

1. Minimising environmental impacts and creating positive social impacts
2. Bringing suppliers alongside PSA SG's Sustainability Journey



### 04 PARTNERS / SHAREHOLDERS

#### **BASIS OF IDENTIFICATION & SELECTION**

We work with various Residents' Committees (RC), and Community Development Council (CDC) along the Southwest CDC/Central Areas to keep residents staying near the port areas updated on its developments.

#### **FREQUENCY & MODE(S) OF ENGAGEMENT**

Port visits were conducted for residents staying near Pasir Panjang Terminal, as well as sponsorships to generate goodwill and understanding.

#### **TOPICS OF CONCERN**

The Public may get information and updates from social media or other media sources which may not provide a full picture, thus skewing their understanding of the port and its businesses.

### 05 AUTHORITIES

#### **BASIS OF IDENTIFICATION & SELECTION**

We work with the relevant authorities such as the Ministry of Transport (MOT) and the Maritime and Port Authority of Singapore (MPA) who regulate and license port and marine services, and facilities in Singapore, also managing vessel traffic in Singapore's port while ensuring safety and security.

#### **FREQUENCY & MODE(S) OF ENGAGEMENT**

Close collaboration and coordination with MOT, MPA and the Ministry of Foreign Affairs (MFA) through high-level visits, meetings, events etc.

#### **TOPICS OF CONCERN**

Maintaining the safety and security of port and marine services in Singapore.

# Our Sustainability **Governance**



PSA's sustainability journey is guided by robust governance.

PSA SG's sustainability approach adheres to the policies and procedures set forth at the Group Level. The Board of Directors holds ultimate responsibility for the company's direction and actively manages sustainability at PSA, overseeing PSA SG's assessments of sustainability materiality.

PSA SG also aligns with the Group's Climate Response Management System (CRMS), managed by the Group Sustainability, established to coordinate and promote group-wide sustainability and climate response efforts.

## **Technology and Sustainability Solutions Division (TSUS)**

Within PSA SG, our TSUS Division spearheads sustainability efforts. This dedicated division reports directly to the Regional CEO, Southeast Asia, who is a part of the Senior Management Council, ensuring sustainability remains a top priority.

There are four departments in the division – Engineering & Equipment Development Department, Smart System Solutions Department, Sustainable Business Practices & Partnerships Department and Sustainability Planning & Development Department.

Working closely with both internal and external stakeholders, TSUS develops and implements comprehensive sustainability policies and strategies that align with PSA SG’s overall goals and values. This includes setting ambitious GHG emission reduction targets, along with robust measurement, reporting, and verification processes. Beyond setting goals, TSUS actively collaborates with other divisions to promote and drive sustainability initiatives throughout PSA SG and its wider value chain. Their focus areas extend to sustainability education and awareness programmes, data collection and reporting systems, and fostering innovation in carbon abatement technologies to mitigate climate risks.

PSA SG adheres to a well-defined governance structure for all material ESG topics. Specific divisions and departments are responsible for managing these topics, leveraging their expertise and aligning with their prescribed roles and functions.

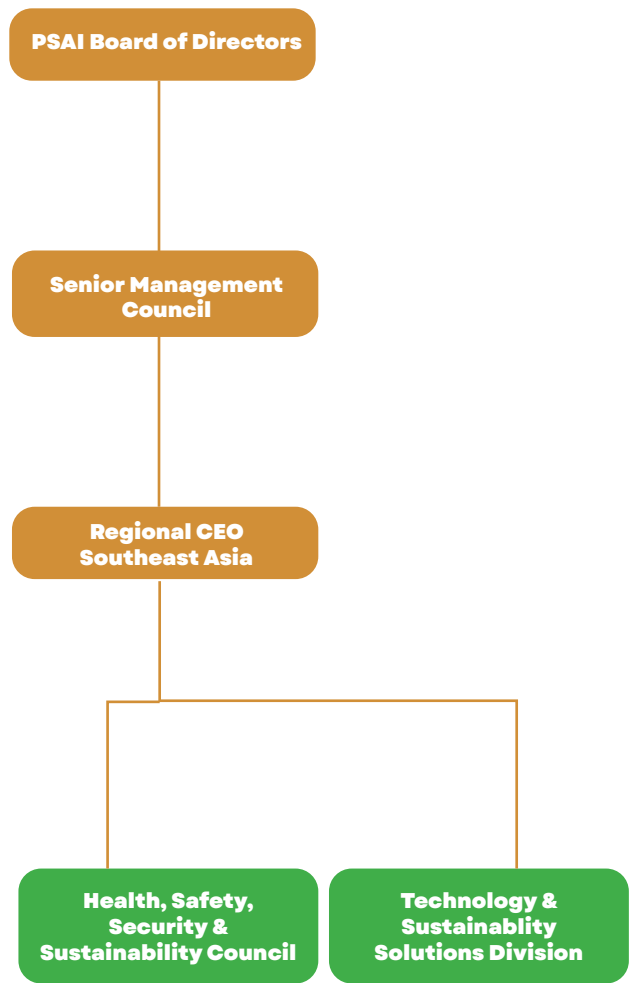
All division heads report to Regional CEO, Southeast Asia, on their progress towards both short-term and long-term sustainability goals monthly, or more frequently as needed. Employees are encouraged to drive sustainability initiatives by contributing positively towards ESG-linked key performance indicators (KPIs) in PSA SG’s remuneration policy. These KPIs serve as one of the factors determining employees’ variables and are reviewed annually to ensure progress and adaptation in our sustainability journey.

Recognising the need for collaborative efforts towards sustainability progress, the TSUS Division also partners with key stakeholders, including Institutes of Higher Learning, the wider maritime community and industry experts to unlock new value pools through private-public partnerships on technology and sustainability-related initiatives.

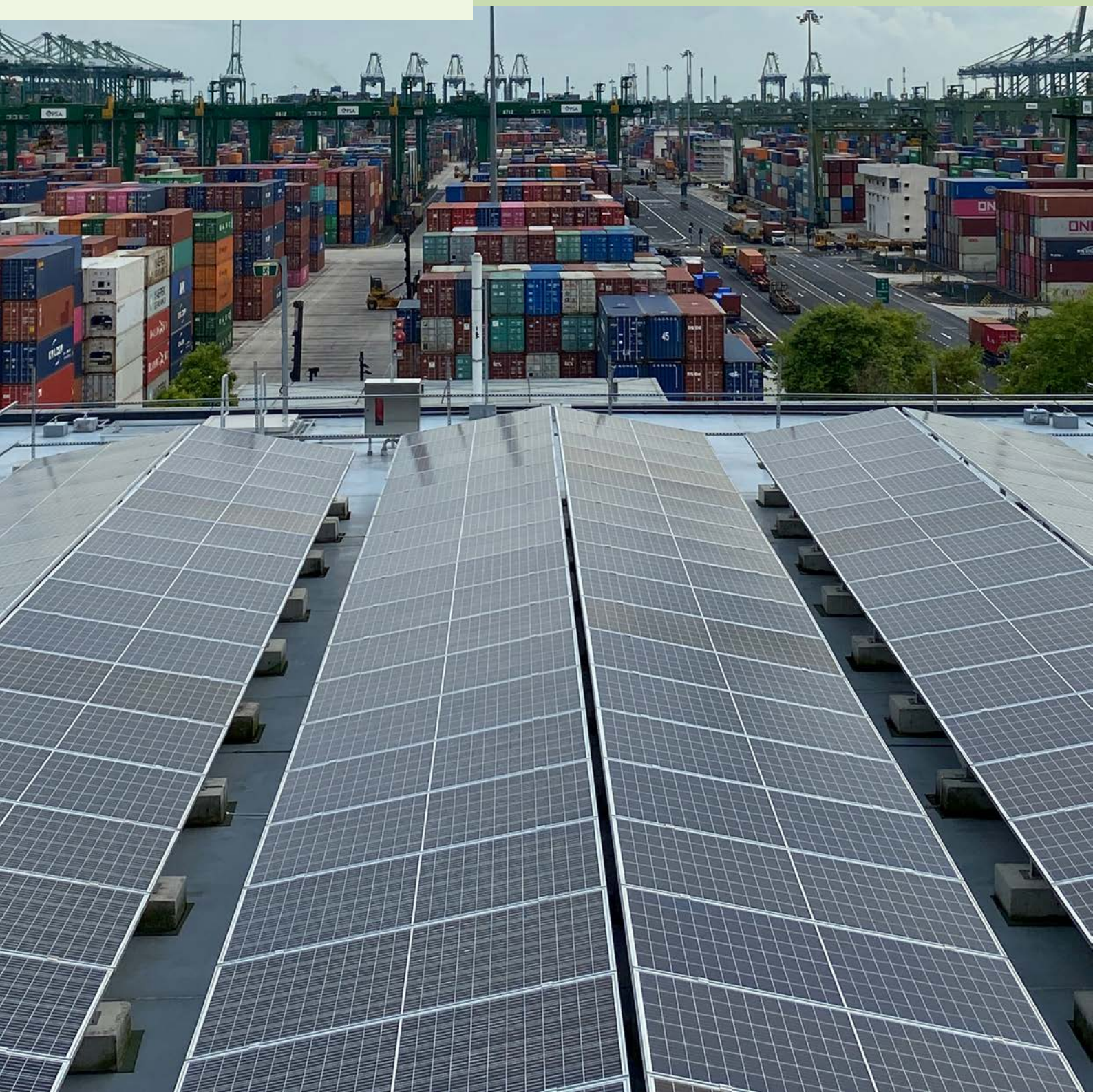
**Health, Safety, Security and Sustainability (HSSS) Council**

Chaired by Regional CEO, Southeast Asia, the HSSS Council comprises unions’ leaders, all heads of divisions and relevant personnel supporting the HSSS functions in PSA SG. The sustainability scope discussed at the council focuses on outreach efforts to staff including awareness, education, and engagement. Meeting every quarter, the council members provide guidance and are updated on HSSS performance and initiatives in PSA SG.

Through our established governance structure, PSA SG seeks to align with and to drive the Group’s sustainability vision and mission.



# Taking **Climate Action**



# Climate **Change** **Adaptation**

Climate change has far-reaching multifaceted implications on our world, from rising sea levels and more severe and frequent extreme weather events to disruptions in global supply chains. PSA SG recognises the significance of climate change adaptation to strengthen our resilience and protect our business from climate change impacts.

Our inputs, initiatives and targets are encompassed within PSA International's Climate Response Management System, which supports climate change mitigation and adaptation against climate-related physical and transition risks.

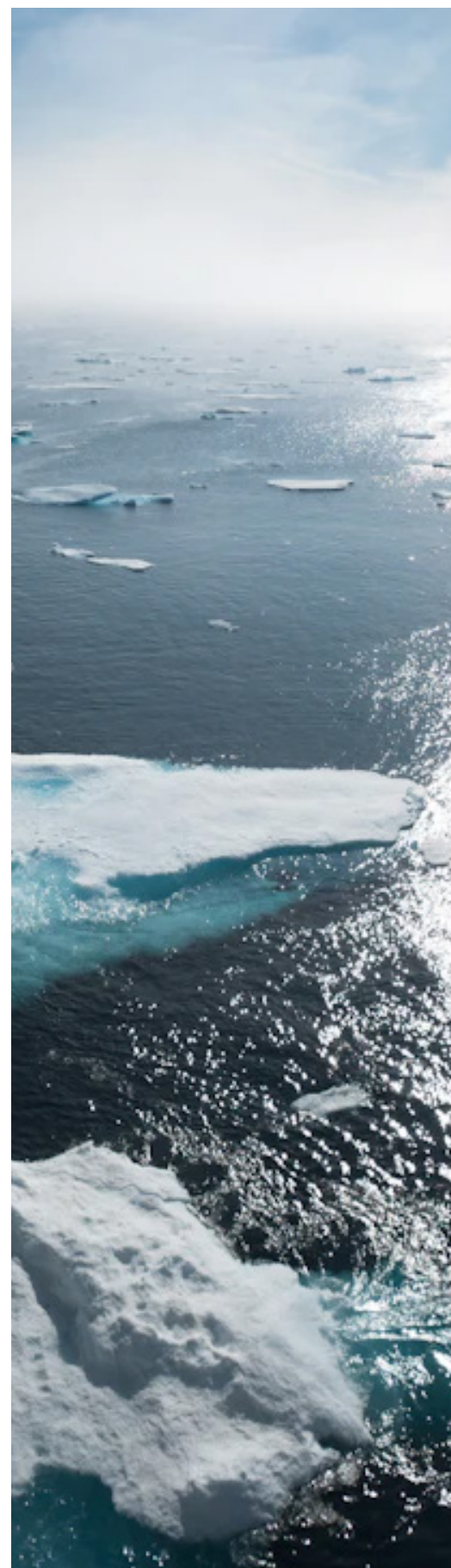
As part of a stress test on our terminals, we conducted a scenario analysis. The exercise assessed how extreme weather events may damage or cause disruptions to our terminal operations in various pathways, ranging from a very high GHG emissions pathway (based on the SSP5-8.5 scenario) to a low carbon pathway (based on the SSP1-2.6 scenario).

We collaborated with Singapore's national agencies, including the Maritime and Port Authority of Singapore and PUB, Singapore's National Water Agency, to strengthen the resilience of our terminals against climate-related risks. This includes building awareness and capacity of our risk and engineering colleagues to assess and respond to the impacts of sea-level rise and changes in precipitation patterns.

## **1. Governance**

Updates relating to our climate change adaptation efforts, including any findings and recommendations, are provided to Group Sustainability (GSUS) which oversees the development and implementation of sustainability-related strategies. GSUS reports to the Group's Senior Management Council (SMC) every quarter. Our Regional CEO represents PSA SG on the SMC.

For more information on PSA SG's Sustainability Governance Structure, please refer to Our Sustainability Governance on pages 24 to 25.



## 2. Strategy, Metrics & Targets

Our response to climate change has always been to address both physical and transition impacts effectively and simultaneously.

Despite expectations of a growing business volume in the coming years, we persist with our long-term decarbonisation target of reducing our absolute emissions by 50% by 2030, 75% by 2040, and achieving net zero emissions by 2050 against the baseline year 2019.

### To achieve our long-term decarbonisation goals, PSA SG has identified three key strategies:

1. Adoption of lower-carbon fuels and transition to using hybrid yard cranes for reducing our diesel consumption.
2. Electrify our ports by replacing our current diesel-operated equipment (e.g. yard cranes and prime movers) with electric or hybrid ones.
3. Increase the amount of green electricity mix to reduce the projected Scope 2 emissions as we intensify our electrification efforts.

For more information on PSA's progress against our key strategies, please refer to the Emissions and Energy section on pages 31 to 33.

As we manage and monitor our identified climate-related physical risks, we follow the Climate Risk Assessment and Adaptation Framework. The PSA-developed framework includes guidelines to ensure that identified risks are taken care of while designing and constructing our Tuas Port in every developmental phase. It also features guidelines relating to adaptation measures for our existing Pasir Panjang Terminals in consultation with an external consultant with inputs from Group Civil Engineering and Group Risk Management.

## 3. Risk Management

Through the scenario analysis exercise, PSA has identified relevant physical and transition climate-related risks.

### Physical Risks

Physical risks refer to the impacts of both acute physical risk drivers (e.g. extreme weather events) as well as chronic physical risk drivers that unfold over a longer period (e.g. increasing mean temperatures and changing rainfall patterns).

### Transition Risks

Transition risks refer to the impacts of societal, regulatory, and economic-related risk drivers that arise due to a shift towards a greener economy and a more climate-friendly future, as requested or expected by our stakeholders

Based on the list of identified risks, we have reviewed and contextualised them to our operations in Singapore. At PSA SG, we recognise the importance of tracking and addressing the climate risks with the largest potential impact, both directly and cumulative on our operations. The process in which PSA SG manages climate-related risks includes risk identification, risk protection, detection, response as well as recovery.

In every quarter, identified risks are assessed holistically and submitted to Group Risk Management which in turn reports to the Audit Risk Committee at the PSAI board level. At the PSA SG level, the overall risk profile is presented to the Risk Council chaired by Regional CEO, Southeast Asia twice yearly.



PSA Singapore and Pacific International Lines (PIL) have signed a Memorandum of Understanding (MOU) to jointly develop sustainable solutions to cut carbon emissions and optimise maritime efficiency.

## Physical Risks

Category	Description	Potential Long-term Impact(s)
<b>Accurate Physical Risks</b>	Extreme weather risks (wind, storms).	Operational difficulties, damage to infrastructure/container handling equipment, disruption to supply chain and shipping schedules.
<b>Chronic Physical Risks</b>	Rising mean sea levels.	Increased risks of coastal inundation of quay infrastructure and flooding risks.
<b>Chronic Physical Risks</b>	Rising mean temperatures.	Loss of workforce productivity, higher occurrence & intensity of transboundary haze events.

## Transition Risks and Opportunities

Category	Description	Potential Short and Long-term Impact(s)
<b>Policy / Legal Risks</b>	Rapidly evolving regulatory and legal landscape over climate and ESG issues.	Risks emerging from current and future carbon taxes with increased compliance reporting requirements impacting supply chains and terminal operations, escalating compliance requirements relating to climate-related and ESG regulations and disclosures.
<b>Market Risks</b>	Changing market preferences and demographics.	<p>Customers, including shipping lines and cargo owners, are including environmental factors in their supply chain decisions.</p> <p><b>Opportunity:</b> The growing focus on sustainability provides emerging market opportunities via green supply chain initiatives such as participation in end-to-end green shipping lanes.</p>
<b>Technology Risks</b>	Rapidly evolving innovation and technological developments.	<p>The transition to a low-carbon economy is driving technological advancements, such as the development of electric and autonomous vehicles, digitisation, and smart port technologies. However, adopting these technologies can be costly and entail significant adaptation efforts, including retraining the workforce.</p> <p><b>Opportunity:</b> Enhancement of productivity, competitiveness, and sustainability of operations through the correct application of technologies.</p>
<b>Reputational Risks</b>	Failure to meet compliance, societal and stakeholder expectations on material ESG matters such as climate response.	PSA's brand name and reputation are critical to maintaining stakeholder relationships, including talents, solution partners and customers. A weakened brand name and reputation may also decrease our ability to recruit & retain talents.

# Emissions and **Energy**

As the world transitions to a low-carbon global economy, every industry and company plays a part in the decarbonisation transition. At PSA SG, we take ownership and commit efforts to decarbonise our operations to achieve our net zero goal by 2050, as aligned to the Singapore Green Plan 2030.

## Targets

### By **2030**

Reduce absolute GHG emission by **50%** from 2019 baseline

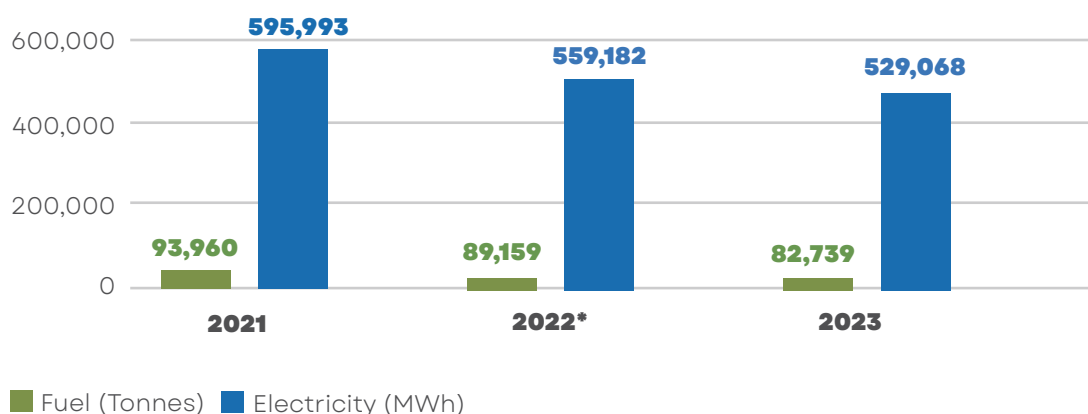
### By **2040**

Reduce absolute GHG emission by **75%** from 2019 baseline

### By **2050**

Achieve **net zero** emissions

## Total Energy Consumption in 2023

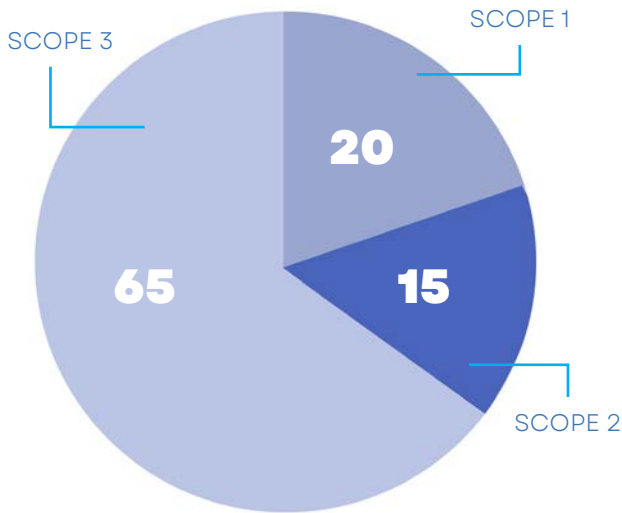


In 2023, PSA SG consumed 82,739 tonnes of fuel and 529,068 MWh of electricity. Compared to 2022, our container volume handled year-on-year in 2023 increased by close to 5%. The decrease in energy consumption despite the increase in throughput volume is possible by having a more energy-efficient Tuas Port handle a bigger proportion of volume and our ongoing efforts in electrification. In addition, there is also a higher proportion of LNG prime movers and higher solar PV capacity.

