

PSA Singapore Sustainability Journey

90.9 million TEUs in 2022

Declared Group throughput

Group revenue of S\$8b in 2022

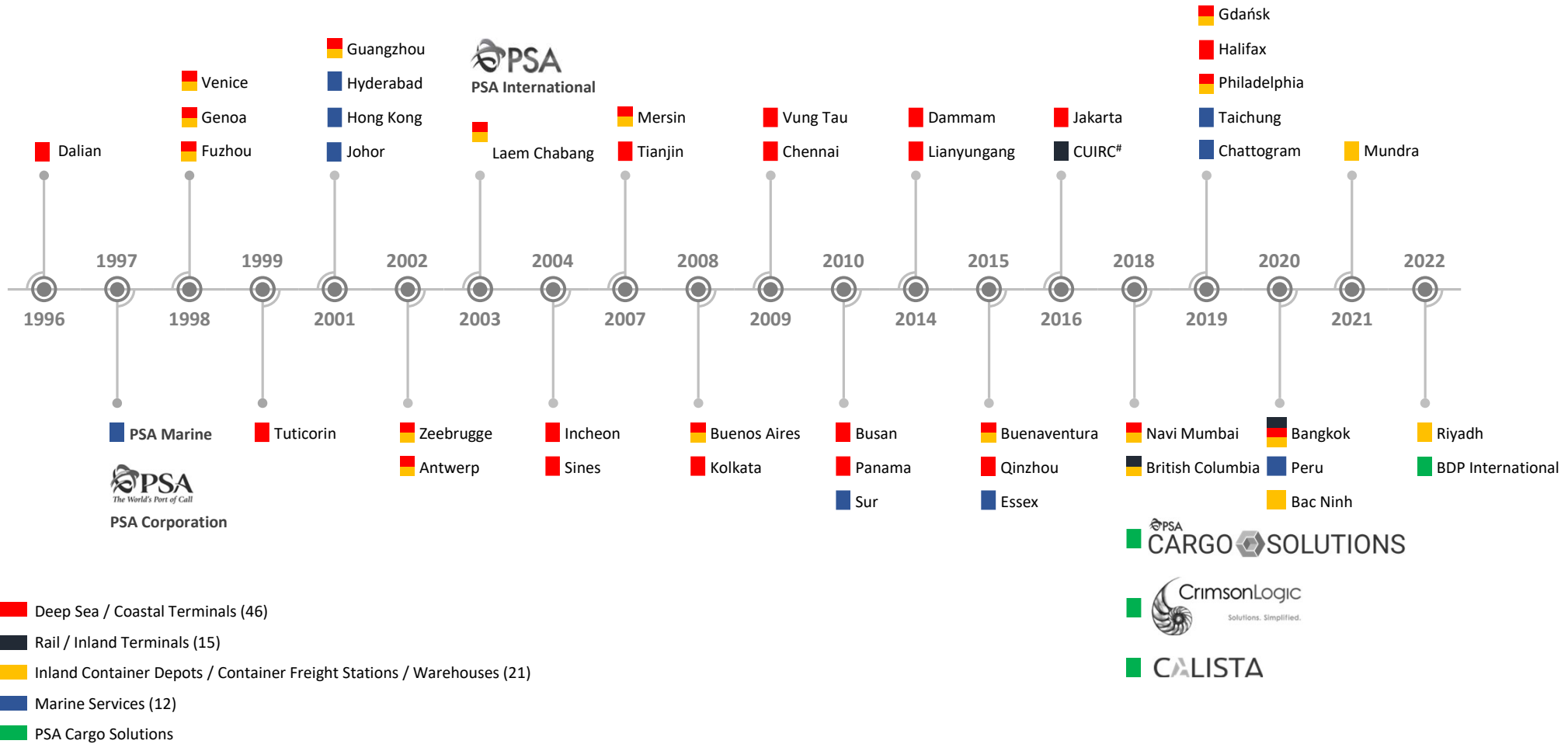
49,000 staff globally

World's Busiest Transshipment Hub

PSA Singapore: 37.0 million TEUs in 2022

(Almost one-seventh of the world's total container transshipment throughput)

PSA'S JOURNEY IN PORTS AND CARGO SOLUTIONS



China United International Rail Containers Co., Limited (CUIRC) has 13 terminals in operation – in Kunming, Chongqing, Chengdu, Zhengzhou, Wuhan, Xi'an, Dalian, Qingdao, Ningbo, Tianjin, Urumqi, Qinzhou and Guangzhou.

