

16th Trans Middle East 2019 Kuwait

Shaping Next-Gen Ports through improvements in Container Terminals Productivity

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Kalmar Automation & Projects Division

Content

1. Kalmar in brief
2. Maritime Industry
Mega-Trends
3. Automation the way
forward in Container
Terminals



Cargotec wants to become the leader in intelligent cargo handling

Strong global player with geographical diversification

Cargotec Group

Sales: EUR 3,250 million
EBIT: 8.0%
Services and software:
33%

Kalmar

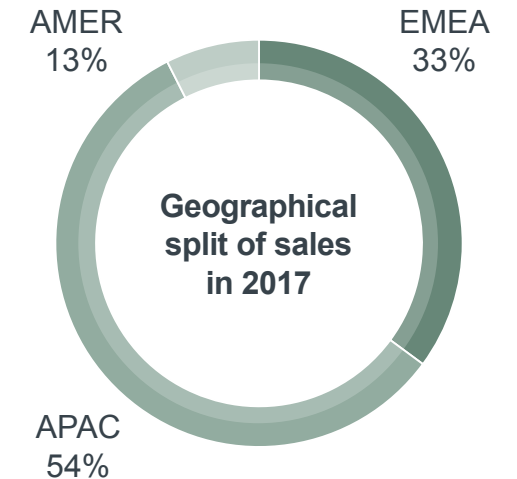
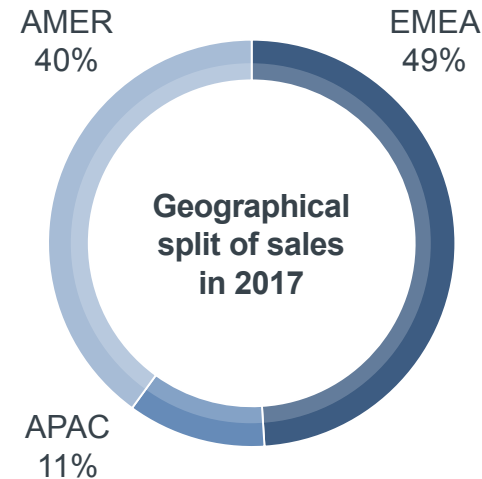
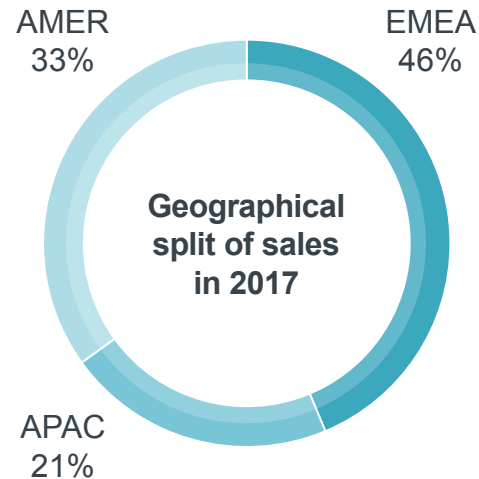
Sales: EUR 1,598 million
EBIT: 8.3%
Services and software:
37%

Hiab

Sales: EUR 1,084 million
EBIT: 14.5%
Services and software:
24%

MacGregor

Sales: EUR 571 million
EBIT: 2.0%
Services and software:
36%



A global reach with personnel in 30 countries and sales and service in more than 100 countries.





One in four container movements around the globe is handled by a **Kalmar solution.**

Kalmar business area solutions



Automation



STS cranes



Reachstackers



Empty container handlers



Crane upgrades



Maintenance



Navis TOS



Bromma spreaders



ASCs, RTGs & RMGs



Straddle & Shuttle carriers and AGVs



Terminal tractors



Forklift trucks



Spare parts



Used equipment



XVELA collaboration platform



ALP

Automation & Projects

Mobile Equipment

Services

Navis XVELA

Bromma

Kalmar's operating environment



Provides integrated port automation solutions including software, services and a wide range of cargo handling equipment



TOS coordinates and optimizes the planning and management of container and equipment moves in complex business environments.

Navis provides also maritime shipping solutions:

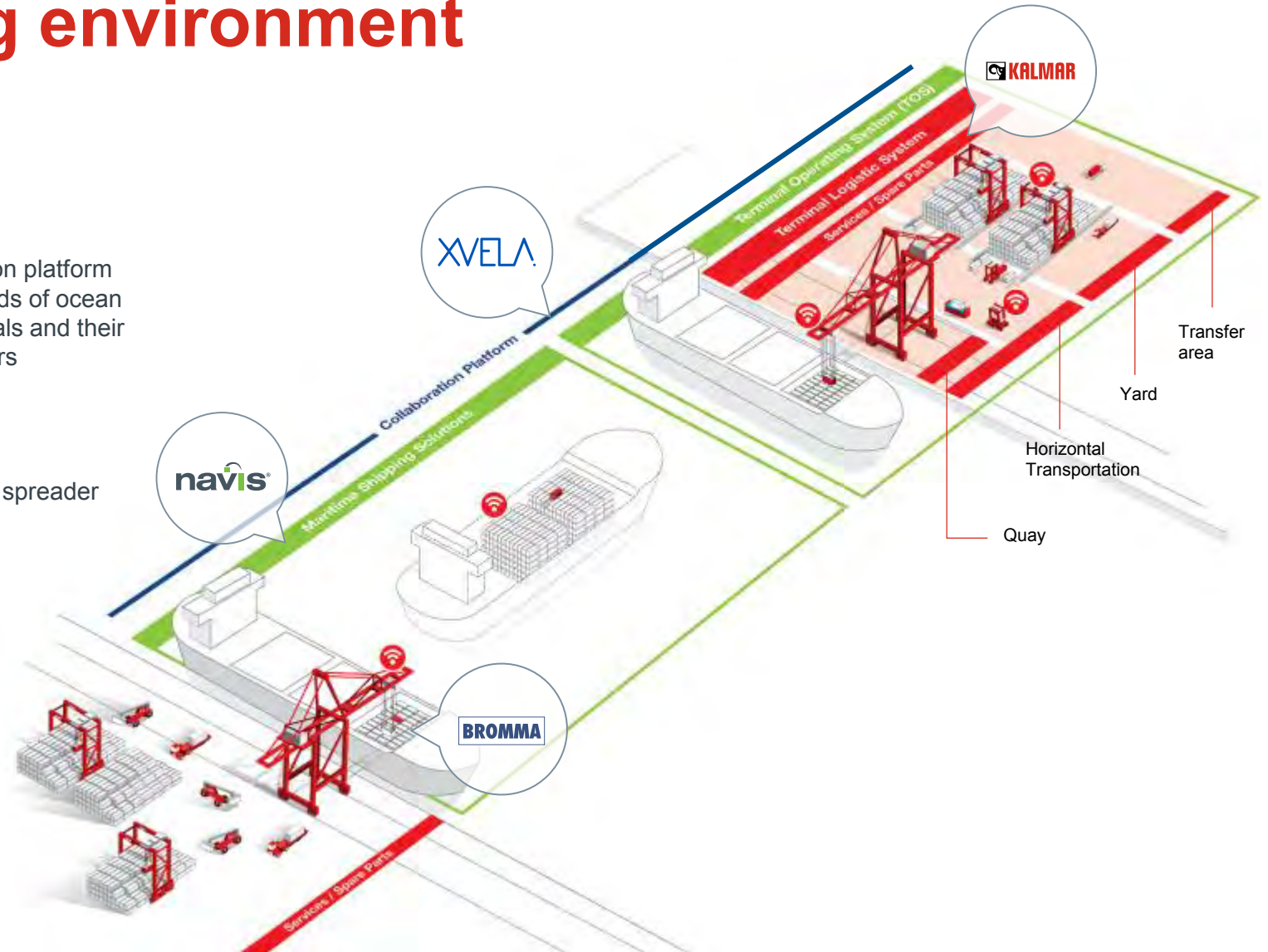
- Stowage planning
- Vessel monitoring
- Loading computer
- Route planning



The collaboration platform serving the needs of ocean carriers, terminals and their shipping partners



