

PECC International Project Seminar

The Era of Mega Vessels and Challenges to Ports

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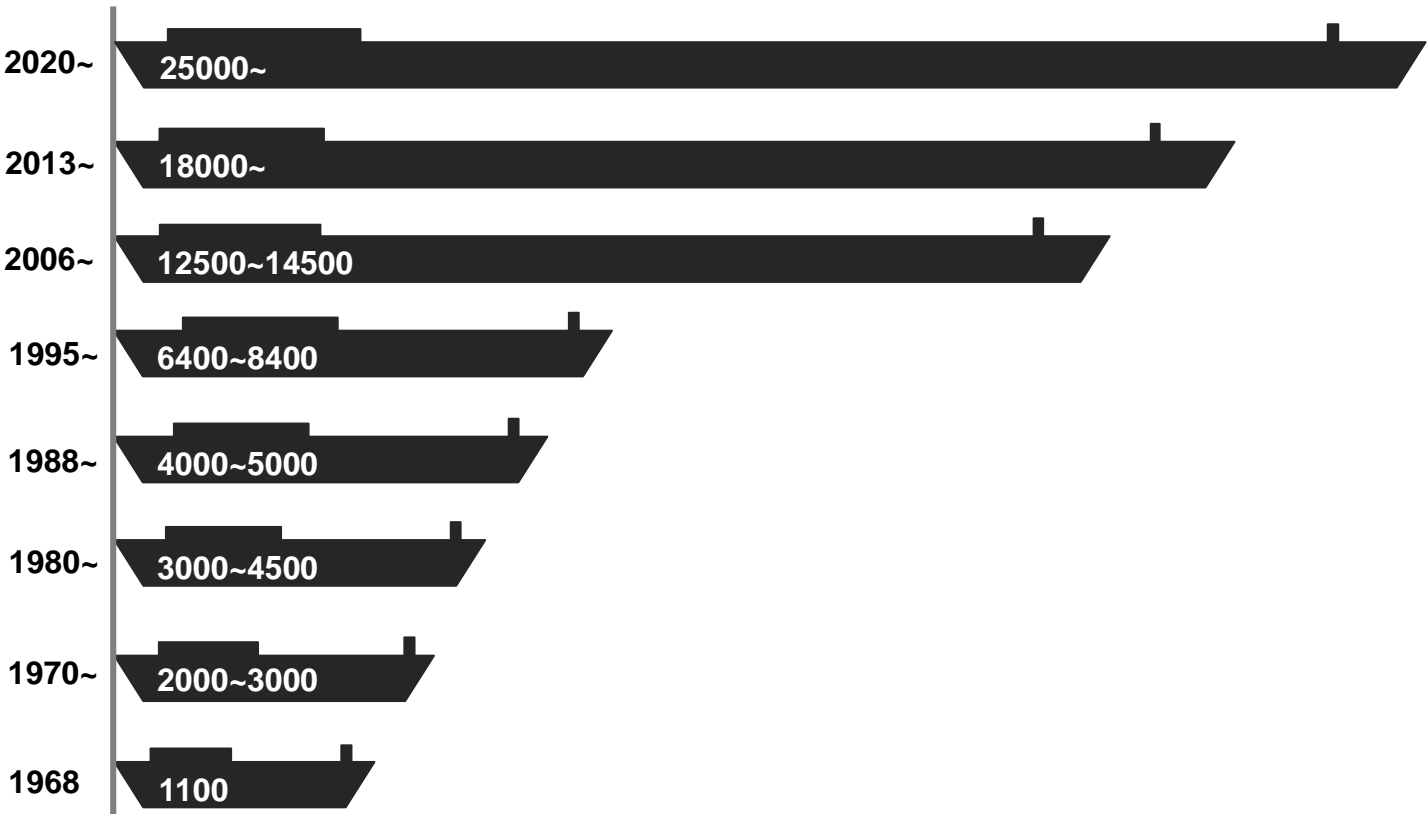
Oct. 2015

