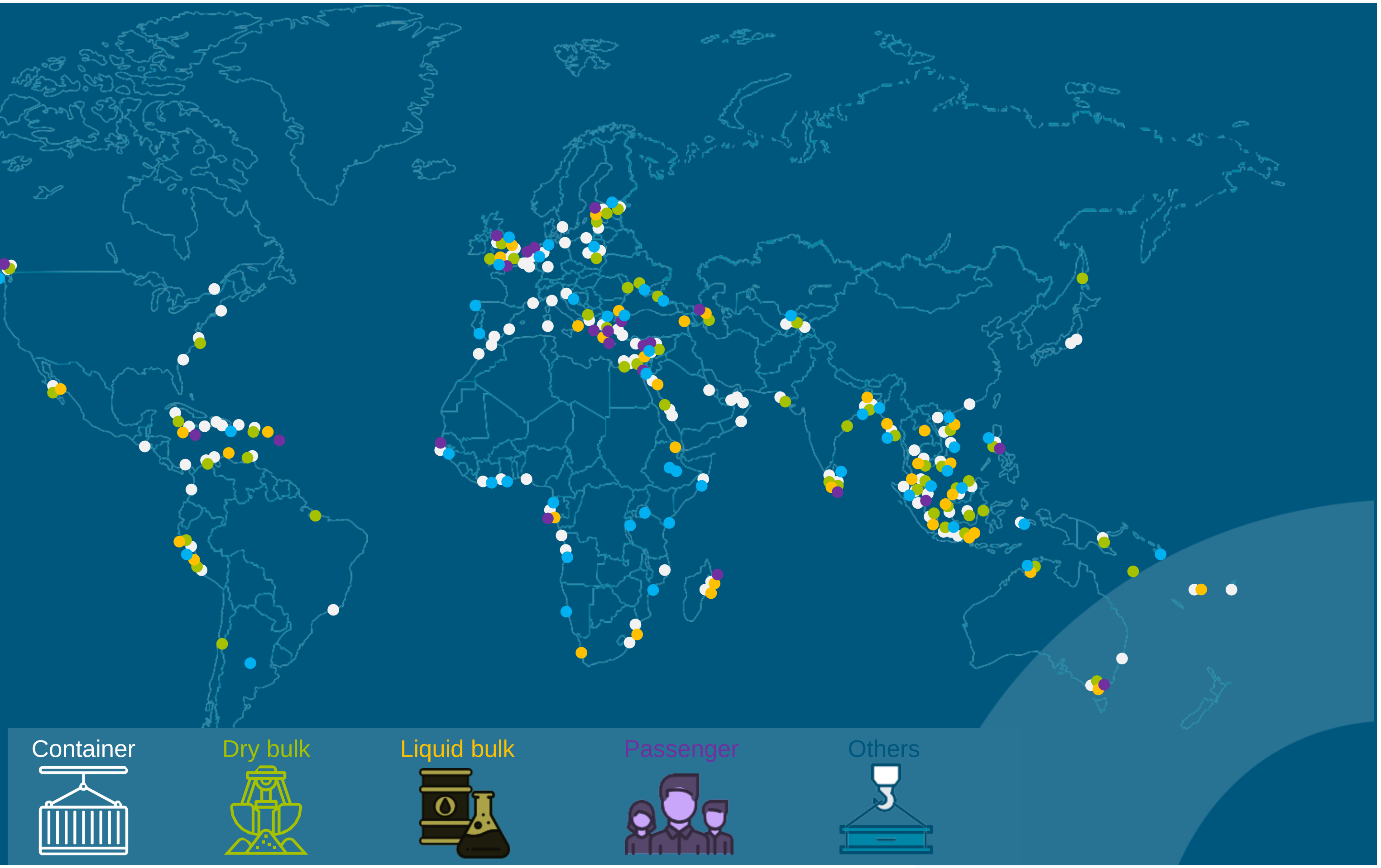
OCEAN SHIPPING CONSULTANTS a company of Royal HaskoningDHV Enhancing Society Together

Port and logistics infrastructure investment opportunities in SEA

TOC Asia Conference

26th November 2024

Royal HaskoningDHV is an international engineering consultancy founded in 1881.



Over
3,000 projects annually

Over
200 clients
including international finance institutions, infrastructure funds, banks, port authorities, governments, shipping lines, terminal operators

We focus the agenda on the terminal operator’s port investment decision making process.

Key market segments

The market segments can be categorised by the location of handling/storage and the cargo types handled.