Total Carbon Emissions Footprint in 2023

Since 2020, PSA SG has been disclosing our Scope 1 and 2 GHG emissions. We are committed to transparent and accountable GHG reporting. In 2022, we completed our Scope 3 GHG emissions screening exercise, and in 2023, we have progressed further to fully disclose our entire GHG footprint according to the GHG Protocol. Furthermore, we have also established a robust methodology that ensures the accurate quantification and reporting of GHG-related information. This methodology aligns with the stringent requirements and principles set forth by the International Organisation for Standardization (ISO), including transparency, relevance, completeness, consistency, and accuracy. PSA SG was awarded the ISO 14064-1:2018 verification statements, the first among PSA business units to achieve this.

Composition of total GHG emissions (%)

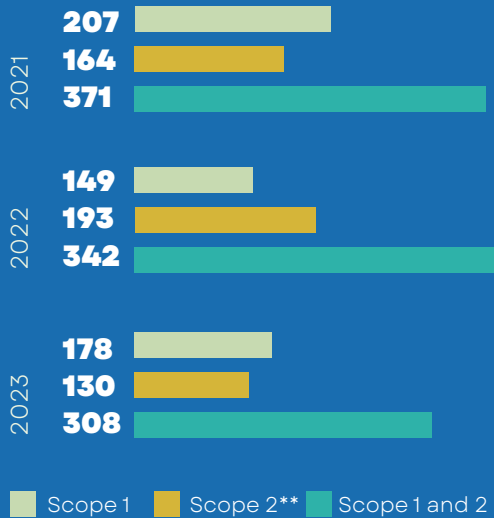


Aiming to achieve net zero by 2050, PSA SG is looking for ways to decarbonise our port operations. We are pleased to report that we are on track towards achieving our near-term target of reducing port GHG emissions by 50% by 2030, against a 2019 baseline. In 2023, PSA SG’s Scope 1 GHG emissions constituted 58% of total Scope 1 and 2 GHG emissions. The main source of our Scope 1 GHG emissions is diesel

Scope 1 and 2

The total Scope 1 and 2 GHG emissions for PSA SG in 2023 was 308 ktCO<sub>2</sub>e, based on the equity share approach, which showcased a 10% decrease from 2022. The decrease was due to more throughput volume handled at Tuas Port, which is fully electric, while a corresponding drop in throughput volume handled at the City Terminals with mostly diesel-powered container handling equipment.

GHG Emissions (ktCO<sub>2</sub>e) of PSA SG\*



\* Scope 1 and 2 GHG emissions in the above table are computed based on an equity share consolidation approach. Gases included in the calculation are CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O. Emission factors for fuel were sourced from GHG Protocol Emission Factors for Cross Sector Tools (March 2023) and the UK Department for Environment, Food and Rural Affairs (DEFRA).

\*\* Scope 2 GHG emissions were computed based on applicable market-based emission factors. TÜV SÜD PSB Pte Ltd externally verifies 2021 GHG emission figures as conforming to the requirements of ISO 14064-1:2018. Reference statement registration no GHG-ISO 14064-0020.

container handling equipment such as yard cranes and prime movers. They contribute about 160 ktCO<sub>2</sub>e of GHG emissions, which makes up more than 50% of our total Scope 1 and 2 GHG emissions.

In terms of our Scope 2 GHG emissions, which constituted 42% of total Scope 1 and 2 GHG emissions in 2023, the main sources are the consumption of electricity for our reefer containers handled and electric container handling equipment such as quay cranes, yard cranes and automated guided vehicles (AGVs).\*

As part of our strategy to reduce our Scope 1 GHG emissions, PSA SG deploys electric-powered yard cranes such as electric-automated rubber tyre gantry cranes, automated/manual rail-mounted gantry cranes, and bridge cranes.

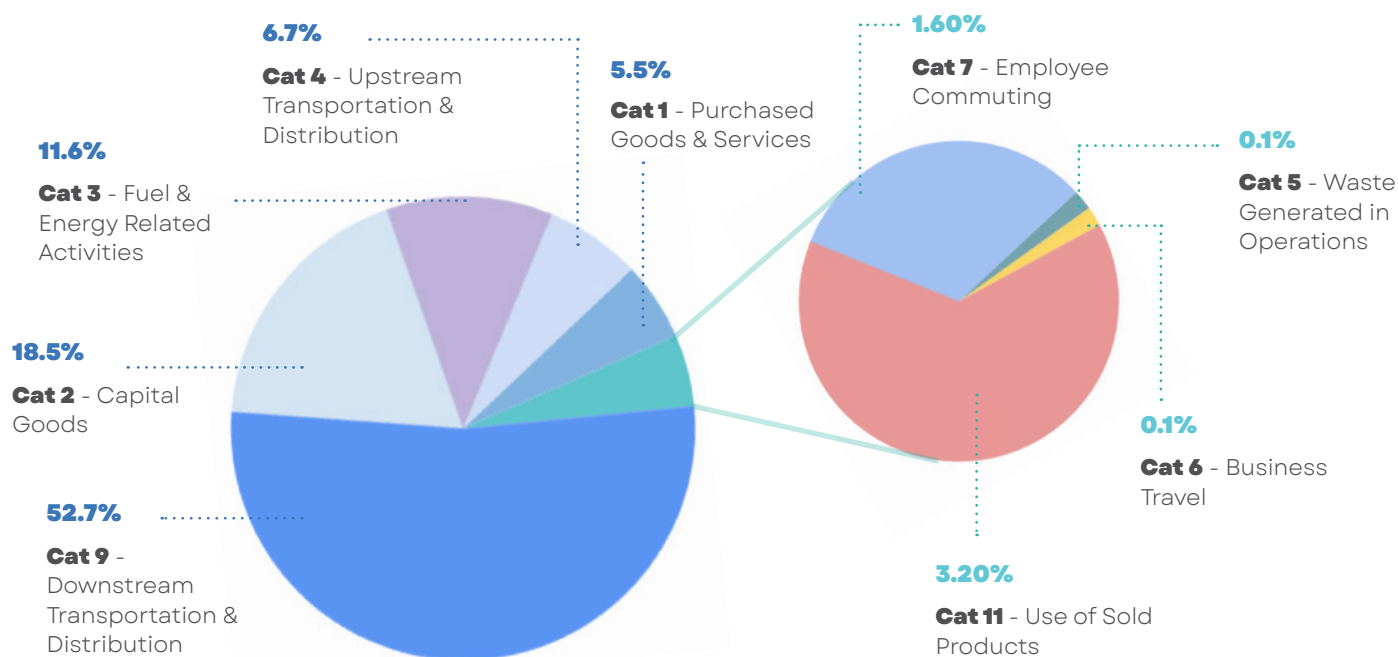
In line with our transition plans, we aim to progressively switch to electric and hybrid yard cranes and shift our volume handling to Tuas Port, a fully electric port.

Hence, we project that the proportion of Scope 2 emissions will account for more than half of the total Scope 1 and 2 emissions by 2025.

### Scope 3

Our commitment to transparency extends to our GHG emissions inventory. We have included all relevant Scope 3\*\* categories that reflect our operational influence. Our primary focus is Category 9, covering GHG emissions from vessels at berth and haulage vehicles operating within our terminals.

Our Scope 3 inventory excludes categories 8 (Upstream Leased Assets), 10 (Processing of Sold Goods) and 12 (End-of-Life Treatment of Sold Goods), as they are not applicable to PSA SG while Category 13 (Downstream Leaded Assets) is already accounted for in Scope 1 and 2. Category 14 (Franchises) and Category 15 (Investments) are excluded as PSA SG does not own any franchise and there is no significant investment. Overall, our Scope 3 emissions totalled 569 ktCO<sub>2</sub>e, with the following breakdown across the categories.



\*PSA SG adopts a market-based emission approach for the accounting of Scope 2 GHG emissions.

\*\*PSA SG's Scope 3 GHG emissions are computed based on an equity share consolidation approach. Gases included in the calculation are CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O. Emissions factors were sourced from GHG Protocol Emissions Factors for Cross Sector Tools (March 2017), the UK Department for Environment, Food and Rural Affairs (DEFRA), IPCC Fifth Assessment Report (AR5), the International Energy Association (IEA).

# Key Pathways to Achieve Our **Decarbonisation Goals**

Our decarbonisation pathway can be summarised by our key strategies.

## Greening Horizontal Transport

Moving forward, we plan to consolidate container volume handling operations at Tuas Port. As the port has been designed and constructed to be fully electric, this would mean that our overall business volumes will be lower-carbon and lower-energy. We envision that more than a third of total volumes in Singapore will be handled at Tuas Port by 2030, paving the way towards mitigating higher operational GHG emissions due to business expansion.

Our green projects are estimated to be completed by 2029 – 2030 and are projected to reduce GHG emissions from the volumes handled at our Pasir Panjang Terminals. To address the GHG emissions generated from the use of diesel to power our port equipment and vehicles, we have adopted a two-pronged approach. Adopting cleaner alternative fuels to power our equipment, we are exploring to power our port operations using hydrogen.

The substitution of our diesel-powered container handling equipment (CHE) is the foundation of our second key strategy. By switching from diesel-powered CHEs to electric, our Scope 1 GHG emissions can be substantially reduced. As part of our electrification efforts, we plan to deploy up to 700 electric prime movers and switch up to 90% of our yard cranes to fully electric or hybrid variants by 2030.

In 2023, the fleet of LNG prime movers expanded to 210 units. In the same year, we introduced eight units of electric prime movers, of which two units are for on-road inter-gateway haulage. The fleet size of electric prime movers will grow steadily in 2024 and beyond.



PSA's H2PM initiative: Pioneering hydrogen-powered mobility for sustainable port operations.

## PSA SG Solar Photovoltaic (PV) Installation Capacity

PSA SG is exploring methods to obtain and utilise green electricity to power our equipment. Electricity produced from renewable sources is projected to constitute about 60-80% of our electricity mix by 2030.

PSA SG intends to maximise solar deployment. We achieved a total solar PV capacity of 9.41 MWp by the end of 2023, generating 11.8 GWh of renewable electricity annually.

PSA SG will be installing solar PV on the top of the machinery house of quay cranes. Solar PV will also be installed at new builds - PSA Supply Chain Hub @ Tuas and Transport Hub, two upcoming civil projects in the Tuas ecosystem.

## More Energy Efficient Data Centres (DCs)

DCs are critical installations supporting PSA SG's digitalisation efforts. We have improved the Power Usage Effectiveness (PUE), an internationally recognised metric to illustrate DC energy efficiency, from 1.83 in 2011 to 1.5 in 2022 and 1.39 in 2023. PUE measures total DC energy utilised over total IT equipment energy utilised.



A milestone in green building: The Tuas Port Maintenance Base Admin Building is PSA SG's first net zero energy building.

The rack containment system implemented in 2022 channels the cold air where it is needed. In 2023, we made further efforts to review the under-floorboard cabling to improve airflow distribution. We re-aligned the perforated floorboards and sealed off all gaps on the racks and floor. With these efforts, we increased both the air conditioning operating temperature and humidity resulting in an improvement in PUE.

## Strategic Connections with Stakeholders

There are many challenges in decarbonisation and reducing carbon emissions and forming public-private partnerships is valuable in overcoming some, if not all, of these challenges.

At PSA SG, we seek to forge strategic connections with our stakeholders, from internal stakeholders

like our employees to external stakeholders like government agencies, research institutes, and industry players, to form a support system with a common goal-decarbonisation.

PSA SG is a corporate member of the following, to contribute and learn from like-minded parties:

1. Hydrogen Fuel Cell Association of Singapore (HFCAS)
2. Singapore Green Building Council (SGBC)
3. Sustainable Energy Association of Singapore (SEAS)
4. Singapore Battery Consortium

With more aligned parties, the collective efforts towards decarbonisation will be more significant. For more information on PSA SG's decarbonisation initiatives and collaborations, please refer to [Innovation and Technology](#).

# Transforming **Supply Chains**



# Optimisation of **Global Supply Chain**

Optimisation of the supply chain is a significant aspect of our operations at PSA SG, to upkeep our competitiveness in the global business landscape and achieve operational excellence. By optimising the supply chain, we can increase efficiency and enhance customer satisfaction.

At PSA SG, we are constantly looking for ways to integrate sustainability into the optimisation of our supply chain. We are committed to improving sustainability practices in local and regional shipping and logistics supply chains through collaborations with our stakeholders. This approach is aligned with our commitment to achieve net zero GHG emissions by 2050.

## **Partnership with Hyundai Motor Group Innovation Centre in Singapore (HMGICS)**

The development of bespoke solutions by the PSA SG team has been pivotal in delivering on the long-term partnership between HMGICS and PSA, whereby PSA SG assumed the role of Lead Logistics Service Orchestrator for HMGICS' Smart Factory in Singapore. This collaboration marked a significant milestone as the factory is pioneering the production of Singapore-made electric vehicles.

Singapore's land scarcity posed several challenges for HMGICS. Firstly, finding a suitable warehouse near the production plant was difficult due to limited

space. Additionally, the cost of large warehouses and conventional conveyor systems was prohibitive, compounded by high manual labour costs.

PSA SG acted quickly to provide comprehensive solutions for HMGICS' challenges. These included leveraging real-time GPS tracking and bespoke trailers such that Bodies-In-Paint and car parts can be efficiently transported between multiple warehouses and production locations. This integration mimics a proximity setup, enabling a seamless flow of operations. This is complemented by Port Ecosystem Business' solution for scalable virtual storage in the terminal, leveraging data analytics to optimise inventory management and facilitate just in time delivery, reducing warehouse space.

The PSA SG team has seamlessly integrated delivery information with HMGICS' system, facilitating their production model tailored for a multi-storey setup at their production plant. Delivery information for various car parts is automatically transmitted to HMGICS' system upon loading pallets onto the trailers, where it is captured by robots for assembly.

Additionally, PSA SG ensures a pre-validation of box sizes, tagging with barcodes and sequencing of parts before delivery to the production plant, enabling the automation activities to take place smoothly for HMGICS.



Our PSA team in South Korea for the SPWU Delegates Seminar.

**Navigating Toward Sustainability:  
Barging as the Greener Transport  
Solution for Energy and Chemical  
Manufacturers in Jurong Island (JI)**

PSA SG is transforming the logistics landscape of JI towards a more sustainable future by offering barging as an eco-friendly alternative to traditional on-road trucking.

Collaborating closely with the Jurong Island Terminal (JIT) community, PSA SG has championed the adoption of barging as a greener mode of transport, marking a significant milestone in the island’s journey towards environmental stewardship. In 2023, the barging volume surged by 13%, propelling JIT to achieve a record-breaking container throughput exceeding 148,000 twenty-foot equivalent units (TEUs) since its inception in 2012.

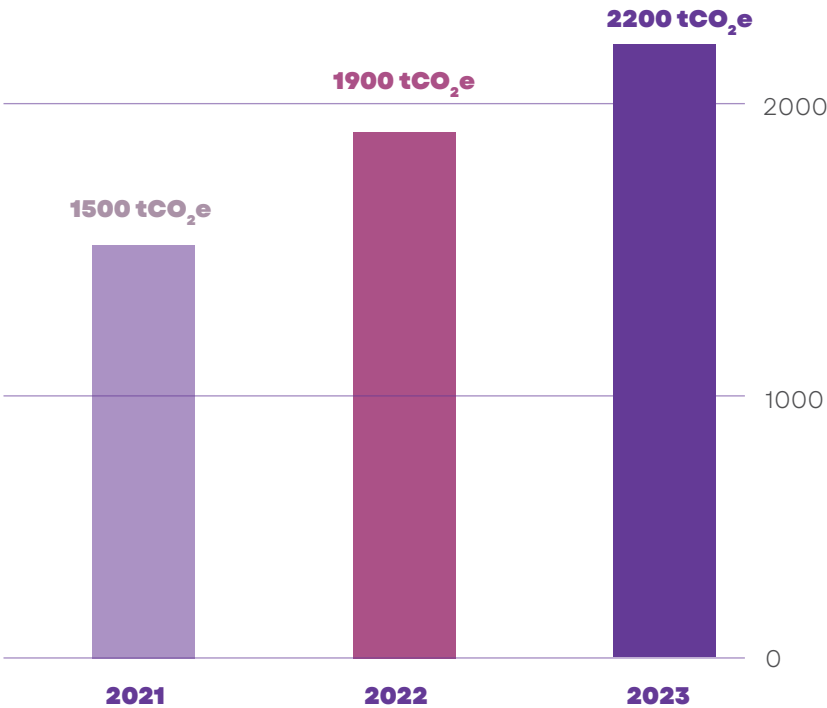
By facilitating the shift from trucking to barging, PSA SG has effectively eliminated over 148,000 truck trips between Jurong Island and PSA Terminals on

mainland Singapore. This translates to a remarkable reduction of up to 37% in GHG emissions per TEU, resulting in tangible savings of 2,200 tCO<sub>2</sub>e.

Apart from barging, PSA SG has expanded its scope of services for JI manufacturers such as Advanced Inventory Management, Transloading, and enhanced digital tracking and tracing of inventory. All these initiatives are developed to address the supply chain pain points of customers, reduce double handling, and uplift overall logistics efficiency.

Such strides towards sustainability underscore PSA SG’s commitment to environmental responsibility and position JI as a trailblazer in forging an eco-friendly supply chain. As industries increasingly prioritise sustainability, adopting greener transport modes like barging emerges as a pivotal step towards achieving Singapore’s vision of a cleaner, greener future. Through collaborative efforts and innovative solutions, JI is poised to emerge as a model of sustainable development, setting the stage for a brighter tomorrow.

Carbon Emissions Savings from Barging





Simultaneous cargo operations and LNG bunkering on NYK's Jasmine Leader.

### **First LNG Bunkering Operations in Pasir Panjang Automobile Terminal (PPAT)**

On 16 August 2023, PSA SG PPAT received NYK's Jasmine Leader which carried out both cargo operations and LNG bunkering simultaneously at Pasir Panjang berth P13.

The bunkering operation was carried out in accordance with Singapore's Technical Reference 56 for LNG Bunkering. This standard is a key part of Maritime and Port Authority of Singapore's framework to ensure safe, reliable, and transparent LNG bunkering operations in Singapore.

This is the first time LNG bunkering was carried out at PSA SG Automobile terminal. This is also the first

time in Southeast Asia that cargo operations were done together with LNG bunkering, for a pure car and truck carrier.

PSA SG, together with NYK, had engaged stakeholders in planning and execution to ensure successful and safe bunkering with no disruption to cargo activities. As the maritime industry strives towards net zero, this collaboration is a testament to the collective dedication to reducing carbon emissions and embracing cleaner alternative fuels.

We are pleased that our Automobile Terminal is progressing in the green journey towards a lower carbon future to support decarbonisation of the maritime industry.



Pure car carrier LNG fueled Jasmine Leader makes her maiden call at PPAT.

## Collaborating with Supply Chain Partners to Orchestrate Cargoes Sustainably

To promote responsible and sustainable business practices, PSA SG has collaborated with supply chain partners, including liners and beneficiary cargo owners, to decarbonise cargo flow.

One such initiative is the orchestration of JI's exports via JI Barging and International Land Sea Trade Corridor (ILSTC). A Beneficial Cargo Owner participated in the freight from Singapore to Chongqing. From its warehouse in JI, PSA SG transferred the containers to its mainland terminals via barging.

The containers were subsequently loaded onto PIL vessels using biofuels and shipped to PSA's Qinzhou terminal in Guangxi. Upon discharge at Qinzhou, the

containers were connected via rail to Chongqing. Compared to traditional barging, the ILSTC Green Corridor is estimated to reduce transit time by more than 50%.

With support from our valued stakeholders and customers, PSA SG strives to move closer to a net zero future by leveraging green initiatives in our respective spheres of influence. With growing demands for emissions visibility due to regulatory requirements for emissions reporting, PSA SG also aims to enhance our capability to provide cargo owners with granular emission visibility to establish the benefits of orchestrating greener supply transport cargo end-to-end.

PSA SG is currently working with key stakeholders on several supply chain routes including Southeast Asia, Intra-Asia, and Asia-Europe.

# Collaboration with a BCO for **Multi-Modal Freight**



Jurong Island Terminal

# Innovation & Technology

Innovation and technology are key enablers of our decarbonisation strategies and are an integral element of our pursuit of sustainability and business success. Through our research and development efforts, we evaluate and adopt suitable innovation and technology solutions for sustainability.

We are thus in a better position to mitigate the environmental impact of our operations and enhance operational efficiency with a reduced carbon footprint.

## Automated Quay Crane (aQC)

In 2023, we successfully developed and implemented a novel 'baton-passing' concept of remote handling over the vessel. Using the aid of high-resolution Light Detection and Ranging, we rolled out the automatic alignment of the spreader to the target container. This reduces the need for remote operators to adjust

the trolley motion, enabling a new remote operator to become proficient within a shorter time frame.

Moving forward, we will continue our push towards sustainable Capability Cycle Time. We seek to enhance the trajectory planning algorithm to achieve an improved automated cycle and enhance the Terminal Operating System to maximise our aQC capabilities.

## Smart Grid Management System & Battery Energy Storage

Powered by artificial intelligence, PSA SG's Smart Grid Management System (SGMS) manages the Battery Energy Storage Systems (BESS). The SGMS intelligently schedules BESS, facilitating optimal market participation and provision for grid ancillary services.



An automated quay crane in operation.



BESS at Pasir Panjang Terminal.

In 2023, our SGMS was deployed successfully. Its functionalities, including energy arbitrage and frequency regulation co-optimisation capability, have been thoroughly verified. Henceforth, we plan to integrate Vanadium Redox Flow BESS (VRFB) into the SGMS. This integration, estimated to be completed by the end of 2024, will allow us to establish a more sustainable, reliable, and cost-effective BESS for market participation and grid ancillary services. The VRFB will be controlled by the SGMS Energy Management System, which is co-developed between PSA SG and Univers, to optimise and automate the orchestration of energy trading and frequency regulation operations.