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PSA GLOBAL NETWORK



PSA
42 Countries
160 Locations
66 Terminals

ASIA	EUROPE	THE AMERICAS	AFRICA	OCEANIA
Bangladesh	Belgium	Argentina	Egypt	Australia
China	Czech Republic	Brazil	Morocco	New Zealand
India	Denmark	Canada		
Indonesia	France	Chile		
Japan	Germany	Colombia		
Malaysia	Ireland	Panama		
Oman	Italy	Peru		
Qatar	Netherlands	Uruguay		
Saudi Arabia	Poland	USA		
Singapore	Portugal			
South Korea	Sweden			
Thailand	Switzerland			
Turkey	Spain			
UAE	United Kingdom			
Vietnam				

CRIMSONLOGIC		
Present in 20 Countries	Implemented >60 Projects	Digital solutions in >40 Countries

Not included in PSA Global Network count

- Deep Sea / Coastal Terminals
- PSA BDP Offices
- Rail / Inland Terminals
- Inland Container Depots / Container Freight Stations / Warehouses
- PSA Marine
- CrimsonLogic

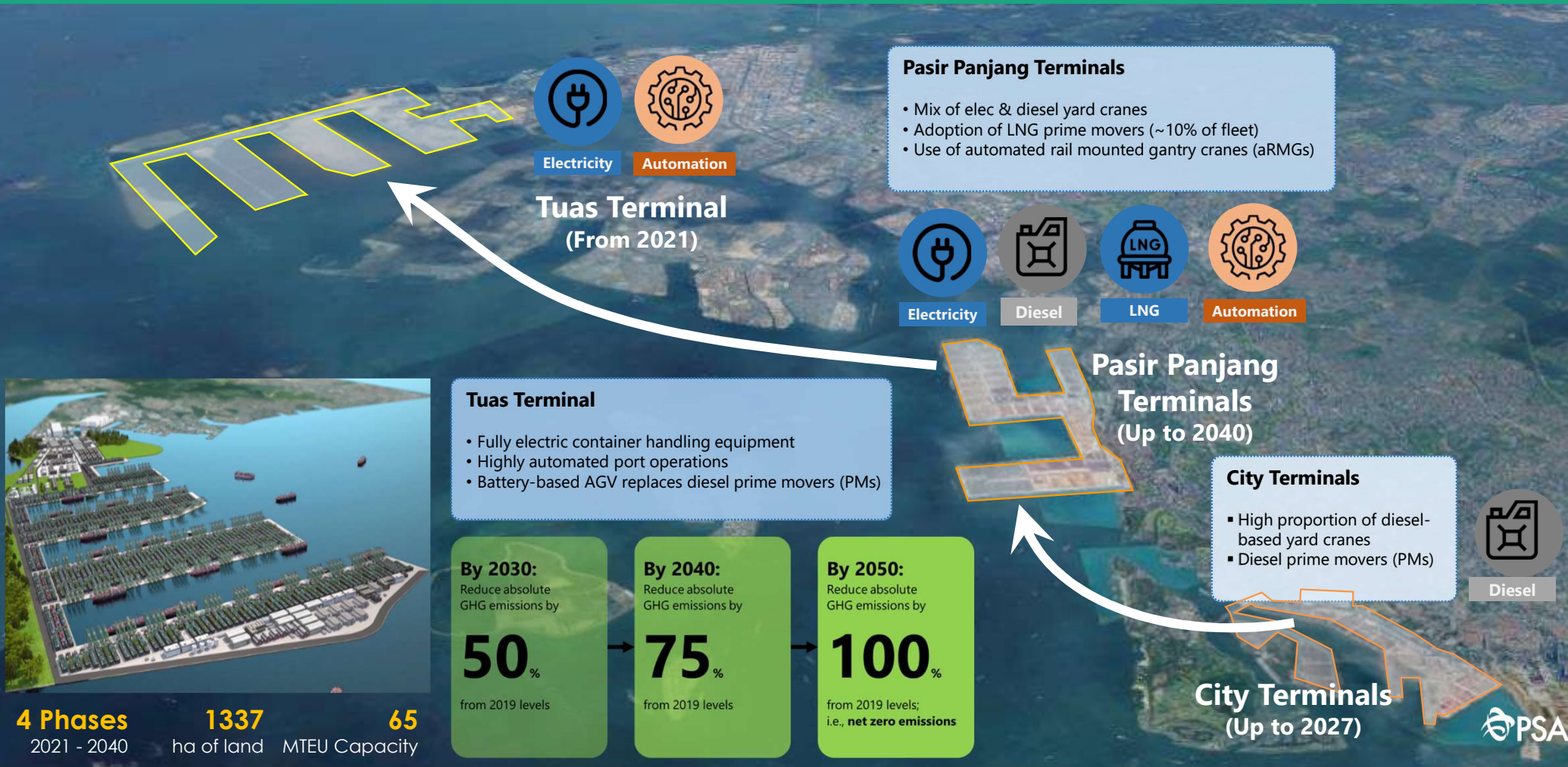
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PSA Sustainability Strategy Framework