Sea transport ↔ Port handling ↔ Inland transportation ↔ Inland storage

Container

Dry bulk

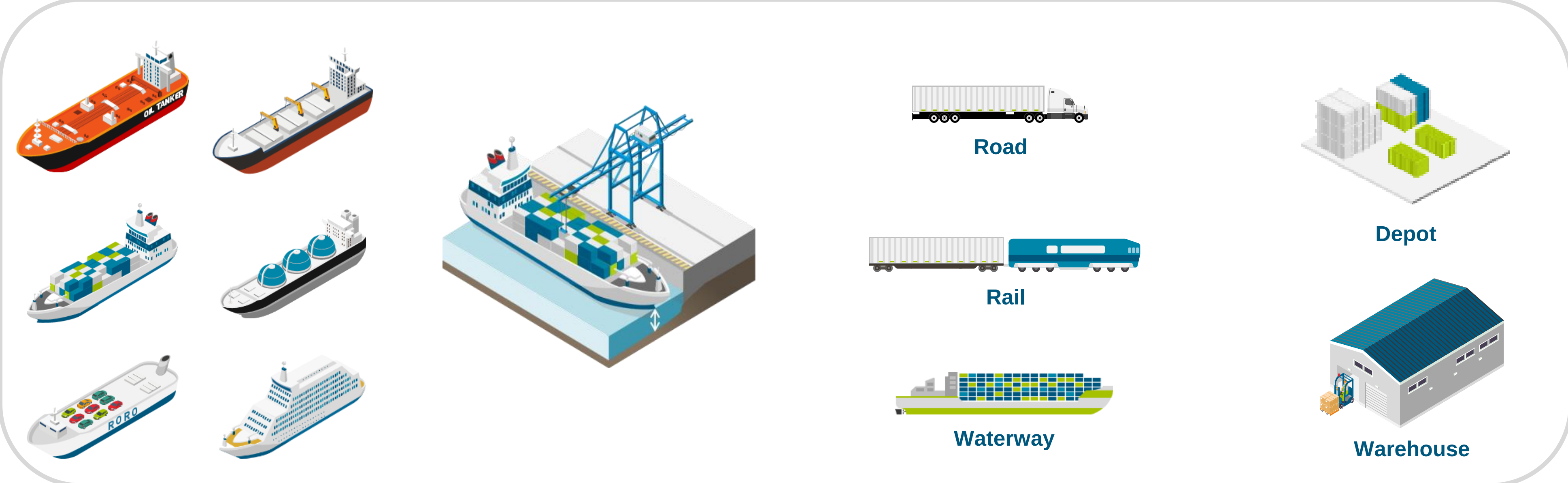
Liquid bulk

Gas bulk

RORO

Cruise

Others



Low frequency of vessel calls with a large number of operators

High volume with limited cargo types per facility

Single cargo type with high frequency and small volumes per handling

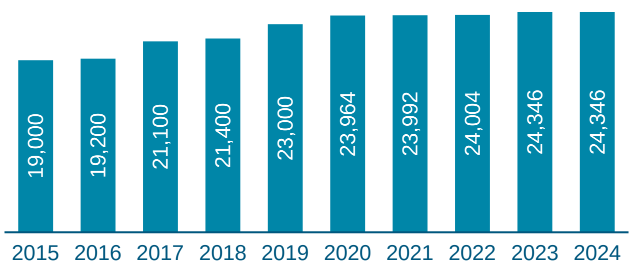
Medium volumes with limited cargo types per facility

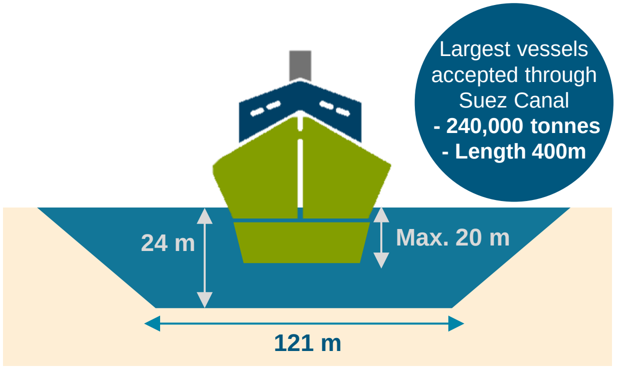
Sea-side

Vessel sizes have reached a limit due to physical or commercial constraints. Further upsizing is unlikely without significant investments in the Suez Canal or changes in the cargo trade.

Container vessel sizes

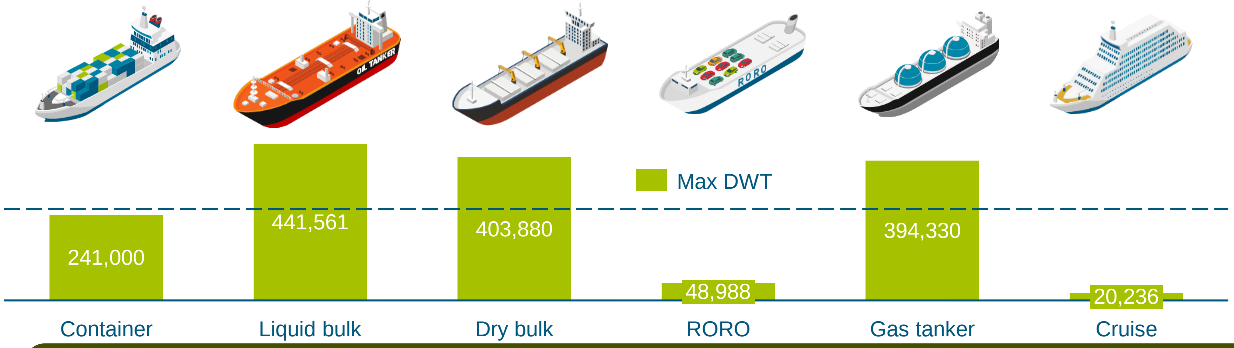
Largest container vessel size (TEU)





The capacity for the largest vessel sizes reach 24k+TEU in 2024. Shipyards are capable of building larger vessels, equipment can be further upsized and berths can be deepened.
However, the vessel dimensions have remained unchanged due to the constraints by the Suez Canal.

Other vessel sizes



Liquid bulk, gas bulk and dry bulk exceed the Suez max. Liquid and gas originating from the Middle East and iron ore from Australia bypasses the Suez Canal. The vessel sizes are limited by the trade and berth drafts.

Container vessels have reached their maximum physical capacity in accordance with the constraints imposed by the Suez Canal's dimensions. Consequently, it reduces the need for ports to cater for larger container vessels.

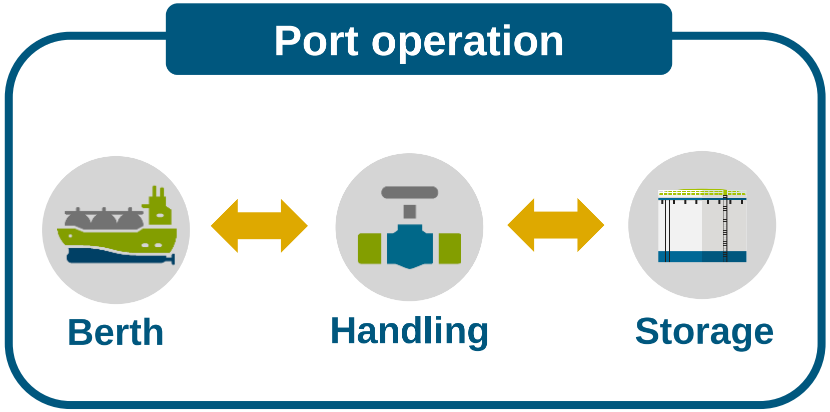
The vessel sizes for other cargo types have reached a plateau due to the trade sizes. The vessel sizes are unlikely to increase further due to diminishing economies of scale.

Source: RHDHV

Port-side

The port operator’s revenue model is mainly from cargo handling, storage and gate collection/delivery. The port operator has limited influence/control on the marine and inland transportation and movements.

Revenue model



Revenue stream

Type of charges	Marine charges	Port charges					
Type of tariff	Marine tariff	Handling		Storage			Collection / delivery
Factors affecting	Vessel size	Type of cargo	Volume	Type of cargo	Volume	Turn-over time	Volume

The main services are vessel handling, cargo transfer, and storage.