## OptETruck

As part of our efforts to further digitalise and decarbonise the container trucking industry, PSA SG has launched our proprietary solution – OptETruck

for the haulier community. The solution uses artificial intelligence to facilitate smarter trip planning and eliminate operational inefficiencies. OptETruck has been welcomed by multiple haulier companies who have adopted OptETruck and reduced their empty truck trips by over 50%. In 2023, this translated to an annual reduction of about 10 kilo-tonnes of CO<sub>2</sub> emissions.

Powered by a real-time resource-matching algorithm and predictive modelling, OptETruck's automated scheduling feature ensures optimal resource allocation through efficient route planning across different nodes in the supply chain. Furthermore, OptETruck encourages hauliers and their partners to collaborate and share resources through its asset pooling feature, allowing for further optimisation of fleet management and routes on a broader scale.



PSA SG innovates with OptETruck solution to further digitalise and decarbonise Singapore's haulier sector.

## OptEVoyage

A similar innovation implemented in PSA SG is OptEVoyage, which aims to achieve bunker savings and carbon emission reduction by helping vessels arrive at the port just in time through the digital solution. Throughout 2023, OptEVoyage witnessed substantial growth, doubling to six liners on board. Presently, there are about 90 services under OptEVoyage.

## Horizontal Transport Decarbonisation and Automation

As part of decarbonisation strategy for horizontal transport, PSA SG has successfully trialed six units of electric prime movers (ePMs) for terminal usage, and two units of ePMs for inter-gateway haulage on-road will be commencing trials by Q2 2024. The first unit of Battery Charging and Swapping Station (BCSS) was constructed at PPT and will undergo tests and commissioning in 2024.

There are plans to progressively onboard more ePMs, with a target of up to 700 units of ePMs by 2030, aligned with fleet renewal strategies.

In 2024, there is a hydrogen prime mover on the proof-of-concept (POC) trial planned at Pasir Panjang Terminal. As part of the POC, a Dehydrogenation Plant has been installed along with building a Hydrogen Refuelling Station. With zero emissions, the successful implementation of the POC will bring PSA SG closer to our emissions targets.

To augment our productivity further, autonomous prime movers (aPM) were also deployed for driverless yard operations in Dec 2023 after a series of trials and validation.

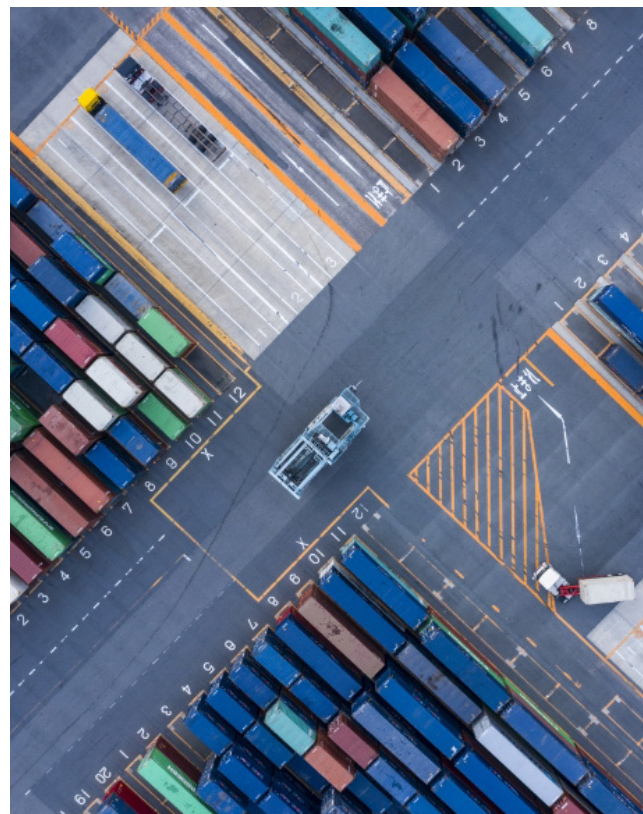
In 2023, PSA SG continued its collaboration with industry partners and Institutes of Higher Learning to co-develop automation solutions for wharf and vessel side activities.

On the wharf side, we have embarked on projects such as the development of a robotic platform to facilitate automated coning and de-coning operations on the Double-Trolley Quay Crane lashing platform at Tuas Port and field trials for Autonomous Mobile Robots with universal Gripper Technology. For vessel automation projects, field trials were done to assess the functionality of a robotic prototype integrated with a Quay Crane spreader to automatically unlock twist locks onboard vessel. Smart lock designs are also being developed to minimise manpower intensive lashing activities onboard vessels.

### **Predictive Maintenance & Equipment Data Analytics**

In 2023, we used predictive maintenance to transition to a data-driven maintenance methodology. It was achieved via anomaly detection in crane systems, enhancing maintenance efficiency and effectiveness, optimising crane performance, and enabling timely component replacement to maximise useful life. We have completed the proliferation for PPT 2-6 QCs and PPT 4-6 aRMGs (Automated rail-mounted gantry crane).

We will continue the proliferation of capabilities to Tuas aRMG in 2024. We are currently collaborating with the NUS Centre of Excellence in Modelling and Simulation for Next Generation Ports (C4NGP) for Predictive Maintenance for QC's (Quay Crane) Hoist System. The solution, which includes additional sensors and data acquisition software, is designed to predict catastrophic failures that are complex to model given their rare occurrence. Successful modelling to predict catastrophic failures in QC's hoist system highly impacts our operations. This collaboration is expected to be completed by 2024.



Enhancing efficiency with iWMS: PSA SG implements advanced Warehouse Management System for streamlined operations.

### **Intelligent Warehouse Management System (iWMS)**

To streamline our processes and further improve our productivity, we have implemented iWMS, a Warehouse Management System designed to enhance the management of Engineering spare parts within PSA SG Engineering warehouses.

With authenticated individual user login into iWMS, there is better accountability and traceability for each transaction, now handled digitally and eliminating the need for hardcopy printouts. This saves 700 – 800 pieces of printing and paper in a month. Integrated with an existing system, the overall inventory status is automatically updated with the completion of each iWMS transaction. The productivity improvements result in more than 1,000 man-hours saved each month.

100



# People **Development**

At PSA, enabling our people to achieve their fullest potential is pivotal to our continued success.

Recognising the rapidly evolving landscape, PSA SG envisions our workforce to be agile and resilient, adeptly navigating through change and embracing lifelong learning. We prioritise and are committed to the development of a future-ready workforce underscored by a strong commitment towards nurturing a supportive culture that encourages reskilling and continuous innovation.

## **Building Future-Ready Capabilities**

A future-ready workforce is one where its employees are well-equipped with the relevant knowledge and skills to tackle imminent challenges. With the fast pace of transformation, continuous learning is important to remain updated with the latest developments. Hence, to support our workforce's development, we promote a lifelong learning environment among our employees and continue to dedicate time and resources to enable our employees to realise their full potential.

Aligning with its holistic development framework, PSA SG actively supports its employees in their professional development and growth. In 2023, we saw the third cohort of 12 participants graduate from PSA University's Work-Study Diploma in Port Automation Technology (WSDIP-PAT). This programme was first launched in 2019 and jointly developed with PSA University, PSA SG, and Singapore's Institute of Technical Education. Participants are equipped with fundamental skills and knowledge in automation and smart technology. Graduates of the programme would be able to handle the new automated equipment and systems, particularly in Tuas Port.

PSA SG leverages diverse platforms, from structured courses to external resources, coaching, and mobile app-enabled learning, to deliver comprehensive training in key emerging fields such as artificial intelligence, robotics, digitalisation, IT, cybersecurity, and sustainability. This approach ensures our people are equipped with the latest skills and knowledge critical for driving innovation and maintaining competitive advantage in today's rapidly evolving business landscape.



2023's graduating batch from PSA University's Work-Study Diploma in Port Automation Technology.

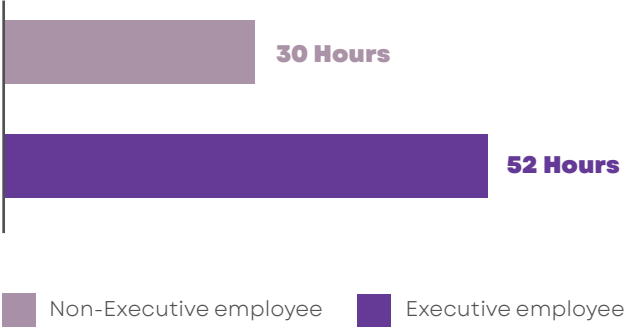
In 2023, our ‘Sustainability – Greenfish Climate Action Lite’ e-learning module was launched to provide frontline employees with a basic appreciation of the impact of climate change, PSA SG’s green efforts and initiatives, and ways to support these efforts through the choices we make.

A firm believer in lifelong learning, PSA SG also champions self-directed development and supports its employees through the ongoing Lifelong Learning Fund and Self-Development Scheme. These initiatives empower employees to chart their learning journey, enabling continuous growth and professional advancement.

PSA SG also participates in the group-wide initiative TalentTech 4.0 (TT4.0), a digital platform that acts as a central hub, offering a wealth of projects, mentorship opportunities, and learning resources across the entire PSA network. In 2023, we continue to cascade the initiative to senior officers globally. Through this, we seek to build greater organisational agility towards a more diverse and

innovative global workforce and promote talent and skills transformation with additional development opportunities for employees’ career growth.

Average number of training hours by employee category in 2023



**Target**  
80% of PSA SG employees to achieve at least 16 training hours per year

**Outcome**  
94% of PSA SG employees achieved at least 16 training hours in 2023



POU Professional Development Seminar 2023.

## Empowering Our Workforce for Innovation, Transformation & Agility

Since 2016, PSA SG has laid a robust foundation to grow our innovative spirit through our Innovate@SEA committee. In 2023, a campaign called 'INnovate IN Me' was launched through a series of events and activities specially curated to ignite, inspire and integrate ideas across the PSA family. Employees were invited to a spectrum of immersive experiences from workshops and learning journeys hosted by industry leaders, all leading to the annual PSA SEA InnoFest. Engaging employees across the SEA region, these programmes strengthened our innovative DNA, which is essential for driving service excellence and pioneering new ways of working.

As PSA SG pushes forward in its technological innovations, our employees' capabilities are enhanced through ongoing reskilling and upskilling programmes. Since the operationalisation of Tuas Port in September 2022, PSA SG has successfully transitioned more than 800 employees to take on new roles and they had acquired new skills and competencies in a new work environment and are now part of the pioneer team orchestrating the port's automated operations.



Supporting our employees' journey of continuous learning and growth.

## Growing Leaders & the People Developer Culture

PSA SG continues to hold workshops to equip leaders with relevant skillsets to conduct effective performance appraisals and career conversations with employees. Transition training programmes are also in place for those promoted to new leadership positions across all levels.

Through corporate and divisional mentoring programmes, employees are provided with additional guidance in their professional and career growth.

\*Percentage of Employees who received performance and career development review (%)

Executive	<b>100</b>
Non-Executive	<b>100</b>

Managers and leaders are supported well in their roles as mentors through the availability of training and reference materials such as mentoring kits. Roadmaps for young talent development are also refined to ensure they keep pace with evolving business demands on future leaders.

\*Note: All staff are required to complete an annual performance appraisal, except for employees who are away on long leave due to unforeseen reasons, employees who have resigned, or new hires who are under probation. New hires will undergo performance reviews upon completion of their probation.

## Growing Global Mobility

PSA SG recognises the importance of harnessing global synergies and growing global mobility as we continuously expand our global network and portfolio.

PSA SG actively participates in the group-wide talent development programme, STRIDE (Short-Term International Development Experience), to enable its talents to glean global perspectives for development, broaden horizons and networks, and contribute to valuable business projects across the Group.

In 2023, PSA SG hosted STRIDE participants from other business units/regions, which harnessed diversity and facilitated the exchange of ideas and best practices, and contributed to the development of global talents. Through the STRIDE programme, we seek to nurture global mindsets and groom talents who embrace and harness diversity, as we shape the future as 'One PSA'.

We also leverage on a range of short-term attachments to broaden perspectives and strengthen the cross-cultural acumen of its talents. Developmental roles in customer-fronting

units within PSA SG and SEA business units were created for potential officers to grow their business competencies.

In 2023, PSA also introduced the Global Management Associate Programme as part of its efforts to enhance leadership potential and global mobility skills for career growth.

## Growing Our Talent Pipeline

As a global leader in the ports and terminals industry, PSA SG remains committed to building the talent pipeline and nurturing the next generation of maritime leaders. It strives to offer more insights into the maritime industry and has partnered with relevant clubs and societies at universities to host learning journeys and fireside chats with PSA leaders, as well as continuing to collaborate with institutions such as the Singapore Maritime Foundation and MOE-SgIS to share career stories and articles.

PSA SG also organised its signature hackathon - PSA Code Sprint 2023, providing the student participants with the opportunity to network and propose solutions to resolve business issues. It has also worked with selected junior colleges to offer work attachment programmes that enable them to experience working life and connect with others.



Participants at PSA Code Sprint 2023.

# Occupational **Health**



A huge turnout at PSA SG Health Roadshow 2023.



Bouldering – a sport for everyone.

Maintaining a healthy workforce is an integral part of ensuring the success of all companies, including PSA SG. A healthy work environment can boost productivity and enhance employees' performance which increases the overall morale of the organisation.

At PSA SG, we are committed to ensuring both the physical and mental well-being of our people by instilling a culture of wellness in our workplace. This is achieved by providing our staff and solution partners with a range of tools and initiatives that support them in taking charge of their health.

Throughout 2023, PSA SG offered a variety of health and wellness programmes for our employees, including physical and mental health talks, monthly fitness workout sessions, regular mental wellness workshops, and health challenges, along with health coaching and screening events, collectively registering over 4,000 participants.

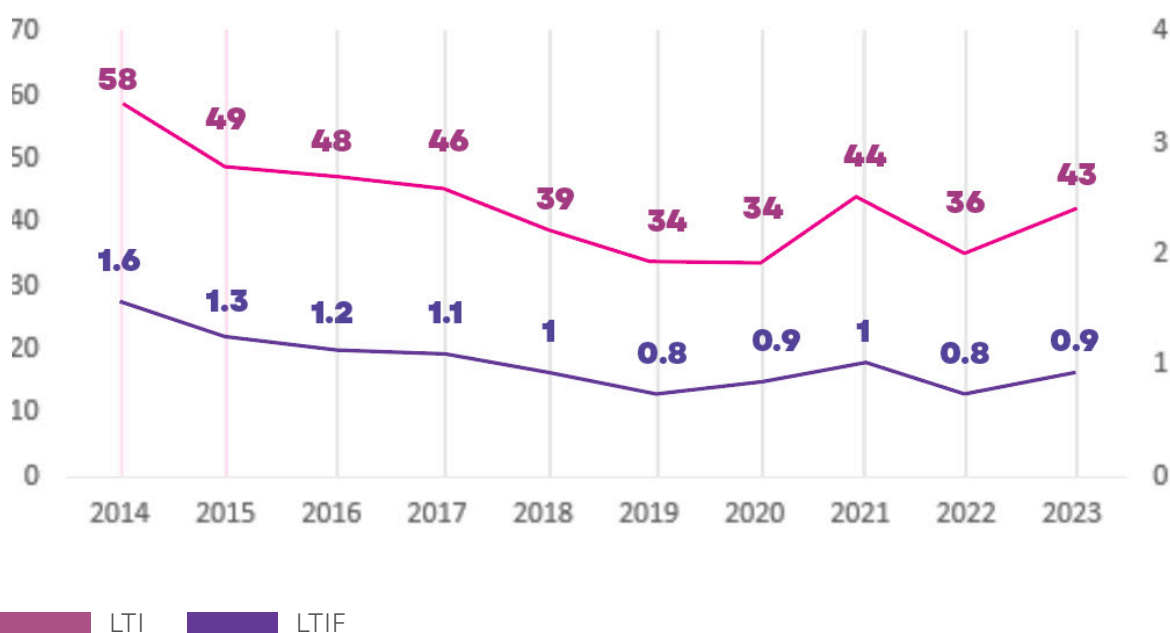
# Safety

## Reinforcing Our Commitment to Safety

Heavy machinery, equipment, and transportation vehicles are involved in daily port operations. These can pose significant safety risks to our people if not effectively managed. Hence, a strong safety culture with robust practices is crucial in preventing accidents and protecting human lives and assets. It is also an integral aspect of sustaining port operations by complying with regulations and safeguarding the trust and confidence of stakeholders.

PSA SG remains dedicated and committed to fostering a strong safety culture across the organisation. Robust safety programmes are implemented and continuously improved to enhance training, procedures, and holistic safety protocols. Leveraging technology and data, and open communication, all at PSA SG are encouraged to report any potential safety hazards. With collaboration with the Institutes of Higher Learning, behavioural safety aspects of staff and solution partners are further improved to create an even safer work environment for all.

### LTI and LTIF Performance 2014-2023



PSA SG Loss Time Injury (LTI)\* and Loss Time Injury Frequency (LTIF)\* Performance from 2014 to 2023.

\*Loss Time Injury (LTI) refers to the number of injury cases.

\*\*Loss Time Injury Frequency (LTIF) refers to the number of injuries per 1,000,000 man-hours.



Participants of Starfish Safety Workshop.

	Employees	Contractors
No. of fatalities	0	2
Rate of fatalities as a result of work-related injury*	0	0.08
No. of high-consequence work-related injuries**	0	0
Rate of high-consequence work-related injuries***	0	0
No. of recordable work-related injuries****	22	21
Rate of recordable work-related injuries*****	0.95	0.8
No. of occupational disease incidents	0	0

PSA SG saw an increase in safety-related incidents in 2023 over 2022. There were also 2 incidents involving our solution partners. All incidents were thoroughly investigated to identify the root causes for immediate and effective rectifications with preventive measures put in place.

Learnings from these incidents were shared throughout the organisation and with solution partners to raise awareness and prevent recurrence.

\*Rate of Fatalities = No. of Fatalities per 1,000,000 hours worked.

\*\*High-consequence work-related injuries, work-related injury that results in a fatality or in an injury from which the worker cannot, does not, or is not expected to recover fully to pre-injury health status within 6 months.

\*\*\*Rate of High-consequence work-related injuries = No. of High-consequence injuries per 1,000,000 hours worked.

\*\*\*\*Recordable work-related injury or ill-health, that results in any of the following: death, days away from work, restricted work or transfer to another job, medical treatment beyond first aid, or loss of consciousness; or significant injury or ill health diagnosed by a physician or other licensed healthcare professional even if it does not result in death, days away from work, restricted work or job transfer, medical treatment beyond first aid, or loss of consciousness.

\*\*\*\*\*Rate of Recordable work-related injury = No. of work-related injury per 1,000,000 hours worked.

# Stronger Together



HSSS Launch 2023.

PSA SG collaborates and continuously engages with various groups to improve team culture and influence positive thinking to enhance team performance and wellbeing.

## Health, Safety, Security and Sustainability (HSSS) Week

The 2023 HSSS Week was kick-started with the HSSS Launch, which aims to raise awareness and encourage staff and solution providers to practice and uphold HSSS values both, at work and in their daily lives. Throughout the week, participants were engaged in various educational activities. These included talks related to nutrition and the dangers of vaping, conducted by the Health Promotion Board, and demonstrations on how to perform cardiopulmonary resuscitation and use the automated external defibrillator.

Beyond educational workshops, participants were also encouraged to maintain both - their mental and physical health through other activities. The Mental Health Experiential Workshop was a platform for

participants to unleash their creativity through tote bag painting activities while participants exercised together during workout sessions. To reinforce the Management's commitment to HSSS, the management union led a safety walkabout. A total of 14 cross-functional teams were formed to engage the staff and solution providers to emphasise the importance of valuing lives, practising the TAKE5+ principles, working towards Healthy Longevity, and encouraging everyone to do their part for the environment and our port's security.

Preventive health measures and taking proactive steps towards maintaining health and well-being are integral in ensuring the well-being of our employees. Hence, as a part of the 2023 HSSS Week at PSA SG, our employees were given opportunities to monitor their health through our sponsored health screening sessions. The health screening sessions include height, weight and body mass index measurements, blood pressure readings, and blood glucose checks. Each participant received an individualised report, allowing them to take ownership of keeping track of their health.

## Starfish Safety Workshop

The Starfish Safety Workshop involves training PSA SG's Operational and Engineering staff and our solution partners to improve our safety culture. Focused on the four FISH! Principles (i.e. Choose



Participants involved in HSSS Launch as part of 2023 HSSS Week.



Tote Bag Painting Activity as part of Mental Health Experiential Workshop.

Your Attitude, Make Their Day, Be There, and Play)), the workshop seamlessly integrates FISH! principles with safety elements in its curriculum.

In the first segment, 'Choose Your Attitude,' participants delve into applying Take5+ principles, PSA SG's hazard identification tool, and gain insights from colleagues across different job functions on accident prevention.



PSA SG's hazard identification tool, adopted by all employees and solution partners.

For the second segment of 'Make Their Day', participants engage in reflective activities, sharing instances where someone positively impacted their workday and vice versa.

The third segment, 'Be There', encourages group discussions on the lessons learned from past accidents, fostering a collective understanding of safety protocols.

Lastly, the fourth segment of 'Play', immerses participants into interactive role-playing activities. Using props, scenarios are re-enacted to illustrate both the negative and positive responses to case studies, reinforcing the practical safety measures dynamically.

Since its inauguration in 2018, 5,461 PSA staff and 742 solution partners' staff have attended the workshop.

# Awards and Recognition



PSA SG received the Gold and Silver Awards at the Workplace Safety and Health (WSH) Innovation Awards.