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Westward shift towards Tuas as part of Decarbonisation



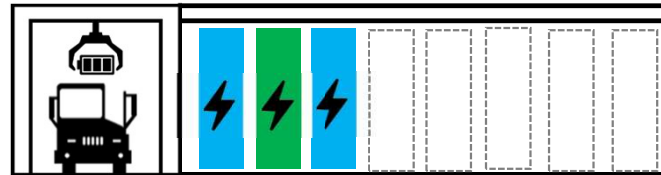
4 Phases 2021 - 2040
1337 ha of land
65 MTEU Capacity



Converging technologies to unlock decarbonisation, productivity and financial values

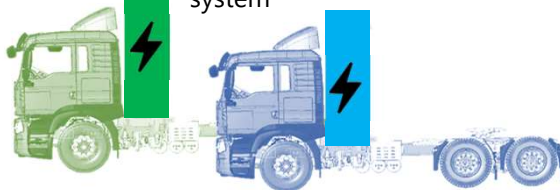


PSA Smart Grid Deployment & Electrical Infrastructure

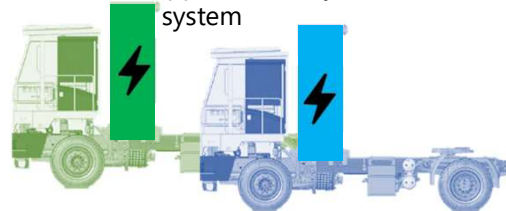


Electric Vehicle Charging Station (EVCS)

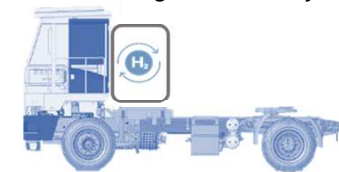
Electric IGH (eIGH) with swappable battery system



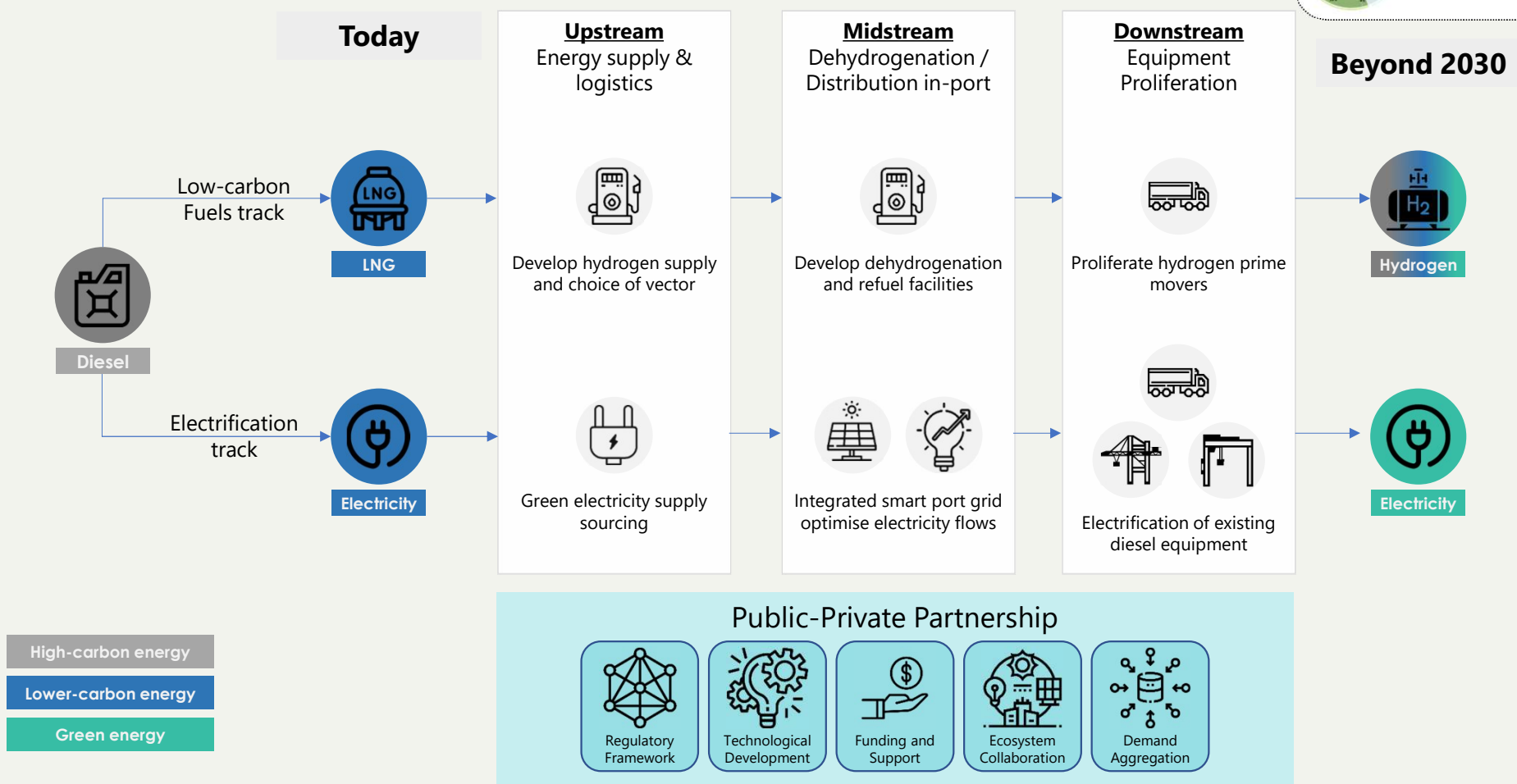
Electric Prime Mover (ePM) with swappable battery system