90% of the port operator’s revenue is made up of the handling, storage and gate collection/delivery

Source: RHDHV

Port-side

Port operators can access to the necessary technical and operating expertise to provide high levels of productivity. The investment and operating cost is the main determinant of the service level provided.

Port productivity

RHDHV port assignments

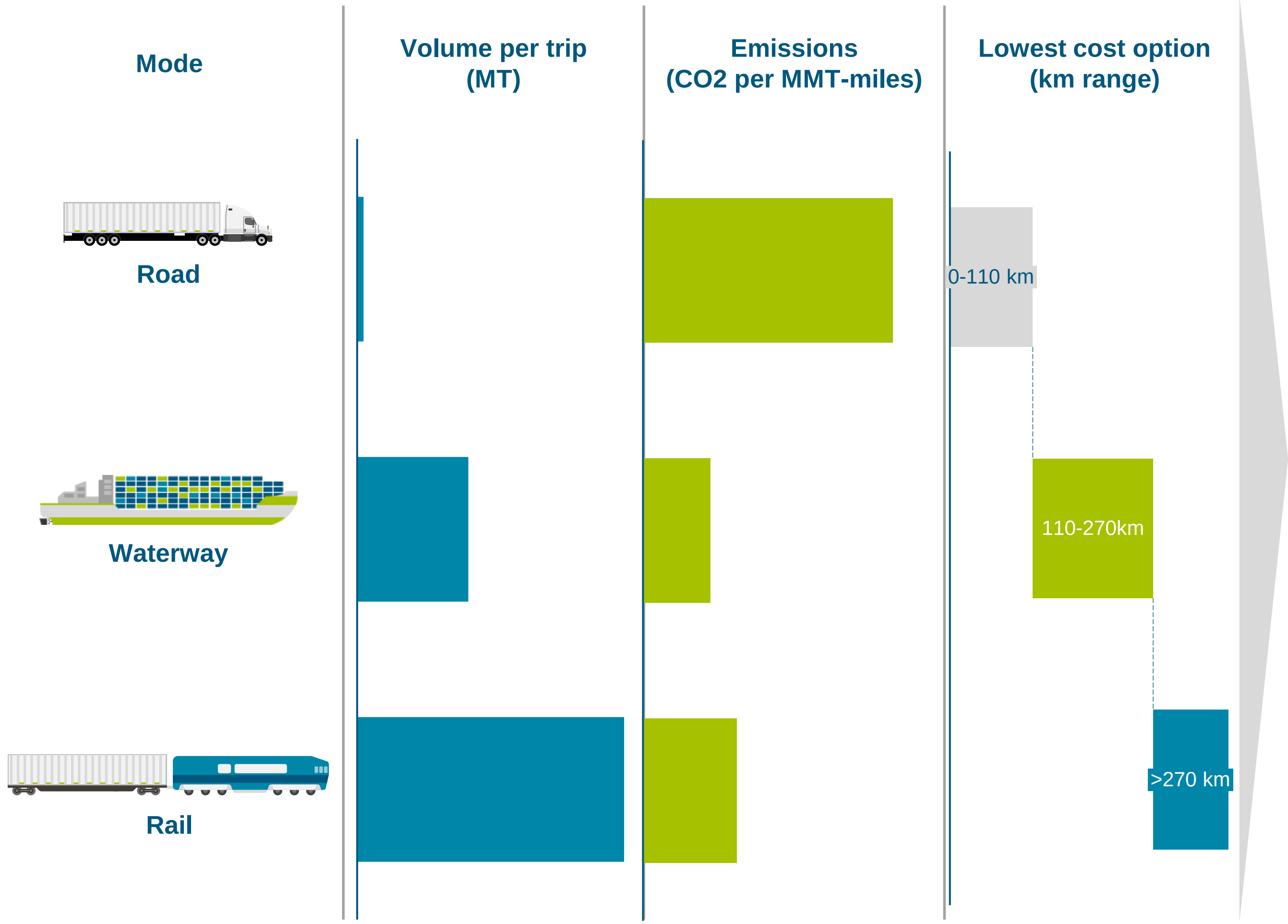
	Productivity drivers	CAPEX	OPEX
Container	Dependent on operator skill and trucks deployed	High	High
Liquid/gas bulk	Number of pipelines and limited by safety measures	High	Low
Dry bulk	Number of cranes and conveyors deployed	High	Medium
Roro	Drivers deployed	Low	High

Source: Anecdotal from past RHDHV projects

Capable operators have shown that high berth productivity can be achieved at a cost.

Assuming the vessel size limitation and productivity being equal, competition among operators is based on pricing and land side solutions.

Shippers will choose the lowest-price option offered by the transporters. Transporters aim to fulfil the service using the lowest-cost mode, which is distance dependent. Port operators operate inland transportation companies to anchor the volumes to the port, and often at cost or low margins.



Shippers tend to choose to go for the lowest cost option which tends to be the mode with the highest economies of scale

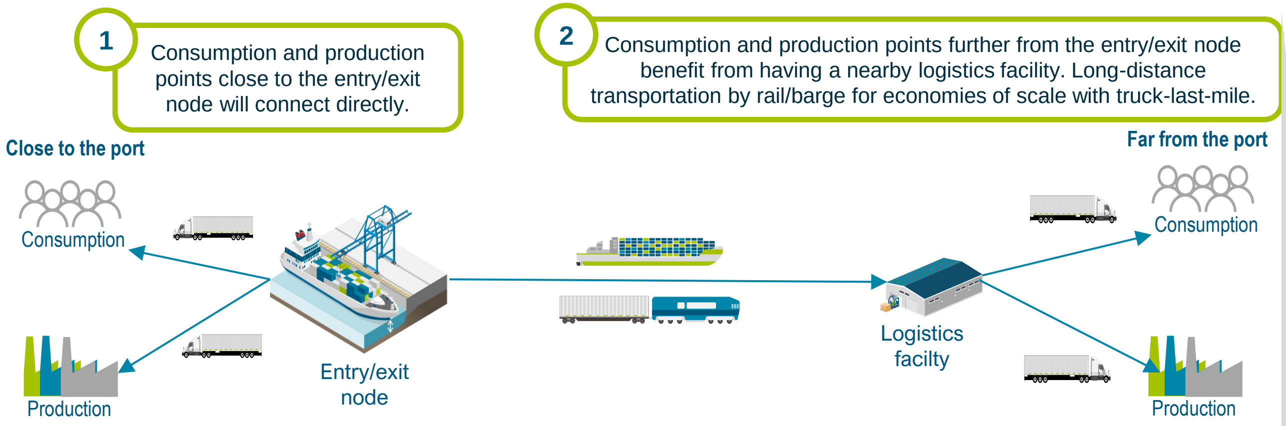
The inland transportation industry has low barriers to entry which is why terminal operators tend to avoid this industry.