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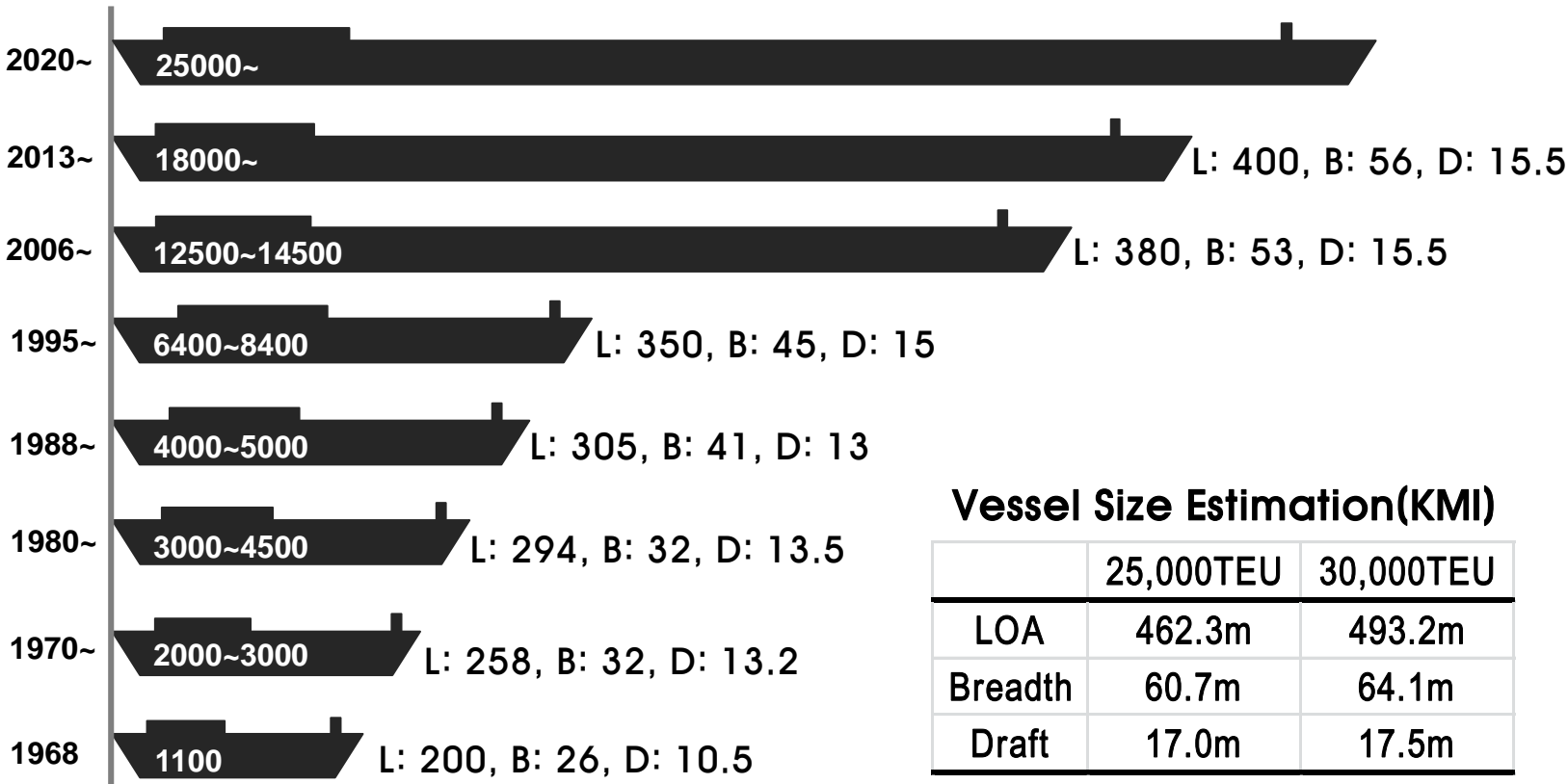
Container vessels have grown in capacity

