OCEAN SHIPPING CONSULTANTS

a company of

Royal HaskoningDHV
Enhancing Society Together

TRANSPORT EVENTS

Key challenges for terminal operators

Livorno, 18th April 2018

6th MED Ports 2017

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Introduction

Nishal Sooredoo, MSc

Current:

OCEAN SHIPPING CONSULTANTS

Past:

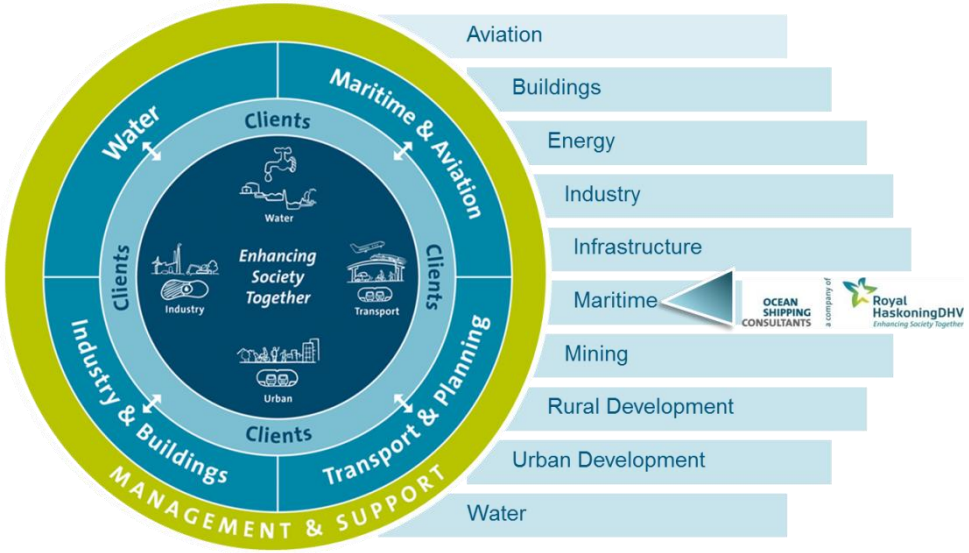
Drewry

ARUP

V.Group

Ocean Shipping Consultants (OSC) is the maritime economic consultancy group of Royal HaskoningDHV, and a leading brand in the maritime sector with more than 35-years of experience

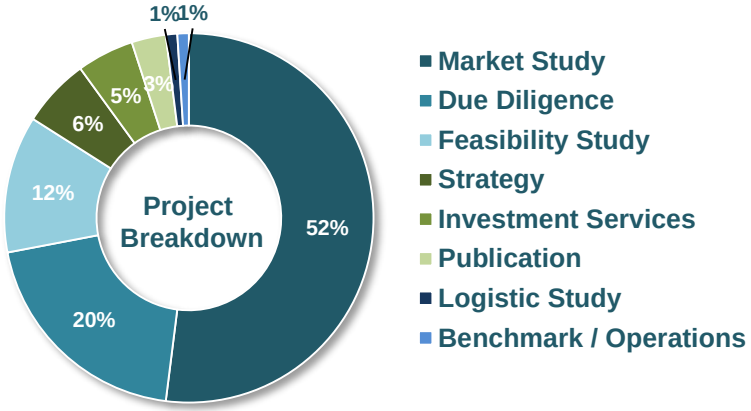
Key profile	Top International Design Firm	Resources
- Originally founded in 1881 - 135 years of experience - Turnover €600m (2016)	Ranked 2nd in Top International Design Firms – Marine & Ports by ENR (2016)	- 6,000 employees - 100 offices in 35 countries - 650 dedicated ports and maritime professionals



OCEAN SHIPPING CONSULTANTS

With over 350 projects in more than 65 countries successfully completed over the last 5 years, OSC provides global bespoke consultancy services from offices in London, Amsterdam, Dubai and Singapore to more than 200 different clients, including port authorities, terminal operating companies, governments, shipping lines, logistics operators and the wider financial community.

These range of services are undertaken for all cargo types and sectors ensuring that clients are able to make appropriate, well informed decisions at all times.



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Examples of OSC projects in Italy

Europe Platform Project**, 2014**

Ocean Shipping Consultants (OSC) were approached by the Livorno Port Authority and asked to assist them in providing a market study to assess the competitive position of a proposed development for the new facility in the port of Livorno (The Europa Platform). The study included overall demand development, current and future balance of the market, relative position of project compared to peers, terminal suitability and hinterland reach.

Venice Container Terminal**, 2014**

During 2014 Royal HaskoningDHV (RHDHV) was appointed by Venice Port Authority (VPA) to assist them with their venture to create a new innovative logistics concept for the Port of Venice. The proposed logistic concept involves:

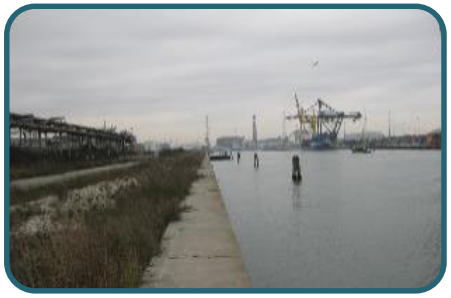
The creation of an offshore island hub which will house a container terminal and oil terminal.

The conversion of the existing onshore terminal at the Porto Marghera.

A novel 'mama vessel' concept for moving multiple container barges between the two terminals (using a specially designed semi-submersible vessel for transporting container barges up to 384 TEU).

Venice Emission study**, 2014**

Following the successful completion of a wider package of works, Royal HaskoningDHV were commissioned by Venice Port Authority (VPA) to undertake a "low emissions study", considering methods to minimise air emissions associated with the planned onshore and offshore container terminals in Venice. VPA adopted a proactive approach to tackling air emissions at the two planned terminals, tasking us with exploring the latest available technology and developing technologies, to minimise air emissions and to assist them with their recommendations for innovative emission reducing technologies (part of the EIA).