Those the enter to this industry tends to operate it at cost.

Source: RHDHV based on Vietnam inland transportation

Inland storage

Port operators are becoming increasingly involved in inland logistics facilities, viewing them as an extension of the port, to serve the hinterland.



Type	Services	Close to port	Close to destination
 Off-dock yard	• Store laden containers • Container freight services • Customs clearance	✓	
 Empty depot	• Store empty containers • Empty container maintenance	✓ For containers without export cargo	✓ For empty containers waiting for export cargo
 Warehouse	• Storage of goods		✓

Inland logistics facilities provide a holding location and reduce need for transportation until the cargo is required.

The location determines the types of services that can be offered.

Port operators enter the market as an extension of their port operations

Traditionally, the economic activity is seen as the driver of cargo growth. The drivers can be further refined based on the consumption and production drivers.

Drivers of cargo growth

1. **Population**

2. **Technology**

3. **Policy**

Cargo growth drivers

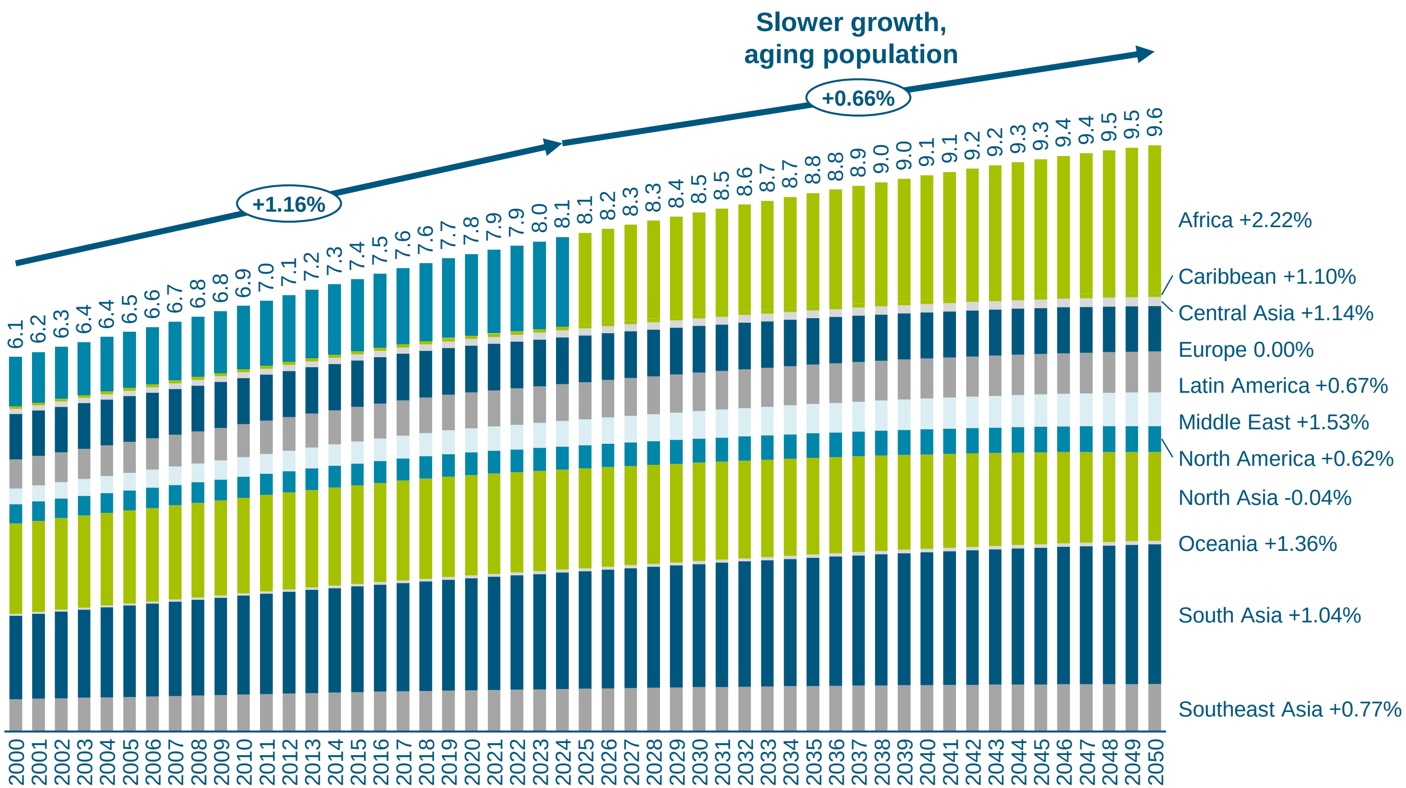
The population boom is over. We have shifted to slower growth, an aging population, and potentially negative population growth in Northeast Asia and Europe. The impact is lower consumption demand.

Drivers of cargo growth

1

Population

World population, 2000-2025 (billion persons)