Industry leading spreader manufacturer



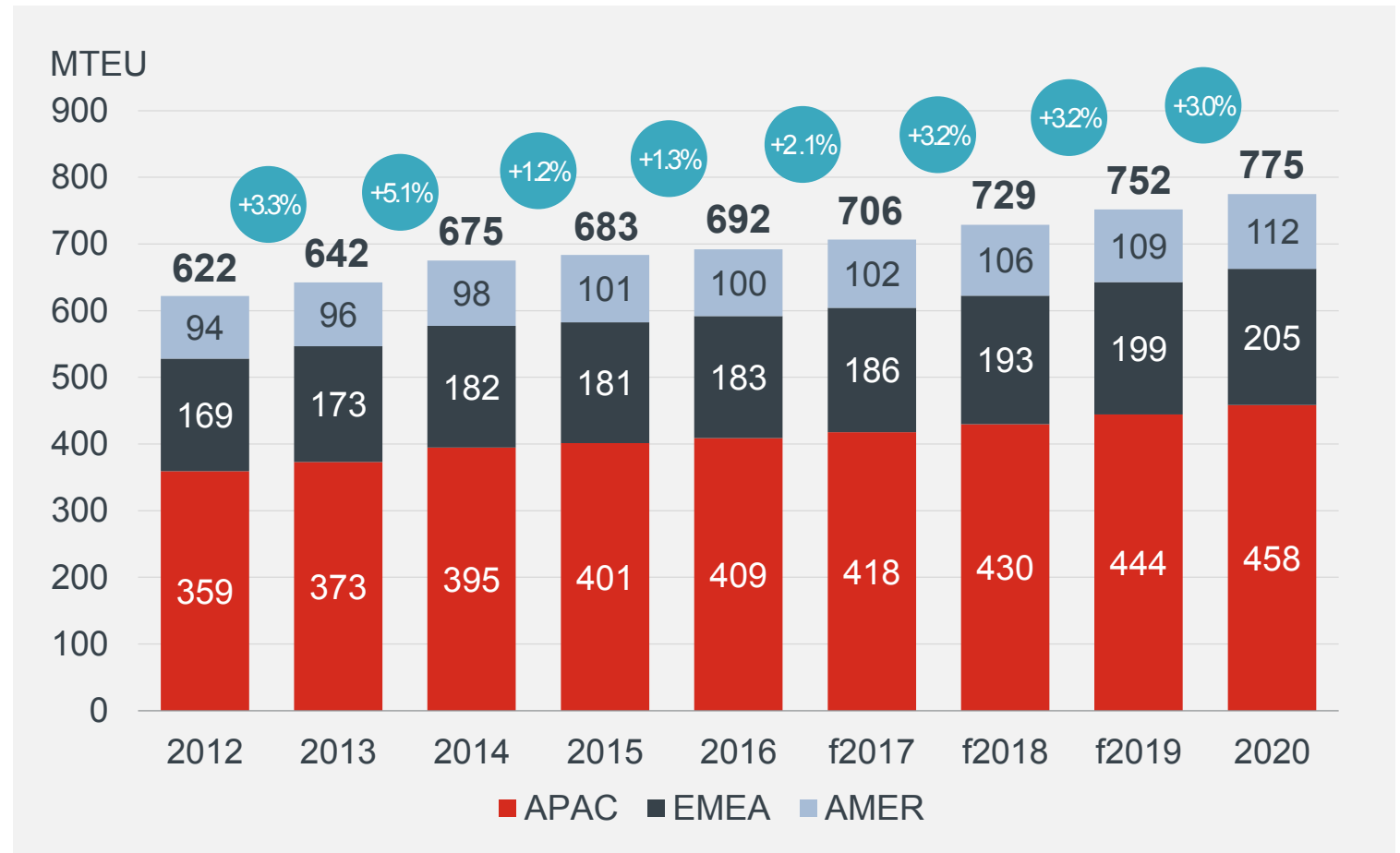
Industry trends

Market environment

Container throughput still forecasted to grow year on year.

Growth trend lower than in the previous decade (2-3% vs. 5-6%)

Growth from 2012 to 2020: **25%**
CAGR: **2,8%**



Source: 2013-2017: Drewry forecaster Q4 2016
F2018-F2020: Drewry forecaster Q3 2016

Mega trends of the industry



Mega vessels

Efficiency demands increase as marine transport continues to grow. Larger ships require capacity improvements from port operators.



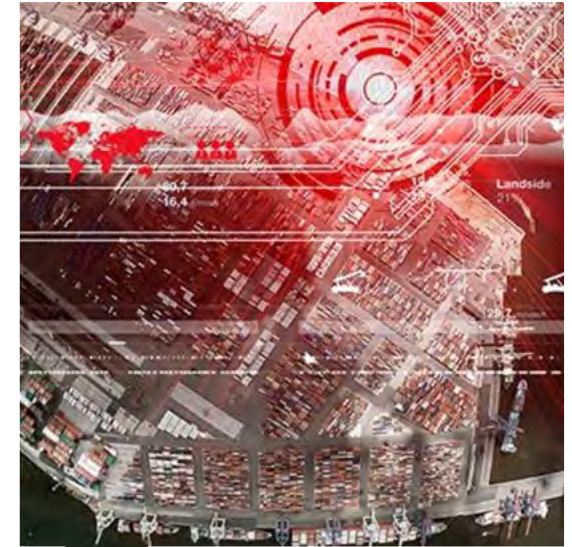
Sustainability

Strict emission requirements & growing concern for the environment increase the demand for more intelligent machines with smaller environmental impact.



Industry consolidation

New alliances between shipping lines are impacting container traffic flows and setting new efficiency standards for port operators.



Digitalisation & automation

Digital and automated solutions provide new possibilities for port operators to improve efficiency, safety and sustainability.

Automation in container terminals the way forward



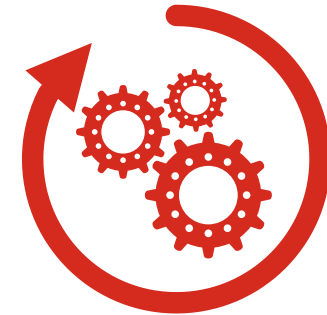
Kalmar Business Area has three focus areas in offering development



Zero
Emission



Automation
&SW



Services

All electric portfolio ready for growth



Shuttle & Straddle Carriers



AGV



RTG



ASC/RMG



STS

ECO-EFFICIENCY AT WORK 

A large container ship is docked at a port. The ship's name, "KOTA LINGGA", is visible on its side. The ship is moored to a concrete pier with yellow bollards and ropes. In the background, several Kalmar container cranes are visible, along with other port infrastructure. The sky is overcast with light clouds. The foreground shows the concrete pier with yellow and white markings and several orange and white safety cones.

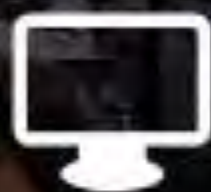
**Kalmar's full offering to be available
as electrically powered by 2021.**

Extending equipment lifetime with service offering



Crane and Automation retrofits

Automation and crane retrofit solutions for Kalmar and 3rd party equipment



Digital Services

Solutions to improve operation efficiency



Customer support

Provide world class customer experience and increase loyalty

Crane Upgrades References. Quay Cranes Heightening & Boom Extension



TCB Barcelona – 2014 APM Group

Heightening 6 meters 3
ZPMC
STS Cranes

- Total Control of the Project
- Execution the whole works on site - Safety is our priority



DPW/GMP Le Havre (France) 2019

Heightening of 9 m- 4 x
ZPMC QC

- Complete Engineering Works
- Provide right Technical Solution
- Execution and Control of the Works
- Testing Protocol



Noatum Valencia 2015

Heightening 7 meters 2
Paccoci
STS Cranes

- Subcontractor of OEM (Paccoci)
- Skidding the cranes and execution the whole works on site - Safety is our priority



MSCTV Valencia 2018

8 STS Crane
Heightening and 8 STS
Boom extension Works

- Manufacturing Control
- Relocate the cranes: Skidding and SPMT
- Crane Heightening and Boom Extension Works
- Testing Protocol
- Certification of the Cranes



Port Klang-2014 Northport Malaysia

Heightening 5 m
8 Impsa STS's

- Complete Engineering
- Manufacturing Control
- Complete Electrical refurb.
- Dismantling Device
- Execution and Control of the Works



Abidjan – Ivory Coast 2016

Repair Kalmar STS
Crane after accident

- Complete Engineering Works: Survey and repair proposal
- Provide right Technical Solution
- Manufacturing Control
- Execution and Control of the Works
- Testing Protocol



