



VAHLE help the port to enhance the efficiency

**Efficiency improvement by lean operation
with humans and equipment**

Hosted by



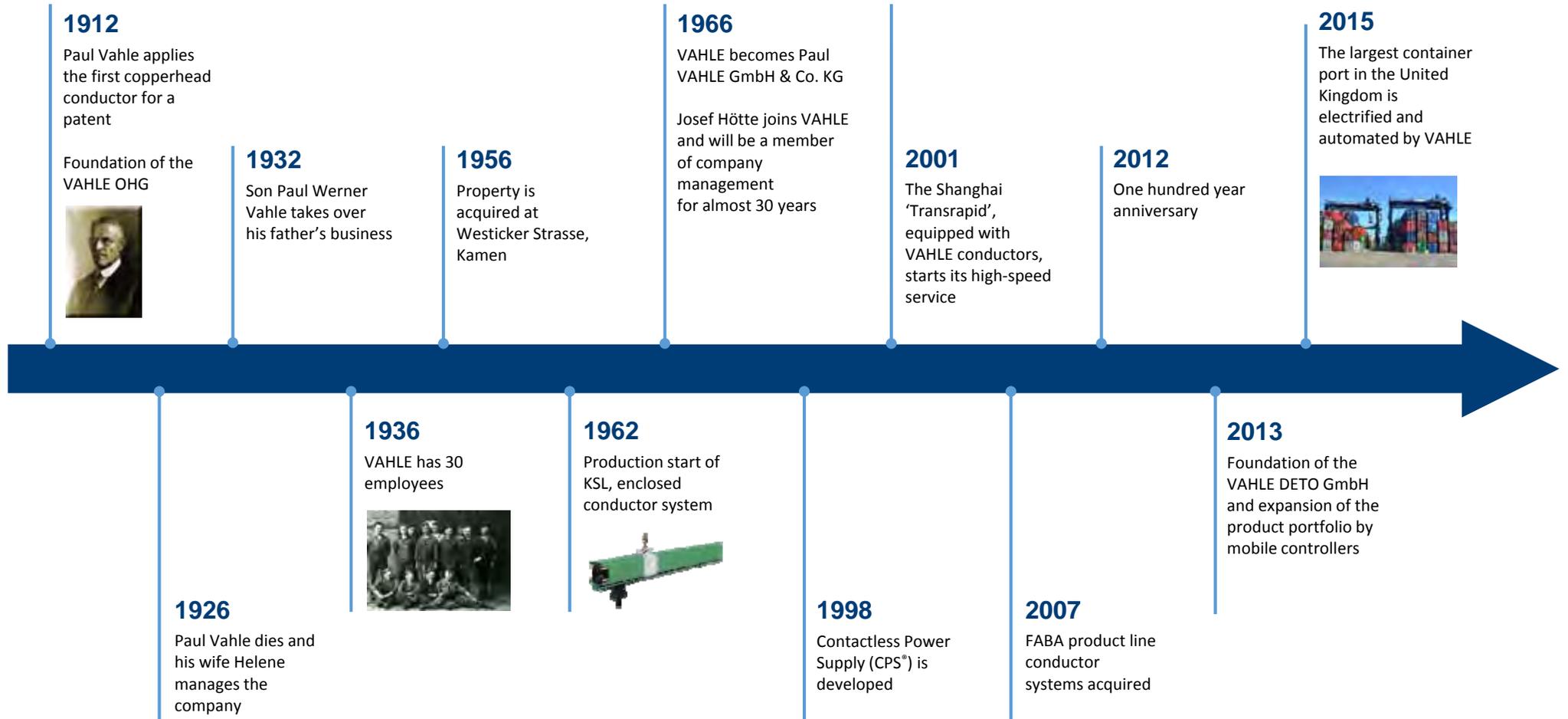
Organised by



TRANSPORT EVENTS

Xiaowei Jiang
Key Account manager
Business Unit Port Technology

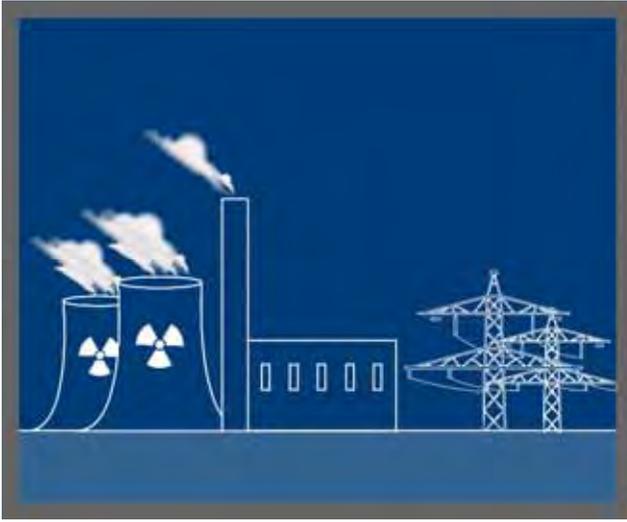
Paul Vahle GmbH & Co. KG
www.vahle.com





- ▲ Founded 1912
- ▲ > € 115 mil. In sales
- ▲ > 750 employees worldwide (01.01.2017)
- ▲ 12 VAHLE subsidiaries worldwide (VAHLE South East Asia founded in 2016)