Source: Oxford Economics

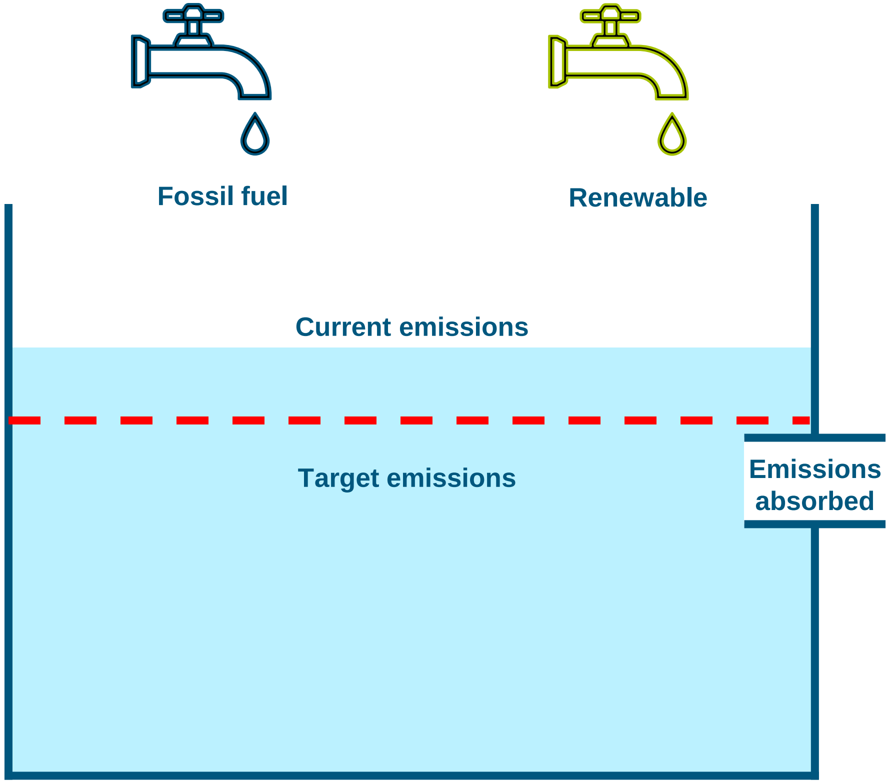
The drive towards renewable energy generation is key to lowering carbon emissions. Thus far, the emissions are not reaching the target levels.

Drivers of cargo growth

2 Technology

1. Carbon emissions are higher than the set target.
2. While energy generation by renewables is increasing, the energy demand is also increasing.
3. There will be a phase of rapid adoption of renewables that reaches a plateau at which fossil fuels cannot be further replaced.
4. Energy demand continues to increase, and emissions continue.

Source: IRENA, RHDHV-OSC's desktop research



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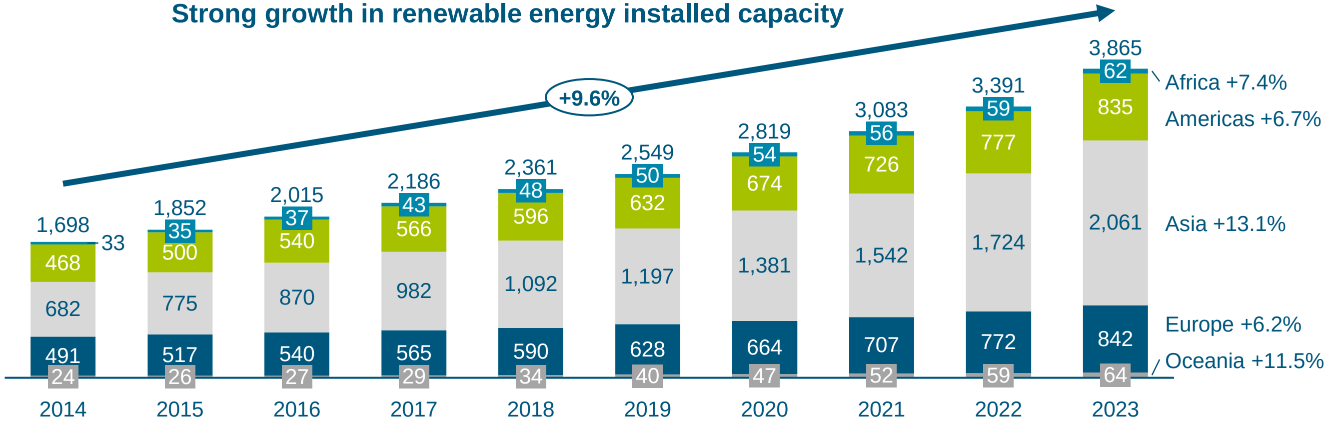
Cargo growth drivers

The adoption of renewables for power generation is increasing but will not be sufficient to replace fossil fuels completely. Renewable energy would have a limited impact on selected cargo types, and is not a game-changer that changes major trade flows.

Drivers of cargo growth

2 Technology

Total renewable energy (RE) installed per region, 2014-2023 ('000 MW)



Energy source	Type of cargo involved	Long-term outlook
Solar	Container	↑ Volumes are for the installation phase
Wind	Break bulk	↑ Volumes are for the installation phase
Hydrogen, ammonia and methanol	Liquid bulk	↑ Volumes will not be a like for like replacement for fossil fuels.
Coal, gas and refined petroleum	Dry bulk and Liquid bulk	↓ Plateau, followed by a decline in volumes in the long-term.

Source: IRENA, RHDHV-OSC's desktop research

The China + 1 strategy resulted in an increase in semi-processed goods from China to SEA, and an increase in the finished product exported to the US. The cargo flows will be further altered should there be changes in the US trade tariff policies.