**“In ten years all
container terminals
will be automated.”**
CEO of Container Terminal Operator

The future will be automated



Safety

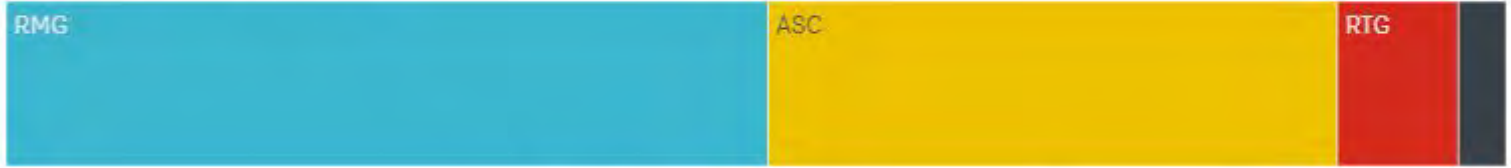


**Cost
competiveness**



**Operational
flexibility**

Handling System by Throughput

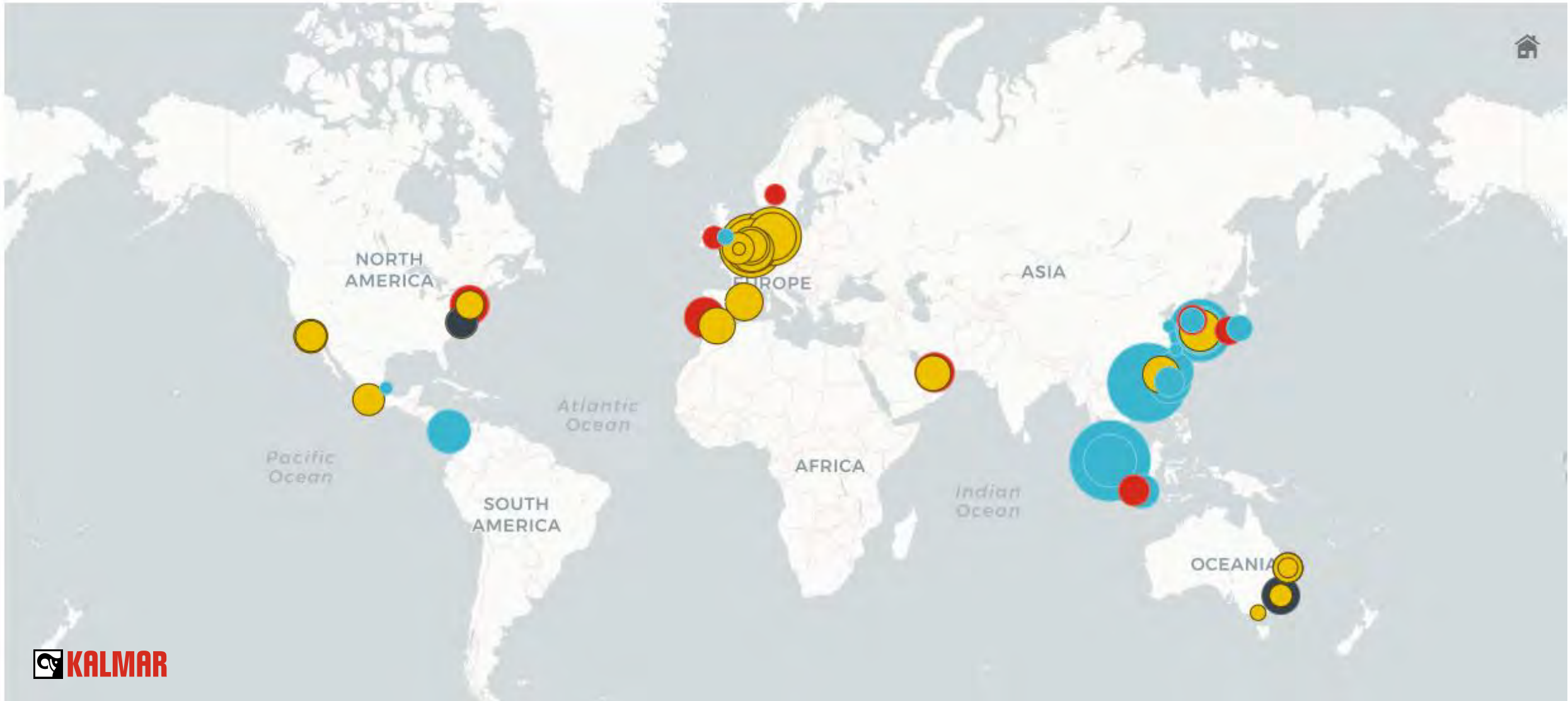


Number of terminals

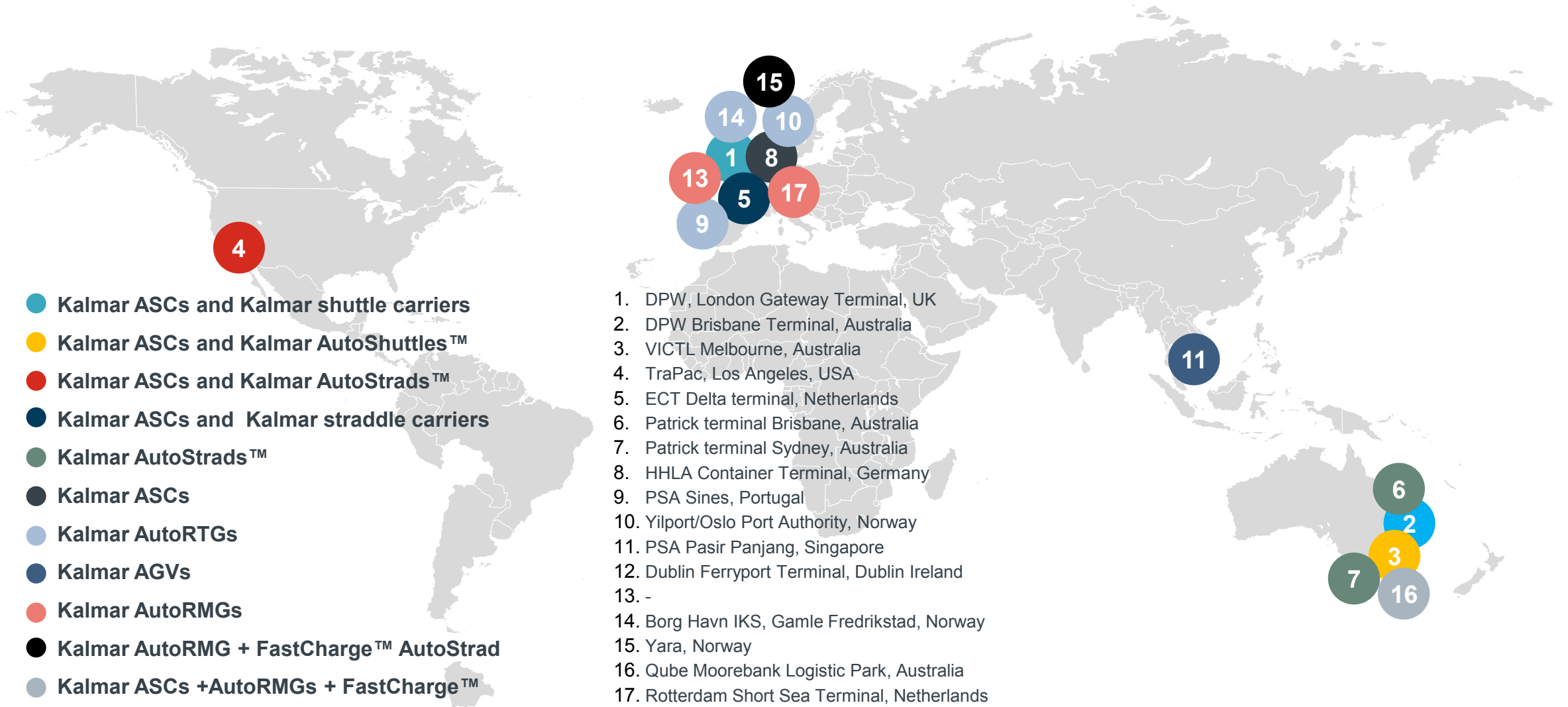
52

Throughput Estimation (2017, T...