Fuel Cell Electric Prime Mover (H2PM) (with smaller rechargeable battery)

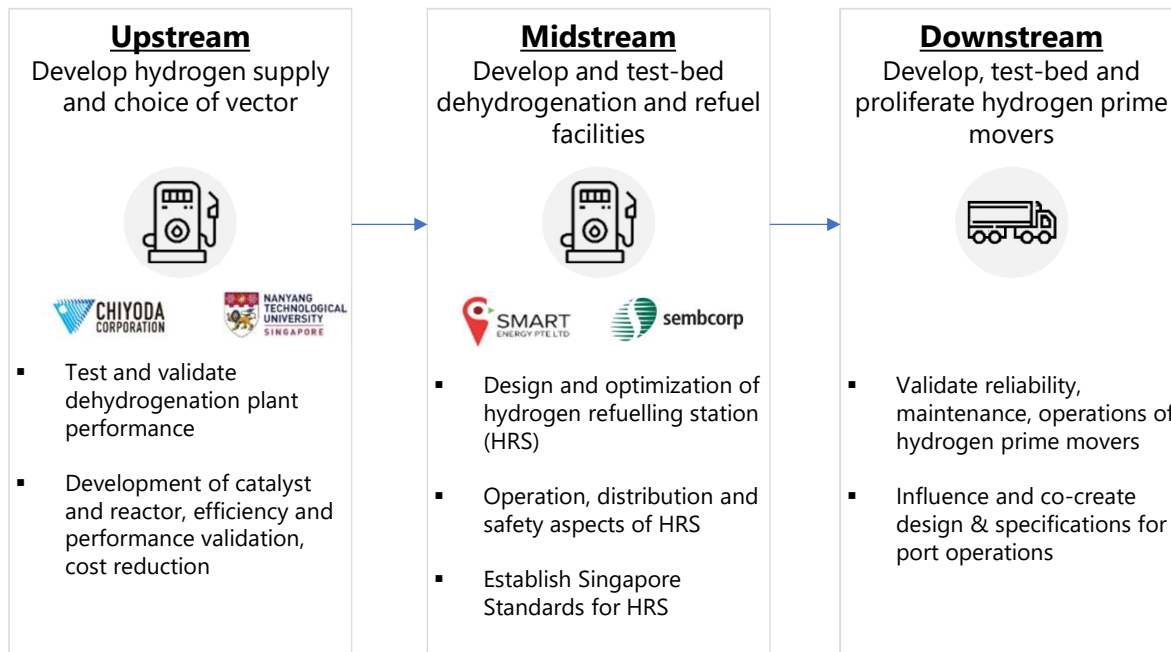


Adopting low-carbon fuels and electrification as main decarbonisation drivers





Proof-of-concept on Hydrogen Prime Movers for Port Deployment



+

Hydrogen Supply Chain

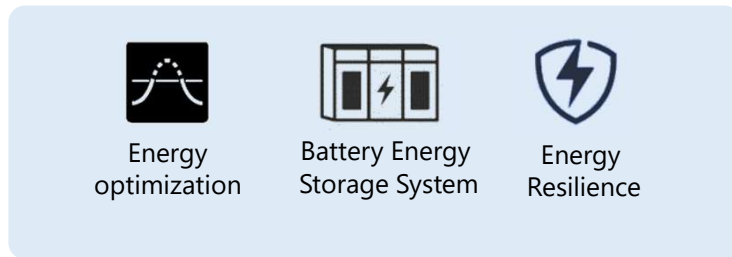
Technical and Economic assessment of the hydrogen supply chain (including transportation and distribution) with the aim of further reducing the cost of hydrogen, cost of the dehydrogenation process and accelerating the realization of such supply chain in Singapore.