## Workplace Safety and Health (WSH) Innovation Awards for Logistics and Transport Sector 2023

PSA SG clinched the Gold and Silver Awards at the Workplace Safety and Health (WSH) Innovation Awards for Logistics and Transport Sector 2023 for two projects – ‘Automated handling of Hauliers and Inter Gateway Haulage Prime Movers with Video Analytics’ and ‘Video Analytics and Electric OverHeight Frames Wireless Recovery’ respectively.

## Singapore Road Safety Awards (SRSA) 2023

PSA SG and one of our staff, Mr Chai Suk Yung, from the Prime Mover Resource Department (PRMD), were recognised at the SRSA 2023 organised by the Singapore Road Safety Council (SRSC). PSA SG received the Merit Award and Mr Chai Suk Yung the Safe Driver Excellence Award in the Heavy Goods Vehicle Category. SRSA is a joint effort between SRSC, Traffic Police, Land Transport Authority and WSH Council to recognise exemplary companies



Awards for Logistics and Transport Sector.

and company drivers for their effort to conscientiously work towards keeping the roads safe.

# Green Port Culture



Gardening basics for growing edible plants workshop.

At PSA SG, we believe that investing in a generative culture is not just the right thing to do but, it is also a smart business decision. Green Port Culture supports PSA SG's values of 'Focused on People' and 'Responsible Corporate Citizenship'.

Through the varied pathways, Green Port Culture seeks to enable, empower, and equip our staff and the community to put on a sustainability lens at work and personal fronts. Through our engagement initiatives, we seek to build a more connected community, an engaged workforce, and a future-proofed company ready to tackle sustainability challenges ahead. We believe that everybody makes a difference.

## Empower and Equip

To foster a company-wide awareness of sustainability topics, we have created a diverse portfolio of engagement activities, including briefings, talks, workshops, training courses, and e-publications.

## Environmental Sustainability Management Course

As a part of our Climate Action Education initiative, we launched the 'Environmental Sustainability Management' course in 2021. This one-day competency training programme is designed for PSA SG's departmental and section managers. The objective is to foster a culture and mindset aligned with global, national, and organisational goals supporting environmental sustainability and management. The course explores the UN SDGs and their connection to PSA SG and Singapore's sustainability efforts. Participants gain a comprehensive understanding of topics related to the environment, learn about PSA SG's sustainability strategy, and develop skills to manage environmental impacts within legal frameworks.

In 2022, we have extended the programme to deputy managers. Since the course's inception, over 700 colleagues have been trained, with more than 200 deputy section managers and above attending this one-day workshop.

## Green Port Conversation Series

Launched in 2020, the Green Port Conversation Series is a platform for industry thought leaders to share their expertise on critical sustainability topics. This forward-looking initiative promotes knowledge exchange and inspires innovative solutions. For instance, during HSSS Week 2023, the series hosted a webinar on 'Singapore's Energy Outlook: Challenges and Opportunities', featuring Mr. Li Zhenhui, Chief Economist of Energy Market Company, a wholly owned subsidiary of SGX. More than 100 participants attended the webinar.

## Environmental Activists Training

Additionally, we provided a one-day competency training programme for environmental activists available to all colleagues during PSA SG's Go Green Month in September, empowering over 200 staff members to date.



Environmental Activists Training session.



## Greenfish Climate Action (Lite) E-learning Programme

Our comprehensive 'Empowering Action' e-learning program equips frontline staff with the knowledge and motivation to become active participants in climate change solutions. This engaging 4-hour program delves into the history and science of climate change, explores the global action agenda, and empowers individuals to understand their role. It goes beyond awareness, encouraging participants to shift their perspective, see opportunity in the challenges, and rethink daily habits to minimise environmental impact. By fostering a culture of personal responsibility for sustainability, this program empowers our staff to drive positive change both within PSA and beyond.

Demonstrating our commitment to a well-informed workforce, over 4,400 frontline colleagues had completed the programme by the end of 2023. We are on track to train all 6,700 frontline staff by 2024.

As part of Greenfish II e-Learning, PSA SG plans to roll out a dedicated 2-hour e-learning program for executives in 2024. This programme aims to deepen their understanding of renewable energy options and showcase the efforts undertaken by our global business units to adopt these solutions. It will also delve into Scope 3 emissions, emphasising the importance of measurement and management strategies for a comprehensive approach to sustainability.

## Greenfish Sustainability Mobile App

In 2022, we launched the Greenfish Sustainability Mobile App (Greenfish App) to enhance the accessibility of engagement and ease of communication with our employees on sustainability topics.

Following the success of the 'Greenfish - Everybody Makes a Difference' campaign in 2022, Phase two of the Greenfish App was launched in 2023. 80% of PSA SG staff use the latest version of the app which introduces several new features.

Firstly, an in-app game called 'Recycle and Bin Right' educates users about recyclable items in different Singapore channels through gamification. Secondly, a 'Resources' section that promotes learning about sustainability topics at the user's own pace. Lastly, a carbon footprint calculator that allows users to compare the carbon footprint of items and make informed decisions.

In conjunction with the launch of the Greenfish App, two three-month-long 'Everybody Makes a Difference Movement' campaigns were conducted (from May to July and from September to November)\*, offering its users various opportunities to earn Greenfish credits both in-app and out-of-app.

Users can accumulate Greenfish credits through activities such as reading in-app articles, watching in-app videos, participating in quizzes, making pledges, attending sustainability-themed workshops, courses, and learning journeys, volunteering for Go Green CSR activities and playing the in-app game 'Recycle and Bin Right'.

During each campaign cycle, two lucky draws were held for users who have achieved a predetermined baseline. Users with at least 100 Greenfish credits at the end of each campaign receive grocery vouchers to encourage them to continue practising sustainability in their daily lives. For qualified users with PSA's email, e-vouchers were sent to them via email.



\* An early phase of 'Greenfish - Everybody Makes a Difference' campaign was launched in 2022 to encourage staff to adopt and embrace environmentally friendly habits as part of their lifestyle and contribute to PSA SG's sustainability efforts.

## Go Green Corporate Social Responsibility (CSR) and Green Partnerships

Launched in 2021, the Go Green CSR initiative aims to empower our CSR partners, their beneficiaries, and the broader community to embrace sustainability. This goal is achieved through a range of events and educational workshops specifically designed for our diverse partners and their beneficiaries.

As a responsible corporate citizen, we are committed to uplifting and positively impacting communities, working together to build a stronger nation for our children and future generations. In 2023, we recorded 585 volunteering hours for Go Green CSR.



Indoor gardening workshop with our PSA SG employees.

### Green Nation Pledge

In 2023, PSA SG participated in The Green Nation Pledge which is supported by Singapore's Ministry of Sustainability and the Environment. It encourages individuals, educational institutions, and corporates to pledge to take action for a green, liveable and climate-resilient Singapore.

As a corporate entity, PSA SG could choose a pledge category that best describes what we are prepared to do: Contributor, Advocate and Champion. Adhering to our commitment to sustainable practices and operations, PSA SG pledged in the most ambitious category - the Champion category. Our PSA SG staff also submitted individual pledges, outlining their commitments to sustainability.





PSA SG volunteers planted, harvested and donated 70kg of produce to St Luke's ElderCare.

### Workshops in Collaboration with NParks

In alignment with Earth Day, gardening workshops were organised for our PSA SG staff. This included an indoor gardening workshop, as well as a workshop on gardening basics for growing edible plants for our colleagues located in Tanjong Pagar Complex, which recently started their rooftop garden.

Both workshops include a hands-on session where the participants re-potted cuttings generously provided by NParks.



Waterway clean-ups by staff volunteers and beneficiaries.

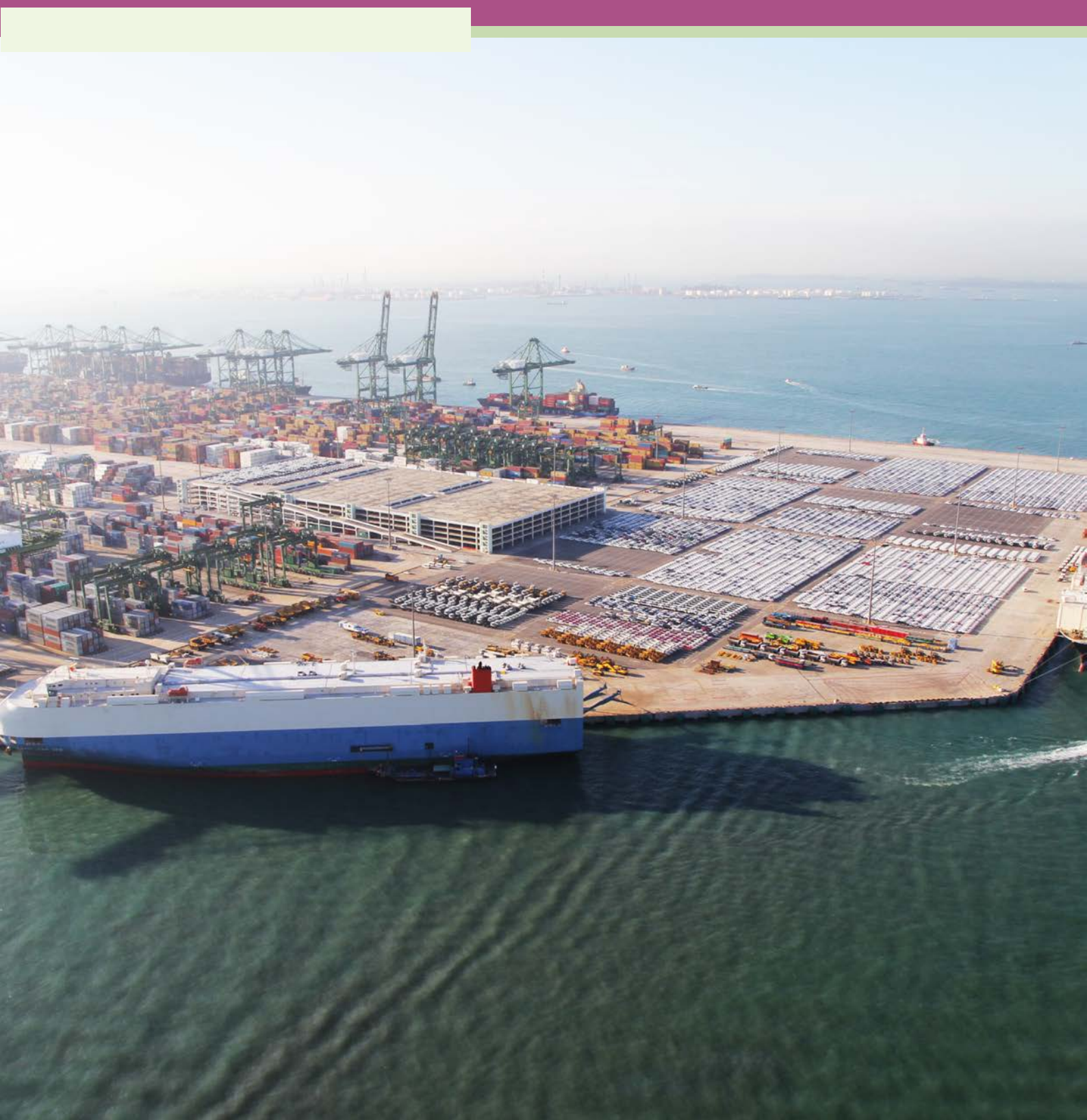
### Singapore World Water Day 2023

In support of Singapore World Water Day 2023, PSA SG turned the corporate logo on our website blue to signify our commitment towards water sustainability. We also organised two waterway clean-ups involving staff volunteers and beneficiaries from our community partners – Gracehaven and The Haven. Such collective and collaborative efforts not only removed 150 kg of trash from the waterway but also provided a valuable learning experience.

Participants gained insights into Singapore's unique water story, specifically the closed-loop system, and the critical role of keeping our waterways free of litter.



# Ensuring **Responsible Operations**



# Sustainable **Port Development**

Acknowledging our responsibility towards the environment and society, PSA SG has executed various initiatives to integrate sustainable practices across our planning and operations to manage and minimise impacts.

As PSA SG strives for a more sustainable future, it is pivotal to ensure the resilience and sustainability of our infrastructure. To effectively mitigate and address environmental impacts stemming from land development and reclamation activities, environmental considerations are integrated into the planning, design and development of our port infrastructure and operations. We continue to stay abreast of the latest sustainability trends and best practices while ensuring operational and economic resilience.

## Tuas Port

In September 2022, the first phase of Tuas Port was officially opened. The development of the Tuas Port will span over four phases and is expected

to be completed in the 2040s. Sustainability is integral to the construction of Tuas Port. With cement manufacturing responsible for up to 8%\* of global GHG emissions, PSA SG considers reduction strategies for embodied carbon emissions from the onset of our developments.

Adhering to PSA's standard in civil construction, green concrete is used in constructing berths and yards. This concrete uses Portland Blast Furnace Cement (PBFC), comprising 80% Ground Granulated Blast-Furnace Slag (GGBFS) and 20% Ordinary Portland Cement (OPC). By incorporating GGBFS into Green Concrete, we have reduced carbon emissions and embodied carbon within the built environment by more than 77% compared to standard cement. It is estimated that using PBFC for Tuas Port will result in a carbon saving of 1.4 million tonnes of CO<sub>2</sub>e for all four phases of development.

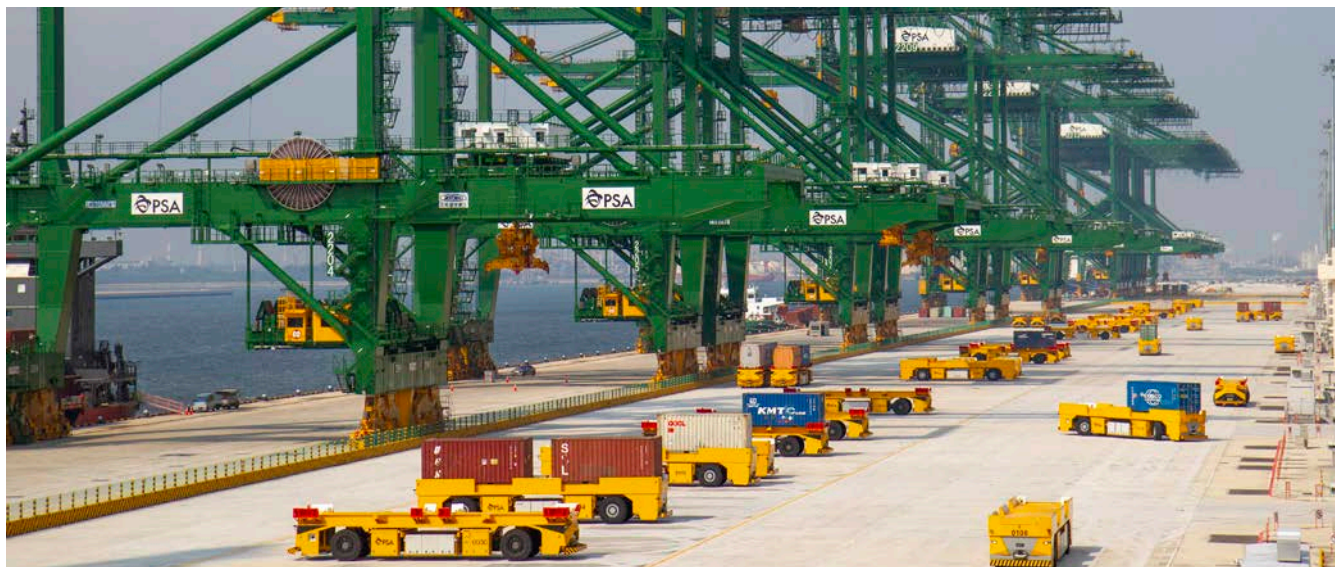
## Recycled Concrete Aggregate

At the Tuas Port development site, a concrete recycling facility has been established to recycle salvaged concrete. Salvaged concrete includes cut-off sections from reinforced concrete piles used for foundation or caissons from berth construction. This recycling initiative forms part of our commitment to fostering an environmentally conscious and sustainable development approach for Tuas Port. In 2023, a total of 17,500 tonnes of concrete has been recycled and processed. To date, close to 90,000 tonnes of concrete have been recycled and processed since 2019.

\* <https://gccassociation.org/key-facts/>



Tuas Port handled 1 Mil TEU Containers in February 2023.



Automated Guided Vehicles (AGVs) at Tuas Port: Enhancing efficiency and sustainability in port operations.

## Flexible Green Concrete ConFlexPave

In 2023, PSA SG commenced a three-year joint proof-of-concept (POC) study on flexible green concrete, ConFlexPave, with an Institute of Higher Learning. Carbon-negative minerals derived from the carbonation of local reject brine or waste concrete sludge were used as fillers. In addition to the use of Ground Granulated Blast-Furnace Slag (GGBFS) as cement replacement, Limestone Calcinced Clay Cement (LC3) from our local Marine Clay can also be used to replace Ordinary Portland Cement (OPC) in the ConFlexPave mix.

Findings from the Life Cycle Assessment and Life Cycle Costing show that, in comparison to standard Concrete Pavement and Hot Mix Asphalt, ConflexPave concrete is thinner, stronger, and flexible, and it can reduce GHG emissions. ConflexPave could also potentially reduce construction and rehabilitation costs by approximately 33% and 40%, respectively.

Following this, the next development phase will involve a comparative study to examine the strength and durability of the concrete, as well as the feasibility of ConFlexPave as an alternative material to steel reinforcement concrete.

## PSA Supply Chain Hub @ Tuas

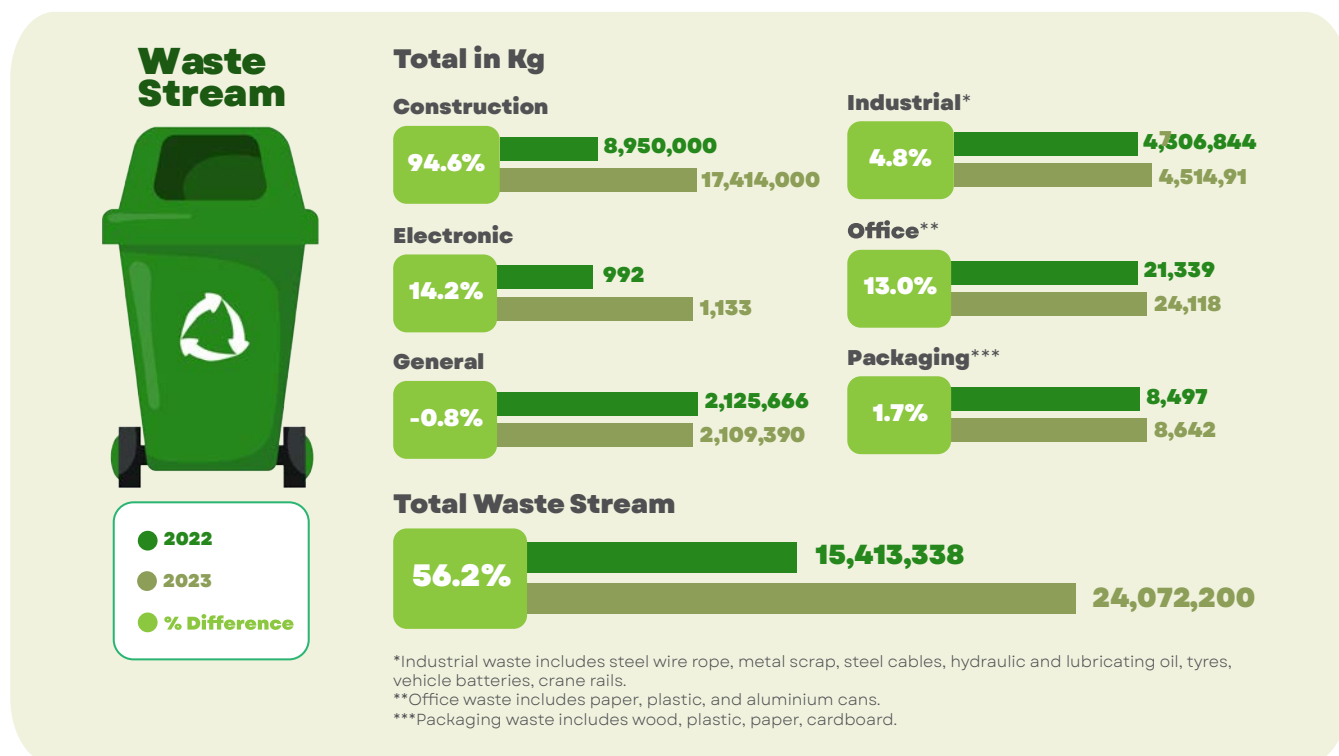
All PSA SG's new buildings are designed and built to be smart and green. With Tuas Port Maintenance Base being PSA SG's first super low energy building (SLEB), PSA SG is planning the second SLEB.

PSA Supply Chain Hub @ Tuas is PSA SG's next-gen warehouse and is designed to attain Platinum Super Low Energy Building status with Whole Life Carbon Badge\* and Maintainability Badge\*\*. PSA Supply Chain Hub @ Tuas is expected to consume up to 80% less electricity annually compared to other similar-sized buildings.

\*The Whole Life Carbon section looks at a project's carbon footprint, focusing on embodied carbon, the use of sustainable construction or retrofit materials and methods, as well as the role of tenants and their fit-outs. The section will also evaluate building owners on their transition towards carbon neutrality at the asset level, translating the corporate objectives into tangible outcomes, as well as their support for tenants to do the same.

\*\*The Maintainability section looks at the design for maintainability and the use of smart Facilities Management Technologies to ensure resource-efficient maintenance regimes in buildings; hence facilitating many of the sustainable outcomes desired within the built environment.