- ▲ Representations in 52 countries
- ▲ 100 % family owned
- ▲ Production based in Germany







Ship to Shore / Quay Cranes:



Festoon Systems



Motor driven cable reels



Trench systems



USMGX for automated cranes

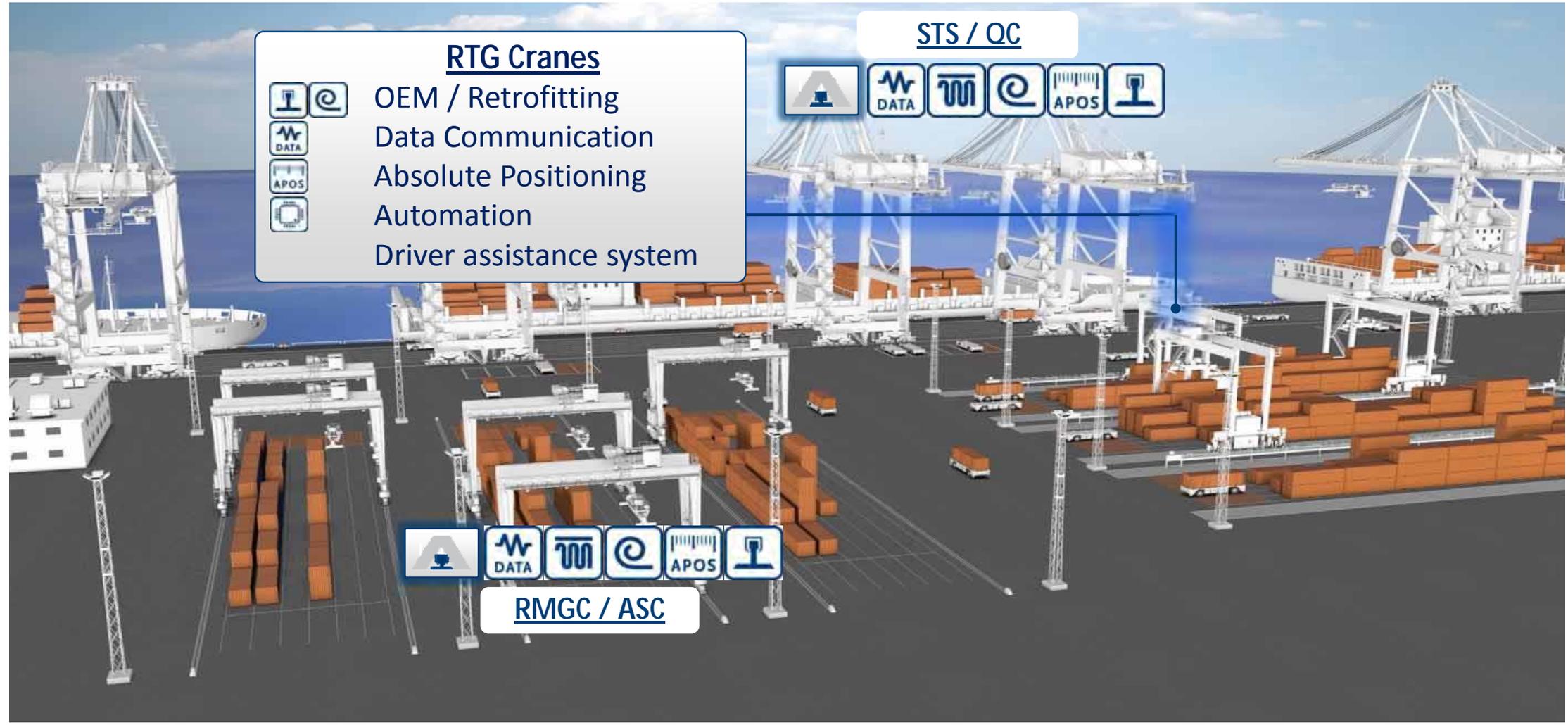


STS / QC



RMG Cranes / ASC

- Ⓢ Electrification with motor driven cable reels
- Ⓡ Electrification with conductor rails for high speed applications
- Ⓜ DATA Data Communication
- Ⓜ APOS Independent Absolute Positioning