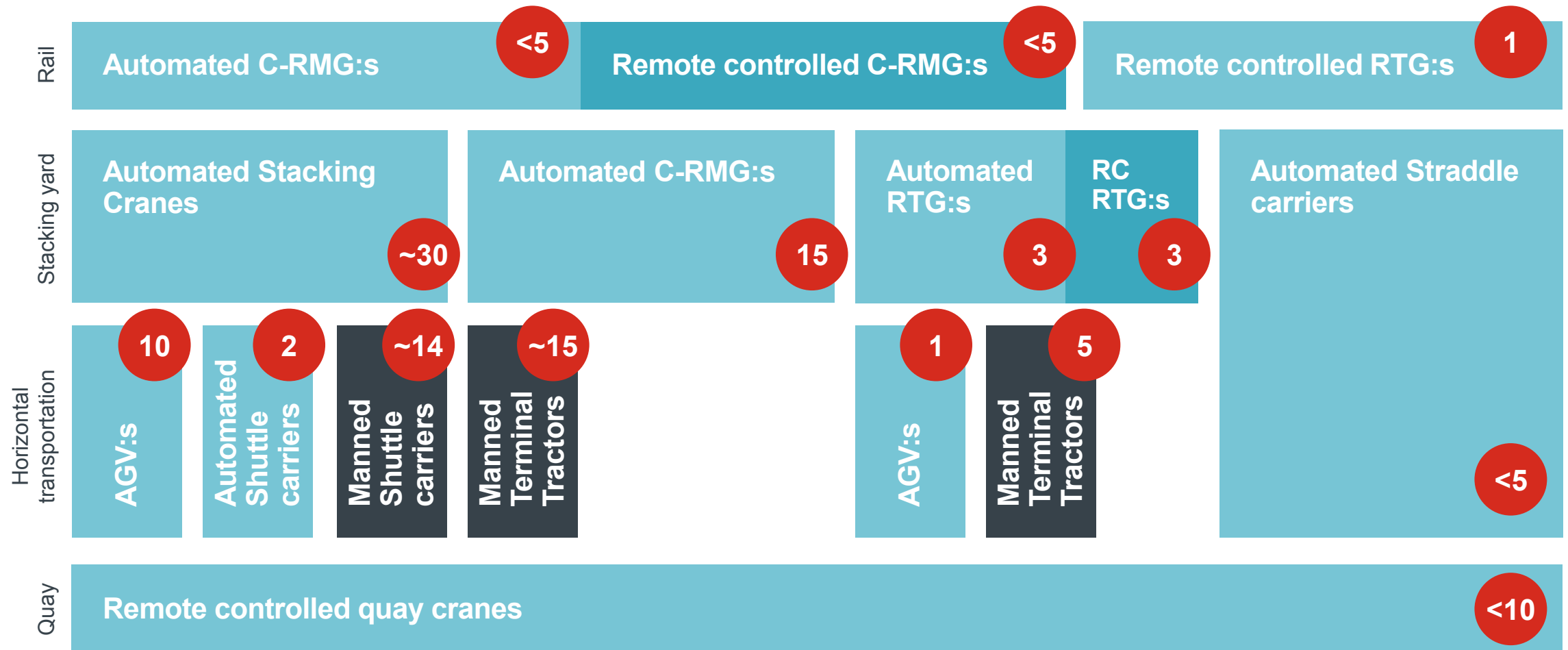
77.75M



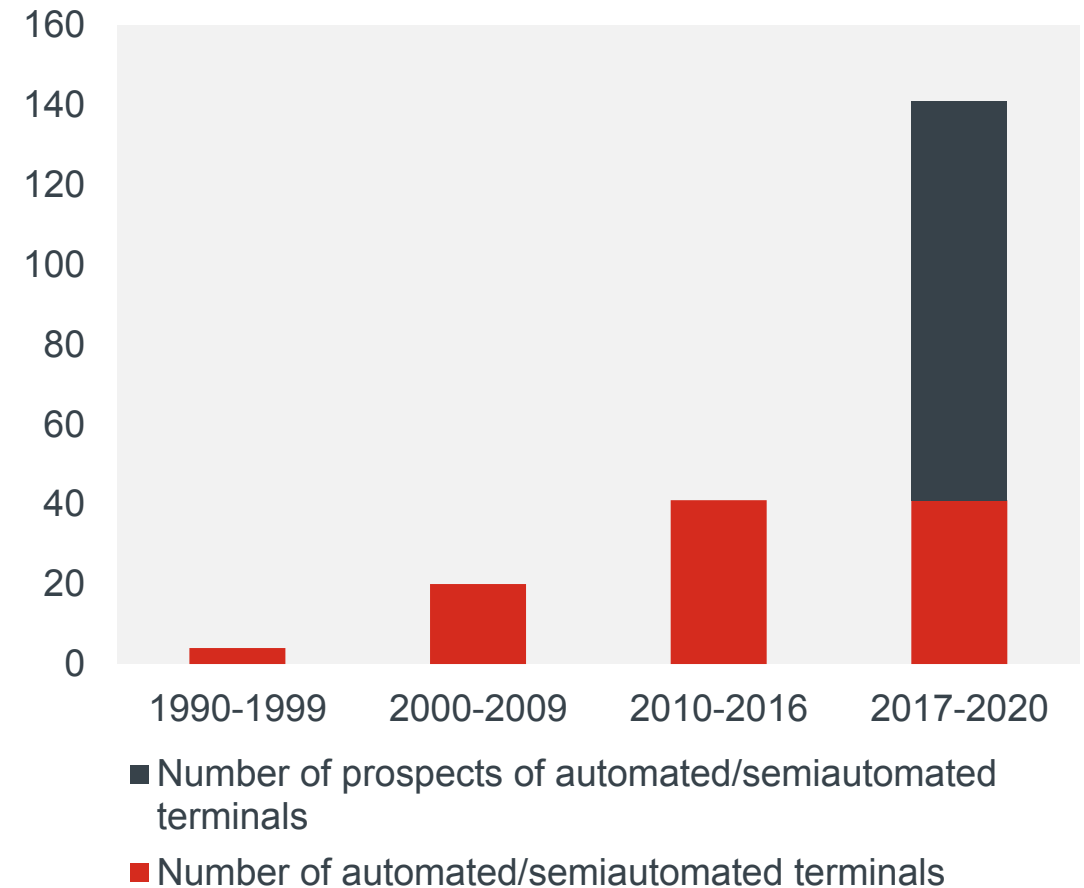
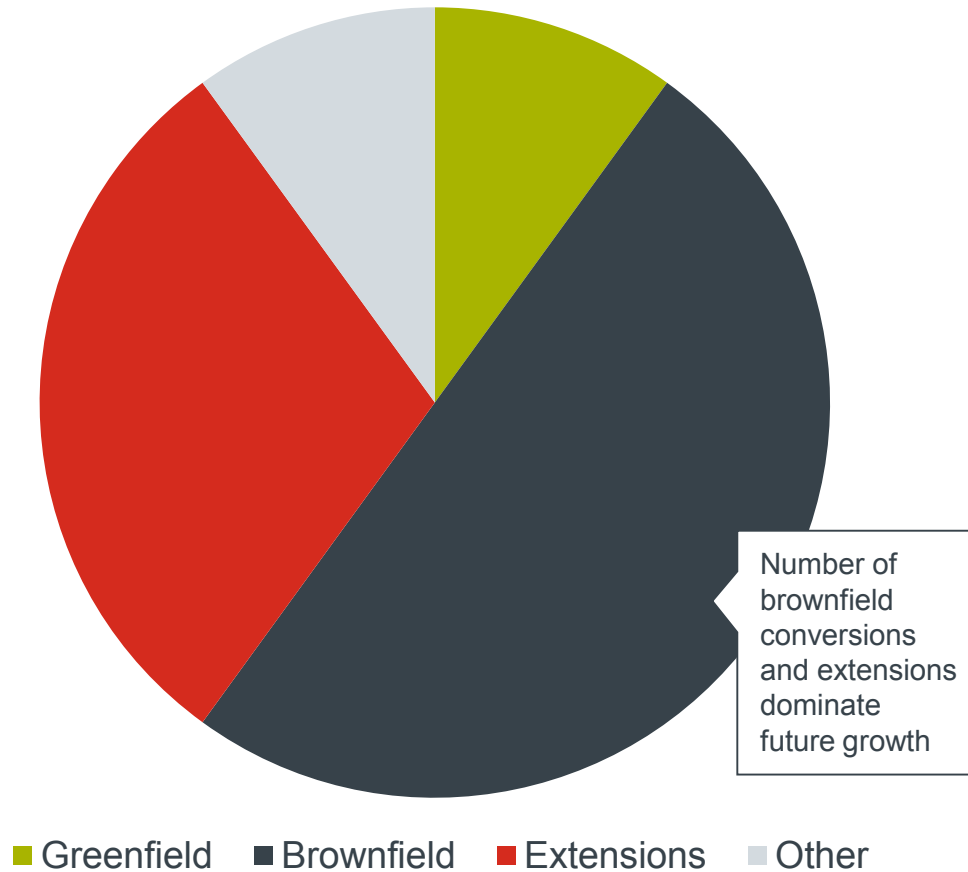
Kalmar automated terminal references



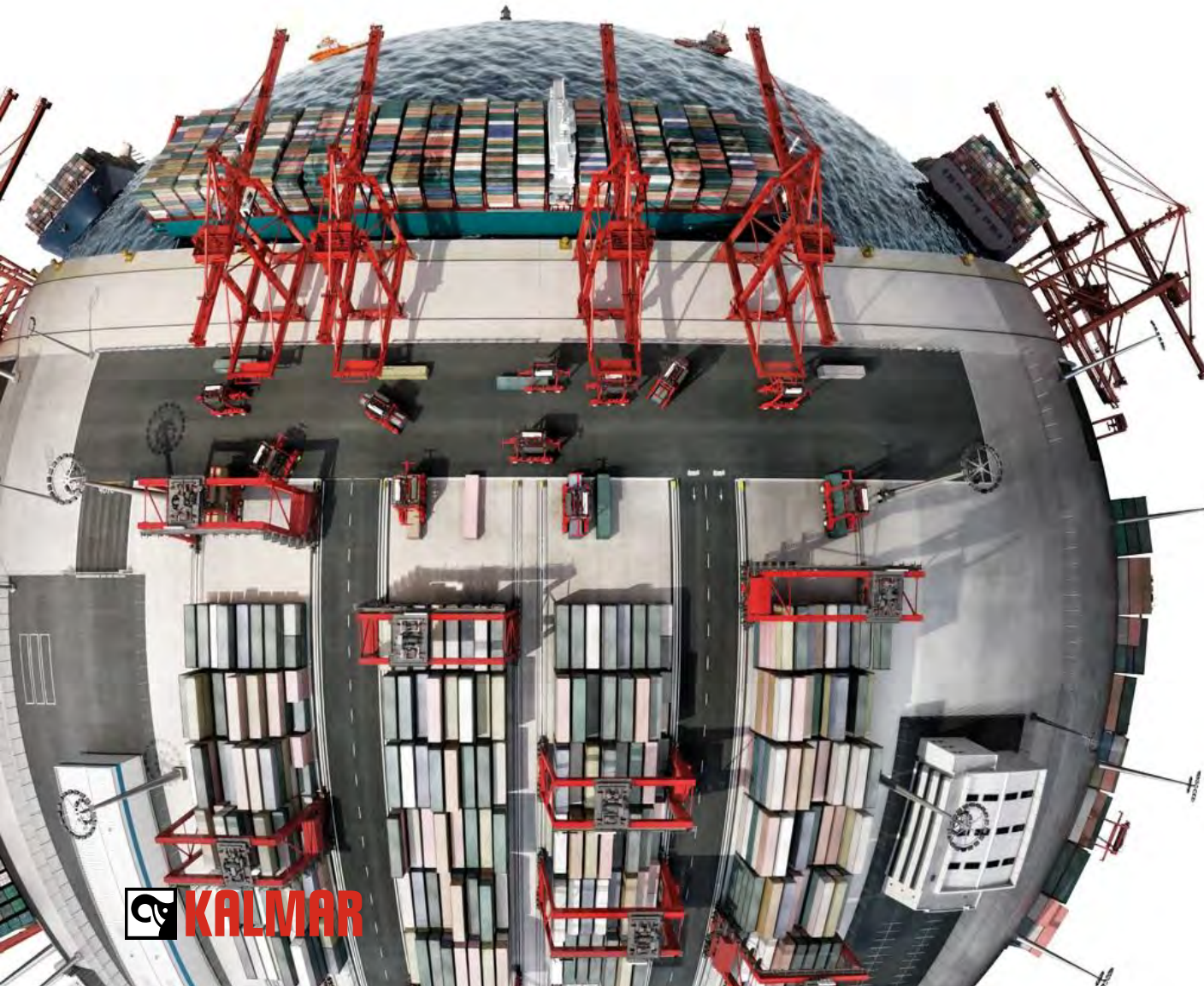
Modes of automated solutions currently adopted in terminals



Number of automated / semi automated projects is forecasted to grow in the near future



Provide standardised, pre-integrated automation solutions with performance guarantees








OneTerminal

Your performance guaranteed.

OneTerminal is a standardised terminal automation package developed by Kalmar and Navis, delivered by one team, that gives you a guaranteed performance level after implementation, helping you realise your investment sooner.



In the scenario of performance-based contracting, the customer does not buy a product, but instead pays for its utility

Value Proposition	Description
	Guaranteed Performance <ul style="list-style-type: none">▪ Kalmar to shift from selling cranes and other lifting equipment to providing guaranteed performance and availability
	Complete Solution <ul style="list-style-type: none">▪ Complete package solution incl. expertise: planning, consulting, design, service, equipment, software and ramp up▪ Temporary service for running operations during the ramp up
	New Pricing Model <ul style="list-style-type: none">▪ Clear fee payment structure based on agreed performance and/or technical availability levels▪ Calculated risk for offering a monthly fee, which is predefined for different customer segments▪ Incorporates financing options, equipment, software and service under the same fee
	Equipment Replacement <ul style="list-style-type: none">▪ Exchange terms for equipment replacements at the end of the equipment lifecycle▪ Common understanding of the residual value of equipment and depreciation schedule
	Equipment & Infrastructure Financing <ul style="list-style-type: none">▪ Equipment or project financing options from banking, institutional investor or bond markets▪ Concession giver or financier might demand access to the assets in the worst case scenario