# Waste Management and Recycling



In 2023, 24,072,200 kg of waste were recorded, with construction waste contributing the highest increase compared to the previous year. This is due to the corresponding increase in construction activity for Tuas Port's berths. The Tuas Port development is slated for completion in the 2040s.

We strive to align our waste management approach with Singapore's Zero Waste Masterplan of a sustainable, resource-efficient, and climate-resilient nation. As part of PSA SG's commitment to minimise our environmental footprint, we adopt a multi-pronged approach to manage waste and optimise the use of resources guided by the principles of Reduce, Reuse and Recycle Right.

## Minimising Materials and Waste

The waste generated can be broadly categorised into two streams: General and industrial waste. General waste arises from activities in the corporate headquarters and terminal buildings, whilst industrial waste is from the construction and renovation activities, as well as the repair and maintenance of our fleet of Container Handling Equipment.



The opening of Recycling Hub during PSA SG Go Green Month.

General waste is collected and managed by general waste collectors licensed by the National Environment Agency. The waste is either sent directly to an incineration plant or a material recovery facility for further sorting and destruction. The weight of general waste and recyclable waste streams are recorded by licensed waste collectors.

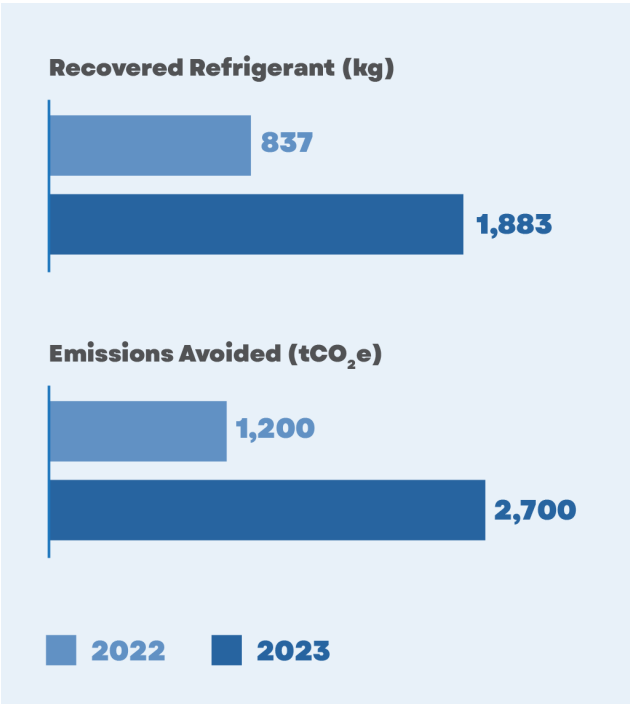
In 2023, the total amount of general waste has shown a slight decrease of about 0.8%. As an organisation, we hope to decrease the amount of general waste produced in our business operations by adopting circularity measures and diverting general waste away from disposal.

Industrial waste which increased by 4.8% in 2023, is collected and disposed of by licensed terminal contractors. The waste is either sent directly to an incineration plant or a material recovery facility for further sorting and destruction.

Use of Reclaimed Refrigerant

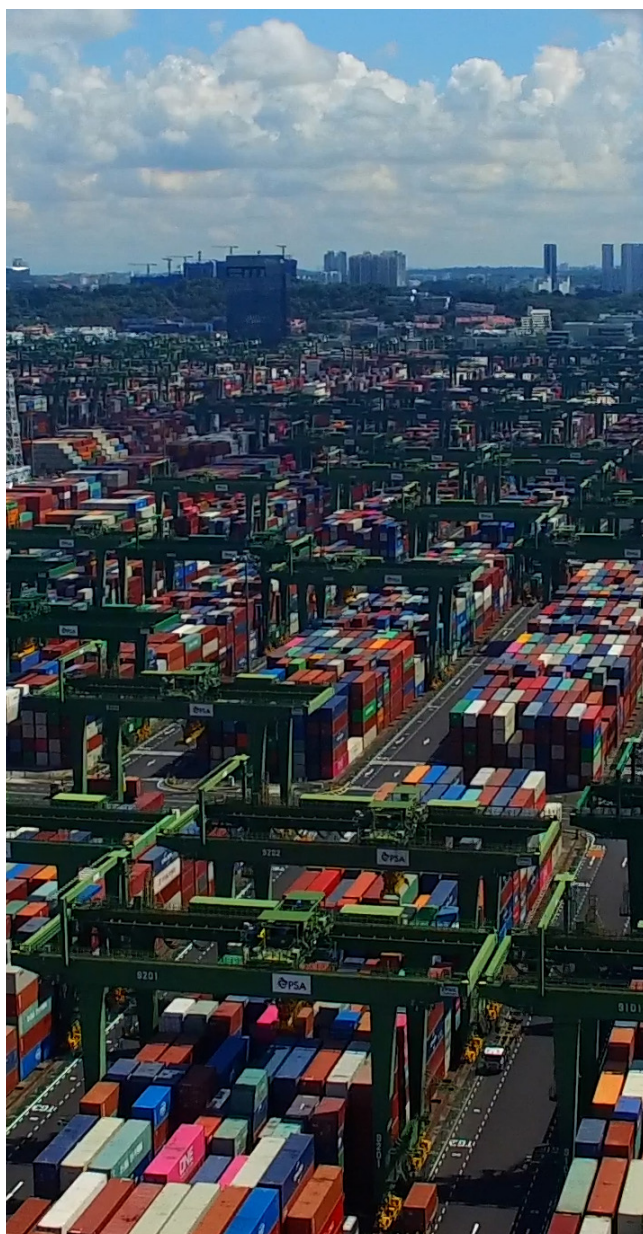
In July 2022, following a successful trial, PSA SG commenced the recovery of refrigerant, typically released during laden reefer repairs. The recovered refrigerant is then sent for reclamation and certified to meet refrigerant AHRI 700 Standard before it is pumped into the laden reefers. Up to 94% of released refrigerant is recovered.

In 2023, 837 kg of refrigerant was recovered, avoiding 1,200 tCO<sub>2</sub>e from being released into the atmosphere. Since July 2022, 3,013 kg of refrigerant was recovered, avoiding 4,309 tCO<sub>2</sub>e from being released.



## Adopting Circular Economy

In a traditional linear economy model, characterised by the 'take, make, throw' approach, there is a risk of overlooking the potential second life value of finite resources. To complement our existing recycling initiatives, we are actively seeking to engage industry partners to explore technology and innovation such as waste valorisation as we transit towards a circular economy. This would, in turn, support Singapore's efforts to extend Semakau Landfill's lifespan beyond 2035. In 2023, PSA SG continued implementing various waste reduction and recycling initiatives to spread awareness amongst employees. A recycling



hub is set up at Pasir Panjang Terminal Building 3 Level 3 to promote recycling habits among employees. This hub facilitates the recycling of various materials including aluminium cans, e-waste, paper, plastic bottles, and textiles. This year, we also organised two e-waste recycling drives, during which nearly one tonne of e-waste was collected. The campaigns ran for over three months from November 2022 to January 2023 at Pasir Panjang Terminal, and over one month in April 2023 at Tanjong Pagar Complex.

Building on the recycling initiatives which took place in 2023, the next phase will focus on extracting the value of waste through waste valorisation efforts, particularly by repurposing materials like rubber tyres and wood. We are forging partnerships with local service providers to repurpose used tyres from our fleet of trailers locally. Although retreading extends the lifespan of tyres, over 100 tonnes of rubber tyres still become unusable each month and are typically sent abroad for reclaiming, recycling and repurposing. Local valorisation efforts could potentially reduce carbon emissions and benefit the local economy. Similar efforts are being made for wood pallets.

In addition to waste valorisation, we are improving the upstream process through green procurement efforts like choosing HDPE over ABS for safety helmets, which will facilitate downstream recycling efforts.

## Joint Study on Recycling Liner Waste

In 2023, PSA SG collaborated with value chain partners to explore recycling liner waste such as paper, plastics, and metal cans. Around 30m<sup>3</sup> of material was collected from October to December 2023 for recycling. In the subsequent phases, the collaboration will be widened to include more stakeholders to work towards reducing maritime waste through local valorisation.

# Water Use and Pollution

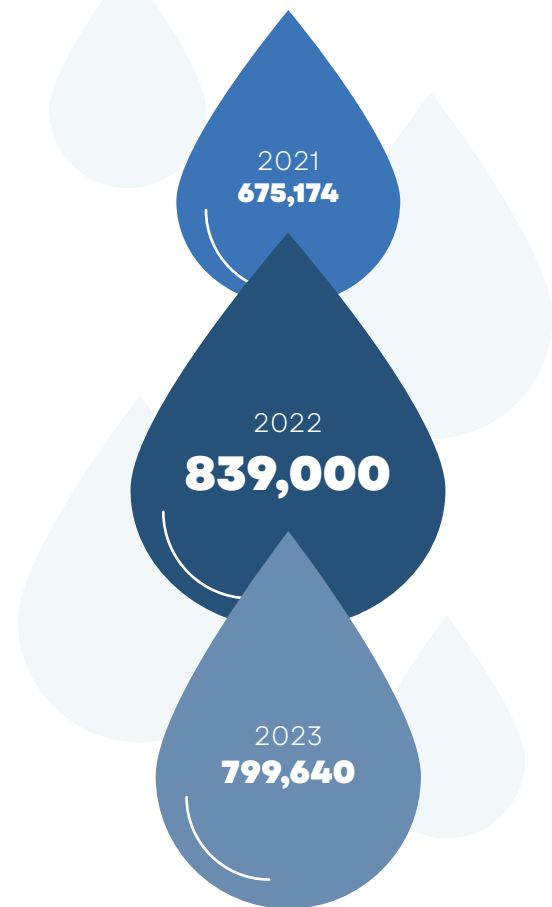
Water is a precious and scarce resource in Singapore. Singapore adopts a holistic approach to water management by establishing a 'closed loop' across the entire water cycle. This approach includes collecting and purifying rainwater, treating, and reclaiming used water into NEWater and desalinating seawater.

In line with PUB's approach, we are committed to sustainably managing our water through a three-pronged approach of efficient water usage, water conservation efforts and responsible management of wastewater discharge. Within our corporate headquarters and terminal buildings, PSA SG draws both potable and NEWater (for non-potable use) for building operations and maintenance activities, such as cooling towers, toilets, pantries, water features, irrigation and washing activities. At our construction sites, potable water is primarily utilised for sanitation purposes.

Overall, the total water consumption decreased by about 4.7% in 2023, from 839,000m<sup>3</sup> in 2022 to 799,640m<sup>3</sup> in 2023. No industrial effluents resulting from our operations are discharged into the environment. Guided by PSA SG's water management systems framework, our wastewater, sewage, and oil receptacles are treated and disposed of considering the industrial best practices and standards. All wastewater from sanitary and washing facilities is directed to PUB's water reclamation plants for treatment. Surface water is channelled into open drains and subsequently processed at PUB's Water Treatment Plant.

We are committed to conserving and managing water usage while striving to close the loop whenever feasible. Existing and ongoing water conservation and improvement initiatives include more than 8,000 cubic metres of rainwater collected

## Water consumption (cubic metres)



\*The above table shows water consumption from third-party water sources including NEWater. It excludes leakage and water consumption for the Community Care and Recovery Facility at Tanjong Pagar Terminal which was handed to the Ministry of Manpower on 1 Jan 2022.

from nine rainwater harvesting tanks spread across our engineering workshops in City Terminals and PPT, corporate headquarters PSA Horizons, PSA Alongside and Tuas Port. An additional 2,800 cubic metres of condensate water was also harvested from the air-conditioning system at PSA Horizons. The non-potable water was used for equipment washing and horticultural maintenance.

In compliance with regulatory standards, PSA SG submits an annual review and comprehensive statistics on water usage to PUB. This commitment reflects our dedication to transparency and accountability in managing water consumption and advocating responsible water usage practices.

# Protecting Our People



# Employee **Diversity and Inclusion**

Guided by PSA Code of Business Ethics and Conduct (The Code), PSA SG strives to create a safe and supportive work environment that celebrates diversity and embraces inclusivity. We remain committed to maintaining a diverse workplace for all genders to achieve growth and success.

## PSA Global Employee Opinion Poll 2023

At PSA SG, we value our employees' views to identify areas of concern and build a better working environment for everyone. 2023 was the year of our biennial PSA Global Employee Opinion Poll (EOP), where PSA SG participated in the survey which was sent out to a record number of employees across 26 business units and PSA SG received a strong participation rate of more than 90%. As with prior EOPs, the survey was administered by a third-party consultant so that employees' responses are kept confidential and anonymous. Hence, our employees remain reassured whilst providing their honest feedback that contribute to improving our workplace environment and culture. In alignment with our digitalisation efforts and to go green, all responses were submitted online.

## Employee Experience

With the valuable insights and objective feedback collected from the PSA Global Employee Opinion Poll, management was able to better understand the ground's sentiment and implement follow-up actions to address concerns raised. In a study conducted by The Straits Times, PSA was recognised as one of Singapore's best employers in 2023. PSA SG continues to support its employees with a conducive working environment while enhancing systems to help promote better user experience. With the increased use of online communication tools, PSA SG piloted the use of pods in its corporate office for employees to have privacy areas for meetings and brainstorming sessions.

We also launched 'iTalent', a new cloud-based performance management solution which provides ease of accessibility and facilitates continuous conversations for learning and career development.

At PSA SG, we understand the importance of our families' support and how being connected to our loved ones brings positive energy into the workplace, creating a purposeful workforce driven by dedication and fulfillment. In 2023, more than 300 family members attended the PSA Family Port Tour where they experienced the hustle and bustle of our operations at Pasir Panjang Terminals.

Traditionally a male-dominated industry, PSA SG actively tracks gender diversity within its talent pool as part of the annual talent review process. We also seek to create an inclusive workplace environment for our female workers. For instance, our corporate headquarters, along with most terminal buildings, are equipped with nursing rooms to support new mothers in their transition back to work. With active development efforts, the proportion of females in its talent pool has grown since 2019.



PSA SG's commitment to employee diversity.

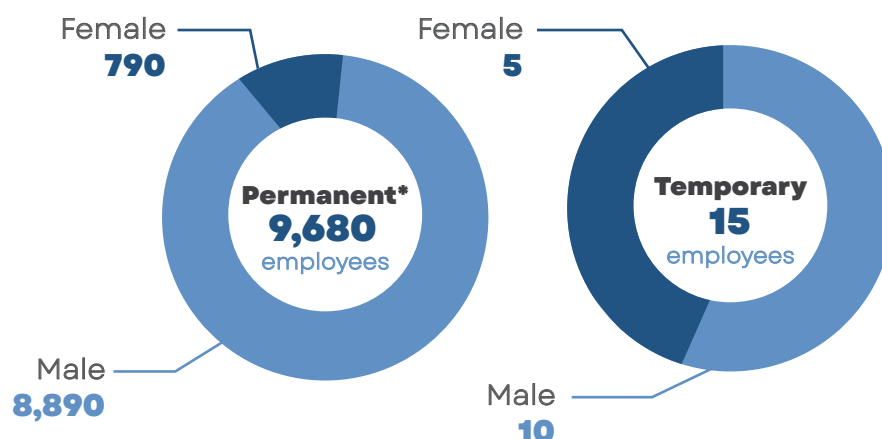
# Overview of Employee Profile

**Number of employees by employment contract (permanent and temporary), by gender, in PSA SG**

Total Male  
**8,900**

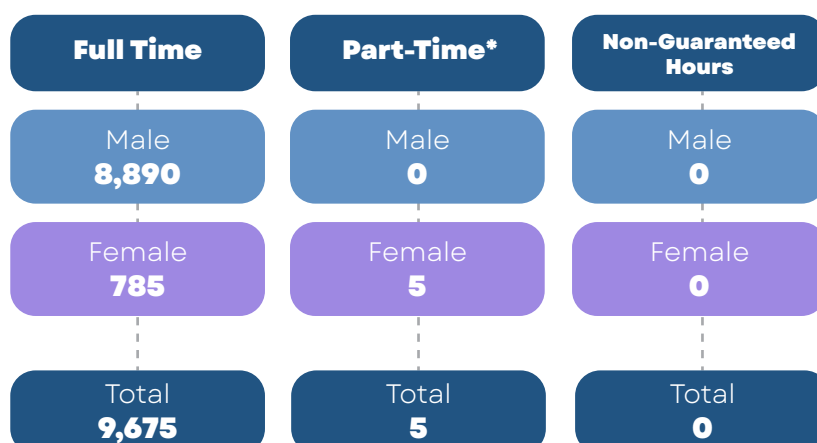
Total Female  
**795**

Total Employees  
**9,695**



\*Permanent employees include contract and re-employed staff.

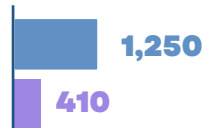
**Number of employees by employment type (full time and part time), by gender, in PSA SG**



\*Employees are on part-time arrangements due to personal reasons.

**Diversity of governance bodies & employees, by gender, in PSA SG**

## Executive

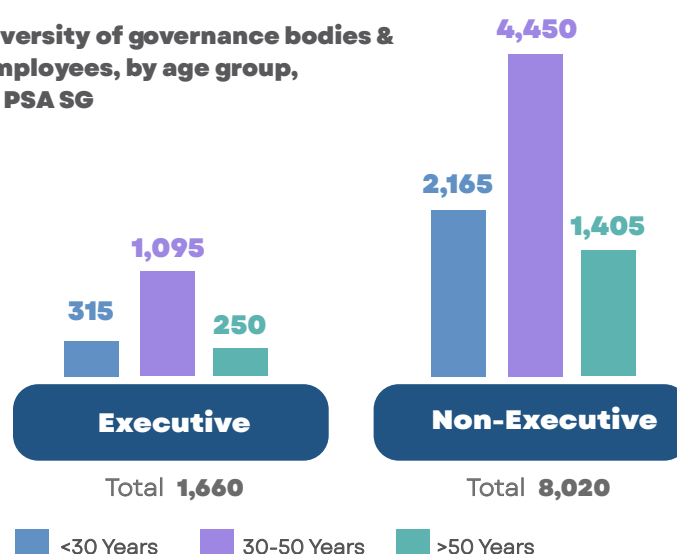


## Non-Executive

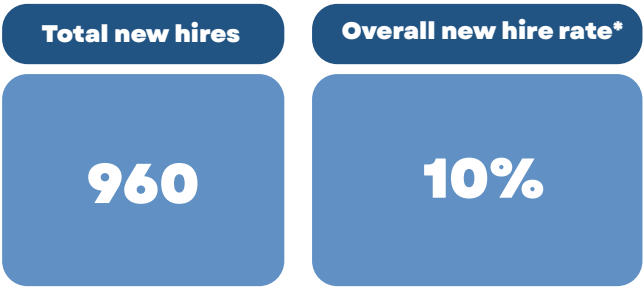


Male Female

**Diversity of governance bodies & employees, by age group, in PSA SG**

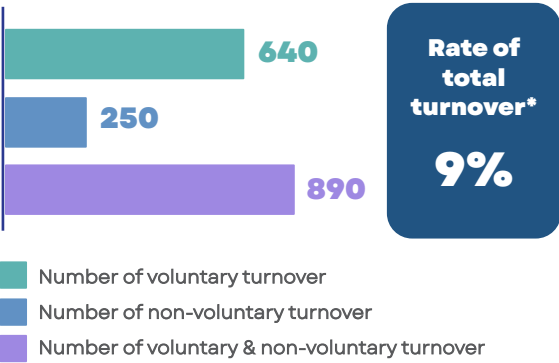


Total number and rate of new employee hires in PSA SG



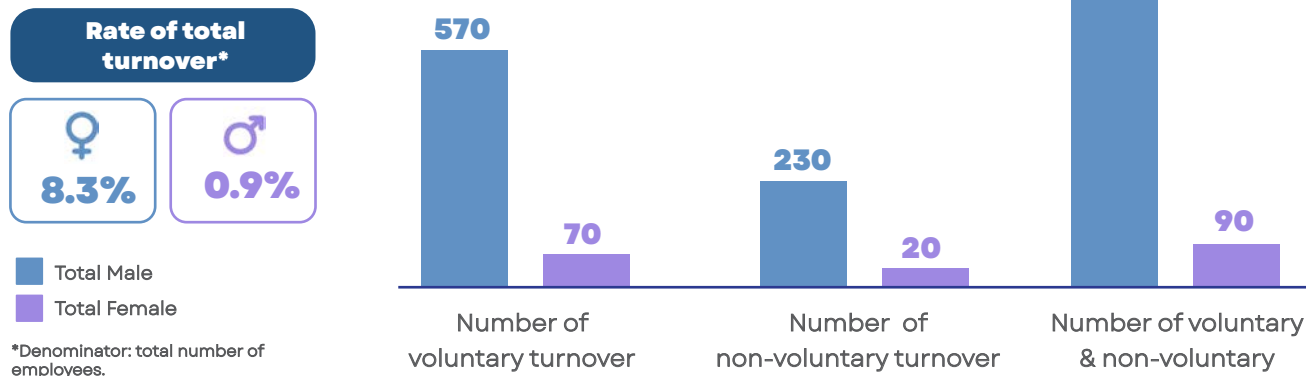
\*Denominator: total number of employees.