RTG Cranes

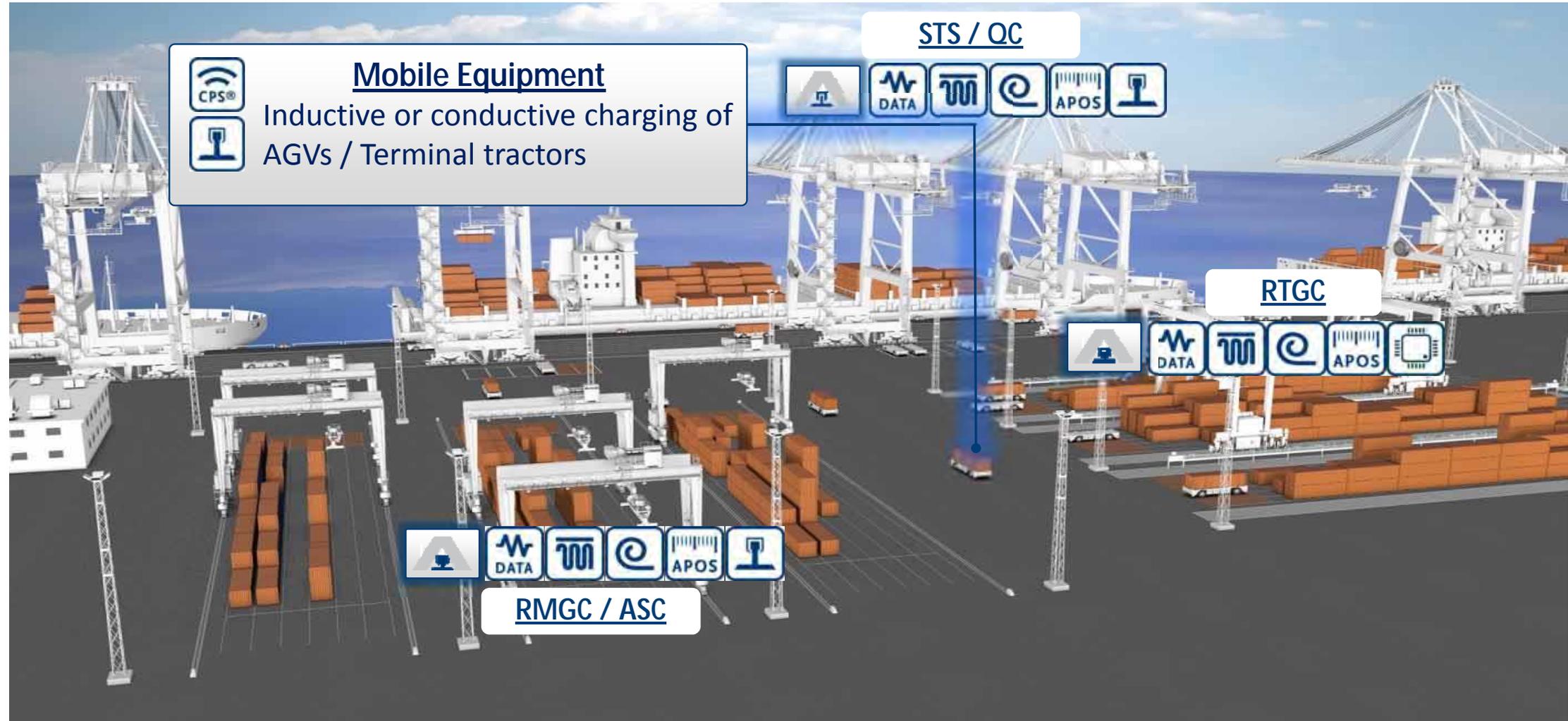
- OEM / Retrofitting
- Data Communication
- Absolute Positioning
- Automation
- Driver assistance system