Container Ships are getting larger and larger



Container vessels have grown in capacity and size

Container Ships are getting larger and larger

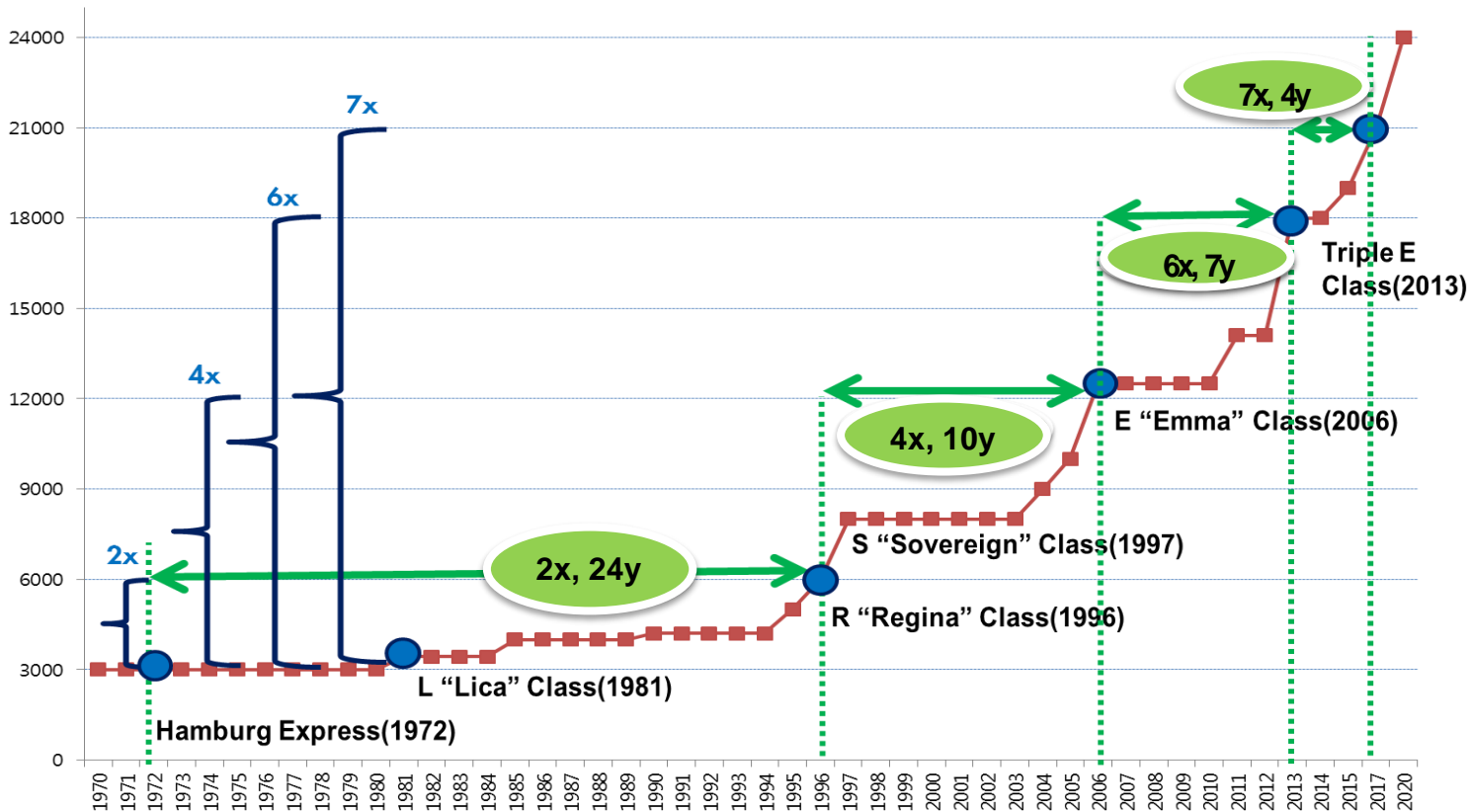


Trend of Ultra Large Container Vessel

After 1968, ship size has increased by 1,200%

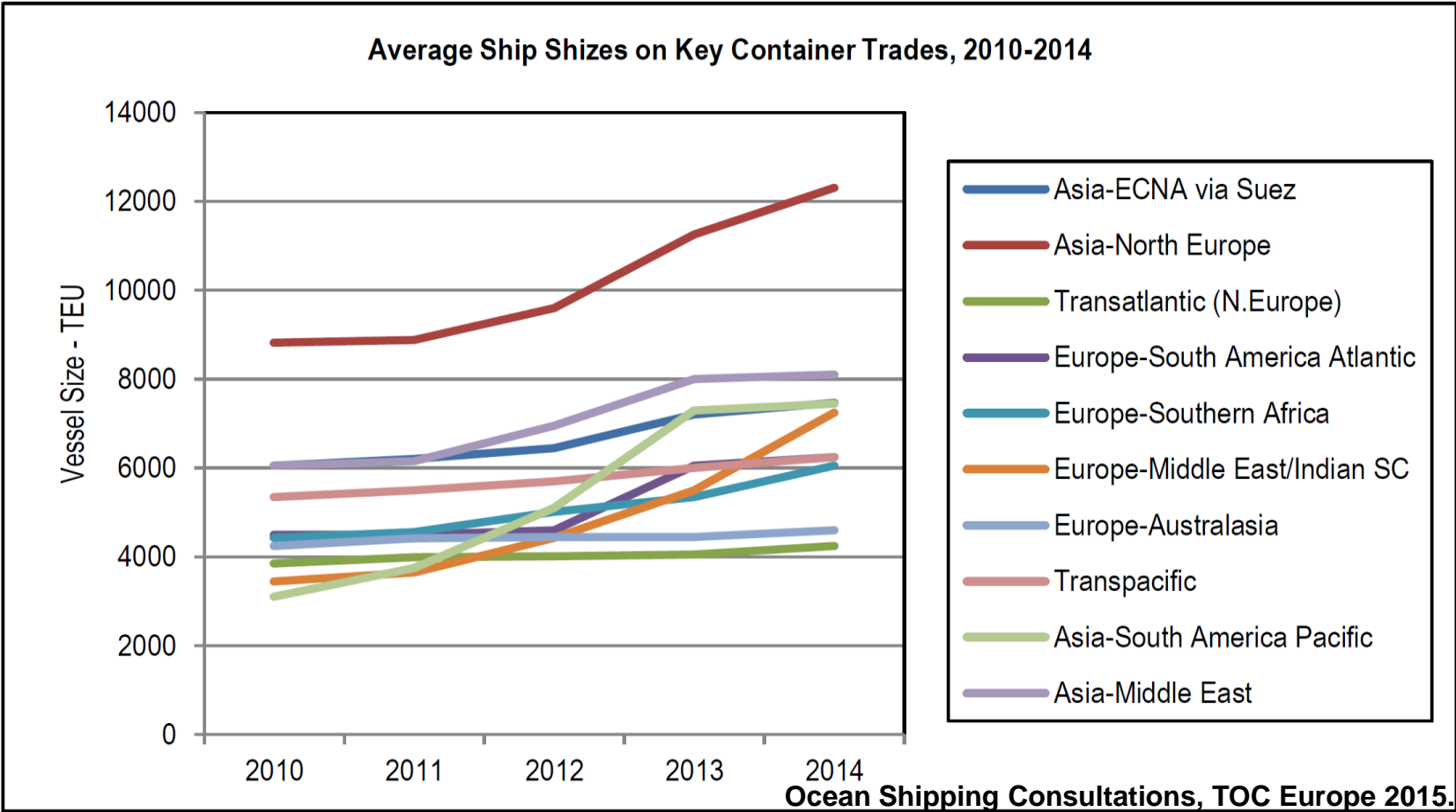
3,000 TEU → 6,000 TEU(24 years) → 12,000 TEU(10years)

→ 18,000TEU(7years) → 21,000TEU(4years)