Electrification + 2nd life batteries supports smart grid and BESS proliferation

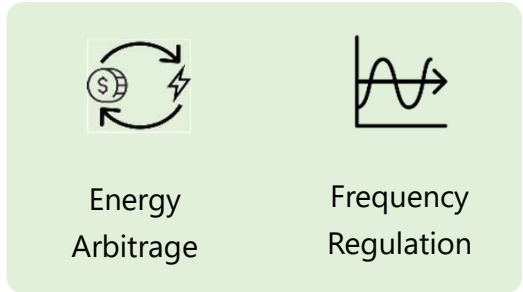


Smart Port Grid (EMA X PSA Joint Grant Call)

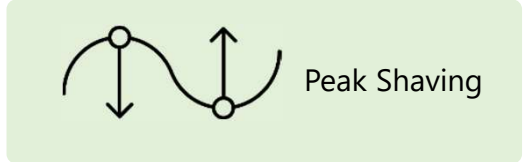
Smart Grid Management System (**SGMS**) as key enabler for easier integration and penetration of new energy technologies, to yield **better energy management, carbon footprint and operational costs**



Electricity Market Participation



Consumer End Management



Closing the loop on handling of parts and waste materials

3

Scope 3 GHG Reduction

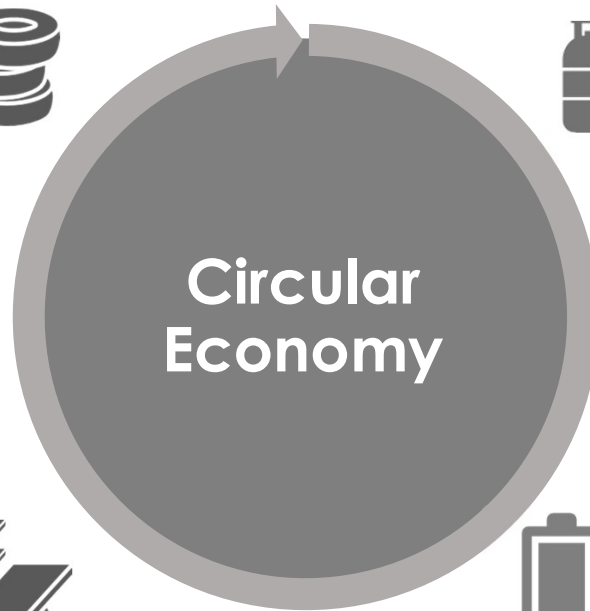
Exploring use of **plasma pyrolysis/gasification** technology to re-purpose **waste rubber tyres** from port operations into **resources**



Use of **reclaimed refrigerants** for **reefer containers**



Circular Economy



Exploring collaboration with industry to re-purpose **waste steel from cranes** as **feedstock** for **green steel production & additive manufacturing**



Continuously scaling up BESS capacity by **repurposing batteries** from AGVs & ePMs



Beyond operational carbon to Scope 3 and value chain emissions

3 Scope 3 GHG Reduction

72 %
Reduction in Embodied Carbon Emissions

GGBS

Ground-granulated blast-furnace slag

- Adopted sustainable concrete for Tuas Port Development (up to 80% GGBS)
- Leverage on Carbon Cure technologies



Embodied Carbon

The emissions from manufacturing, transportation, and installation of building materials.



Total Carbon Savings: **1.3 mil tonne CO2e**

Electric truck eco-system to accelerate land transport sector decarbonisation.



**Electric PMs
- Demand
Aggregation**



**R&D to Design
Inter-Changeable
Battery Packs &
Energy Storage Systems**



**Battery Swap
Market
Development**



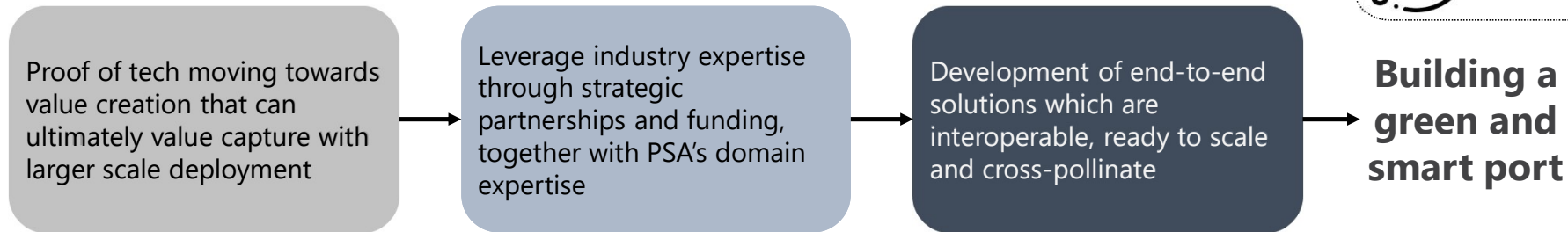
**Safety & Regulatory
Frameworks
Aligned with International
Standards**