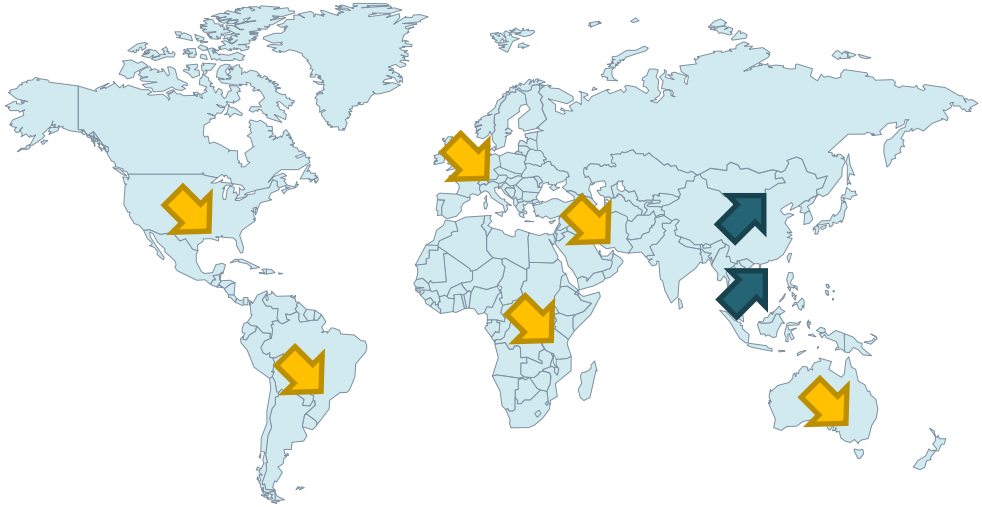
Venice Montesyndial Container **, 2014**

In 2014 Royal HaskoningDHV carried out a container terminal planning study for the full combined Montefibre & Syndial areas (circa 90ha). Venice Port Authority intend to develop the terminal in stages, with Phase 1 being the partial development of the Montefibre area only. This project is to produce the main design for this area, consisting of two new berths (610m of new quay wall, to a depth of -12.5mCD), with approximately 12Ha of container terminal area adjacent to the berths. The project brief included planning, static mooring & passing vessel analysis, main design of the quay wall, capping beam and quay furniture, pavements, electrical and mechanical infrastructure and detailed engineering cost estimates

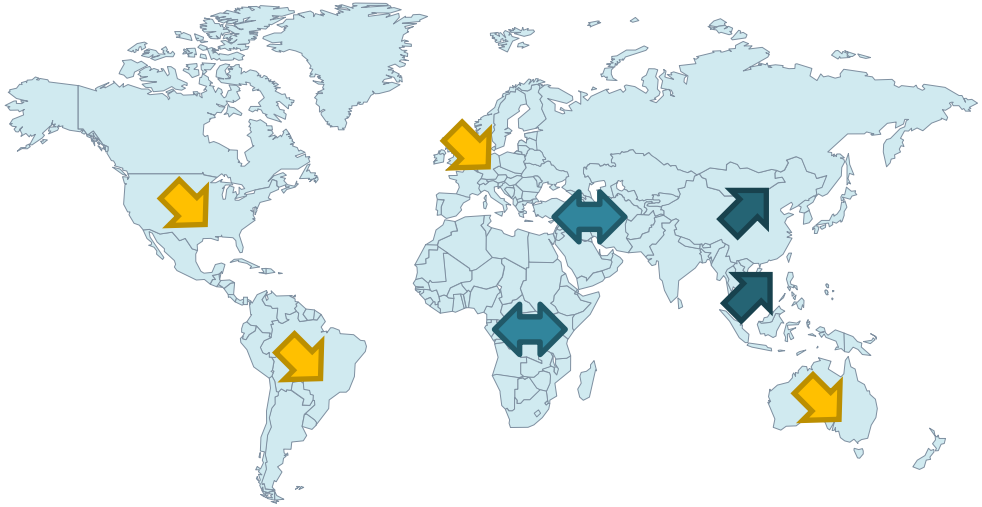
Global Economic Outlook & the Container Shipping Sector

SE Asia and China are expected to out perform other regional economies in the near future.

Current GDP Performance* by Region (2017)



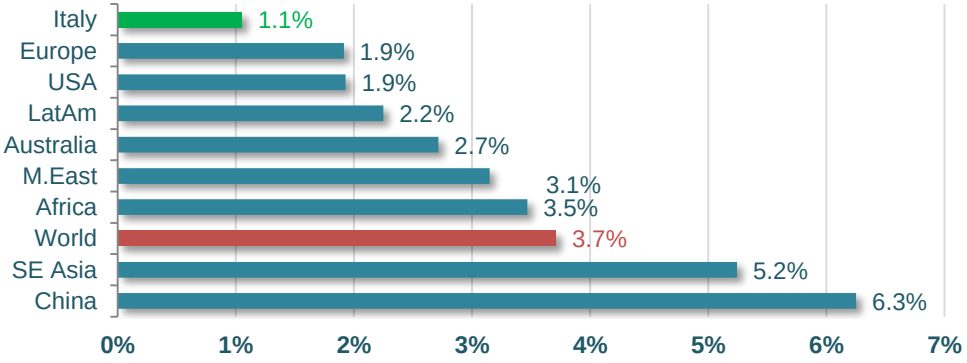
Future GDP Performance* Outlook by Region



Over-Performing World Avg. Growth | **Performing to World Avg. Growth** | **Under-Performing World Avg. Growth**

Source: OSC / IMF
Performance as compared to Average World GDP Growth

GDP forecast CAGR, 2017-2022 (%)