Perceived benefits and risks of automation for container terminals

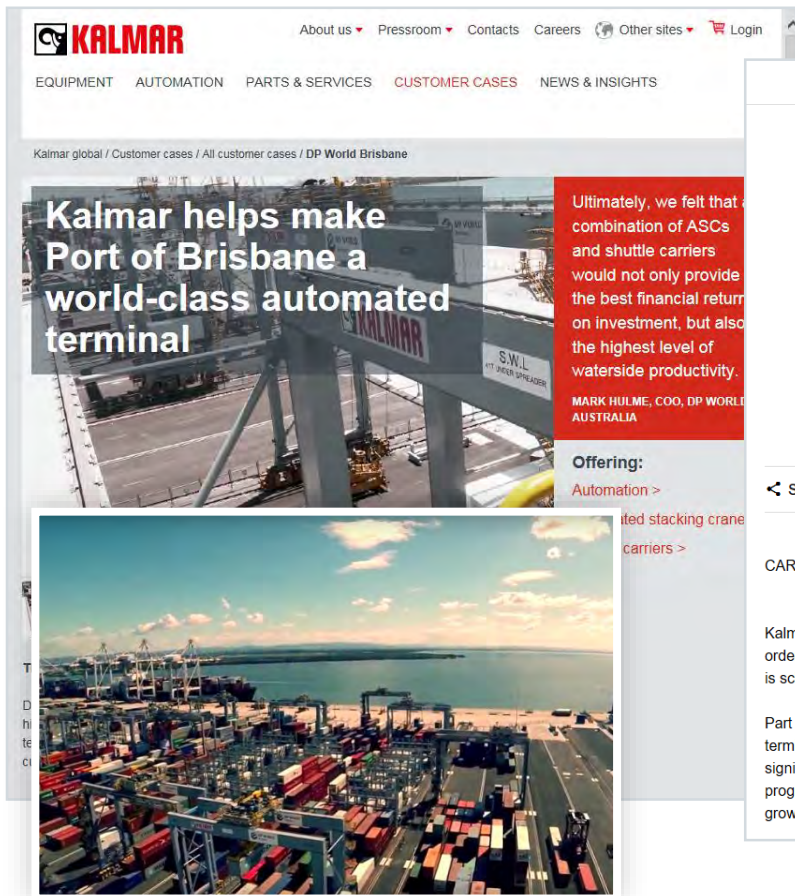
- Safety improvement
- Consistency of productivity
- Financial benefits, lower operating costs
- Good visibility to the operational parameters
- Helps to address labour availability issues
- No need to optimize the labour headcount during quiet times – full fleet always in use
- Low corrective maintenance cost
- Operator ergonomics improvement



- High initial investment cost
- Implementation challenges to the existing terminals
- Increased preventive maintenance cost
- Requires new kind of skills



Automation is not anymore only for mega terminals



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EQUIPMENT AUTOMATION PARTS & SERVICES CUSTOMER CASES NEWS & INSIGHTS

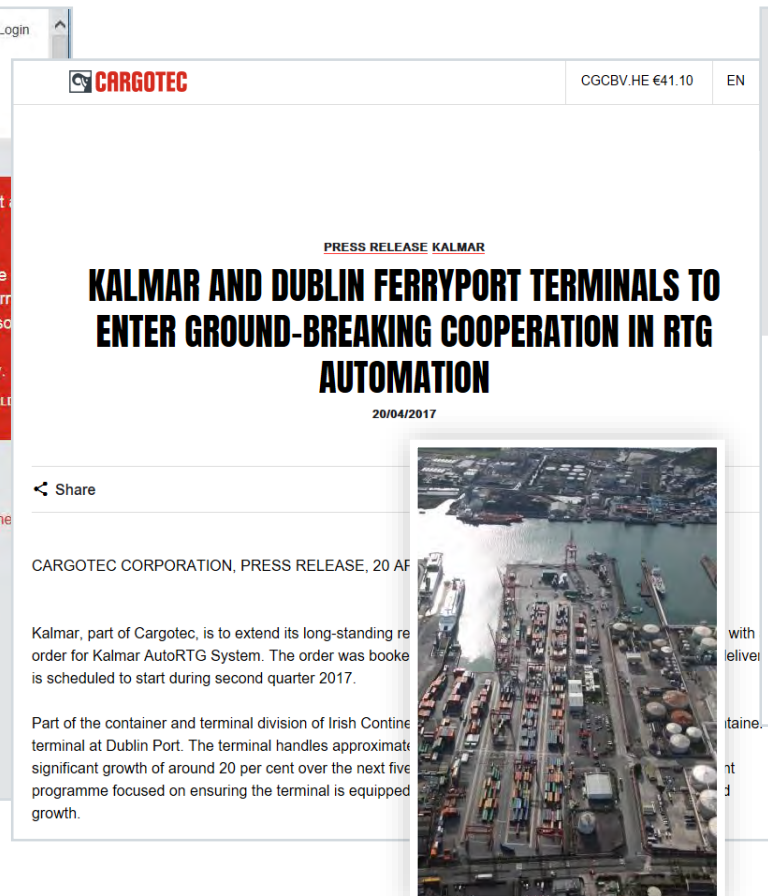

Kalmar global / Customer cases / All customer cases / DP World Brisbane

Kalmar helps make Port of Brisbane a world-class automated terminal

Ultimately, we felt that combination of ASCs and shuttle carriers would not only provide the best financial return on investment, but also the highest level of waterside productivity.

MARK HULME, COO, DP WORLD AUSTRALIA

Offering: Automation > Automated stacking cranes > Shuttle carriers >



CARGOTEC CGCBV.HE €41.10 EN

EQUIPMENT AUTOMATION PARTS & SERVICES CUSTOMER CASES NEWS & INSIGHTS

Kalmar global / Pressroom / Press releases / Kalmar and Yara to develop world's first fully-digitalized and zero emission cargo solution for Yara Birkeland

KALMAR AND DUBLIN FERRYPORT TERMINALS TO ENTER GROUND-BREAKING COOPERATION IN RTG AUTOMATION

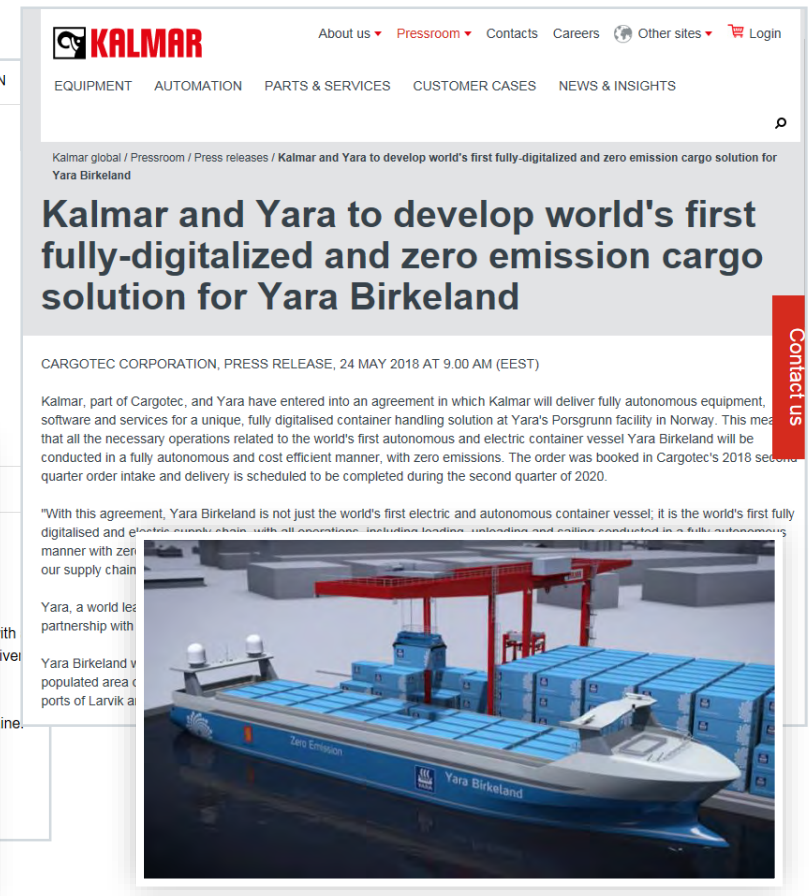
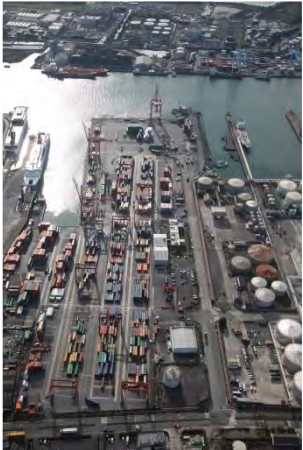
20/04/2017

Share

CARGOTEC CORPORATION, PRESS RELEASE, 20 APRIL 2017

Kalmar, part of Cargotec, is to extend its long-standing relationship with Dublin Port by ordering a new order for Kalmar AutoRTG System. The order was booked in 2016 and is scheduled to start during second quarter 2017.

Part of the container and terminal division of Irish Contine terminal at Dublin Port. The terminal handles approximate significant growth of around 20 per cent over the next five programme focused on ensuring the terminal is equipped with growth.



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EQUIPMENT AUTOMATION PARTS & SERVICES CUSTOMER CASES NEWS & INSIGHTS


Kalmar global / Pressroom / Press releases / Kalmar and Yara to develop world's first fully-digitalized and zero emission cargo solution for Yara Birkeland

Kalmar and Yara to develop world's first fully-digitalized and zero emission cargo solution for Yara Birkeland

CARGOTEC CORPORATION, PRESS RELEASE, 24 MAY 2018 AT 9.00 AM (EEST)

Kalmar, part of Cargotec, and Yara have entered into an agreement in which Kalmar will deliver fully autonomous equipment, software and services for a unique, fully digitalised container handling solution at Yara's Porsgrunn facility in Norway. This means that all the necessary operations related to the world's first autonomous and electric container vessel Yara Birkeland will be conducted in a fully autonomous and cost efficient manner, with zero emissions. The order was booked in Cargotec's 2018 second quarter order intake and delivery is scheduled to be completed during the second quarter of 2020.

"With this agreement, Yara Birkeland is not just the world's first electric and autonomous container vessel; it is the world's first fully digitalised and electric supply chain, with all operations, including loading and unloading, conducted in a fully autonomous manner with zero emissions." Yara, a world leading partnership with Kalmar, is pleased to deliver the world's first fully digitalised and electric supply chain, with all operations, including loading and unloading, conducted in a fully autonomous manner with zero emissions.



Automation options for brownfield terminals



Challenge

- How to get all people onboard with the change?
- How to manage the change with unions?
- What to do with the existing equipment having still residual value?
- How to manage the change in IT environment?
- How to phase the construction works?
- What kind of new skills will be required?