Rate of turnover in PSA SG

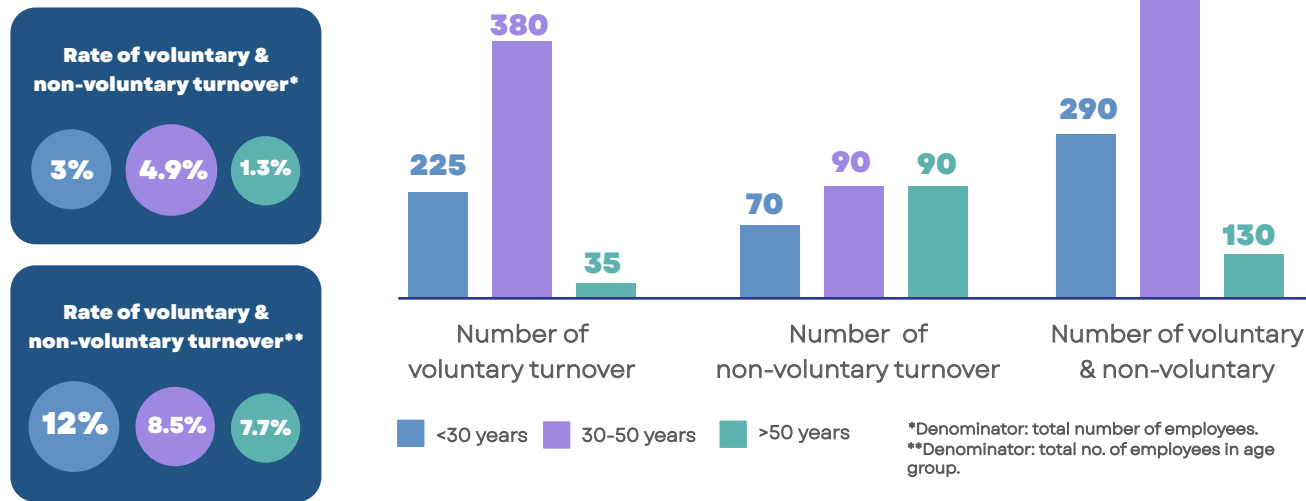


\*Denominator: total number of employees

Rate of turnover, by gender



Rate of turnover, by age group, in PSA SG



In 2023, PSA SG’s overall new hire rate was recorded to be 10% slightly lower than the 12% recorded in 2022 due to lower turnover rate.

We have observed a decrease in overall turnover rates from 10% in 2022 to 9% in 2023. The national turnover rate, as reported in the Labour Market Report Fourth Quarter 2023 published by the Ministry of Manpower, is about 16.8%\*. In comparison, PSA SG’s turnover rate is much lower than the national average. We continue to retain and attract talents and to remain competitive in the job market.

\*The national turnover rate was extracted from the Labour Market Report Fourth Quarter 2023, published by the Ministry of Manpower in Singapore.

# Labour Relations and **Worker Wellbeing**

In our dedication to ethical and responsible employment, we seek to establish strong connections with our unions to build a fair and conducive workplace for all employees. We adhere to high labour standards and maintain a zero-tolerance policy towards any form of discrimination. Regular communications with both employees and unions were held to ensure that all were aware of business direction, policy changes or new work practices. All employees are treated with dignity, respect, and fairness, with a focus on their professional development to ensure they remain employable for the long term. In 2023, 74.3% of our employees are covered by collective bargaining agreements.

## Partnering our Unions

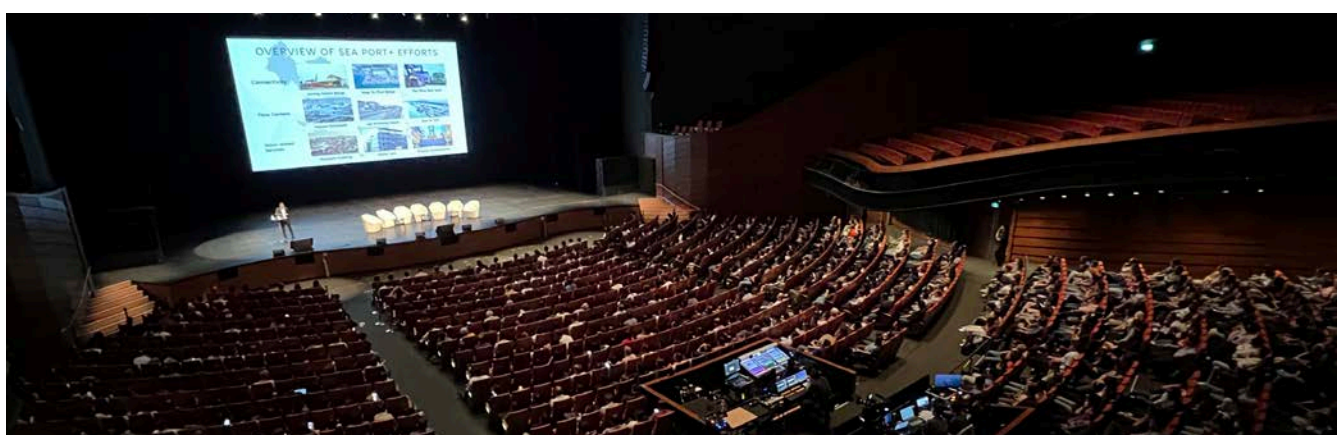
Strengthening and fostering the excellent labour management relations with our unions remain key to a safe, agile, and resilient workforce. To this end, PSA and its unions, the Singapore Port Workers Union (SPWU), and Port Officers' Union (POU) continued to embark on a series of events and initiatives.

Representatives from the various divisions and departments within PSA SG and unions meet monthly to discuss new initiatives and workforce matters. Employees are actively engaged in these discussions, and the rationale and circumstances for any changes are communicated before

implementation. PSA's senior management regularly engages in discussions and gatherings to keep union leaders informed about the business outlook and upcoming developments.

In 2023, our biennial SPWU Delegates Seminar was held in South Korea, where partners from the Ministry of Manpower, unions and management came together to renew our ties. The theme 'Futurisation...SPWU & PSA with U' was aptly chosen, and all parties reflected on the importance of being agile to stay relevant as a business and reaffirmed the commitment to strong labour-management relationships.

Testament to our strong relationship with unions, we have embarked on several initiatives through the 'Towards Endearing Partnership' with the common goal of creating a positive work environment and inculcating a culture of lifelong learning. The 'Be Kind, Be Gracious, Be There' campaign was introduced to promote a culture of appreciation and graciousness among our teams. The Gracious Communications Walkabout, which focused on the theme of being 'Professional, Polite, Precise and Thank you', was led by senior management and unions to raise awareness about the importance of communicating with kindness and politeness to create a wholesome and pleasant work environment for everyone.



PSA SEA Townhall 2023.

On the learning front, POU, together with PSA SG Human Resource and Singapore University for Social Sciences (SUSS) continued their long-term collaboration for professional seminars, covering discussions on emerging trends such as artificial intelligence and sustainability.

Jointly organised by both unions and PSA SG, 2023 marked the return of the signature biennial Union-Management Games. Over six games which spanned badminton, carrom, darts, futsal, mixed netball and table tennis, the unions, employees, and management showcased their talents while bonding and forging new friendships with one another.

## **Towards Mental Wellbeing**

At PSA SG, we recognise that our employees play a pivotal role in driving value and achieving success for our organisation and we are committed to care for their wellbeing. A guidebook titled 'Towards Work-life Harmony' was introduced, as a part of the efforts to enhance the overall well-being of our staff. This guidebook encompasses best practices for conducting effective meetings and fostering gracious communication, in particular after-hours communication. We have also launched a 'Towards Mental Wellness' toolkit, designed to raise awareness, and offer tips for improving mental well-being. This toolkit includes information and resources on how to identify early signs of stress, along with management strategies. The in-house program on mental wellness, 'FishBall' continue to be cascaded to offer practical tips and recommendations to fortify mental resilience.

We aspire to create a great workplace culture where employees would feel psychologically safe to share ideas and feel empowered to innovate. Prioritising the resilience of our workforce and promoting the mental wellbeing of our employees are key and several programmes have been put in place to aid this effort, including the 'Confidant Programme'.

In strengthening the support in this area, PSA SG continues the journey of building the pool of peer supporters and confidants who can offer assistance to colleagues who face challenges. PSA SG also offers an Employee Assistance Program as an additional channel of support for employees who require professional support.

## **Towards Healthy Longevity**

PSA SG recognises that our people are at the heart of creating value and bringing success to our organisation. Supporting our workforce and the local community towards a healthy lifestyle is part of our healthy longevity roadmap.

In 2023, cross-division committees were formed to formulate and organise wellness workshops and talks on the importance of taking ownership of personal health. To raise awareness of these initiatives, a series of videos, banners, flyers, and standees were produced to reach out to the employees. PSA also worked with several healthcare industry partners to raise the health quotient in our employees. For example, a pilot 6-month personalised program was introduced to help employees with chronic conditions to better manage their high blood pressure, diabetes, and high cholesterol levels.

To encourage purposeful longevity, PSA SG stepped up its efforts to stay connected with its retirees through its in-house clubhouse, PSA Alongside. Retirees were encouraged to join as Associate Members to continue enjoying the club's benefits and facilities and receive invitations for selected PSA's events. Further information on ways to keep their minds and body active and healthy after retirement was shared through a 'Staying Connected' brochure during their retirement engagement with departments. Subsequently, to allow for greater ease of access, a webpage dedicated towards healthy longevity has been developed.

## PSA SG Health Roadshow 2023

An 800-strong crowd was amassed at PSA Alongside on 31 August 2023 for the PSA SG Health Roadshow. Themed 'Healthy Longevity: Let's Add Life to Lives', featured a curated selection of educational booths from various healthcare providers, such as Health Promotion Board (HPB), National Dental Care Singapore, Fullerton Health, and Care Corner Singapore. Participants learned about managing chronic diseases, the importance of mental wellbeing and improving their lives with good oral health.

Besides educational booths, participants could also take part in interactive games and mass workout sessions. One of the highlights of the roadshow was our Cycle for Charity station, where participants cycled on stationary bicycles to raise funds for charity. This allowed participants to exercise while contributing to a good cause. Through this activity, S\$5,000 was raised for Care Corner Singapore's CAREVOLUTION, to provide financial support to individuals experiencing mental health challenges for their counselling and therapy sessions.



Participants engrossed in their pouch painting.



Fun-filled moments at our PSA SG Roadshow 2023.



Our colleagues working hard to raise S\$50 for every kilometre recorded in our Cycle for Charity booth.

# Awards and Recognition

## Silver Ribbon Mental Health Awards for Employers 2023

The Silver Ribbon Mental Health Awards for Employers recognises and celebrates organisations in Singapore that demonstrate exceptional commitment to promoting mental wellbeing in the workplace.

For three consecutive years, PSA SG was recognised for putting efforts into promoting a mental health-friendly workplace at the Silver Ribbon Mental Health Awards for Employers 2023. PSA SG supports the Silver Ribbon (Singapore)’s vision of promoting a positive attitude towards mental health in our community.



PSA SG receiving the award at the Silver Ribbon Mental Health Awards Ceremony.

PSA SG was amongst 13 Singapore-based organisations receiving recognition for its impactful work in promoting positive mental health and tackling stigma in the workplace.

# Environmental Protection

PSA SG’s operations produce air and noise pollution through construction, equipment, truck movements and cargo handling. These forms of pollution are of significant concern as they pose health risks to the workers, local communities, and the environment. We are proactively exploring ways to reduce air and noise pollution and its associated environmental and health impacts. Through monitoring and management plans, we aim to maintain air quality and boundary noise levels within acceptable and healthy limits.

## Ambient Air Quality Monitoring (AAQM)

PSA SG fully adheres to the guidelines and requirements set forth by the National Environment Agency (NEA) under the Environmental Protection and Management Regulations. We seek to maintain the air quality at all terminals within Singapore Ambient Air Quality Targets.

As part of our commitment, Ambient Air Quality Monitoring (AAQM) is conducted annually at all terminals. In November 2023, we engaged an NEA-

licensed operator to conduct air quality testing at 20 locations around Brani Terminal, Keppel Terminal, Keppel DistriPark, Pasir Panjang Terminals and Tuas Port. Air quality sensors were installed, and the levels of air pollutants including Particulate Matter PM2.5 (<2.5 µm) and PM10 (<10 µm), Nitrogen Dioxide (NO<sup>2</sup>) and Carbon Monoxide (CO) were monitored throughout a 24-hour sampling regime.

The findings show that all air samples collected at the terminals have met Singapore Ambient Air Quality Targets. The average concentration of the various air pollutants at the monitoring sampling locations was as follows:

Type of Air Pollutant	Value Recorded	Within Healthy Limit
Nitrogen Dioxide (NO <sup>2</sup> )	< 20 µg/m <sup>3</sup>	200 µg/m <sup>3</sup> (1hr)
Carbon Monoxide (CO)	1.0 to 2.0 mg/m <sup>3</sup>	10 mg/m <sup>3</sup> (8hr)
PM 10	5 to 15 µg/m <sup>3</sup>	50 µg/m <sup>3</sup> (24hr)
PM 2.5	4 to 14 µg/m <sup>3</sup>	37.5 µg/m <sup>3</sup> (24hr)

## Boundary Noise Assessment

PSA SG seeks to minimise noise pollution through compliance with NEA's Environmental Protection and Management Act and ensures that the noise levels at all terminals are within the thresholds specified in the Environmental Protection and Management (Boundary Noise Limits for Factory Premises) Regulations 2008.

In November 2023, we engaged an NEA - licensed operator to conduct our annual boundary noise monitoring exercise. 24-hour noise monitoring stations were established within PSA SG Terminals as well as along the boundary of each terminal site. This allows a comprehensive evaluation of noise levels and their effects on both employees and local communities.

The findings show that all the sampling locations were within the maximum permissible boundary noise levels (up to 75 dB) for morning, evening, and night periods. Singapore experiences smoke haze from time to time. The haze arises due to forest fires in the regional countries, and the burning to clear the land for agricultural purposes. It can be exacerbated by dry seasons, changes in wind directions, and low precipitation. Prevailing winds sometimes carry smoke haze over Singapore's skies, particularly during the Southwest monsoon season.

On 7 October 2023, the 24-hour PSI levels in Singapore reached 107 in the Eastern region, which was classified by the National Environment Agency (NEA) as under the unhealthy range. PSA SG responded in releasing an advisory and activated the Haze Response Plan to protect her workforce and ensure business continuity.

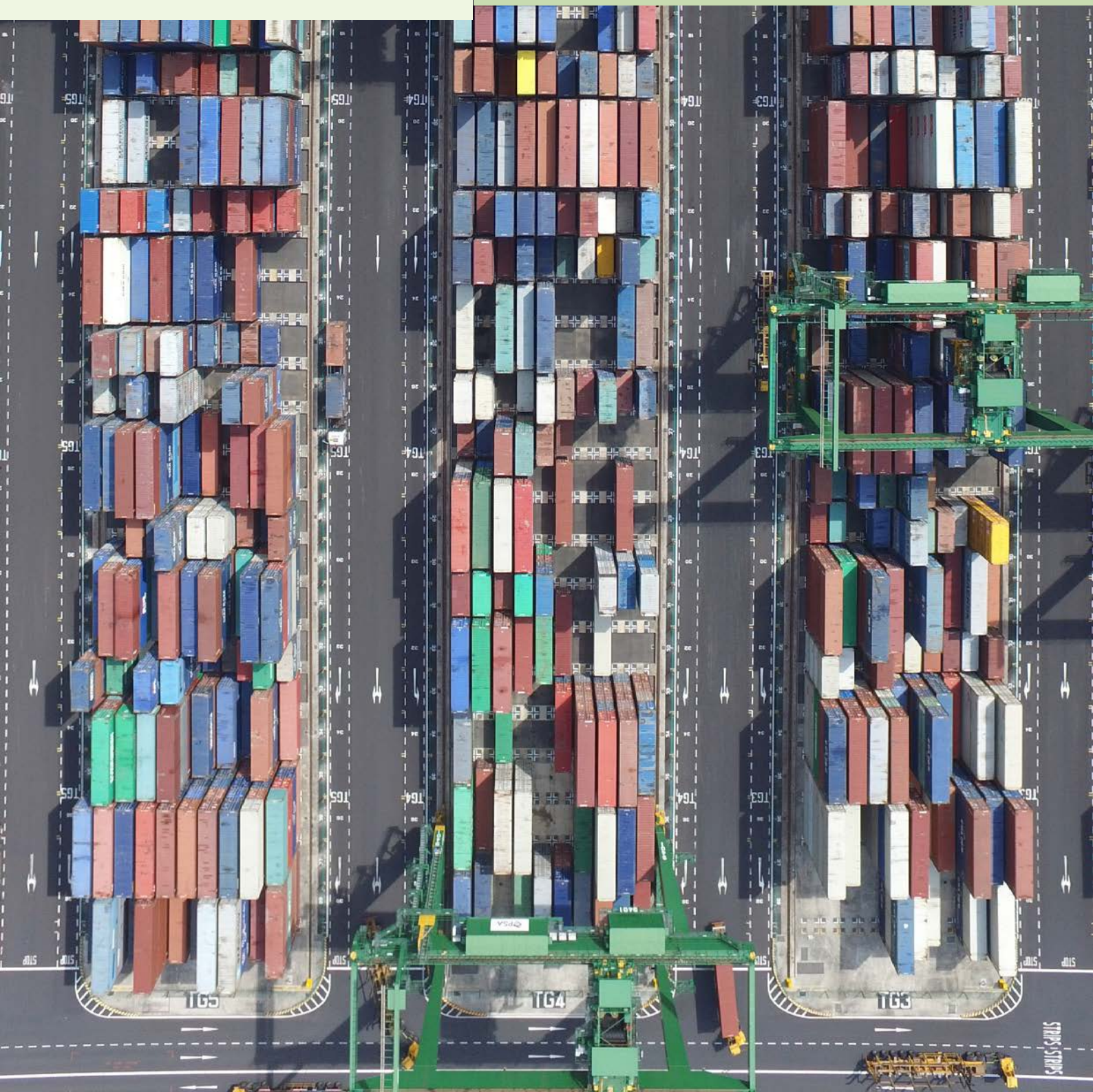
Several measures put in place included regular haze level reporting, issuance of haze PPE to staff, dissemination of precautionary measures and allocation of designated indoor rest areas. Administration of the measures were coordinated by the respective Departments and Division Haze Response Coordinators. PSA SG's Haze Response Measures were suspended on 26 October 2023, with a low risk of transboundary haze affecting Singapore for the rest of the year.

## Haze Response Plan and Guidelines

PSA SG's comprehensive haze response plan and guidelines include:

- 1.** Understand transboundary haze and haze risk management
- 2.** Define the roles and responsibilities of the haze committee, task force, and coordinators in the event of response plan activation
- 3.** Identify different levels of haze alerts and escalation of haze response according to well-defined severity situations
- 4.** Set clear response guidelines for different haze severity levels
- 5.** Ensure sufficient provision of PPE (N95 masks) for our employees and stakeholders
- 6.** Raise awareness of haze-related environmental health issues and mitigation measures

# Acting With **Integrity**



# Ethical Business Conduct

At PSA SG, we uphold the highest standards of ethics and integrity in conducting our business, aiming to cultivate a workplace and reputation that instill pride in all of us.

PSA firmly believes that business operations should adhere not only to the highest standards of economic efficiency but also to the utmost ethical standards.

These standards exceed mere legal requirements and underscore PSA's long-term commitment to establishing a successful, honest, and responsible business that all our employees can take pride in. In 2023, a refresher was conducted on PSA's Code of Business Ethics and Conduct (The Code) led by Group HR, Group Internal Audit/Group Risk Management, and Group Legal. The Code encapsulates PSA's business principles and offers guidance to our employees on navigating critical issues in alignment with the company's values and aspirations.

All PSA employees are required to understand and comply with The Code. This resource is readily available online and routinely reinforced through various internal communications channels. All new hires are required to acknowledge their dedication to complying with the Code of Conduct as part of their onboarding process.

The Code includes the Whistle Blowing policy and channel, which provides employees with a safe and confidential way to report any concerns they may have about potential misconduct. This includes violations of company policies, legal or regulatory issues, or unethical behaviour. Through the dedicated Whistle Blowing hotline or email, employees are empowered to speak up without fear of retaliation. The company is committed to investigating all reports thoroughly and taking appropriate action to address any wrongdoing.

For more information on PSA SG's Whistle Blowing Policy, please visit :

<https://www.globalpsa.com/psa-international/#thecode>

PSA SG ensures full compliance with local laws and regulations, collaborates with authorities, respects local culture and businesses, and carefully considers social norms and environmental issues in all commercial decisions. There are no instances of non-compliance with laws and regulations in FY2023, including both monetary and non-monetary penalties.

## 'The Code' e-learning

To reinforce ethics and integrity within the organisation, e-learning courses tailored to our employees' needs have also been developed and rolled out. These courses ensure that employees have a thorough understanding of The Code, as well as PSA's policies and procedures for maintaining ethical business practices. These e-learning modules are also introduced to our new hires to support their onboarding process. These modules are designed to acquaint each new hire with the workplace environment and culture. They cover a wide range of topics including cybersecurity, office productivity tools, data analytics, environmental trends, and PSA SG's sustainability initiatives. The modules also offer guidance on PDPA regulations and workplace safety, including procedures for reporting suspicious characters, behaviours, and activities. In 2023, Group HR collaborated with PSA University to update the 'Code Refresher' e-learning program, which is accessible online.

Employees **Nominated**

**1,528**

Employees **Completed**

**1,525**

Completion **99.8%**



As of 31 Dec 2023

# Sustainable Procurement

At PSA, we believe that environmental, social stewardship and responsible business practices extend beyond our operations. We remain steadfast in our commitment to responsible procurement, minimising environmental impacts and creating positive social impacts through the procurement of goods and services, by integrating sustainability criteria in the selection, monitoring, and evaluation of suppliers, including ethical behaviours, environmental protection, and upholding human rights.

Operationalising the Group's Sustainable Procurement Framework further from 2022, PSA SG focused on actions and outcomes in 2023 to align the strategic direction with our key suppliers whilst supporting suppliers with less mature sustainability practices.