Source: OSC / IMF

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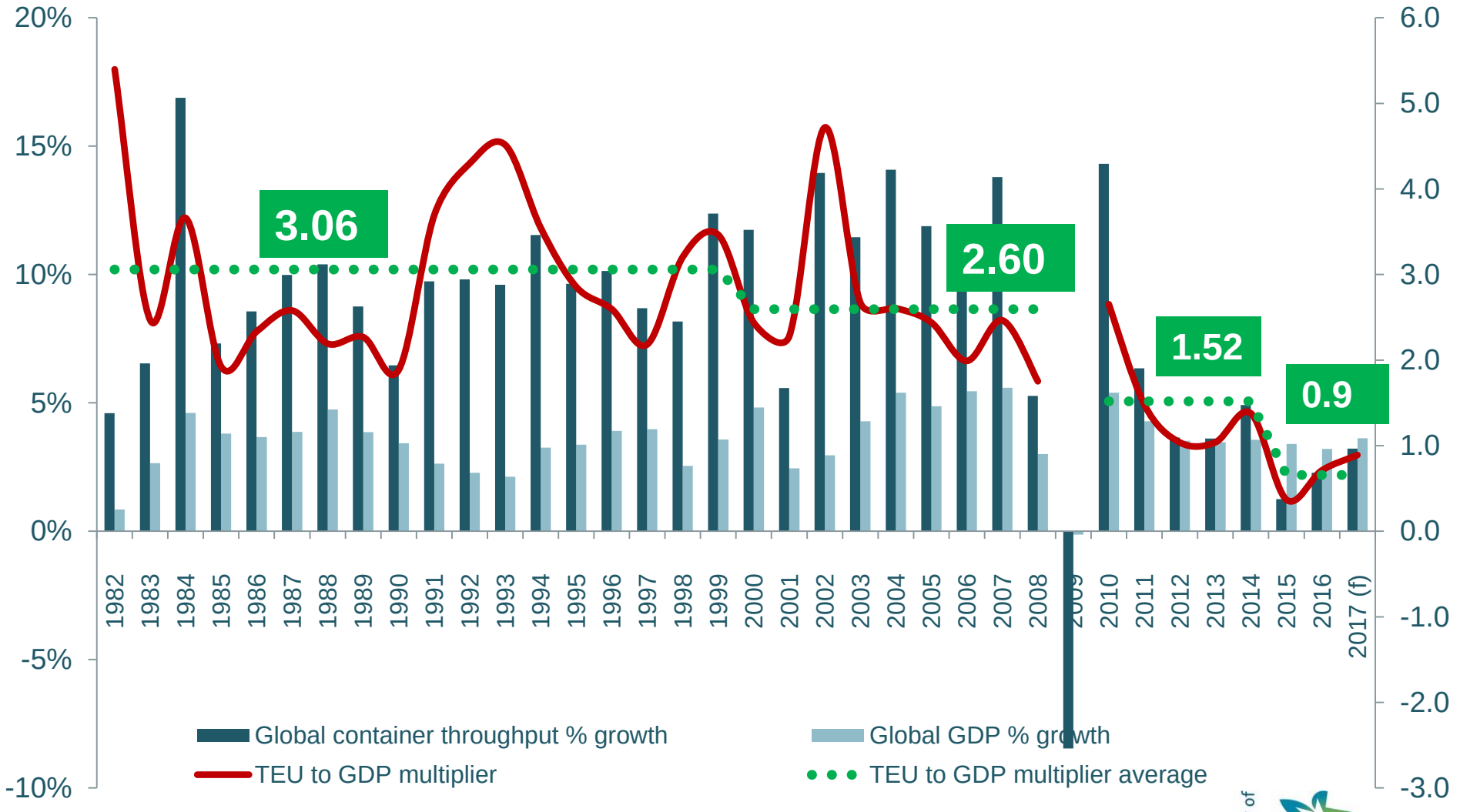
The declines in the container volume growth is putting pressure on Shipping Lines and Terminal Operators.



Source: OSC / Clarkson

The declining TEU/GDP multiplier is driven by underlying changes in the market. For shipping lines and ports, this means lower TEU demand than in past years.

Less offshoring, more reshoring:

- Offshoring to lower-cost countries is a onetime effect
- Increased reshoring

Plateauing in the levels of containerization:

- Most commodities suitable for containerized transportation have already been migrated to containers
- Increasing trend toward miniaturization of manufactured goods

Improvement of port facilities:

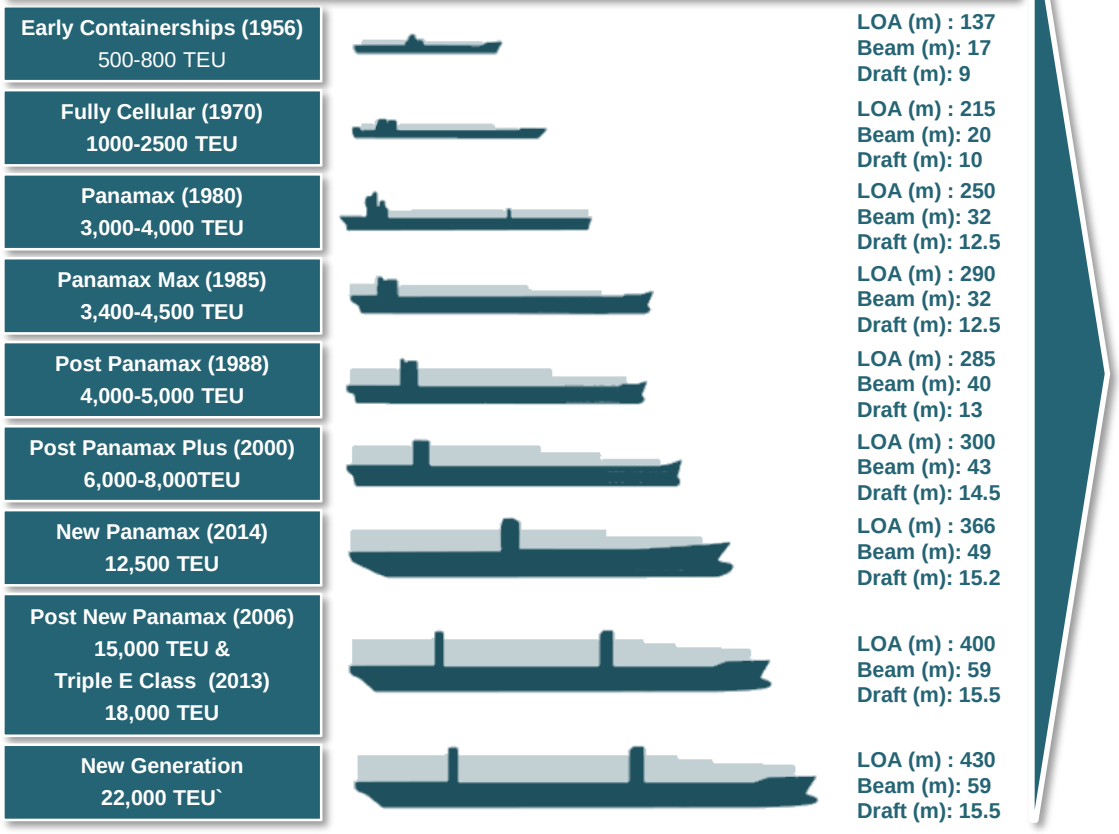
- More ports can be part of direct main line services
- More TS with large vessels deployment on main routes by less TS volume – as a result of vessel cascading