Drivers of cargo growth

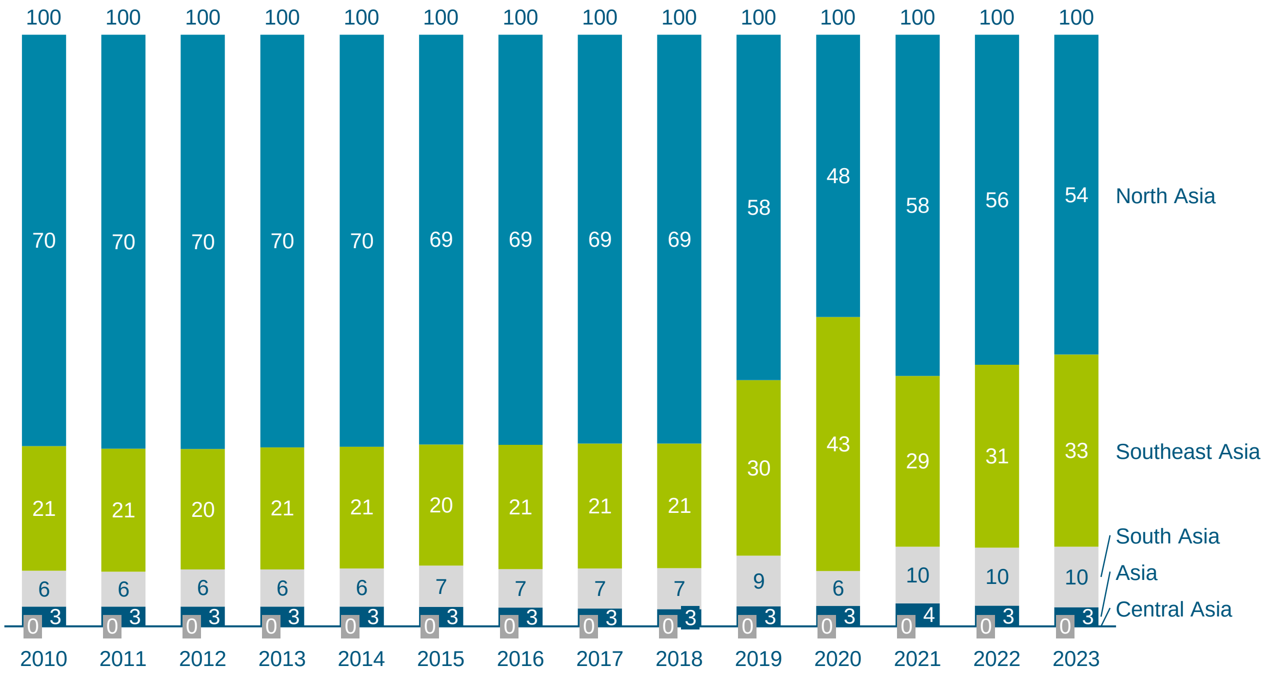
3 Policy

The **China + 1 Strategy**, or Plus One or C+1, is a supply chain strategy that reduces a company's reliance on China by diversifying sourcing and manufacturing to other countries. Should US impose further tariffs, China could take one of three routes:

1. Retaliate
2. Double down on China + 1
3. Negotiate

Percentage of container exports from Asia to USA, 2010-2023 (%)

Estimated 80 MTEU of imports. 1% of change equates to 800,000 TEU of exports



Source: IRENA, RHDHV-OSC's desktop research

The table below shows the classification of Southeast Asian countries on their attractiveness for various port logistics and port investments.