## The 7 Key Elements of the Sustainable Procurement Framework



### Ensuring Responsible Operations

- 1 Practicing Circular Economy
- 2 Exploring Green Alternatives



### Protecting Our Workers

- 3 Strengthening Contractor H&S
- 4 Caring for Contract & Migrant Workers



### Acting With Integrity

- 5 Raising The Bar on Ourselves and Our Suppliers



### Supporting Our Communities

- 6 Supporting Local or Minority Businesses



### Keeping Our Operations Safe & Secure

- 7 Strengthening Cybersecurity

## Embedment of Suppliers' Code of Conduct

We recognise the pivotal role suppliers play in our supply chain, and we are dedicated to fostering ethical, social, and environmental responsibility throughout our network. As part of this effort, PSA SG rolled out the Suppliers' Code of Conduct (SCC) in 2022, and through 2023, this had been integrated into our contracts for supplier compliance.

The SCC, developed by the Group Legal and Procurement, highlights PSA SG's expectations of our suppliers and our shared commitment to ESG performance, aiming to improve the reputation of both PSA and our suppliers. The SCC lays out guidelines on how business should be conducted and provides guidance on the standards of behaviour we expect our suppliers to adhere to, emphasising transparency, robust health and safety measures, environmental stewardship, and ethical conduct. PSA SG requires that all suppliers meet the standards set out within the SCC. For more information on PSA SG's SCC, please refer to [PSA's webpage](#).

## ESG Surveys for Key Existing Suppliers and Tenders

We have initiated the collection of GHG- and ESG-related information from our key and strategic suppliers. Since July 2023, we have also integrated ESG considerations into our key tender evaluations. By incorporating these in our tender process, we ensure that our business partnerships align with our sustainability goals. This strategic approach underscores our dedication to driving positive environmental impacts across our entire value chain.

Furthermore, as part of our commitment to health and safety excellence, we have implemented enhanced scrutiny for contracts that involve higher health and safety risks. In these instances, a standardised assessment of the health and safety policy, programme and records had been used to ensure that our partners have strong safety

measures in place. This added layer of due diligence aligns with our goal to foster a secure and healthy working environment for all stakeholders involved in our supply chain. By prioritising health and safety in our supplier selection process, we not only reinforce our commitment to the wellbeing of our workforce but also contribute to the broader cultivation of industry best practices.

## Data and Information Collection Platform for New Suppliers and Tenders

Following the development of the data and information collection platform in 2022, we have successfully onboarded key suppliers and tenderers to the platform. The platform is used to track suppliers' GHG footprint as well as for assessing the ESG maturity of our suppliers by using survey questions covering Health, Safety and Environment, Compliance and Cyber Security.

We are pleased to report that 100% of newly awarded suppliers in key tenders have been screened using both environmental and social criteria. Their responses deepened our understanding of supplier ESG performance, facilitating more informed decision-making aligned with our sustainability objectives.

In recognition of the design and execution of the GHG Emission and ESG program with our suppliers, as well as the use of a structured platform for consolidating internal Scope 1, 2 and 3 GHG emissions, we are proud to announce that this budding program had won PSA the Best Sustainability Project of the Year Award at the 2023 CIPS Asia Excellence in Procurement Awards.



PSA wins sustainable project of the year with the use of the platform.

ESG Score

	Higher Scoring Responses	Lower Scoring Responses
Generalised groups of Suppliers	International Equipment Manufacturers, IT MNCs, Regional Suppliers	Small and Medium Enterprises, Transport companies
Action Plans	Environmental targets and actions to be reviewed with PSA's plans	Further development of sustainability reports, labour rights policies

Building upon the insights from the ESG survey responses, we have identified best practices and typical gaps in different industries and suppliers. For suppliers that are advanced in their ESG programmes, the next steps will involve an evaluation of their environmental targets and actions and how they will support PSA's sustainability efforts.

In the past year, the PSA SG team and our suppliers have been authentic and committed to moving forward on this programme. The engagements were honest and collaborative, enabling us to exchange insights and address challenges as a team. Moving forward, we are looking to expand the collaboration to a wider scope of the key suppliers and implement an annual follow-up process to allow suppliers to refresh ESG responses, track progress and drive enhancements in supplier performance.

Through regular assessments and dialogues, we will work closely with our suppliers to address any remaining gaps and implement necessary upgrades in environmental and social practices. We seek to address the challenges faced by SMEs in implementing and enhancing comprehensive sustainability policies by identifying key action plans with them, recognising that their journey toward sustainability may require tailored solutions, support, and time. Emphasising ongoing dialogue, we are committed to driving positive environmental, social, and governance outcomes for a sustainable future.

Sustainable Procurement in Action

In addition to setting clear processes and guidelines for supplier assessment, we have also introduced specific procurement guidelines for goods and services that directly impact our sustainability goals, particularly in waste management.

Sustainable disposal of used IT assets contract



In our ongoing commitment to responsible electronic waste management, the supplier selected to handle our contract for sustainable disposal of used IT assets is R2 (Responsible Recycling) certified. The R2 certification signifies a stringent commitment to environmentally sound practices, data security, and worker health and safety throughout the electronic waste recycling processes. With this requirement, we aim to ensure that our partners align with the highest industry standards, promoting responsible and ethical handling of electronic waste.

Wood waste collection contract

Rather than direct disposal of wood waste, PSA SG awarded the collection contract to a vendor who can choose between processing the waste for electricity generation for their plants or recycling it into wood chips to create new products. The innovative use of their specialised infrastructure allows them to optimise the waste stream utilisation based on product and market demands.

# Supporting Our Communities



# Community Relations

At PSA SG, we believe strong community relationships are the cornerstone of a thriving and sustainable business.

We recognise that maintaining a social license to operate requires constant engagement with our communities. The conferment of the Champions of Good award signifies this commitment and inspires us to further elevate our community engagement efforts. As such, we have taken a slightly different approach to our community engagement efforts for 2023 as we strive to become a positive force in society - by creating opportunities to amplify our 'Doing Good' movement and contribute meaningfully to the wellbeing of the communities and ecosystems we interact with.



PSA employee volunteers visit to Bird Paradise with St Luke's ElderCare Telok Blangah Centre.

## To accomplish this, we turn to our 3Cs as guiding principles



### Resilient Core

We stay true to our mission of stewarding responsible business in the communities that we operate in, regardless of challenges faced.



### Value Creation

We provide a variety of volunteering activities, with the aim of multiplying our impact and outreach to involve different stakeholders.



### Sustainability

We work with partners to increase our and the community's awareness of the importance of sustainability, and to encourage a go green mindset in all.

## Our 2023 initiatives can be categorised into 3 main areas:

1

### Co-create

Where we partner with agencies such as the Ministry of Health, National Volunteer and Philanthropy Centre (NVPC) and Agency for Integrated Care (AIC) to strengthen our efforts to remain at the forefront of national initiatives related to preventive and active ageing.

2

### Cultivate

To cultivate skills within our volunteers that will allow them to volunteer better, as well as ensure their knowledge stays current and relevant.

3

### Collaborate

In which we actively partner with our various stakeholders such as community groups (Southwest Community Development Council), subsidiaries (PSA Marine, CrimsonLogic & PSA BDP) and customers/vendors to do good together.

## Together, We Can Make a Difference



H@H activity with Lion Befriender at Clementi.

### Health@Home (H@H)

Launched in 2015, PSA SG's flagship community programme, H@H, was developed to support home-based healthcare and eldercare through corporate volunteerism among its Singapore-based staff. To fulfil both societal and community needs, the H@H initiative is built on two fundamentals; sharing caregiving knowledge with staff to help the seniors and themselves.

Our pool of over 680 H@H volunteers had clocked 20,000 volunteering hours at our partner beneficiaries, such as St Luke's ElderCare, HCA Hospice, Lions Befrienders, National University Health System, Gracehaven and Stroke Support Station, since 2015. Through active volunteerism with our beneficiaries, PSA SG looks to support, enrich, and bring joy to the lives of the seniors in our community.



Visit to Singapore Chinese Cultural Centre with St Luke's ElderCare Ayer Rajah.

## Developing 'Doing Good' Mindset

### Division CSR Coordinator (DCCs)

Introduced in 2022, the DCCs initiative aims to foster accountability among PSA SG's staff of about 10,000 in Singapore by appointing a representative from each division to promote and cultivate a volunteering ethos among employees. The DCCs play a crucial role in coordinating, encouraging, and overseeing volunteering activities as part of our 'Doing Good' movement. They are empowered to organise such initiatives freely. Moreover, DCCs are exposed to various forms of community engagement, including our green efforts.

### Retiree Volunteer Programme (RVP)

The commitment to doing good and serving the community does not end with retirement. Through the RVP initiative, PSA SG employees can continue their volunteering efforts even after they retire. Aligned with our goal of promoting active ageing among our employees, retired volunteers not only maintain social connections but also gain valuable eldercare skills that contribute to their mental and physical well-being. This initiative enables them to age gracefully while continuing to make meaningful contributions to the community.

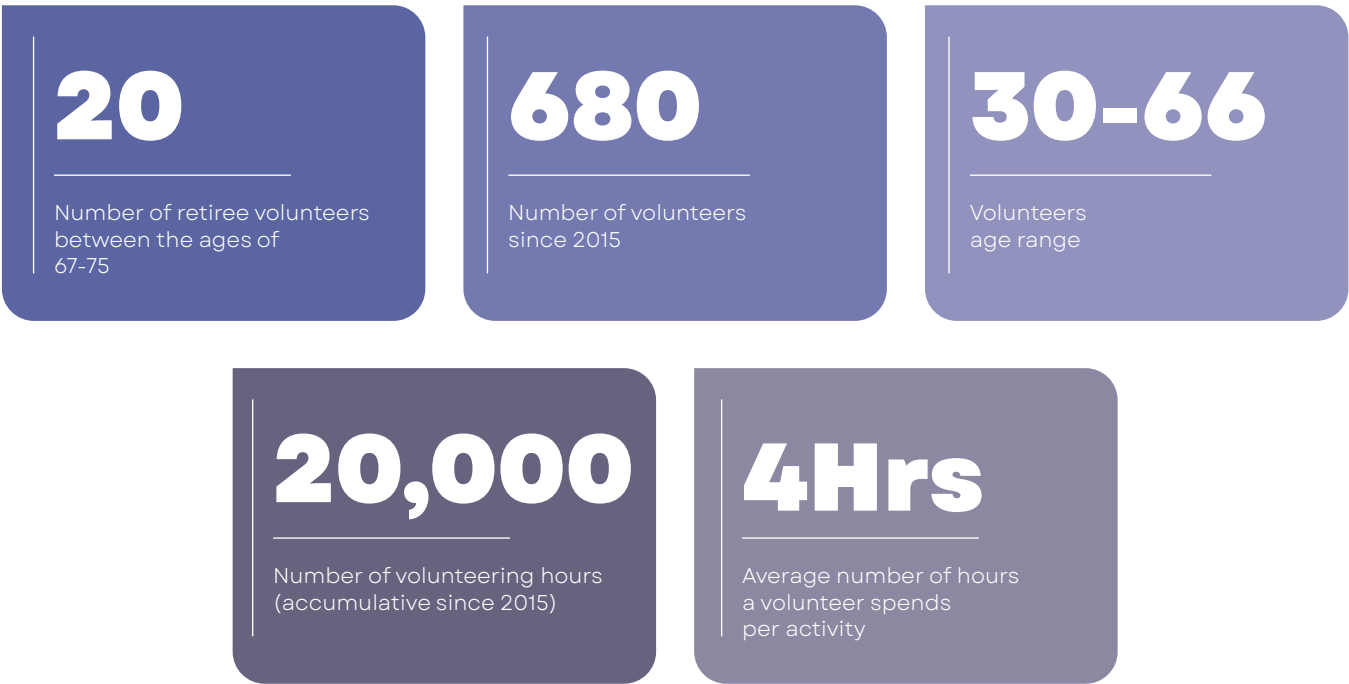
Multiplying our ‘Doing Good’ Movement

Aligned with our vision to broaden our ‘Doing Good’ initiative, the PSA Community Engagement team engages our diverse stakeholders in our philanthropic endeavours, facilitating opportunities for our partners to directly support our beneficiaries.

- PSA SG organised the PSA Golf Invitational on 14 July, with Stroke Support Station (S3) as the beneficiary organisation. With over 110 players, comprising our shipping line customers, various government agencies and associations, the event raised a tidy sum of \$70,000.
- PSA SG partnered with Ocean Network Express (ONE) to organise a Waterways Litter Picking activity in the Marina Reservoir on World Clean Up Day, highlighting the importance of keeping our waterways clean and safe for all. Coming together with kayaks, pedal boats and power boats, the volunteers were able to collect over 80kg of litter.
- PSA SG and CMA CGM joined forces to distribute over 250 packs of food items to senior beneficiaries of the Thye Hua Kwan Active Aging Centre.

- PSA Charity Fair, with the theme of ‘Good Old Days’, featured a total of 22 stalls from the different Divisions, and an attendance of over 600 staff. A total of S\$40,000 was raised from staff at the event and donated to HCA Hospice, supporting the wellbeing of end-of-life patients.
- As part of the Christmas celebrations, volunteers from PSA SG and ONE brought joy to the residents at HCA Oasis by serving a sumptuous buffet lunch, organising a craft-making session, and an impromptu karaoke session with the residents.
- PSA SG collaborates with a ground-up community group, Fridge Restock Community SG (FRC) to organise food rescue for ‘ugly’ fresh produce at Pasir Panjang Wholesale Centre and distribute them to the community. Together with volunteers from FRC, our volunteers participated in two food rescue sessions at Pasir Panjang Wholesale Centre. A total of 5.8 tonnes of ‘ugly’ fresh produce was rescued and distributed to 6 community locations.

Metrics





H@H Activity - St Luke's ElderCare Ayer Rajah Centre  
- DIY Easter Egg Basket with Chocolates.

## Moving beyond H@H

At PSA SG, we believe in sharing knowledge and inspiring others on their sustainability journeys. At the request of NVPC, our Community Engagement team hosted a group of NVPC-led companies on a learning journey.

This programme included a comprehensive presentation showcasing PSA SG's community engagement journey, followed by a visit to St Luke's ElderCare, a key partner in our social initiatives. The visit provided the company representatives with firsthand experience of our community engagement efforts.

The learning journey proved to be a valuable platform for knowledge exchange. The representatives gained insights into how to implement a successful community engagement programme within their own companies. This further strengthens our position as a thought leader in this space.

Building on this success, NVPC has expressed interest in hosting more such learning journeys, with PSA SG as the lead organiser. We are thrilled at the opportunity to share our experiences in community engagement and collaborate with others to create a more sustainable future. Additionally, MSF, in collaboration with NCSS and NVPC, has asked PSA SG to help in developing a Sustainable Philanthropy Framework and playbook, to be launched nationally in 2024.

## PSA SG in Bloom

PSA SG also seeks to engage the wider community to foster a sense of togetherness in this collective pursuit towards sustainability. Our PSA SG in Bloom initiative aims to bring nature and biodiversity closer to the port and local community through a diverse range of activities, including tree planting, food gardens, and recreation gardens.



One of the two murals at the second shelter.

Following up on our sponsorship to the Garden City Fund in 2019 towards the development and beautifying of Pasir Panjang Park, we have donated three 20-foot repurposed containers which feature painted murals that depict the themes of globalisation and cultural diversity - a testament to PSA's global presence. Besides providing shelter to visitors, these containers also incorporate green features such as solar panels and green roofs. Together with the opening of the park in 2023, PSA SG also organised a tree-planting activity, supporting NParks 'One Million Trees' movement, planting a total of 75 trees since 2016.

To promote the consumption of locally sourced food, PSA SG has also taken significant steps to establish food gardens across its premises. From the first food garden in 2019, there are now six food gardens spread across PSA SG, with the latest addition at Tanjong Pagar Complex. With our dedicated staff managing these gardens, we produced a combined harvest of 750kg of fresh produce, consisting of an impressive array of 140 different varieties of flowering plants, fruits, herbs, and vegetables; 165kg were donated to charitable causes and the remaining produce was shared with colleagues.

Two of our food gardens, PATIO@PPTB3 and Botanicals Sky@MB, have been recognised as winners of the prestigious 'Top 50 CIB Garden' award in Singapore. This award by NParks serves as a testament to our efforts in creating beautiful green spaces, fostering community engagement, and promoting sustainable practices throughout our operations.

## Go Green Community Engagements and Green Partnerships

Initiated in 2021, the Go Green community engagement initiative aims to empower our community engagement partners, their beneficiaries, and the broader community towards sustainability. This is manifested through a range of tailored events and educational workshops designed for our diverse partners and their beneficiaries. As responsible corporate citizens, we are dedicated to empowering and positively influencing communities to collectively build a more sustainable future for our children and generations to come.

In 2023, the Group's Corporate Centre collaborated with local vendors to host an Eco Pop-up Fair, accessible to all colleagues based in Singapore. This fair showcased a variety of eco-friendly products and featured an on-site plastic injector machine capable of creating upcycled coasters and carabiners from plastic waste.

In partnership with CrimsonLogic Singapore, PSA SG also organised educational tours for staff, including visits to the NEWater (reclaimed wastewater) plant and Senoko waste-to-energy plant, offering insights into the nation's water treatment and waste disposal systems.

To promote food sustainability while fostering eco-consciousness within local communities, PSA Marine hosted voluntary welfare organisations at its very own hydroponics farm together with PSA SG volunteers.

## Awards and Recognition

### Friends of Community Care Award by AIC

PSA SG's steadfast dedication to promoting sustainability has earned us recognition for our efforts. A notable highlight of the year was PSA SG being honoured with the 'Friends of the Community Care' award, presented by AIC. This marked the first time PSA SG received such recognition. We are grateful to our community care partners – HCA Hospice and Lions Befrienders Service Association (Singapore) – for acknowledging our enduring commitment to supporting the community through volunteerism.



PSA SG receives the 'Friends of Community Care' Award from AIC, celebrating our commitment to sustainability and community support.

# Keeping Our Operations **Safe and Secure**



# Cybersecurity and Data Privacy



All PSA employees are guided by our internal cybersecurity policies, standards and guidelines.

At PSA SG, security is paramount. Guided by our internal cybersecurity policies, standards and guidelines, we implement efficient cybersecurity controls across all our operations, fostering a safer and more sustainable environment for global trade. This commitment translates into actively addressing port vulnerabilities and building robust cybersecurity.

As one of the busiest and most technologically advanced ports in the world, PSA SG understands the critical importance of cybersecurity and data in safeguarding critical infrastructure, including IT systems, networks, and communication channels, from potential cyber threats that could disrupt port operations, compromise data integrity, or result in financial loss.

PSA SG takes a proactive approach to cybersecurity, implementing robust measures to deter, detect, and respond to cyber threats. Aligning with the Group, our cybersecurity and data protection governance framework ensures business continuity by protecting our digital assets, maintaining customer trust, elevating staff's cyber competency and reducing the risk of costly security incidents. Ensuring we stay abreast of emerging and evolving cyber threats, PSA SG has also established multi-year cybersecurity roadmaps to increase our resilience.

We are pleased to report that in FY2023, there were zero cases of substantiated complaints received concerning breaches of customer privacy. There were also zero cases of identified leaks, thefts, or loss of customer data.

## Robust Governance for Cybersecurity Management

Risk Council, comprising Regional CEO, Southeast Asia and senior leaders from the divisions in PSA SG, provides stewardship and corporate governance oversight of identifying, strategising, and mitigating operational and external environmental risks. Personal Data Privacy and Security is one such risk monitored closely under the Enterprise Risk Management (ERM) framework.

Cyber Security Steering Committees, comprising the MD of Container Division, Head of Cyber Security (SEA), Regional Head of IT (SEA), Head of Infocomm Technology and Data, and Cybersecurity/IT/OT leaders ensure cyber security governance, approve security strategy, monitor security metrics, incidents, and exceptions.

Established in 2021, the Personal Data Protection Office (PDPO) oversees PSA SG's compliance with the Personal Data Protection Act (PDPA) and internal policies. It operationalises policies into processes and procedures to ensure that the risk of reputational, regulatory, or legal exposure is minimised.

## Internal Awareness, Education and Training

Awareness, education, and training on cybersecurity issues are cascaded down from the top and catered to the functions which the employees operate.

Starting at the top, PDPO members enhance their knowledge by organising cross-learning trips to our partners certified with Data Protection Trustmark, fostering best practice exchange. To bolster the competencies of our IT and engineering staff, PSA SG has also introduced targeted specialised security training for them. Recognising that employees are

our last line of defence, PSA SG also raises user cybersecurity awareness by providing training, conducting phishing exercises, and sharing relevant security advisories at all levels. PDPO has rolled out e-learning and training on personal data protection to all employees including those on the frontline of container operations. Furthermore, all employees are required to abide by the Group's policies including PSA Group Data Policy, PSA Group IT Security Policy, PSA Group Document and Information Policies and PSA Personal Data Protection Policy.

To ensure continuous improvement and the effectiveness of our cybersecurity measures, PSA SG conducts regular security drills to assess and improve our cyber-readiness.

## Data Protection Assurance

To ensure compliance with the PDPA, a joint audit was conducted by an external consultant and PSA Group Internal Audit. This comprehensive audit assessed the adequacy of our controls for data protection.

Furthermore, PDPO has taken proactive steps to address the risks posed from third parties/data intermediaries (DI). This includes due diligence checklists, assessments, and guidelines for the departments in better managing third-party data interactions. To ensure preparedness, simulated data breach notification exercises were also conducted with DIs, reinforcing their obligations under the PDPA, and familiarising them with our response procedures.



Team photo at Critical Infrastructure Defence Exercise (CIDeX) 2023.

## Collaborative Cyber Preparedness

With the increasing emphasis on addressing cybersecurity threats, PSA SG had the opportunity to attend various industry-specific and cross-sector events aimed at skill development for cybersecurity response and cyber defence.