Unfavourable trade-growth dynamics:

- Chinese economy shifts toward domestic consumption / regional sourcing

Driven by market share & economies of scale, the ship size revolution has continued, but savings are decreasing

Container Ship Size Evolution



Source: OSC, Alphaliner

Effect of Container Shipping Market

- Larger container volume exchanges resulted in the port call frequency to drop.
- Replaced vessels are downsized to other Secondary and Tertiary trade lanes.
- Formation of fewer, larger alliances in an effort to maximise vessel utilisation.

Ship sizes: Container vessel capacity has increased while dimensions (400m by 59m) remain largely unchanged.

2006 - E-Class Maersk
14,770 TEU, 397m long, 56m beam (22 rows)

- Ports around the world were sized to accommodate the E class Maersk by providing 16m of draft.
- Cranes were upgraded to 22 rows

2013 – Triple E-Class Maersk
18,000 TEU, 400m long, 59m beam (23 rows)

- Cranes were extended to 23 rows
- No change required for berth or channel drafts

2017 - Madrid Maersk
20,568 TEU, 400m long, 59m beam (23 rows)

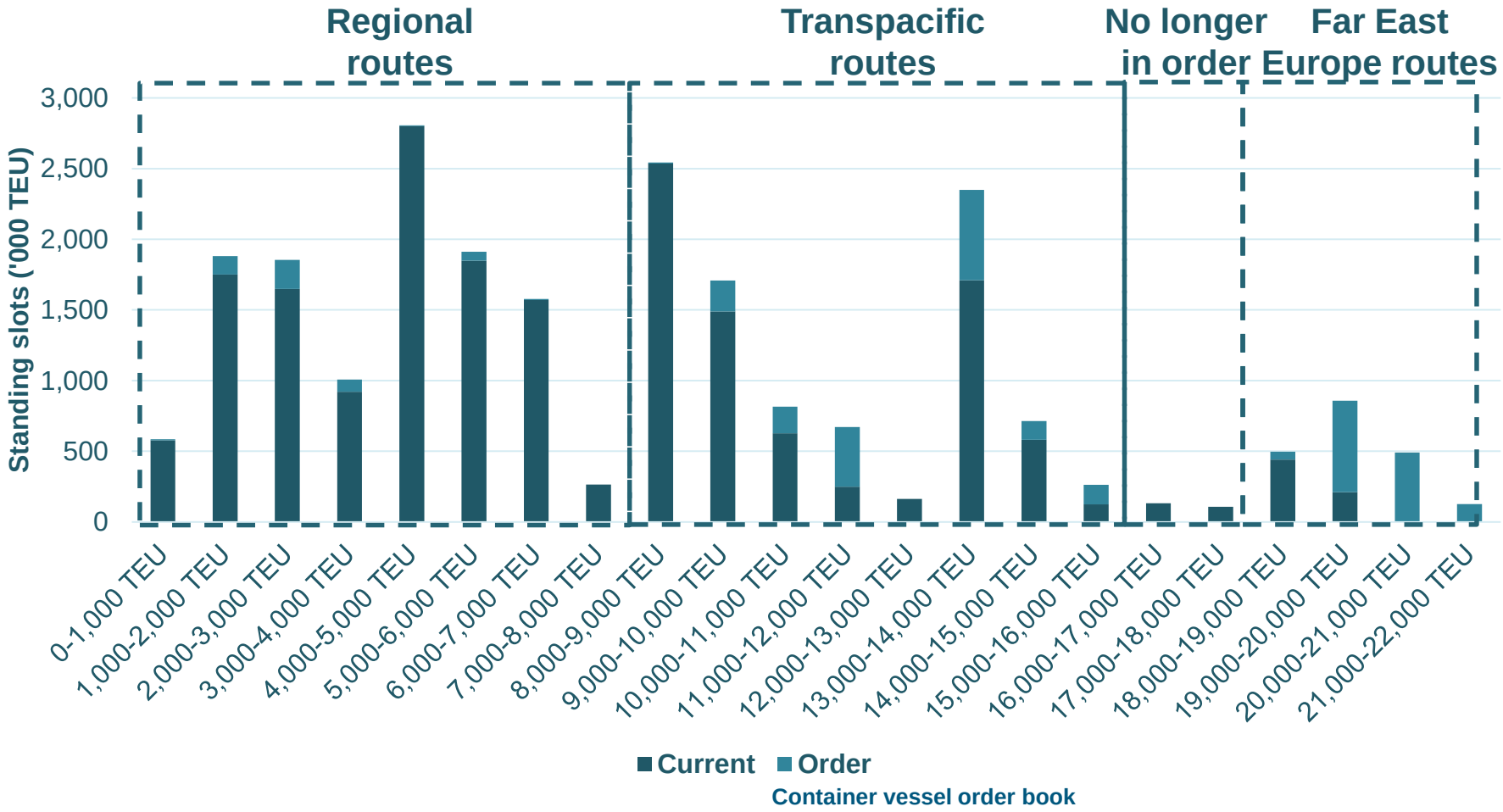
- Only possible with deepening of hull.
- MOL Triumph (20,105 TEU) stacked 8 high on deck