How to ensure there will be minimal disruption to the current operation?



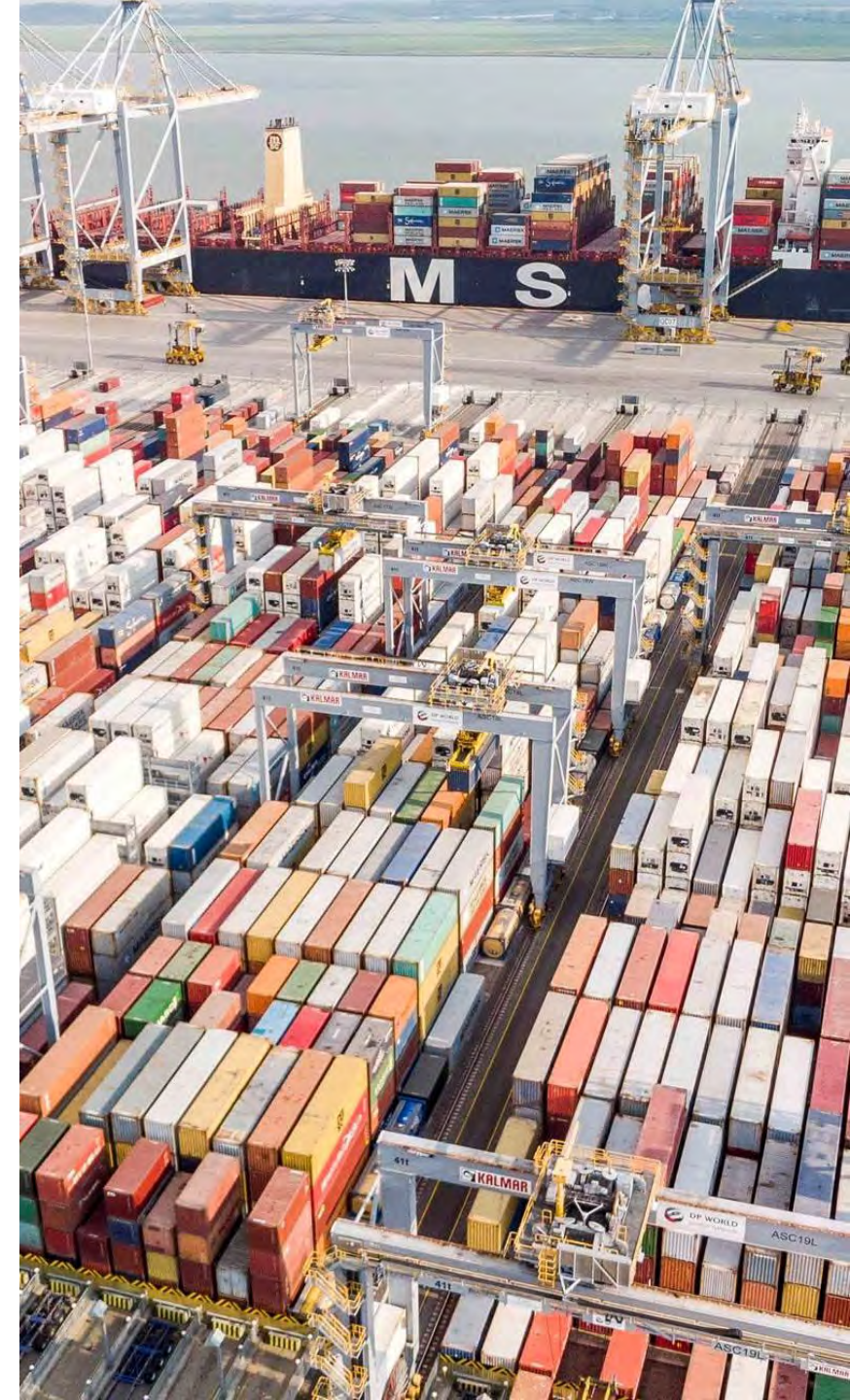
Set the goals of automation project

- Cost savings
- Productivity targets
- Capacity increase
- Customer service improvement
- Safety improvement
- Sustainability