STS / QC

-
- DATA
-
-
- APOS
-

-
- DATA
-
-
- APOS
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RMGC / ASC



Energy Management

Energy storage technology

- Use of solar electricity
- Feeding vessels and yachts
- Powering infrastructure
- Decentral power management

Containerized Substations

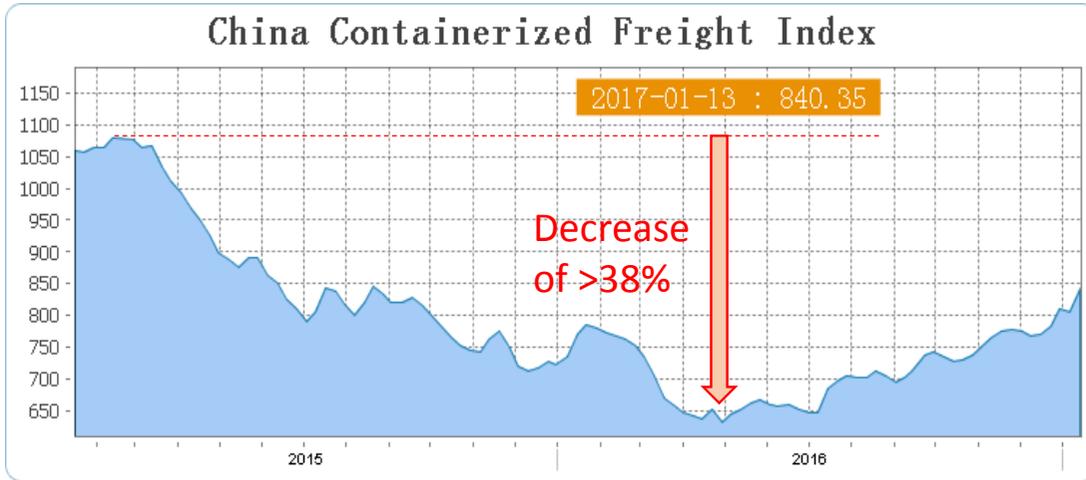
STS / QC

RTGC

RMGC / ASC

Mobile Equipment

- Massive Supply-Demand imbalance



- Capacity is already high - Supply growth outpaced demand growth by more than 2% in 2016



- Investment for Terminal Operators to serve the bigger sized Container Vessels



- Maintain the handling charges by reducing the operational expenses
 - Fuel, maintenance, etc.
 - Idle time