Electric Truck Ecosystem

Smart and Green Port - pushing new frontiers for technology and sustainability



Technology As an enabler

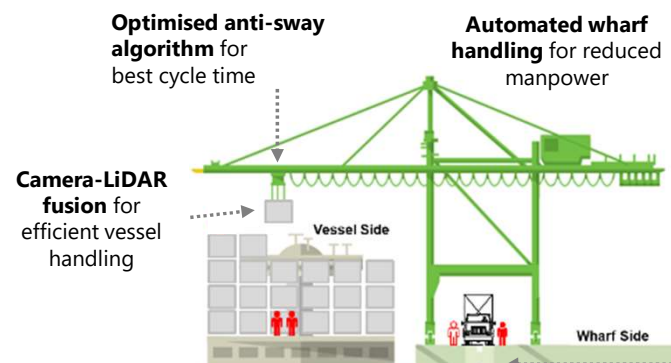


Strategic Technology Enablers

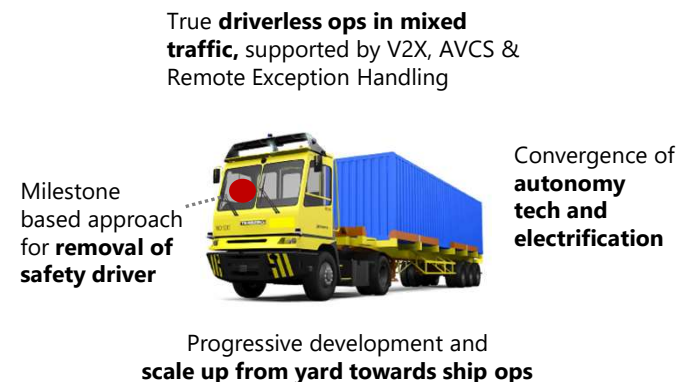
Wharf & Vessel Mechanization



World's 1st - Fully Automated Quay Crane



Autonomous Prime Mover

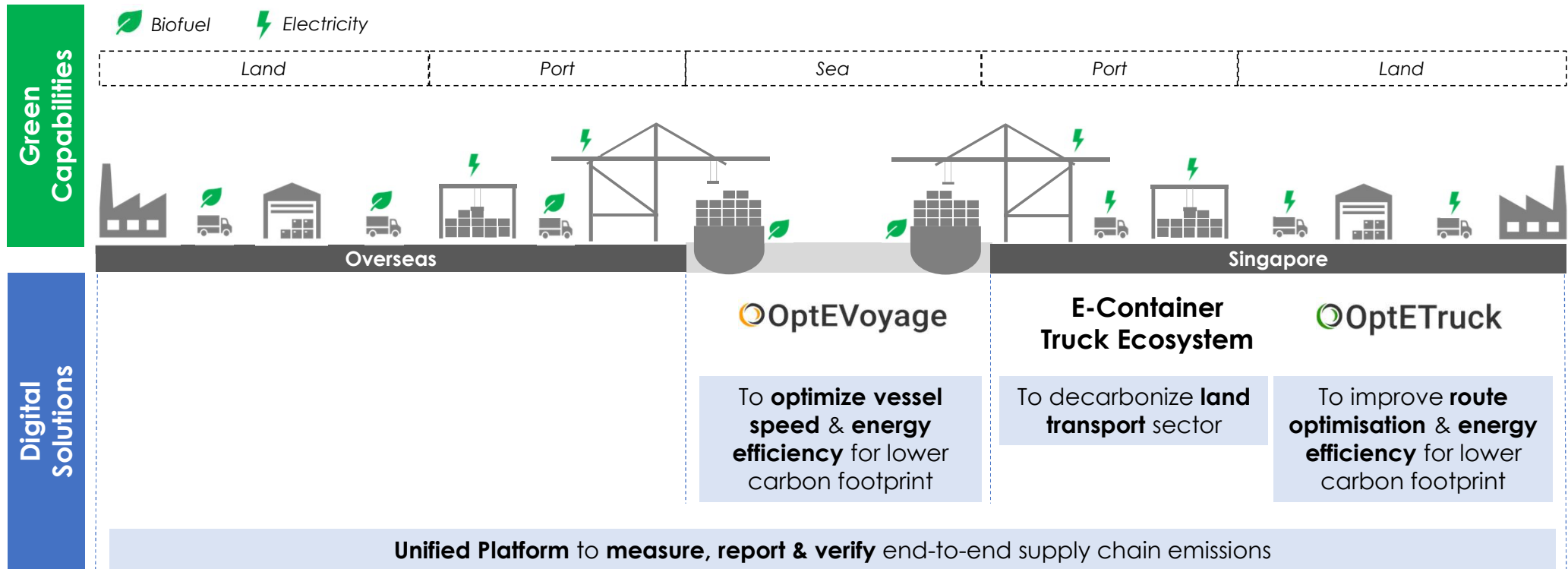


Catalysing End-to-End Supply Chain Decarbonisation

Via Partnership with Ecosystem Stakeholders & Enabled by Green Capabilities & Digital Solutions

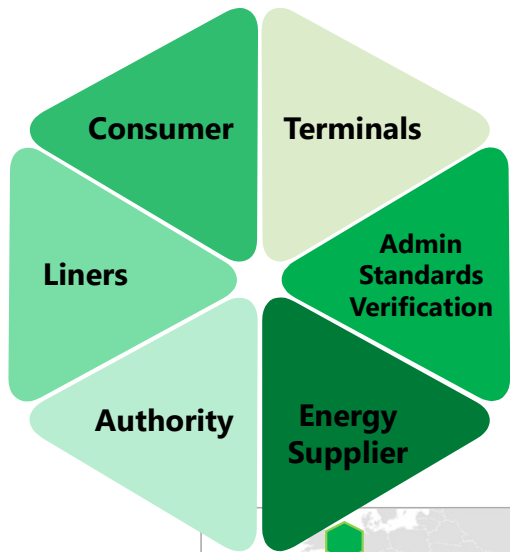


Supply Chain Decarbonisation



Sustainability Supply Chain Network

Accelerate maritime decarbonisation via development of green shipping corridors



Green
Hexagon
Framework

Intra-Asia

Silk Alliance led by Llyod's Register with liners & other stakeholders

South East Asia

Pilot of end-to-end green supply chain by PSA Singapore

Asia-Europe

Green & Digital corridor led by Maritime & Port Authority of Singapore (MPA) & Port of Rotterdam Authority

Trans-Pacific

Green & Digital corridor led by MPA, Port of Los Angeles, Port of Long Beach & C40 Cities

Green Port Culture

Onboard and engage all staff on sustainability



- Strengthen a generative culture where all staff are **green-minded, green-skilled** and **green-motivated**
- Through these 6 pathways:

1. Greenfish

2. Towards Enduring Partnership (TEP)! Go Green

3. PSA SG in Bloom

4. Empower & Equip

**5. Go Green
Corporate Social Responsibility**

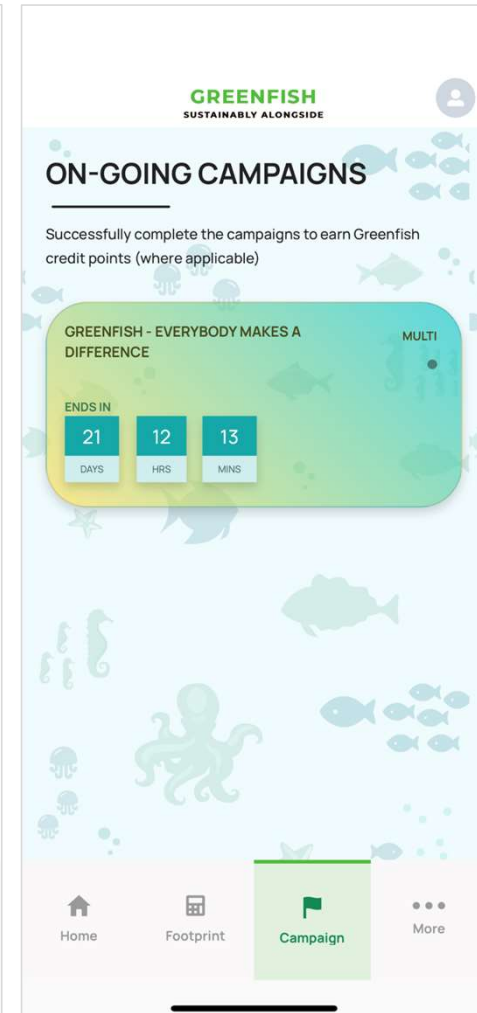
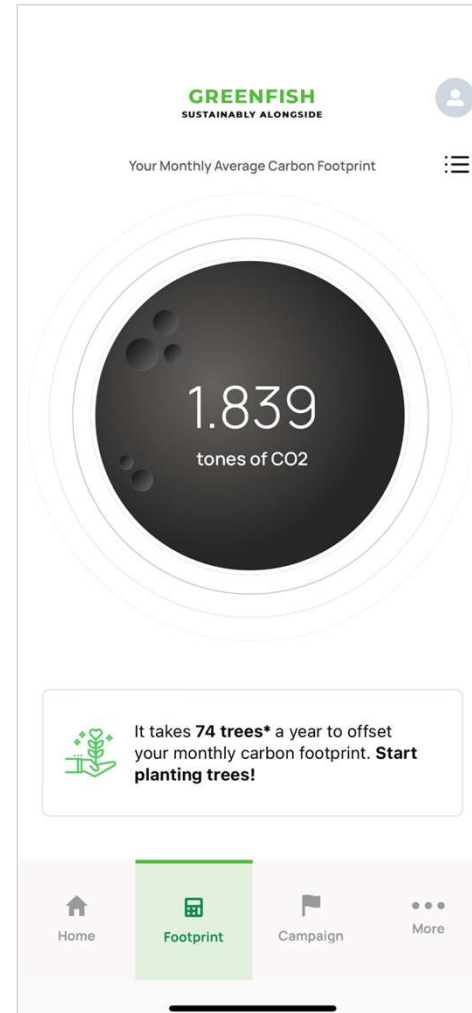
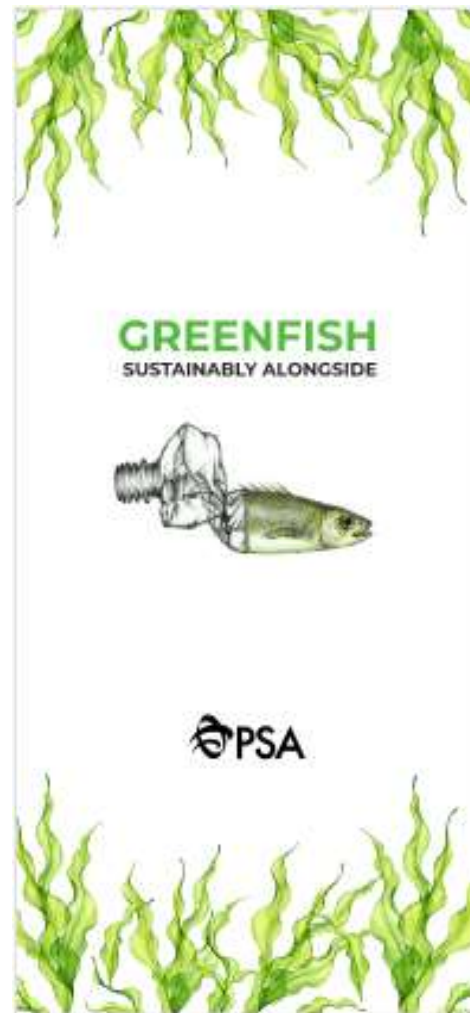
6. Green Partnerships

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Greenfish Sustainability Mobile App (Greenfish App)

For PSA SG staff

- Personal carbon footprint calculator
- Learn through in-app resources such as game, newsletter, videos
- Participate in organised campaigns jointly organised with internal stakeholders



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PSA SG in Bloom



Left : PSA contributes S\$3.5m to Garden City Fund to co-create 2.5km stretch of Pasir Panjang Park to reach out to community

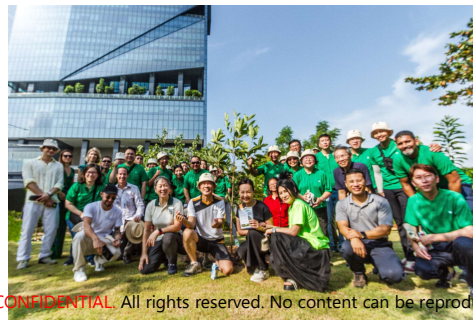
NParks Community in Bloom (CIB) Awards 2023 Top 50 Garden (Organisations)



Pasir Panjang Park



- S\$3.5m to Garden City Fund to co-create 2.5km stretch of Pasir Panjang Park to reach out to community
- 3 containers refurbished into 2 container shelters for park users
 - Green roofs
 - Maritime artefacts
 - Painted murals



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Sustainability at PSA Singapore 2022

- 6th annual report
- Themed 'Propelled by Purpose' and available on PSA Singapore's website at below link:
<https://www.singaporepsa.com/media/sustainability-psasg/>
- In accordance with the updated GRI Universal Standards 2021
- Our climate change adaptation approach is aligned to the recommendations of the Taskforce on Climate-related Financial Disclosures (TCFD)



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Thank You



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