2019 - CMA-CGM & MSC
Order 20x 22,000 TEU ships

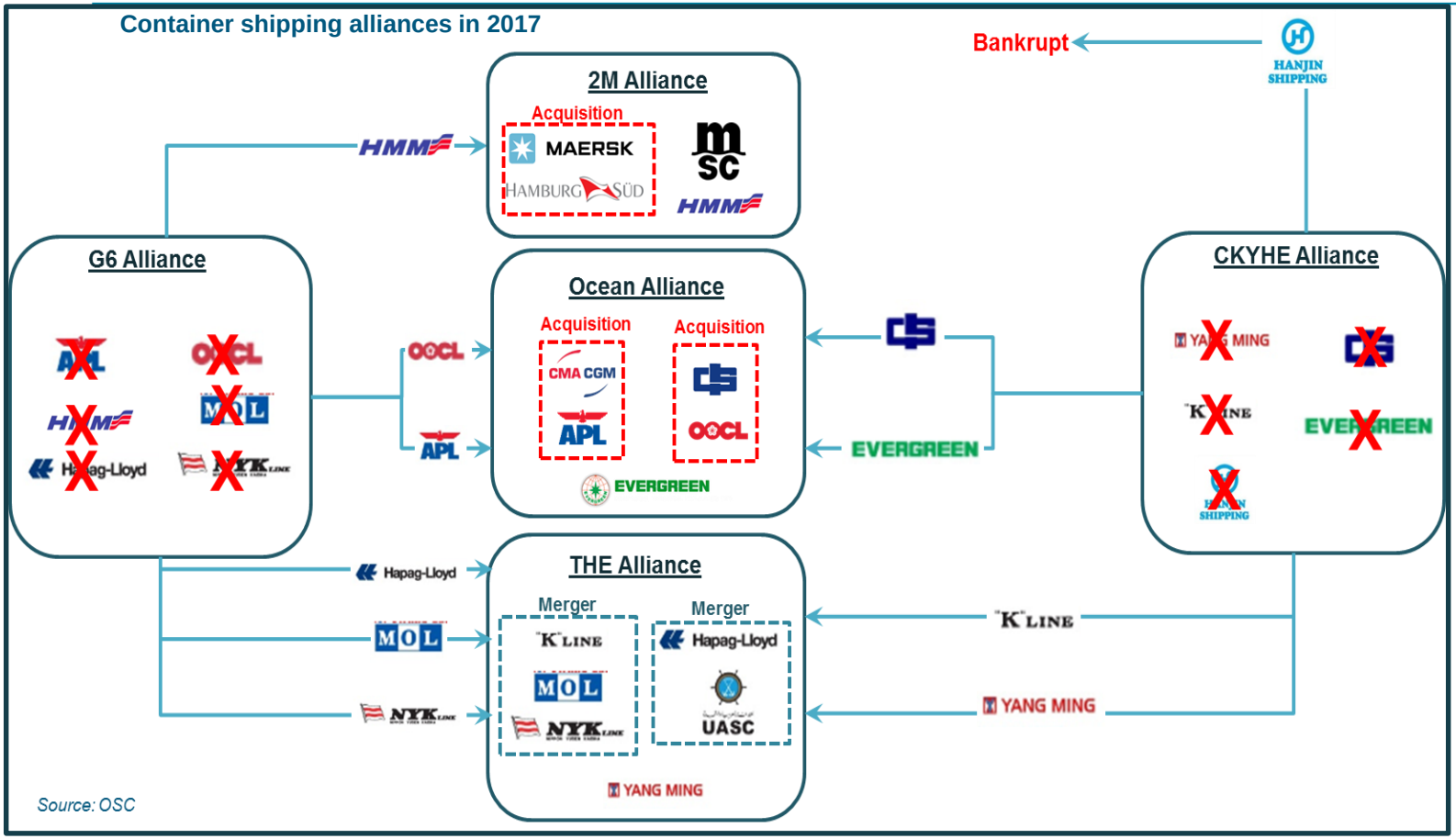
- No detail given as to the length and beam of the ships.
- Likely >400m
- Delivery expected in 2019.
- Reported operating cost savings of US$500 per TEU compared to E-Class Maersk