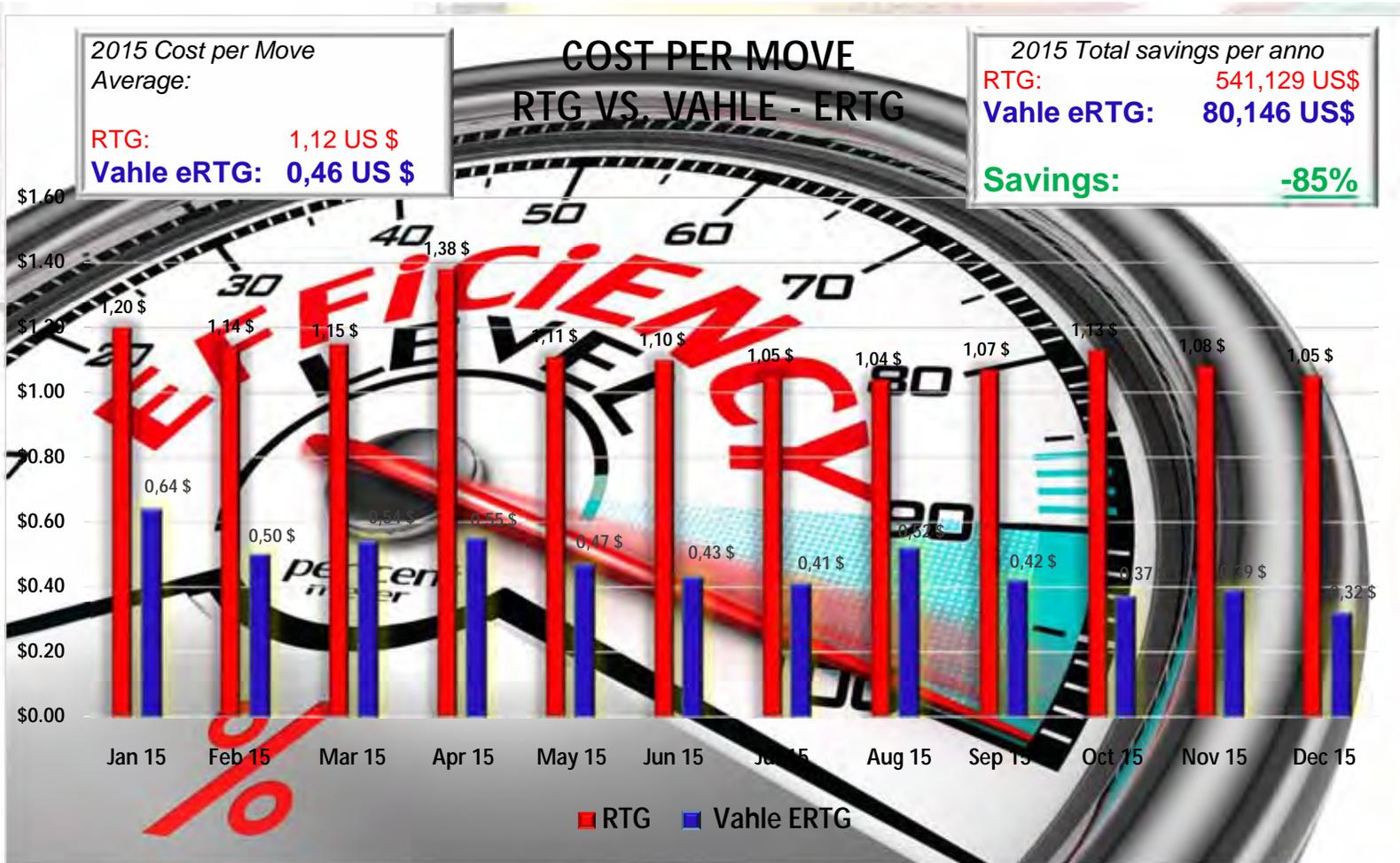
Electrification of RTG Cranes

Reduction of operational costs
Keeping the operational flexibility

References in eRTG conversion

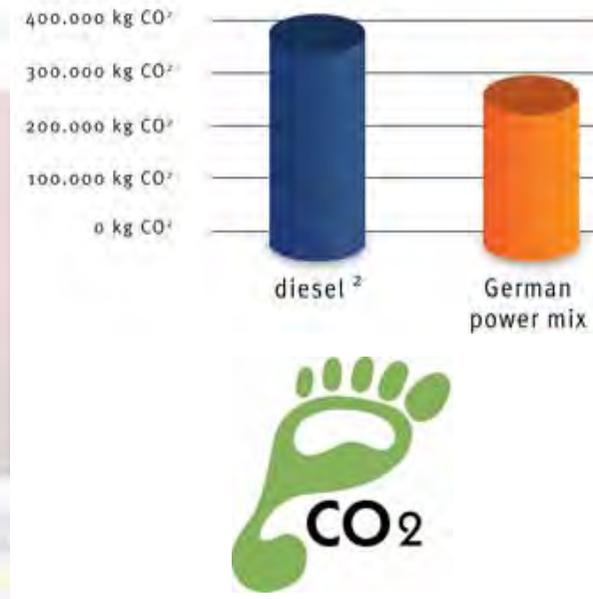
<u>Retrofitted RTGs:</u>	247
<u>New RTGs (OEM):</u>	108
<u>eRTGs in total:</u>	355

Supply of turnkey solutions



Source: 1 of World's Top 3 Terminal Operator

Reduction of carbon footprint



²: based on 13L Diesel engine; 12h/d operations



Data communication

Different technologies available
- Radio frequency, Cable, Waveguide

Positioning Systems

Different technologies available
- GPS, D-GPS, Position Beacons,
Optical Systems, RFID

IMPORTANT ASPECTS

- ✓ Reliability of safe data communication
- ✓ Average availability of data
- ✓ Protection against external influences

Data communication SMGX

Shielded communication
(slotted waveguides)

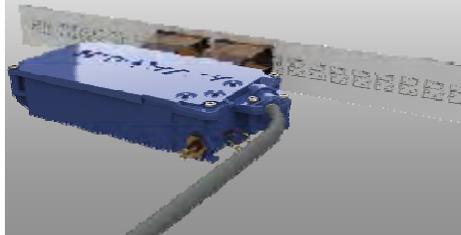
Electrification: flexible

- Electrification by **Conductor Rails**
- **Automated Power Connection** for block changes
- **Automated seamless switching**