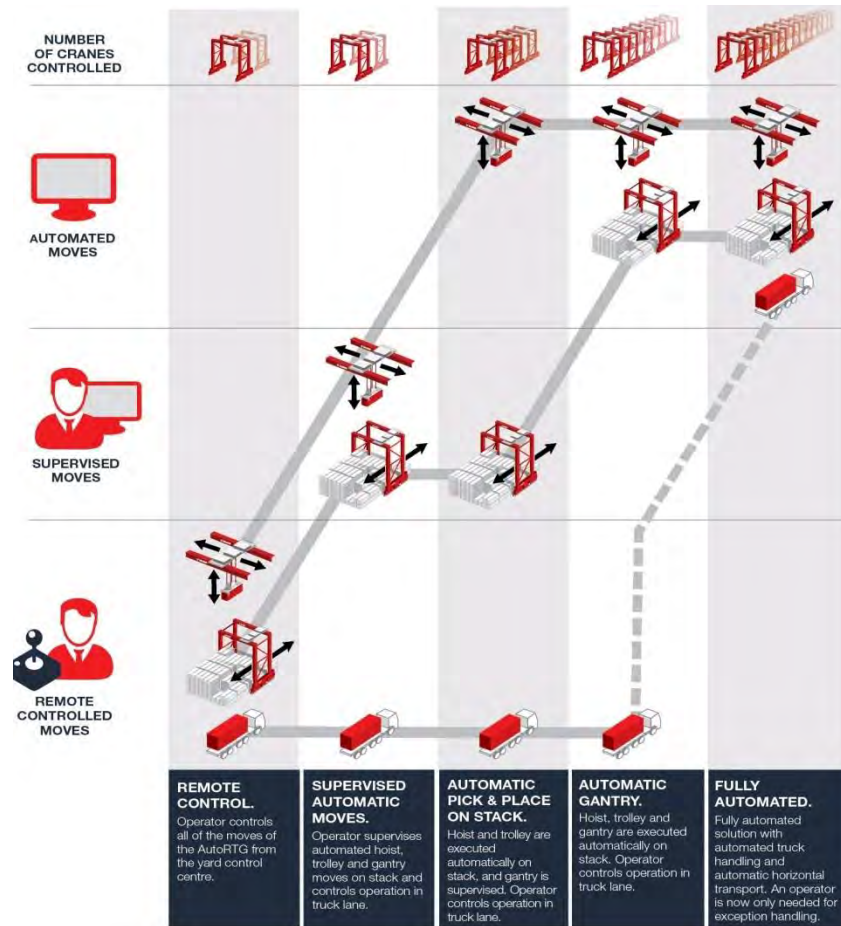


Possible ways for implementation

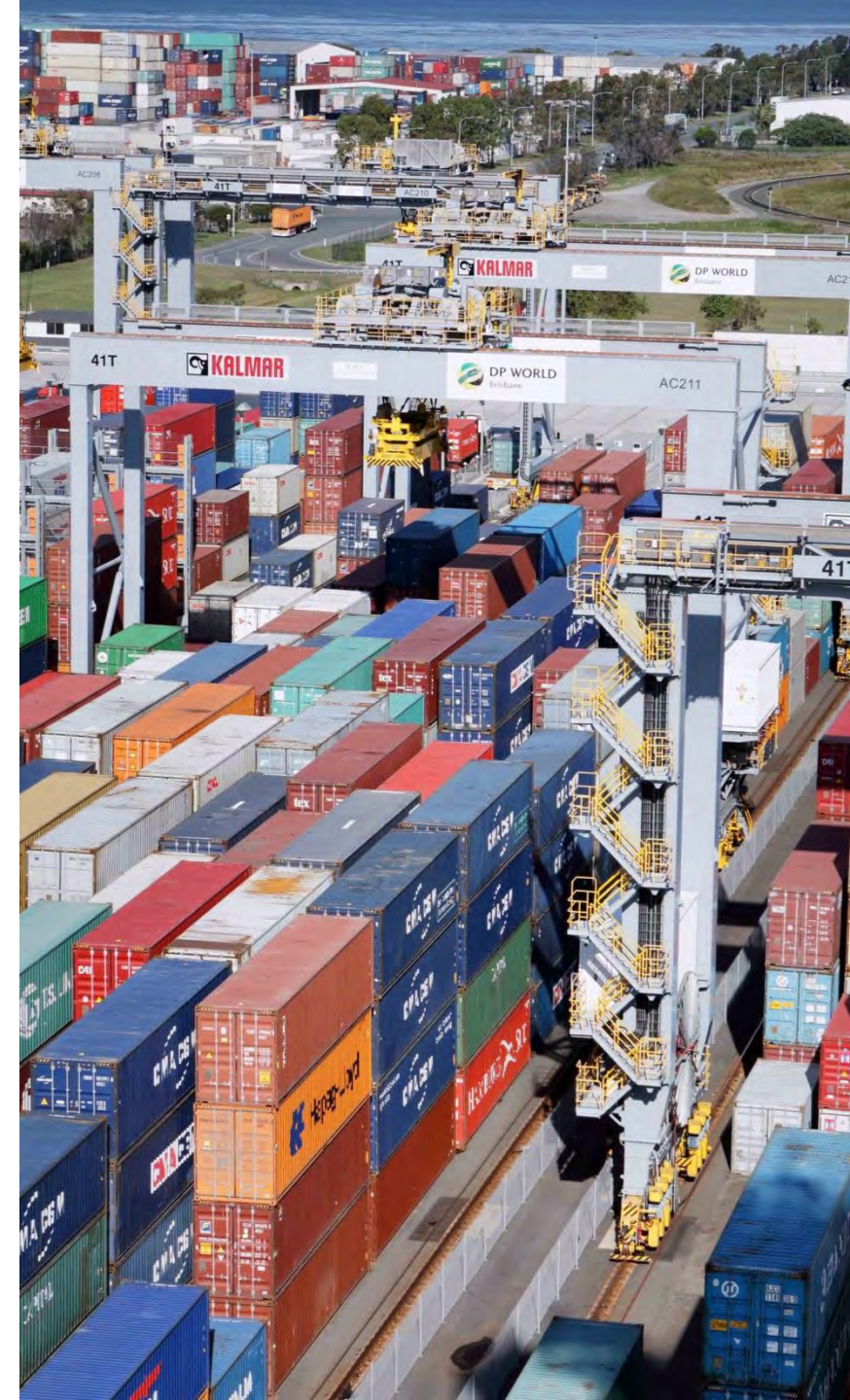
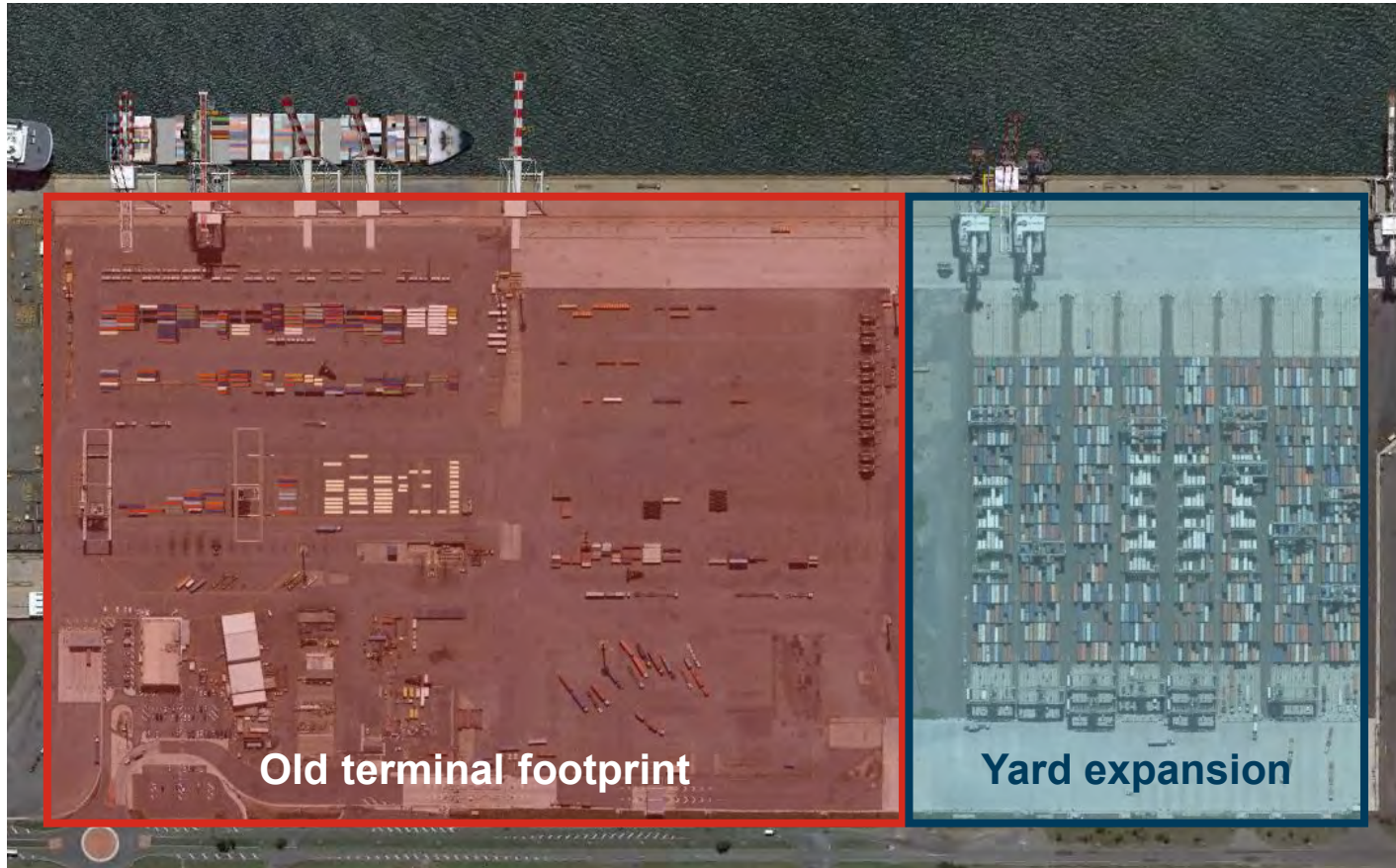
- Retrofitting to the current fleet and increase automation level in multiple steps
 - Block by block
 - Step by step
- Change the operating mode through yard expansion
 - Build automation first on a container yard expansion and make that operational, once that is done, gradually finish the existing yard as well
- Big bang approach
 - Construct the automation system in the middle of operation
 - Through a short downtime max few days convert from manual to fully automated



Retrofit and gradual increase

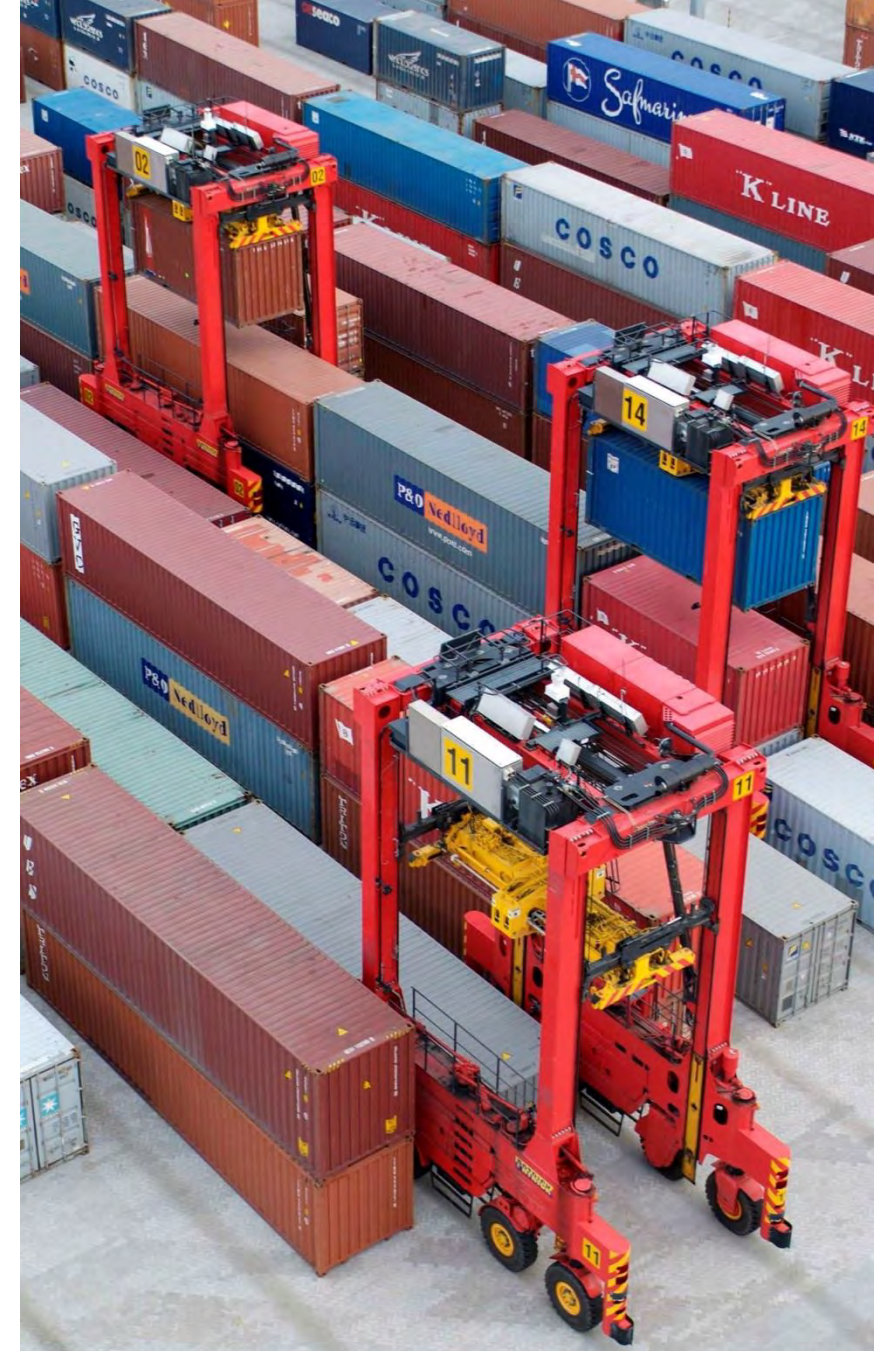
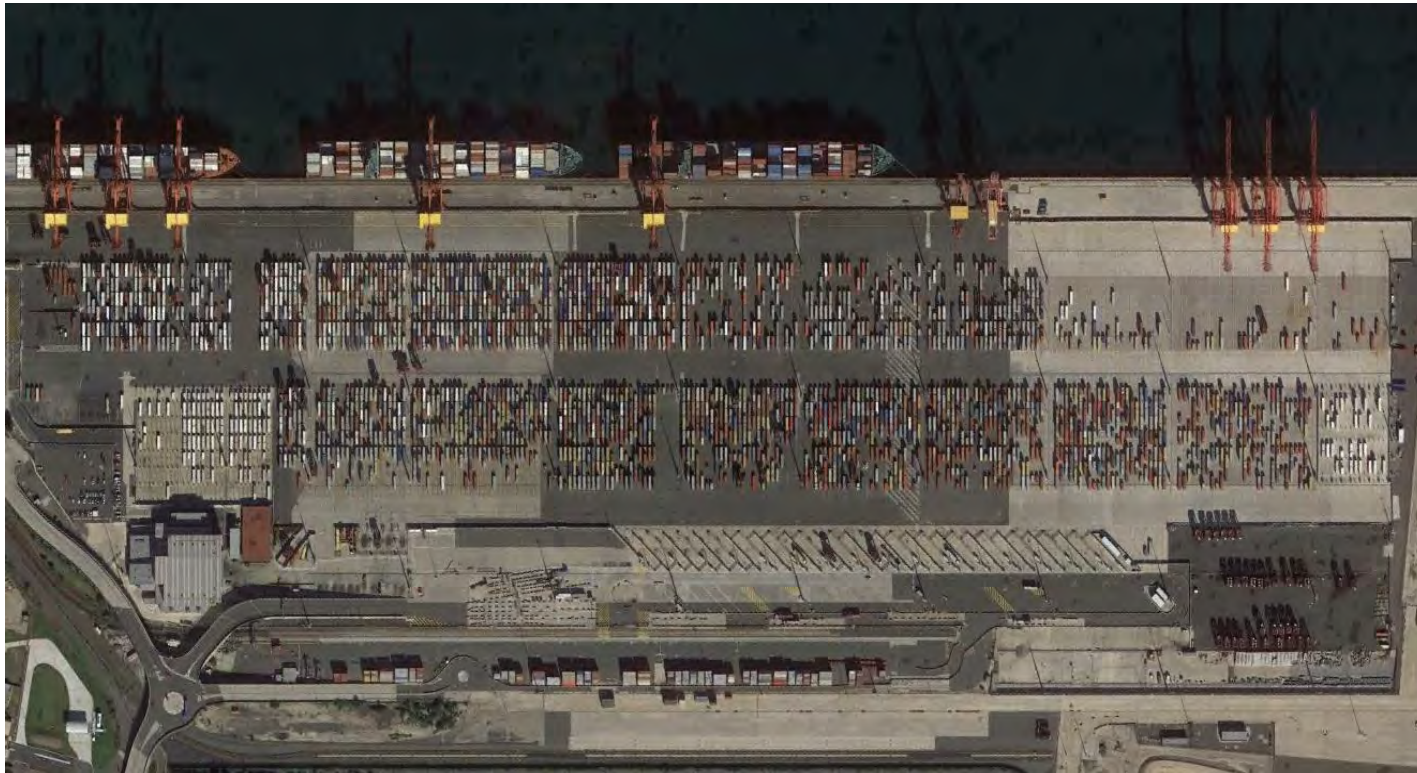