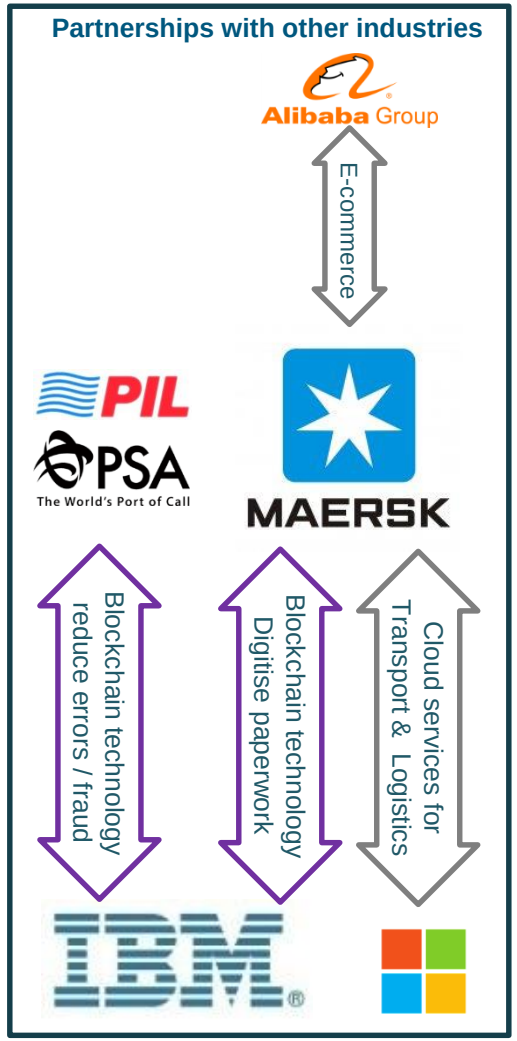
Obsolescence of recent mega vessels

Container vessel order book

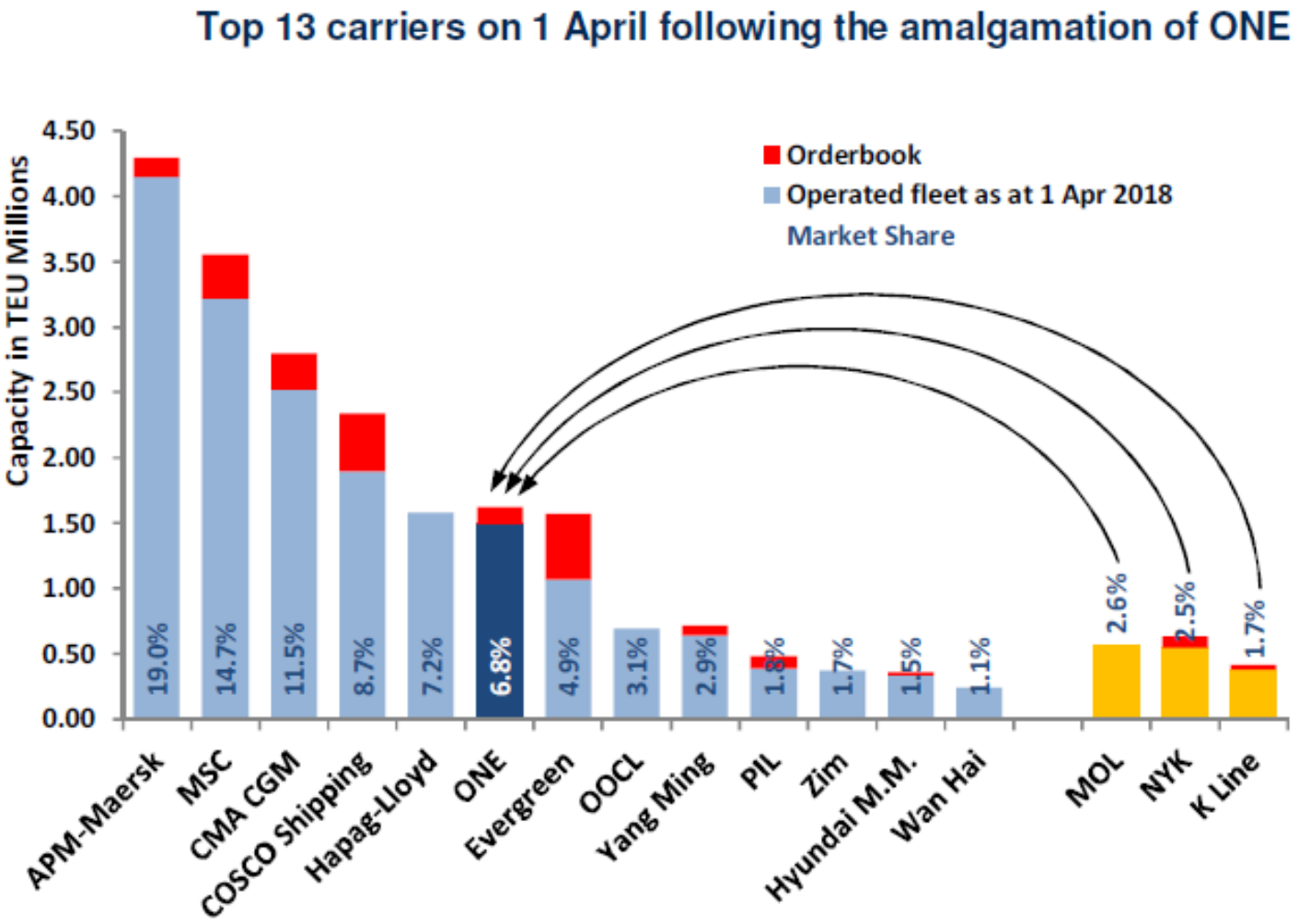


Complete reshape of shipping alliances and acquisitions in 2017.





Orders placed after the consolidation to maintain market position.



Source: Alphaliner

Costs are rapidly increasing for terminals due to larger ships, less frequent calls and larger alliances.

Larger Ships

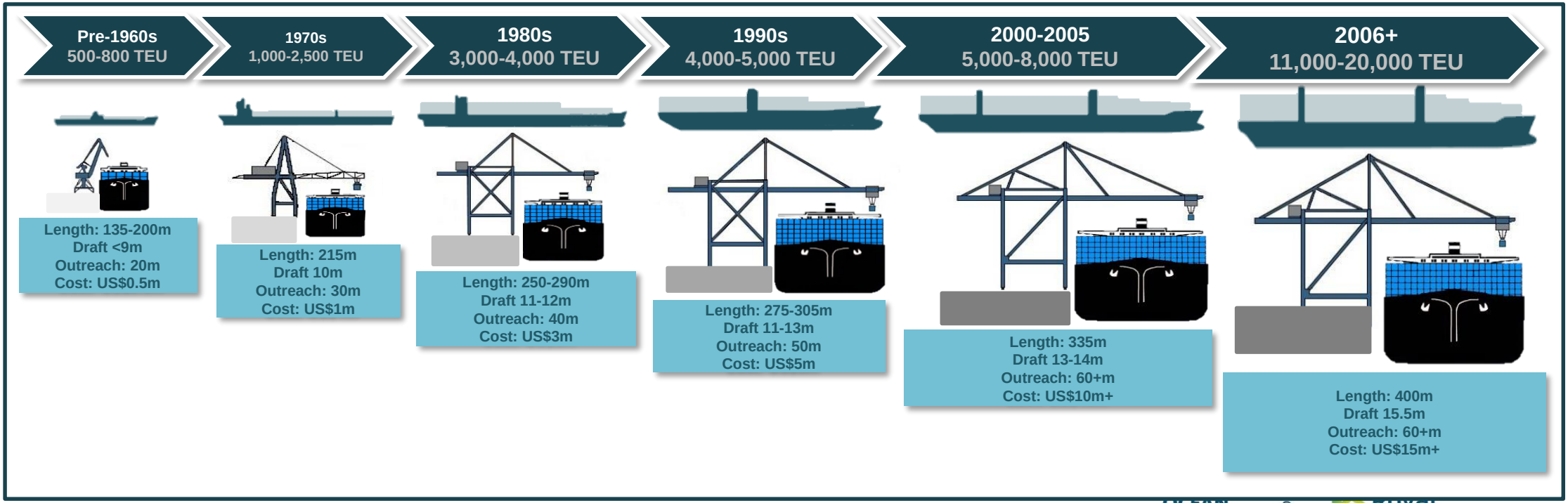
- **Larger cranes**
- **Additional dredging**
- **Other upgrading**
  Quay wall strength, locks, bridges, etc
- **Increased insurance cost**