A *Accessibility for investment*
V *Volume outlook*
M *Financial margins*

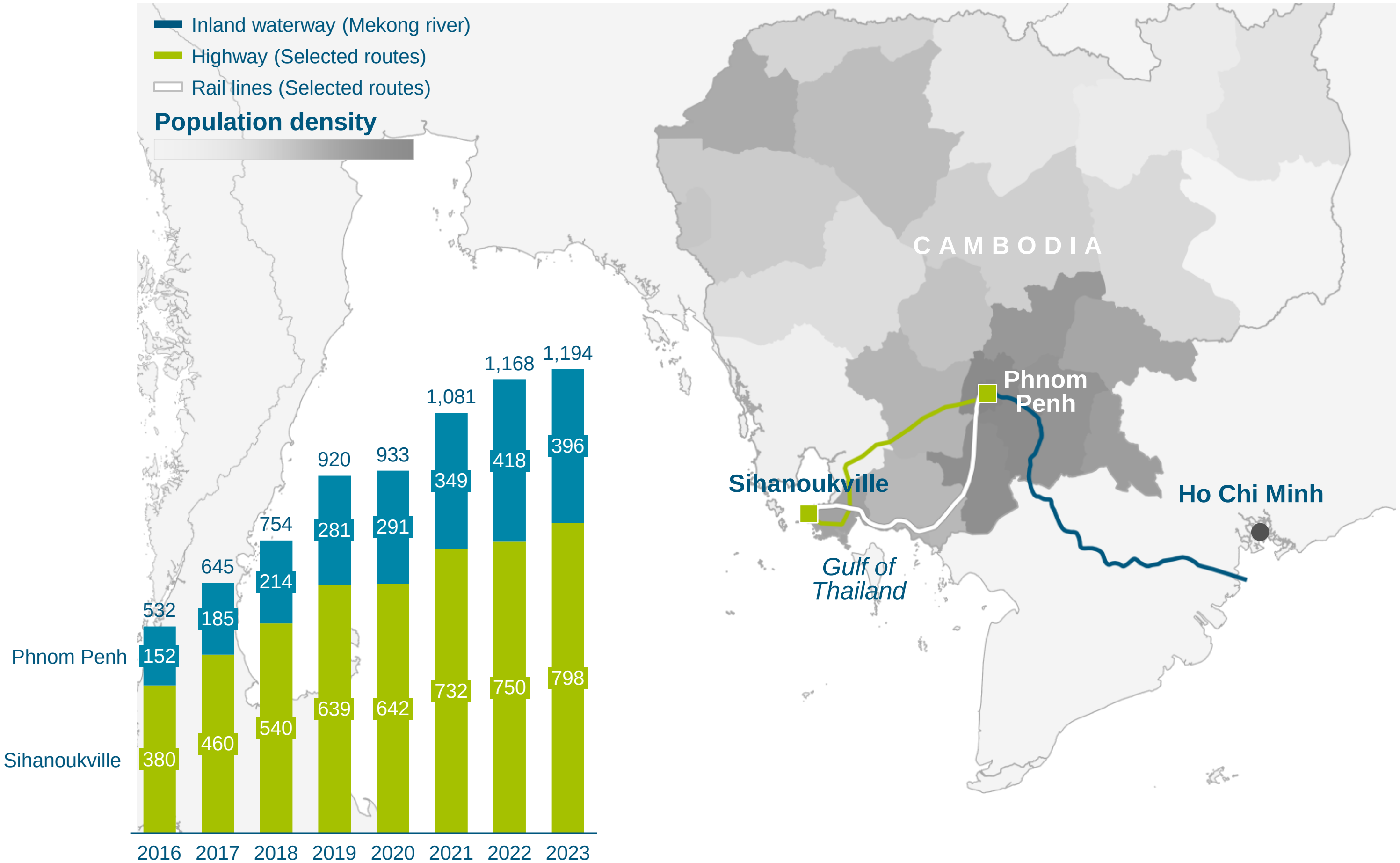
Good
Fair
Poor
Not meaningful

	Vietnam	Indonesia	Cambodia	Thailand	Philippines	Malaysia	Singapore	Laos	Myanmar
Container	A: Good, V: Good, M: Poor	A: Fair, V: Good, M: Fair	A: Poor, V: Good, M: Good	A: Good, V: Fair, M: Fair	A: Fair, V: Fair, M: Fair	A: Fair, V: Good, M: Good	A: Poor, V: Good, M: Good	A: Good, V: Fair, M: Fair	A: Poor, V: Not meaningful, M: Not meaningful
Liquid bulk	A: Fair, V: Fair, M: Good	A: Poor, V: Good, M: Good	A: Poor, V: Not meaningful, M: Not meaningful	A: Good, V: Fair, M: Fair	A: Fair, V: Fair, M: Good	A: Good, V: Fair, M: Fair	A: Good, V: Poor, M: Fair	A: Good, V: Good, M: Fair	A: Poor, V: Not meaningful, M: Not meaningful
Dry bulk	A: Fair, V: Fair, M: Good	A: Good, V: Fair, M: Fair	A: Good, V: Good, M: Poor	A: Fair, V: Fair, M: Fair	A: Fair, V: Fair, M: Good	A: Fair, V: Fair, M: Good	A: Poor, V: Good, M: Good	A: Good, V: Fair, M: Fair	A: Poor, V: Not meaningful, M: Not meaningful
Logistics assets	A: Fair, V: Fair, M: Fair	A: Good, V: Fair, M: Fair	A: Good, V: Fair, M: Fair	A: Fair, V: Fair, M: Fair	A: Fair, V: Fair, M: Good	A: Fair, V: Good, M: Good	A: Fair, V: Good, M: Fair	A: Fair, V: Good, M: Good	A: Poor, V: Not meaningful, M: Not meaningful
Renewable	A: Good, V: Fair, M: Fair	A: Fair, V: Fair, M: Fair	A: Fair, V: Fair, M: Fair	A: Fair, V: Fair, M: Fair	A: Fair, V: Fair, M: Fair	A: Fair, V: Fair, M: Fair	A: Good, V: Poor, M: Fair	A: Good, V: Good, M: Good	A: Poor, V: Not meaningful, M: Not meaningful

Funan Techo Canal

The Cambodian Government plans to build a canal to connect the capital to the sea, bypassing cargo transfer in Vietnam.

Cambodia's seaports and their hinterland connections



Sources: PAS and PPAP annual and quarterly reports

Status

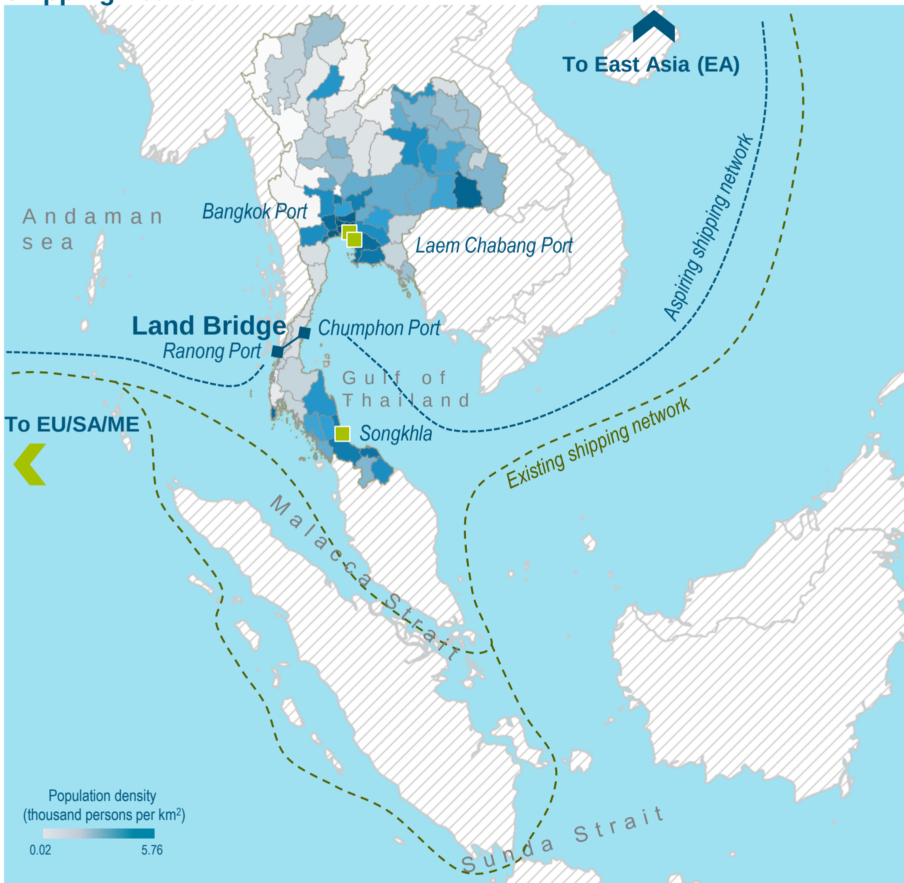
1. Cambodia has a river port in Phnom Penh and a deep sea port in Sihanoukville.
2. All container volumes handled at Phnom Penh port are barged from/to a port in Southeast Vietnam as the seagoing vessel cannot sail up the Mekong River to Phnom Penh.
3. The Cambodian government plans to build a 180 km canal from Phnom Penh to reach the Gulf of Thailand. The declared cost is 1.7 billion USD.

Potential impact

1. Up to 0.4 MTEU of containers could be shifted from Southeast Vietnam to the port of Sihanoukville.

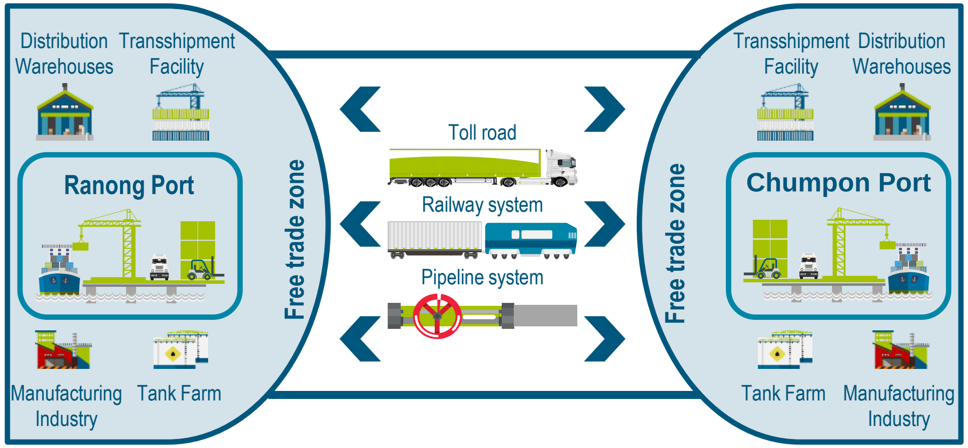
The Thai Landbridge plans to handle gateway, transit and transhipment volumes using a two-port land bridge concept.