## Maritime Cyber Readiness

PSA SG actively participated in the Maritime Sector Cybersecurity Exercise, codenamed Exercise Cyber Maritime 2023 (XCM23), held by the Maritime and Port Authority of Singapore in May 2023. This large-scale exercise tested collaboration across the industry in managing cyberattacks, emergency responses, and crisis communication. By simulating cyber and data breaches, XCM23 evaluated our ability to detect, respond, and recover from such incidents. The valuable insights and recommendations gleaned from the exercise will contribute significantly to enhancing PSA's overall cyber-preparedness.

## Cybersecurity Capability Continuous Improvement

PSA SG bolstered its cyber defences by participating in the Critical Infrastructure Defence Exercise (CIDeX) 2023, the largest national event focused on protecting critical infrastructure.

Organised by Ministry of Defence (MINDEF), the exercise provided a crucial platform for collaboration among Singapore's cyber defenders. This year's edition went a step further, integrating MINDEF's Digital and Intelligence Service's (DIS) Cyber Range and CyTEC with physical testbeds at iTrust/SUTD, creating a realistic training environment that spanned both digital and physical domains. PSA SG's multidisciplinary team honed their skills against maritime, DIS, and Cyber Security Agency of Singapore's professionals, fostering valuable connections across sectors and further solidifying their commitment to robust cybersecurity.



Fire blanket tested to cover affected EV completely.

## Port **Security**

Beyond facilitating global trade, ports play a crucial role in national and international security. PSA SG prioritises the highest safety and security standards to maintain its position as a trusted and preferred port of call. As a Protected Area, Protected Place, and Free Trade Zone, we strive for zero security breaches.

To safeguard critical entrepot trade and transshipment activities, PSA SG employs a comprehensive security regime, including a dedicated team of Port Facility Security Officers, Emergency Response personnel, Auxiliary Police, and Operations staff. Furthermore, we maintain close collaboration with relevant ministries and government agencies, ensuring full compliance with international and local security regulations. We are happy to report zero port security breaches in 2023.

### **PSA SG Assures Safe and Secure Port Operations**

#### **Security Regime**

PSA SG maintains a robust security regime grounded in compliance with legislative requirements by adhering to the Maritime and Port Authority of Singapore Act, Immigration Act, Free

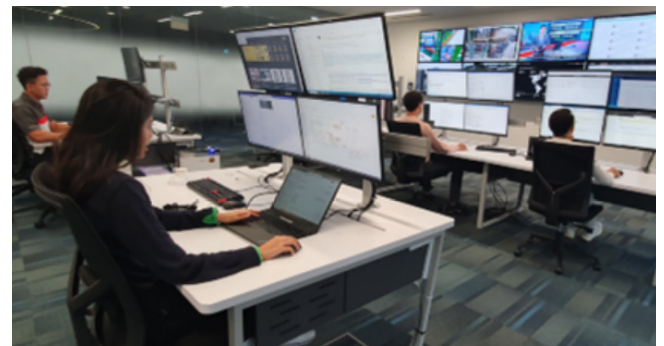
Trade Zone Act, and Infrastructure Protection Act, as well as relevant international codes, including the International Maritime Organisation's International Ship and Port Facility Security Code. Port access is restricted and administered by a comprehensive set of safety, security and environmental rules and regulations with the implementation of a need-based PSA pass and Access Control System.

Our commitment is demonstrated by our Secure Trade Partnership certification, which aligns with the World Customs Organisation's SAFE Framework of Standards. This certification signifies our robust security measures throughout the supply chain. Furthermore, we actively maintain our emergency response capabilities. The Company Emergency Response Team (CERT) undergoes regular audits by the Singapore Civil Defence Force (SCDF). These audits go beyond routine assessments and address emerging threats.

For instance, recognising the rise of fires involving batteries and electric vehicles (EVs). SCDF recently assessed CERT's ability to handle such emergencies within PSA SG premises.

#### **Setup of the Emergency Response and Security Control Centre (ERSCC)**

Established in 2023, the ERSCC integrates Information Technology / Operational Technology (IT/OT) and physical security systems for optimising security monitoring and incident response capabilities. Its location within the terminal operations building fosters close communication among stakeholders.



PSA SG staff in ERSCC.

In collaboration with Exercise Eclipse, a successful joint exercise with ICA and other line departments validated the ERSCC's Total Security Response in handling various security scenarios, including perimeter breaches, equipment sabotage, and ransomware attacks.

## Collaboration and Compliance

PSA SG actively collaborates with key agencies, including MPA, Immigration and Checkpoints Authority, Singapore Customs, Singapore Police Force (SPF), and SCDF, to enhance security and response protocols. This partnership is demonstrated through successful joint exercises, such as Exercise Spectrum in validating joint response plans and escalation processes for emergency preparedness.

In a demonstration of inter-agency collaboration, PSA SG participated in Exercise Spectrum in October 2023. This large-scale inaugural exercise involved personnel from key agencies and our security solutions provider, AETOS. It involved a simulation of a terrorist trespass and hostage situation, which is a

complex security threat. 20 response vehicles and 90 participants from various agencies were deployed to test their coordinated response capabilities.

## Training and Awareness

PSA SG recognises that robust port security requires a multi-layered approach. Empowering both staff and port users plays a critical role in this strategy.

Our Threat-Oriented Person Screening Integrated System programme equips all personnel, including non-security trained staff like cleaners, with the skills to identify suspicious behavior and report it. This program goes beyond traditional security personnel and fosters vigilance across the entire port community.

To ensure preparedness, we conduct regular drills and exercises. In 2023, PSA SG saw a significant 40% increase in the frequency of International Ship and Port Facility Security drills and exercises compared to 2022. This commitment to training strengthens our collective response capabilities.

# Awards and Recognition

PSA SG's unwavering commitment to security excellence has been acknowledged with prestigious awards, including the Outstanding CERT Award, Commissioner Commendation, and Operational Excellence Awards.

These accolades underscore PSA SG's commitment to excellence and dedication to its exceptional security practices, effective collaboration, and operational efficiency. These awards not only celebrate our achievements but also underscore our commitment to continuously improve and maintain the highest security standards.



PSA receives Minister for Home Affairs Operational Excellence Award.

# Regional **Development**



PSA upholds its pledge to safeguard the environment and drives the promotion of environmental sustainability through its terminals worldwide. The following section of this report showcases the performance of terminals situated in Southeast Asia, excluding Singapore, and underscores the initiatives they have undertaken to uphold PSA's vision and goals for sustainability.

## ESG Performance

The SEA Terminals (excluding Singapore Terminals) are:

Country	Name	Short Name
Indonesia	PT New Priok Container Terminal One	NPCT1
Indonesia	PT PSA Cargo Solutions Indonesia	PCSID
Thailand	Eastern Sea Laem Chabang Terminal Co., Ltd.	ESCO
Thailand	LCB Container Terminal 1 Ltd.	LCB1
Thailand	Thai Connectivity Terminal Co., Ltd.	TCT
Vietnam	SP-PSA International Port Co., Ltd.	SP-PSA

## Energy Emissions of PSA's Southeast Asia Terminals

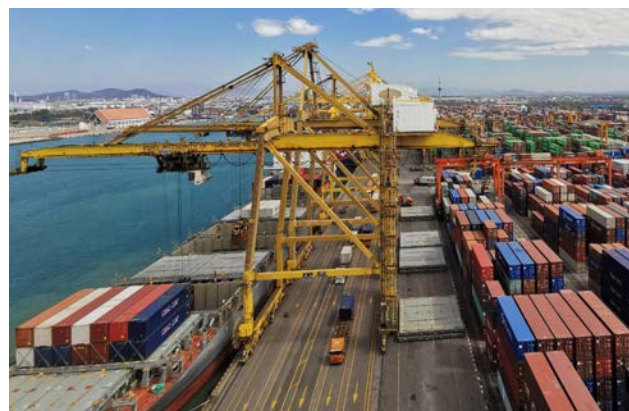
Carbon Emissions (ktCO <sub>2</sub> e)	2021	2022	2023
Scope 1	14.16	21.21	19.28
Scope 2	16.75	25.05	22.61
Scope 1 and 2	30.91	46.26	41.89

The Southeast Asia Terminals (excluding PSA SG) Scope 1 emissions is 19.28 ktCO<sub>2</sub>e and Scope 2 emissions is 22.61 ktCO<sub>2</sub>e, bringing the total Scope 1 and Scope 2 emissions to 41.89 ktCO<sub>2</sub>e. The decrease in total emissions in 2023 from 2022 is mostly attributed to about 9% decrease in throughput volume in 2023.

At PSA, the safety and well-being of our employees and the environment are paramount. To continuously improve Health, Safety, and Security, and strengthen risk resilience across our Southeast Asia Business Units (SEA BUs), a dedicated team of four HSS officers led by the Head of HSS Southeast Asia conducted comprehensive audits in 2023.

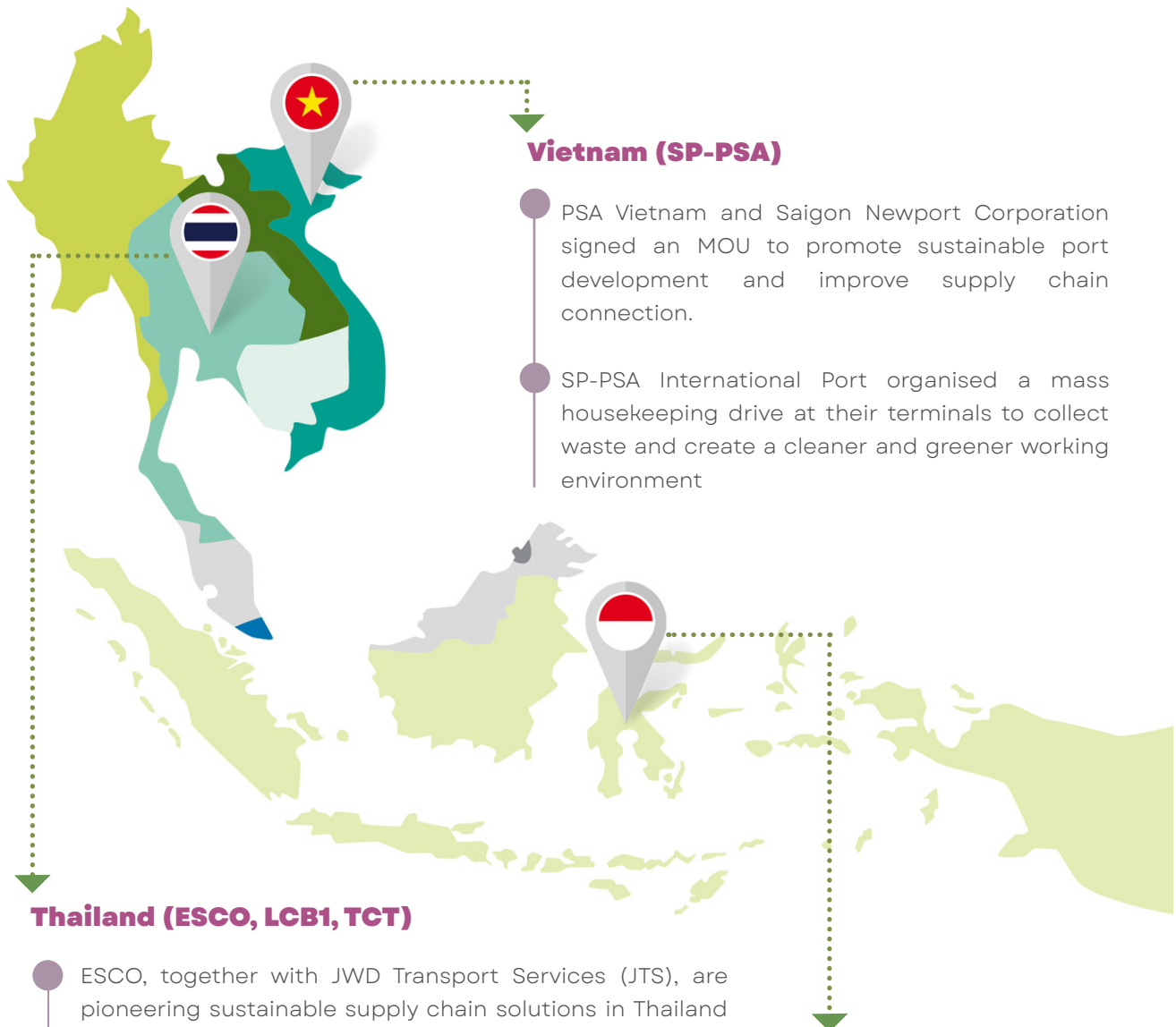
These audits employed a multi-pronged approach, ensuring a thorough assessment of HSS practices

within each BU. This included a thorough process of document reviews (HSS programs, incident reports, and action plans), interviews with managers and ground staff and on-site inspections to identify potential safety concerns. The audit findings were then discussed collaboratively with the Terminals to determine the next course of action to address these concerns.



ESCO terminal in Thailand.

# Promoting Environmental Sustainability **in Southeast Asia**



## Vietnam (SP-PSA)

- PSA Vietnam and Saigon Newport Corporation signed an MOU to promote sustainable port development and improve supply chain connection.
- SP-PSA International Port organised a mass housekeeping drive at their terminals to collect waste and create a cleaner and greener working environment

## Thailand (ESCO, LCB1, TCT)

- ESCO, together with JWD Transport Services (JTS), are pioneering sustainable supply chain solutions in Thailand with the launch of the Green Transport Lane service. As a dedicated Electric Vehicle (EV) trucking route between Laem Chabang seaport and Lat Krabang Dryport, the Green Transport Lane service is the first of its kind in Thailand and offers sustainable solutions for cargo owners as it reduces carbon emissions in comparison to the current conventional diesel trucking. This is also provided to Beneficial Cargo Owners for first and last-mile services.
- ESCO also conducts tests with other stakeholders on the deployment of electric trains to further reduce carbon emissions.
- New hybrid reach stacker deployed at LCB1.
- ESCO organised beach-cleaning activities, fostering partnerships with local organisations and communities.

## Indonesia (PCSID, NPCT1)

PSA Indonesia has partnered with PT Kereta Api Indonesia (Persero) to enhance the rail and rail-linked Logistics, fostering an efficient and sustainable multi-modal transportation network.

# GRI Content Index

**Statement of use:** PSA SG has reported the information cited in this GRI content index for the period, 1 January 2023 to 31 December 2023, in accordance with the GRI Standards.

**GRI 1 used:** GRI 1: Foundation 2021

GRI Standard	Disclosure Number	Disclosure Title	Page Number and Reasons for Omissions, if applicable
<b>General Disclosures</b>			
<b>GRI 2: General Disclosures 2021</b>	2-1	Organizational details	About PSA Singapore, Pg 9
<b>GRI 2: General Disclosures 2021</b>	2-2	Entities included in the Organization's Sustainability Reporting	About this Report, Pg 3
<b>GRI 2: General Disclosures 2021</b>	2-3	Reporting Period, Frequency and Contact Point	About this Report, Pg 3
<b>GRI 2: General Disclosures 2021</b>	2-4	Restatements of Information	About this Report, Pg 3
<b>GRI 2: General Disclosures 2021</b>	2-5	External Assurance	About this Report, Pg 3
<b>GRI 2: General Disclosures 2021</b>	2-6	Activities, Value-Chain and Other Business Relationships	About PSA Singapore, Pg 9
<b>GRI 2: General Disclosures 2021</b>	2-7	Employees	Protecting Our People > Employee Diversity and Inclusion, Pg 71
<b>GRI 2: General Disclosures 2021</b>	2-8	Workers who are not employees	Not Applicable: Due to the nature of our business, PSA SG does not have any workers who are not employees
<b>GRI 2: General Disclosures 2021</b>	2-9	Governance Structure and composition	Our Approach to Sustainability > Our Sustainability Governance, Pg 24-25
<b>GRI 2: General Disclosures 2021</b>	2-10	Nomination and selection of the highest governance body	Confidentiality constraints: PSA is a private entity and does not currently disclose the following information.
<b>GRI 2: General Disclosures 2021</b>	2-11	Chair of the highest governance body	Refer to PSAI AR2023, Pg 9
<b>GRI 2: General Disclosures 2021</b>	2-12	Role of the highest governance body in overseeing the management of impacts	Refer to PSAI SR2023, Pg 20, 25

<b>GRI 2: General Disclosures 2021</b>	2-13	Delegation of responsibility for managing impacts	Refer to PSAI SR2023, Pg 20, 25
<b>GRI 2: General Disclosures 2021</b>	2-14	Role of the highest governance body in sustainability reporting	Refer to PSAI SR2023, Pg 20, 25
<b>GRI 2: General Disclosures 2021</b>	2-15	Conflicts of interest	Confidentiality constraints: PSA is a private entity and does not currently disclose the following information.
<b>GRI 2: General Disclosures 2021</b>	2-16	Communication of critical concerns	Refer to PSAI SR2023, page 20
<b>GRI 2: General Disclosures 2021</b>	2-17	Collective knowledge of the highest governance body	Refer to PSAI SR2023, page 20
<b>GRI 2: General Disclosures 2021</b>	2-18	Evaluation of the performance of the highest governance body	Confidentiality constraints: PSA is a private entity and does not currently disclose the following information.
<b>GRI 2: General Disclosures 2021</b>	2-19	Remuneration policies	Confidentiality constraints: PSA is a private entity and does not currently disclose the following information.
<b>GRI 2: General Disclosures 2021</b>	2-20	Process to determine remuneration	Confidentiality constraints: PSA is a private entity and does not currently disclose the following information.
<b>GRI 2: General Disclosures 2021</b>	2-21	Annual total compensation ratio	Confidentiality constraints: PSA is a private entity and does not currently disclose the following information.
<b>GRI 2: General Disclosures 2021</b>	2-22	Statement on sustainable development strategy	RCEO'S Message, Pg 4
<b>GRI 2: General Disclosures 2021</b>	2-23	Policy Commitments	Acting with Integrity > Ethical Business Conduct, Pg 79
<b>GRI 2: General Disclosures 2021</b>	2-24	Embedding policy commitments	Acting with Integrity > Ethical Business Conduct, Pg 79 Acting with Integrity > Sustainable Procurement, Pg 80
<b>GRI 2: General Disclosures 2021</b>	2-25	Processes to remediate negative impacts	Refer to PSAI SR2023, Pg 72
<b>GRI 2: General Disclosures 2021</b>	2-26	Mechanisms for seeking advice and raising concerns	Acting with Integrity > Ethical Business Conduct, Pg 79

<b>GRI 2: General Disclosures 2021</b>	2-27	Compliance with laws and regulations	Acting with Integrity > Ethical Business Conduct, Pg 79
<b>GRI 2: General Disclosures 2021</b>	2-28	Membership associations	Emissions and Energy > Strategic Connections with Stakeholders for Bigger Decarbonisation Impact, Pg 35
<b>GRI 2: General Disclosures 2021</b>	2-29	Approach to stakeholder engagement	Our Approach to Sustainability > Material Sustainability Topics, Pg 18
<b>GRI 2: General Disclosures 2021</b>	2-30	Collective bargaining agreements	Protecting Our People > Labour Relations & Worker Well-being, Pg 72-73
<b>Topic Specific Disclosures</b>			
<b>GRI 3: Material Topics 2021</b>	3-1	Process to determine material topics	Our Approach to Sustainability > Material Sustainability Topics, Pg. 18
<b>GRI 3: Material Topics 2021</b>	3-2	List of material topics	Our Approach to Sustainability > Material Sustainability Topics, Pg. 18
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<b>GRI 3: Material Topics 2021</b>	3-3	Management of material topics	Taking Climate Action > Climate Change Adaptation, Pg. 27
<b>Emissions and Energy</b>			
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<b>GRI 302: Energy 2016</b>	302-1	Energy consumption within the organisation	Taking Climate Action > Emissions and Energy, Pg. 31
<b>GRI 305: Emissions 2016</b>	305-1	Direct (Scope 1) GHG emissions	Taking Climate Action > Emissions and Energy, Pg. 32
<b>GRI 305: Emissions 2016</b>	305-2	Energy indirect (Scope 2) GHG emissions	Taking Climate Action > Emissions and Energy, Pg. 33
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<b>GRI 3: Material Topics 2021</b>	3-3	Management of material topics	Protecting Our People > Environmental Protection, Pg. 76

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<b>GRI 306: Waste 2020</b>	306-3	Waste generated	Ensuring Responsible Operations > Waste Management and Recycling, Pg. 65
<b>GRI 306: Waste 2020</b>	306-4	Waste diverted from disposal	Ensuring Responsible Operations > Waste Management and Recycling, Pg. 65
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<b>GRI 403: Occupational Health and Safety 2018</b>	403-2	Hazard identification, risk assessment, and incident investigation	Nurturing Future-Ready Workforce > Safety, Pg. 52
<b>GRI 403: Occupational Health and Safety 2018</b>	403-5	Worker training on occupational health and safety	Nurturing Future-Ready Workforce > Occupational Health, Pg. 51 Nurturing Future-Ready Workforce > Safety, Pg. 52
<b>GRI 403: Occupational Health and Safety 2018</b>	403-6	Promotion of worker health	Nurturing Future-Ready Workforce > Occupational Health, Pg. 51
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<b>GRI 3: Material Topics 2021</b>	3-3	Management of material topics	Nurturing Future-Ready Workforce > People Development, Pg. 47
<b>GRI 404: Training and Education 2016</b>	404-1	Average hours of trainings per year per employee	Nurturing Future-Ready Workforce > People Development, Pg. 48
<b>GRI 404: Training and Education 2016</b>	404-2	Programs for upgrading employee skills and transition assistance programs	Nurturing Future-Ready Workforce > People Development, Pg. 49
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