Less frequent calls

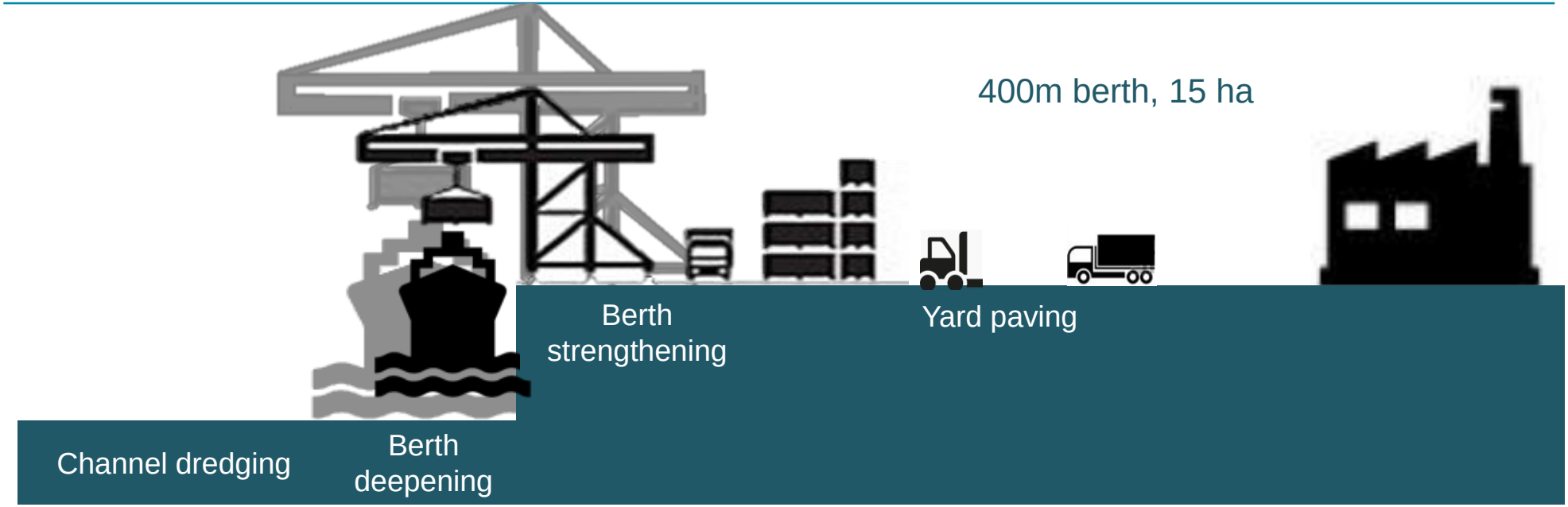
- **Larger container exchanges**
  Higher peak capacity & productivity required throughout the terminal
- **More flexible labour needed**
- **Increased impact when losing a client**

Larger Alliances

- **Increased bargaining power of Alliances**
- **Lower number of port calls consolidated in fewer ports**
  Some ports are bound to lose customers with port selection dictated by strongest alliance member



The increase in vessel sizes has resulted in port authorities and terminal operators incurring capital expenditure to upgrade their facilities.



Area	Current	New	Estimated cost (US$ millions)
Channel depth & width	1 km, 242m wide, 15m	295 wide, 16m	4
Berth depth	400m, 15.0m	16.0m	2
Equipment upgrades	4 cranes with 18 rows	4 cranes with 23 rows	40
Yard	15 ha	20ha	30
Total			**76**

Will the lines pay for these extra costs?

Port operators have responded by slowing or canceling greenfield terminal projects, forming alliances, partnering with shipping lines, or acquiring/merging with competitors.

Slowing or canceling greenfield terminal projects

- Total number of greenfield terminal projects has fallen by almost half compared to 10 years ago

Alliance & Partnerships

- Conference agreement between Port of Miami Terminal Operating Company (Pomtoc) and South Florida Container Terminal (SFCT)
- Co-management Agreement Between COSCO Shipping Ports and Hutchison Port Holdings of several terminal in Hong-Kong