Thailand plan development –Thai Land Bridge and aspired change in shipping network



Source: *https://issuu.com/, RHDHV/OSC*

Thai Land Bridge concept



Status

1. The project is at a feasibility stage.
2. Targeting gateway, transit and transhipment cargo

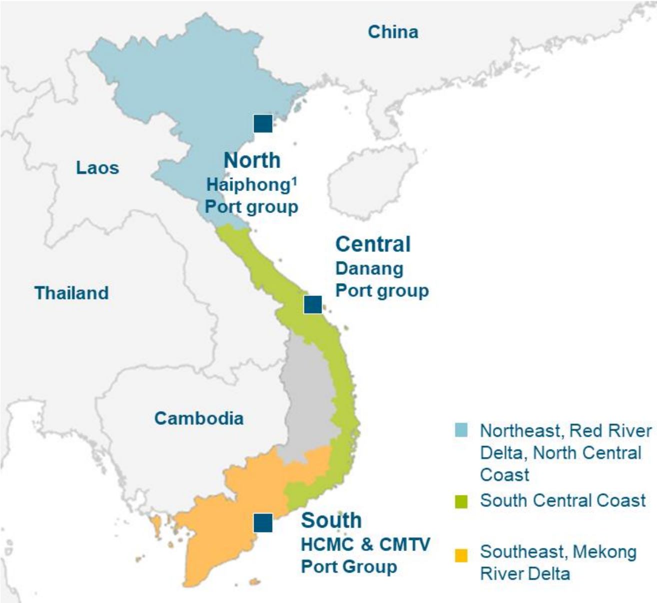
Potential impact

1. **Gateway**: Gateway to the South Thailand market and an alternative to the volumes going through Penang port.
2. **Transit 1:** Rail cargo from South China
3. **Transit 2:** Bypass Malacca Straits (limited by land bridge capacity)
4. **Transhipment**: Compete for the TS market in SEA.

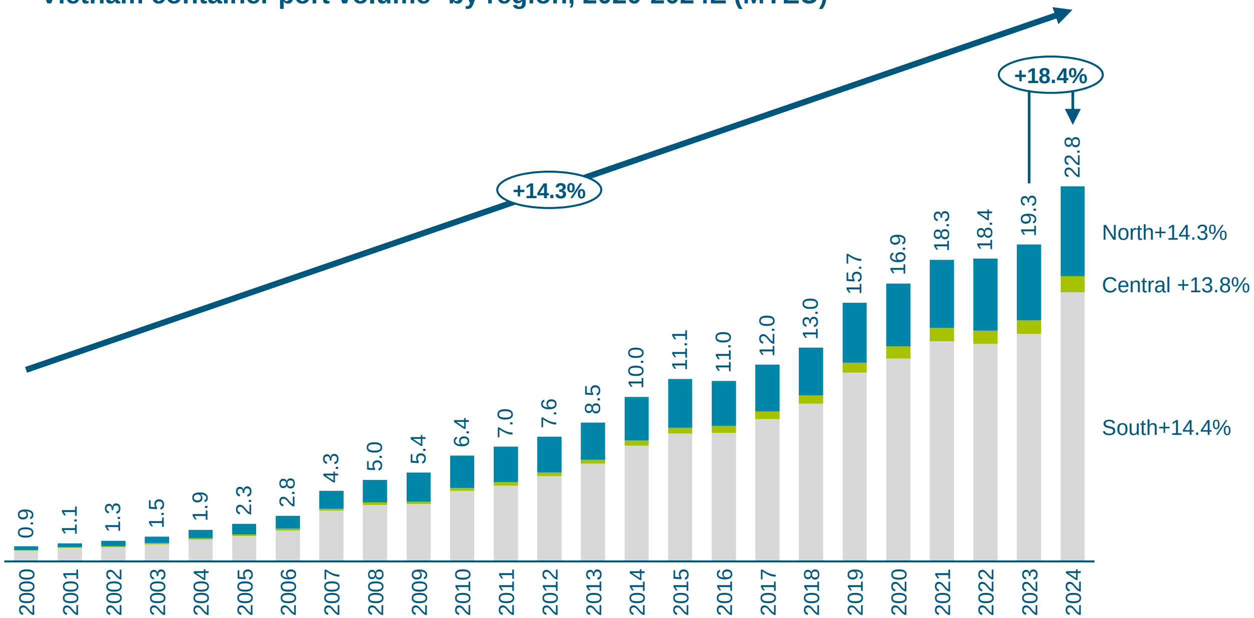
Strong container volume growth in Vietnam

Vietnam's container market grew strongly from 0.9 MTEU in 2000 to 22.8 MTEU in 2024, a CAGR of 14.3%. The growth in 2024 is projected at 18.4%. In particular, the Cai Mep Thi Vai region is growing at a CAGR of more than 30%.

Vietnam container port groups



Vietnam container port volume[2] by region, 2020-2024E (MTEU)



- **Country container volume growth:** The historical CAGR from 2000 to 2024 is 14.3% for Vietnam container ports.
- **Regional container volume:** The growth of the North and South Vietnam port volumes aligns with the country-level growth. The Central region's growth is marginally lower, accounting for 4.2% of the total country volume.
- **Recent growth:** The growth in 2024 is projected at 18.4% based on the YTD volumes. The drivers for the growth are:
  - Inventory was run down in 2023 as buyers waited as shipping lines rerouted to avoid the Suez Canal due to ship attacks in the Red Sea. The inventory was replenished in 2024 as the services stabilised.
  - Buyers increased their inventory, anticipating potential disruptions due to union negotiations in the US East Coast ports.
  - Producers believe that the 2024 volume growth is a one-off and not likely to be sustained into 2025.

Source: VPA website. 2024 volumes are extrapolated from 7-month YTD data. Note: [1]Selected ports in Hai Phong (Red River Delta) did not report their volumes annually and had their volumes excluded when calculating the CAGR. [2] The volume presented includes foreign and domestic containers but excludes barging containers.