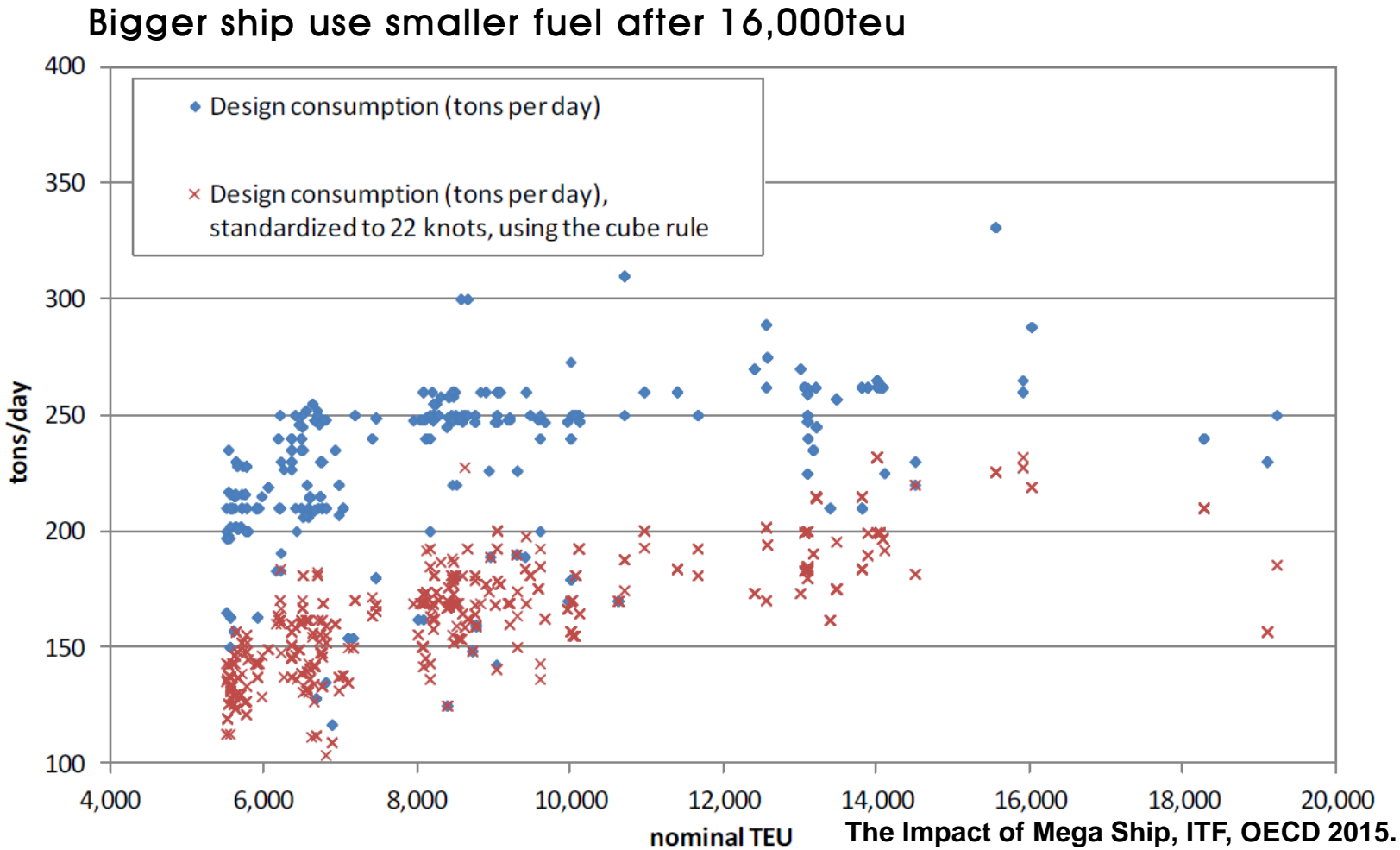


Trend of Ultra Large Container Vessel

The Cascading Effect on Other Trade Routes

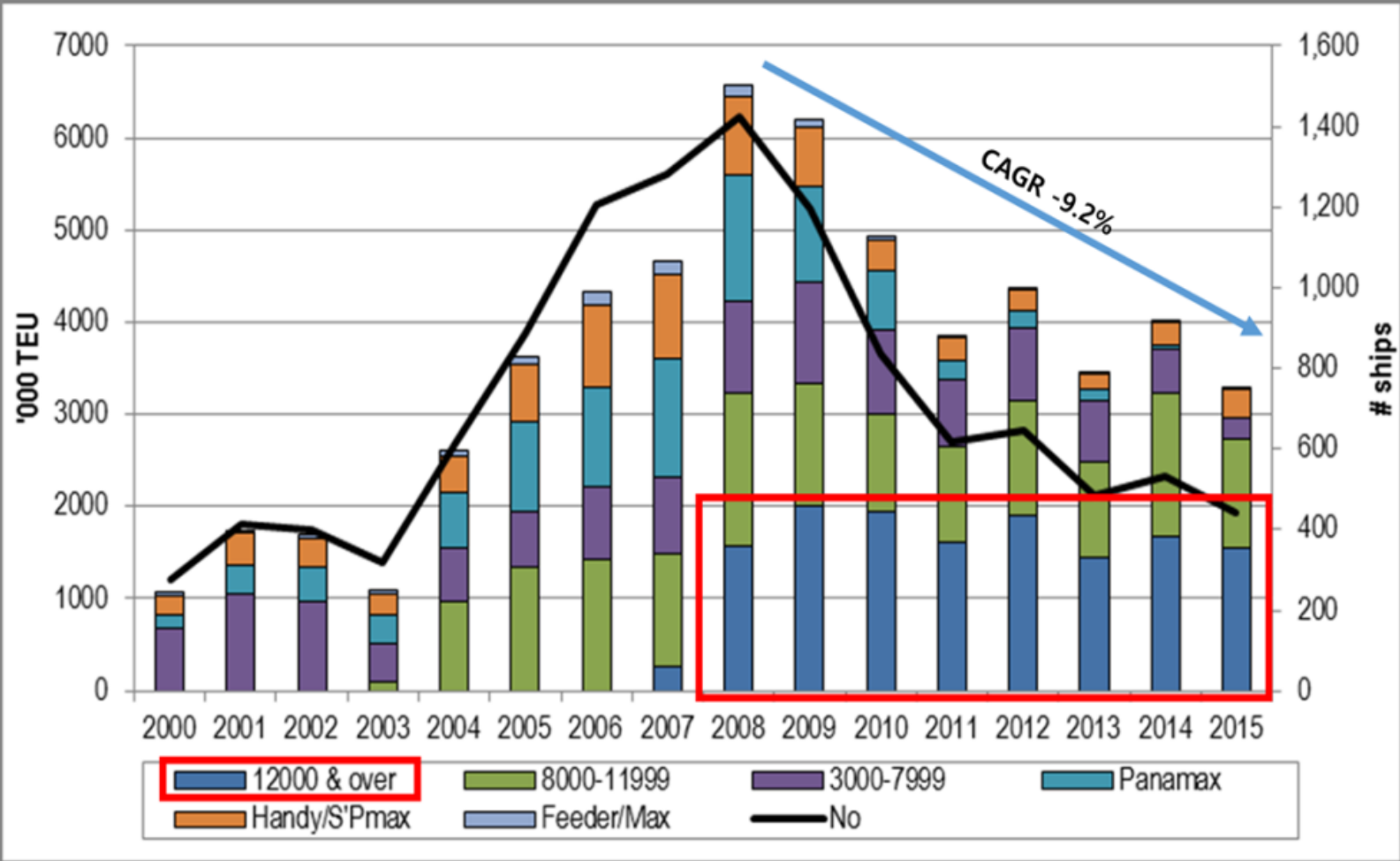


Technology has been improved



Outlook for Mega Container Vessel

Demand for Big Size Vessels will be sustained



Outlook for Mega Container Vessel

In 2020, 24000TEU vessels are expected to be on order

Already over 20,000TEU Vessels are on order

Shipping Company	Ship Size (TEU)	Num.	Shipyard	Expected Delivery Date
CMA CGM	20,600	3	Hanjin Industry	End of 2017
OOCL	20,100	6	Samsung Industry	Nov. 2017
MOL	20,100	4	Samsung Industry	Aug. 2017
EVERGREEN	20,000	11	Imabari Shipyard	2018