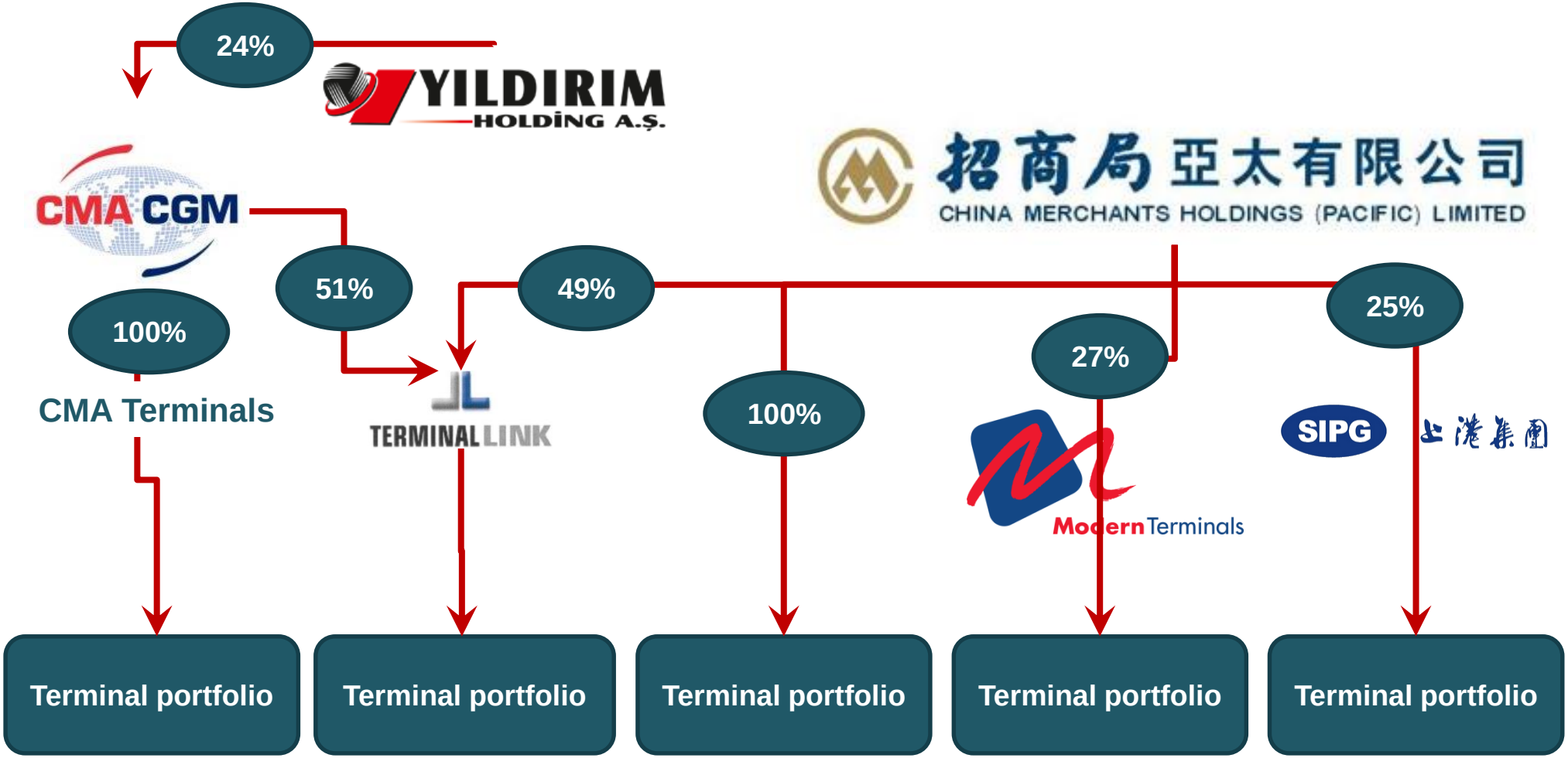
Mergers & Acquisitions

- APM Terminals acquired Grup TCB
- COSCO SHIPPING Ports acquire 40% interest in the Vado Terminals in Italy
- COSCO SHIPPING Ports acquire 35% interest in Euromax Terminal in Rotterdam
- COSCO SHIPPING Ports increase its stake in Qingdao Port International (QPI) to 18.41%
- DP World acquired an additional 23.94% stake in Pusan Newport Company (PNC) in South Korea
- DP World creating an investment fund with Caisse de dépôt et placement du Québec (55/45) to jointly invest in ports and terminals

Joint venture deals with shipping lines

- CMA CGM and PSA create a container terminal joint venture in Singapore
- COSCO Shipping and PSA create a container terminal joint venture in Singapore
- MSC and PSA create container terminal in Antwerp

Terminal Operator ownership complexity



RHDHV’s unique Geospatial Tool

RHDHV's unique Geospatial Tool

We have developed a powerful proprietary Geospatial tool for Maritime advisory projects. This can be used to analyse and visualise the trade and hinterland of a group of ports within various markets.

1 Various facilities and commodities

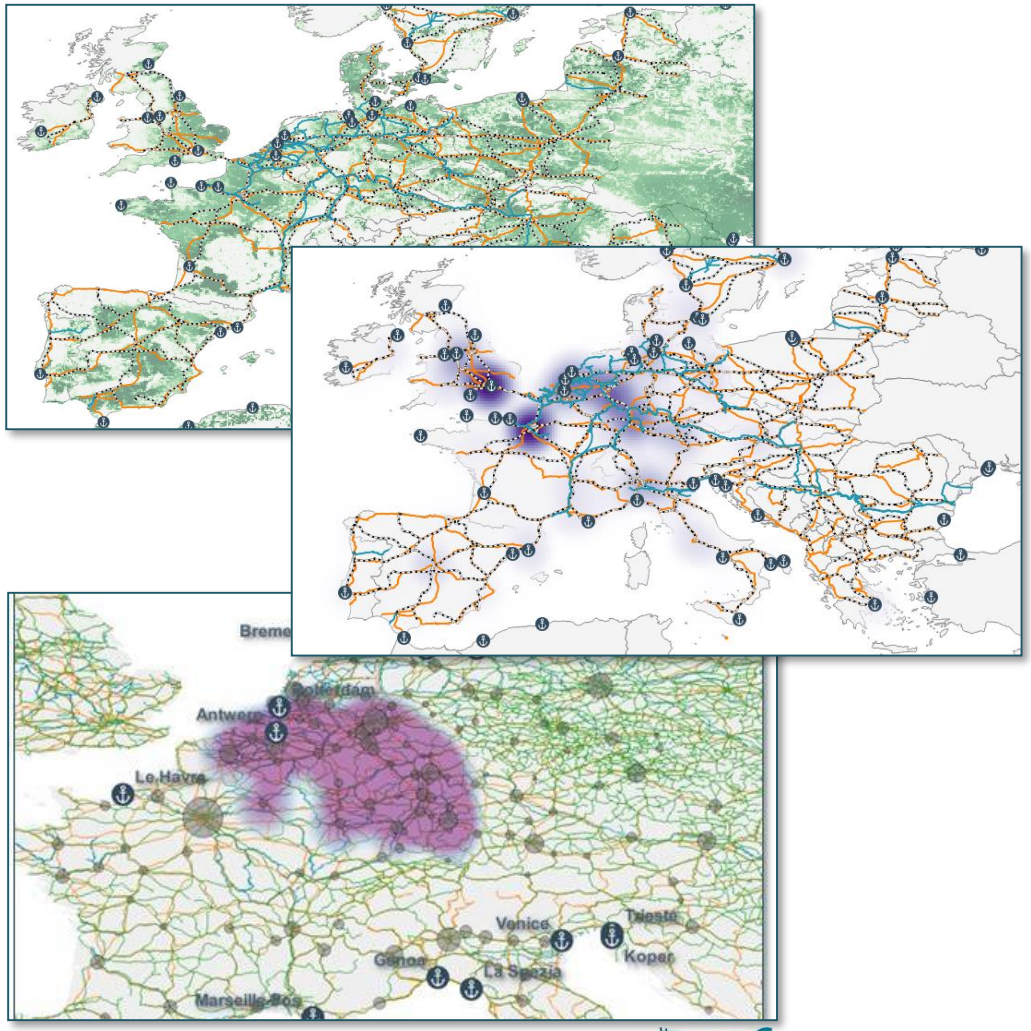
Woodchip & pulp	Sugar	Fertilizers	Coal	Steel

2 Geospatial analysis

Location of the port competitors	Distances and cost to markets	Market shares based on distance / cost models

3 Benefits

Map of port and competitors	Extent of hinterland	Determine impact of logistics costs changes on market share



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