Change operating mode through a yard expansion

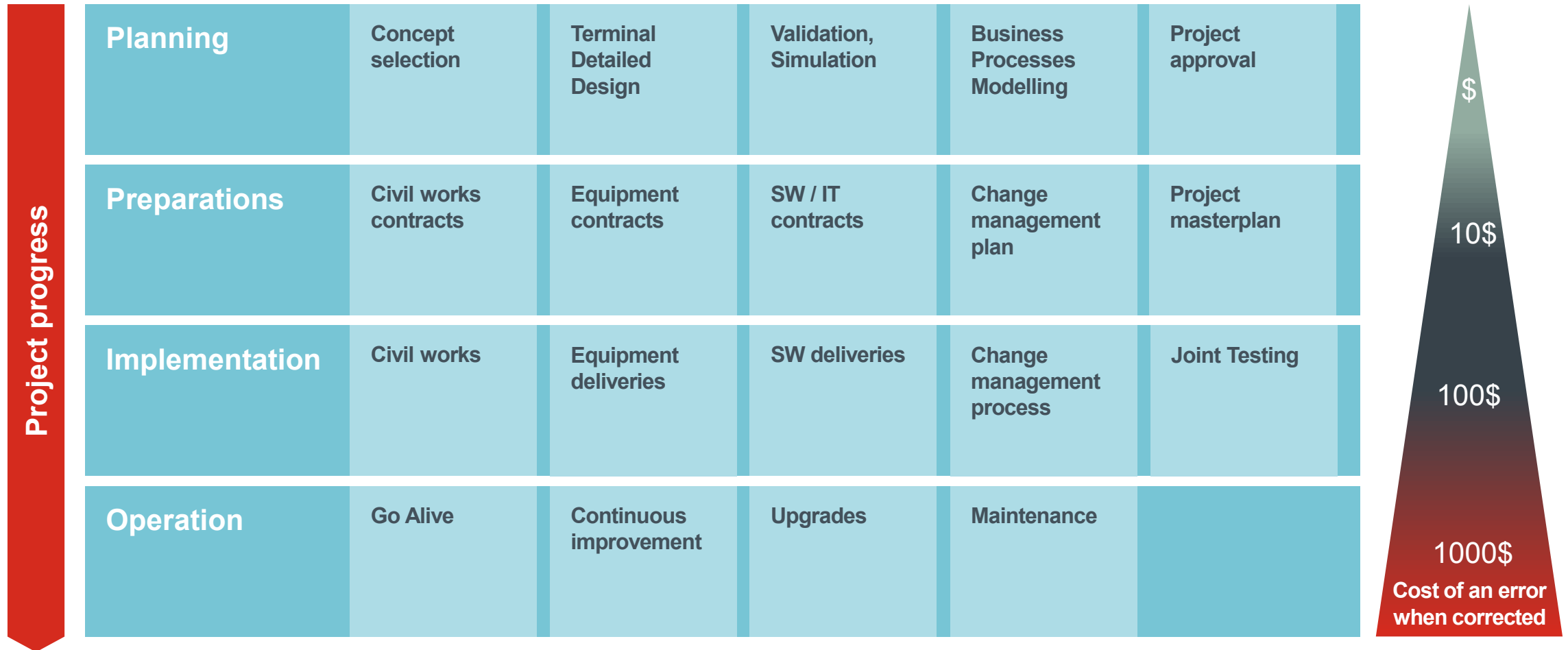


Big bang approach

Example: Patrick Port Botany

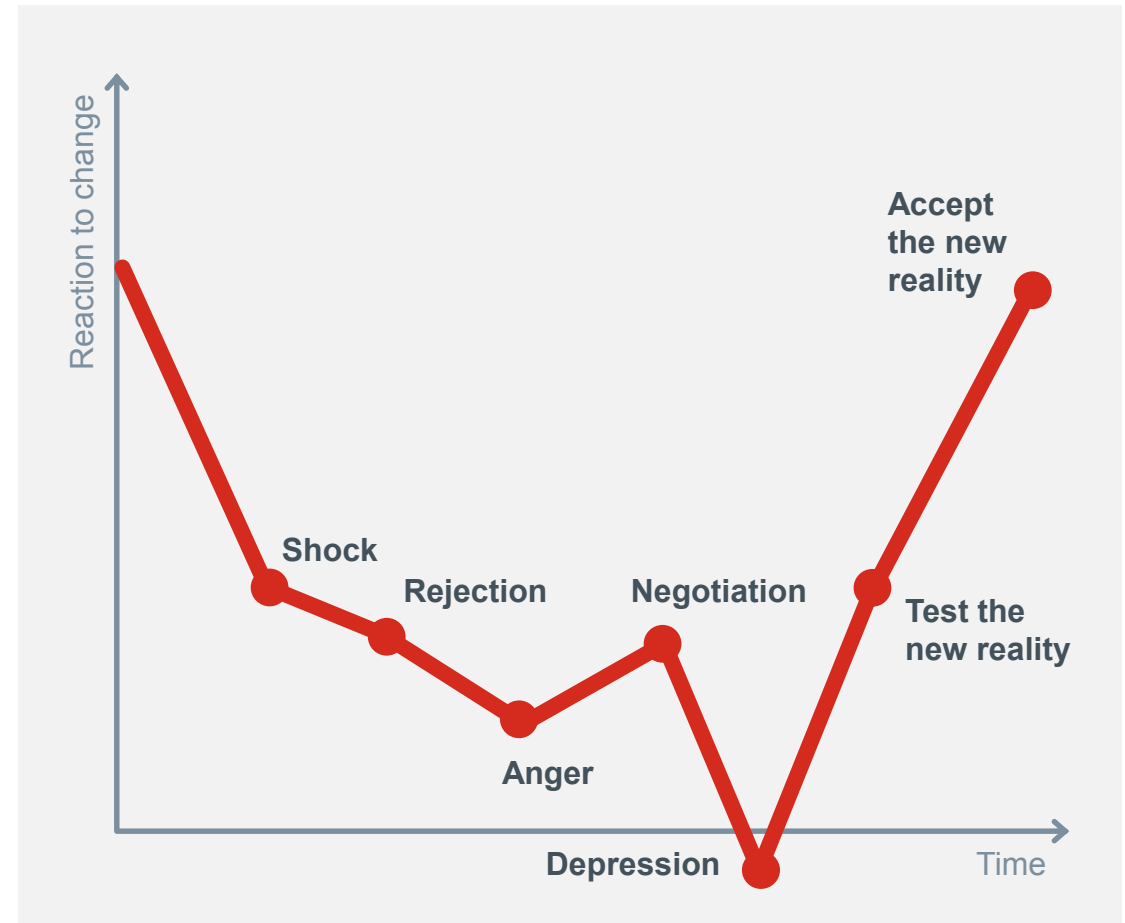


Whatever you do, it requires tedious planning



It is not just a technology project!

- Automation requires always a complete change in the roles, working procedures and methods
- Openness in the communication with people is a key
- Proper change management procedures have to be put in place to ensure that the change is adopted by the people
- Proper training needs to be in place from the beginning. Automation system still needs capable users to address exceptions.
- In the end it is the people who make it happen!



Summary

- › Automation adoption in container handling industry has been increasing rapidly during last years
- › Nowadays there are multiple automation solutions available in the market, for different equipment types and automation levels
- › Brownfield terminals can follow several different ways for deploying automation in their operations
 - Gradual deployment through retrofits
 - Through yard expansion
 - Big bang approach
- › Automation implementation to existing operation is always a challenging task that requires careful and tedious planning. Cost of an error increases rapidly after planning phase.
- › Technology is only one part. Have the focus also in the change management prodecures.



A low-angle shot of four hands holding interlocking gears against a bright sunset sky. The sun is on the right, creating a lens flare and silhouetting the hands and gears. The gears are of various sizes and are being held together by the hands, symbolizing teamwork and industry.

Together we can shape our industry

Thank you for listening



Making your every move count.