Many major maritime consulting company expect that...

Organization	Outlook
OECD ITF	In 2020, 24,000TEU Vessels are in operation
OSC	24,000TEU vessels will be ordered in 2016
Lloyd's Register	24,000TEU vessels are not far from
CTI	24,000TEU vessels will start on a voyage in 2020
KMI	Over 24,000TEU vessels will be built before 2020

Outlook for Mega Container Vessel

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Challenges to Ports

Quay Crane and Yard Productivity

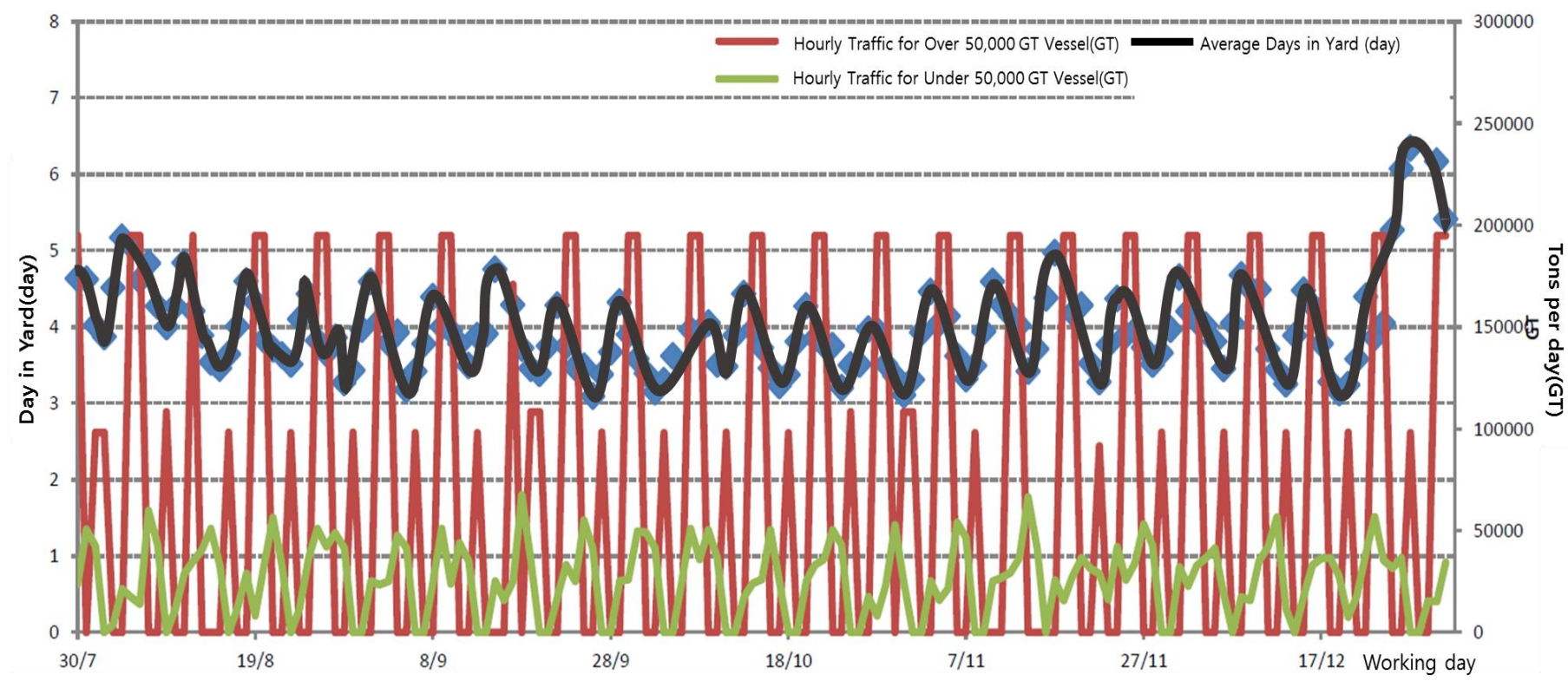
The consensus among big ship carriers nowadays is that terminals should handle mega ships in one day → terminal need to increase the productivity

Size (A)	Moves (B)	Time (C)	Quay Productivity (D)=(B/C)	LOA (m) (E)	Max Crane (F)=E/50	Quay Crane Productivity (G)=(D/F)
12,000TEU	4,000box	23 hr	174box/hr	360M	7	25box/hr
18,000TEU	6,000box	23 hr	261box/hr	400M	8	31box/hr
25,000TEU	8,334box	23 hr	362box/hr	465M	9	40box/hr
30,000TEU	10,000box	23 hr	435box/hr	495M	9	48box/hr

Challenges to Ports

Need more yard space

Concentration of container traffic in one day ask more yard space to handle the huge number of containers

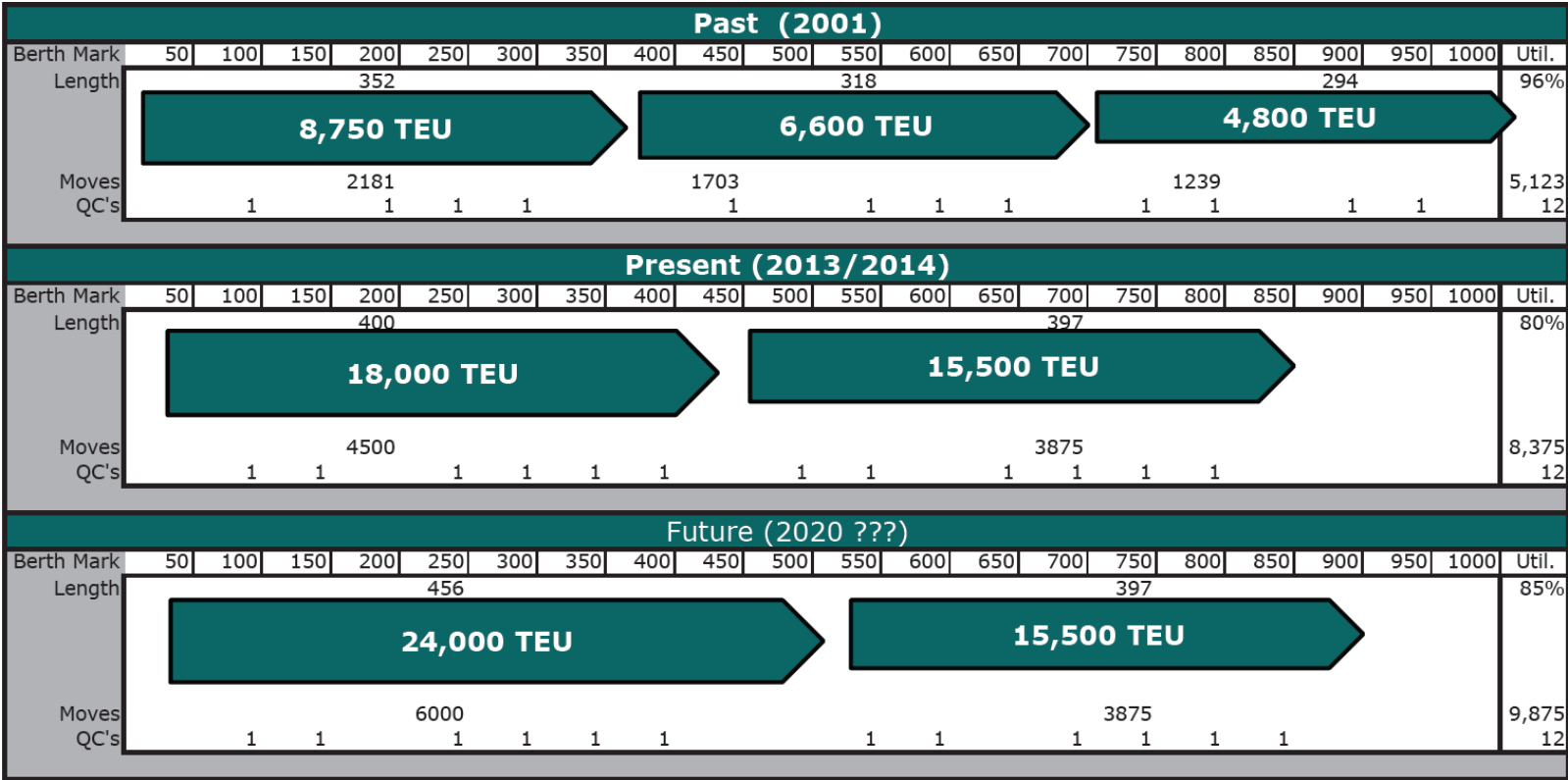


The Impact of Mega Ship, ITF, OECD 2015.

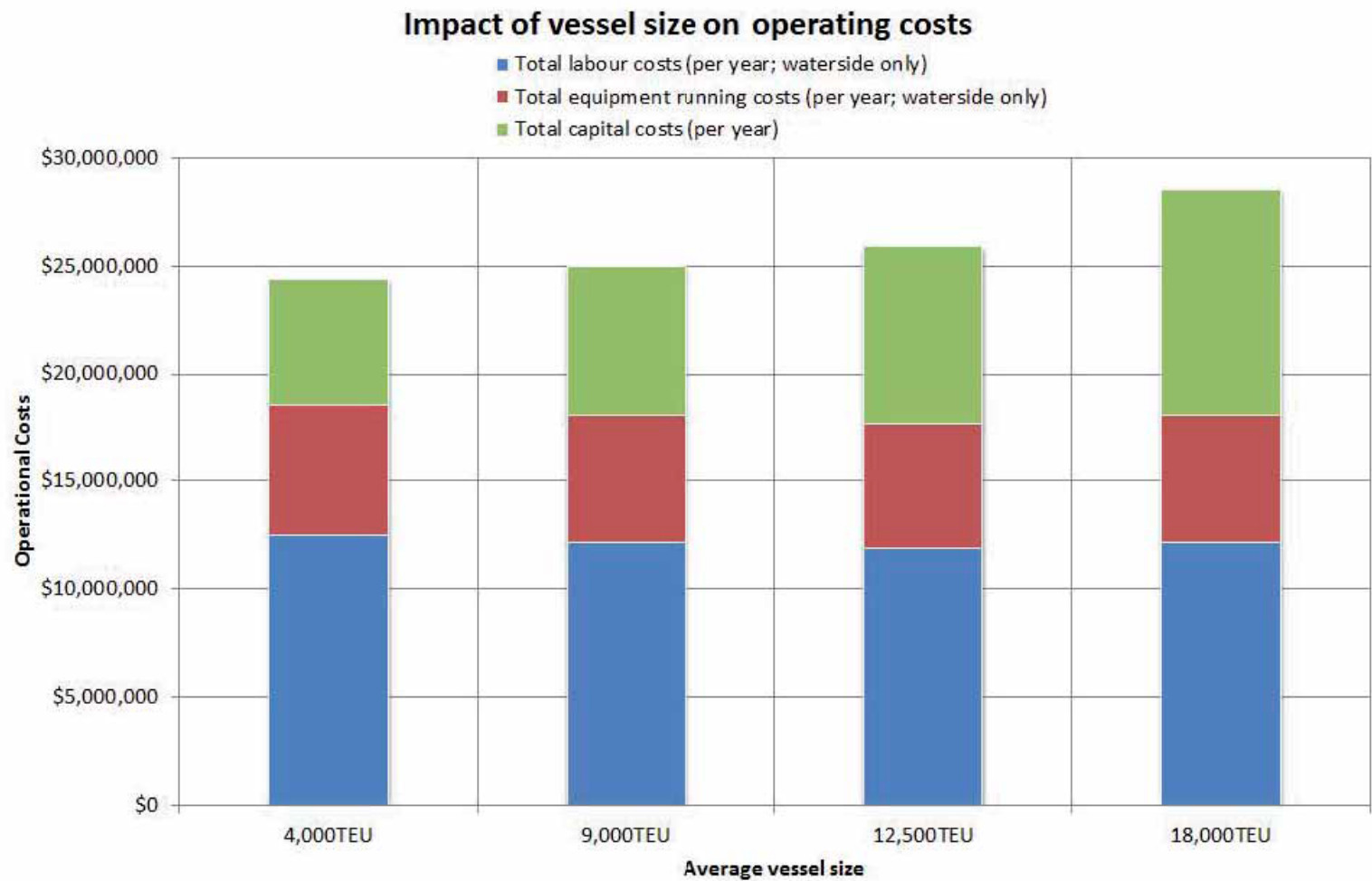
Challenges to Ports

Low Quay Utilization

The length of 18,000TEU vessel is about over 400m → Quay utilization rate is decreased under 80~85% (Current 95%)



High Operation Cost



How to Come Through These Challenges

Automation

Automation can reduce operation cost and save working time

Europe
(Rotterdam,



China
(Yangshan,
Qingdao,
Xiamen)



How to Come Through These Challenges

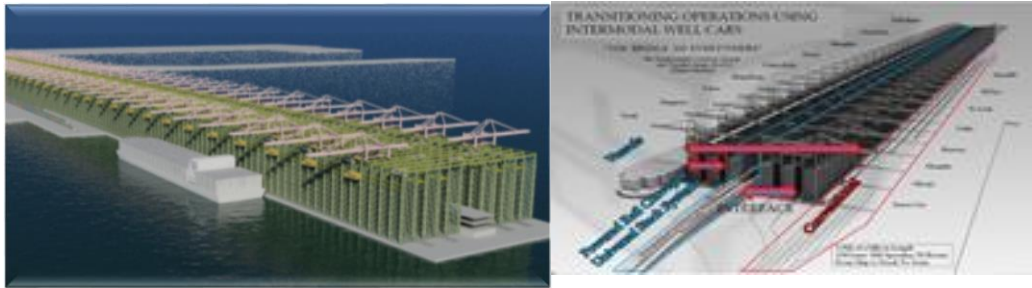
New Concept of Container Terminal

Totally new concept of container terminal

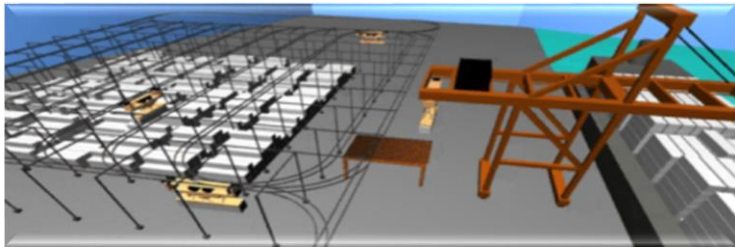
Singa Port



GRID Super Dock



GRAIL



SPEEDPORT



How to Come Through These Challenges

New Concept of Container Terminal

Totally new concept of container terminal

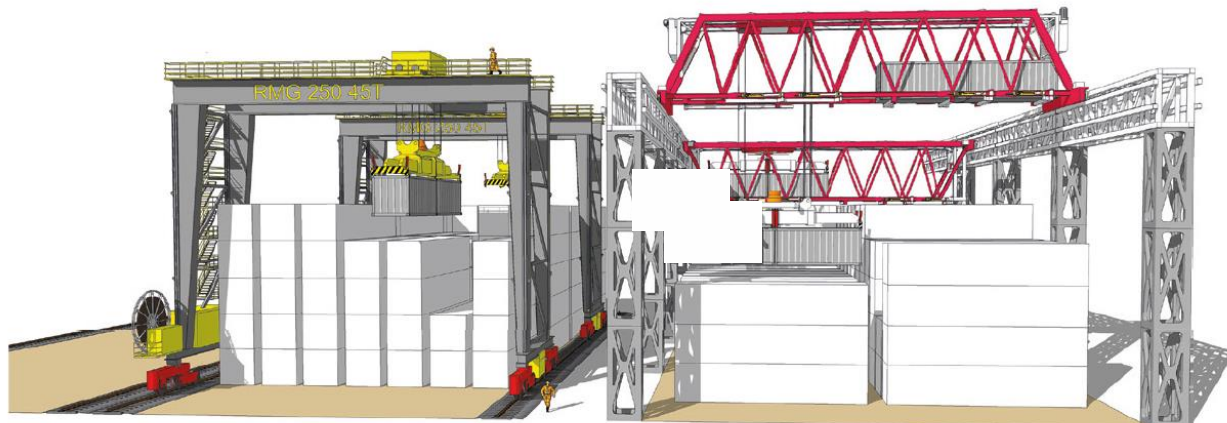
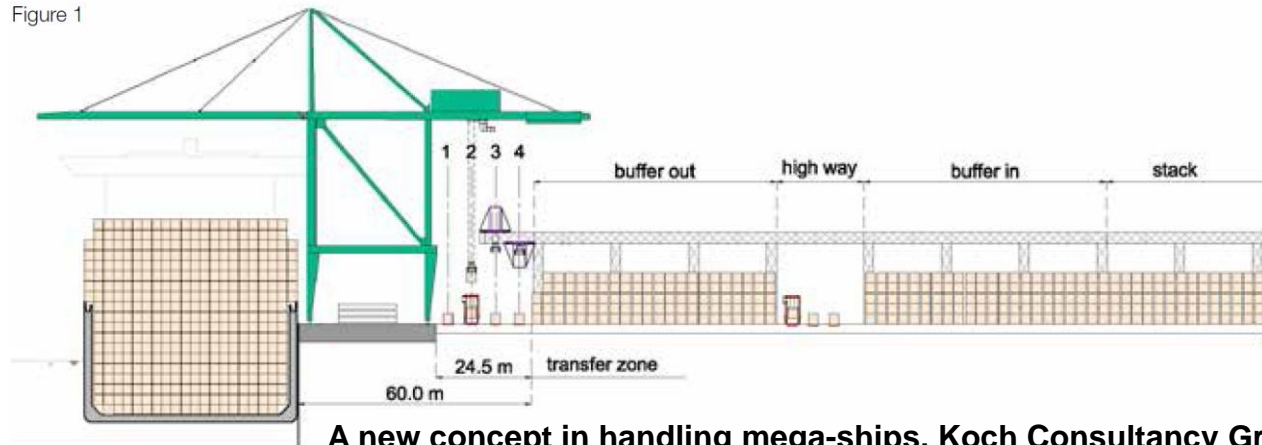


Figure 1



Question?

Thanks