Positioning: accurate

- **Absolute Positioning System** independent from external influences
- Position accuracy up to ± 1 mm
- **PN / PB / Ethernet** Interfaces for Plug and Play Integration



Data Communication: safe

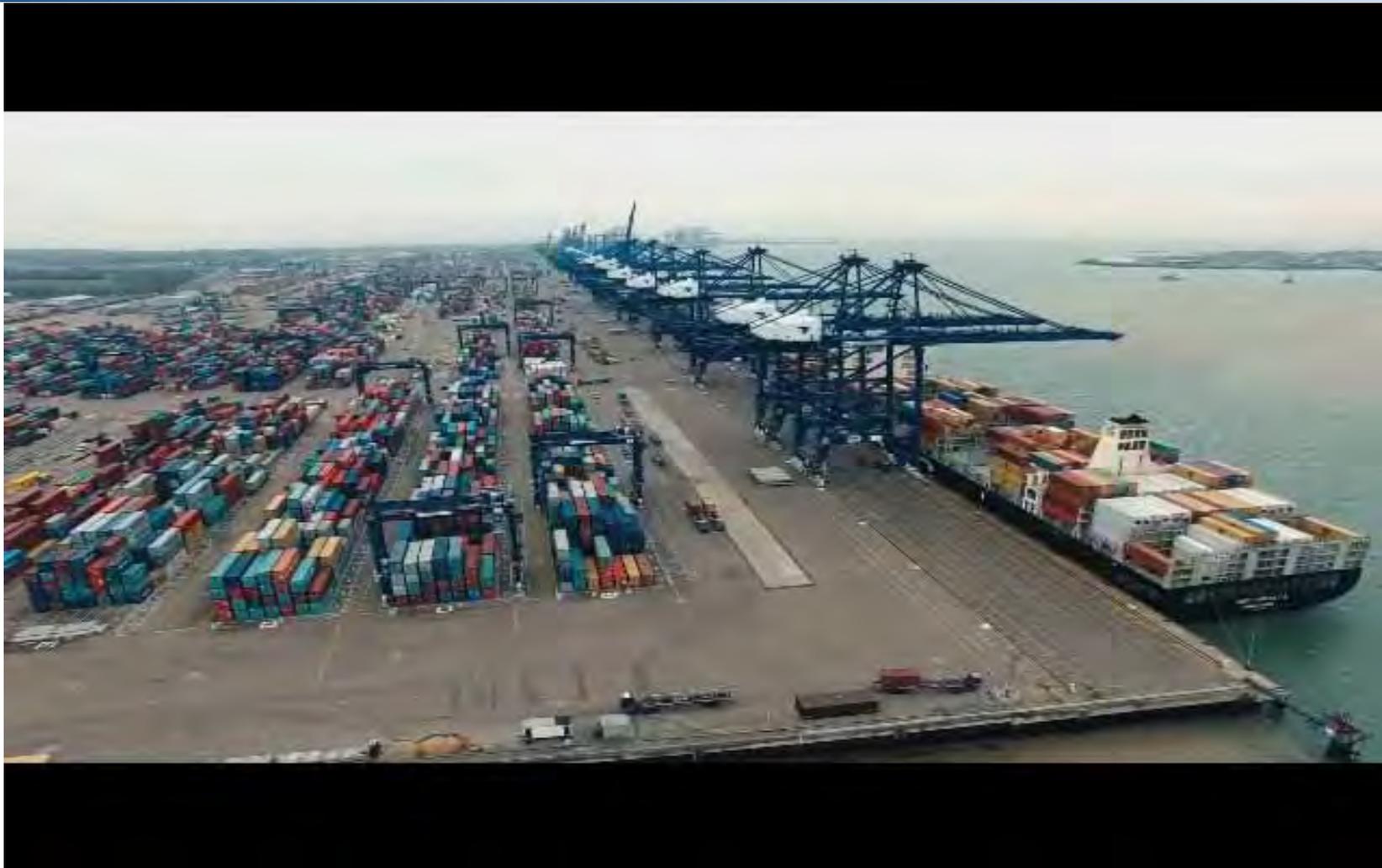
- **Highly shielded** data communication
- Up to **100Mbit/s** gross rate
- **Low latency** times
- Interfaces **Ready for Automation** - Ethernet, Profinet & Profinet Safe



Control systems: modular

- **Autosteering**
- **Power measurement**
- **Remote Maintenance**
- **Operating data acquisition**

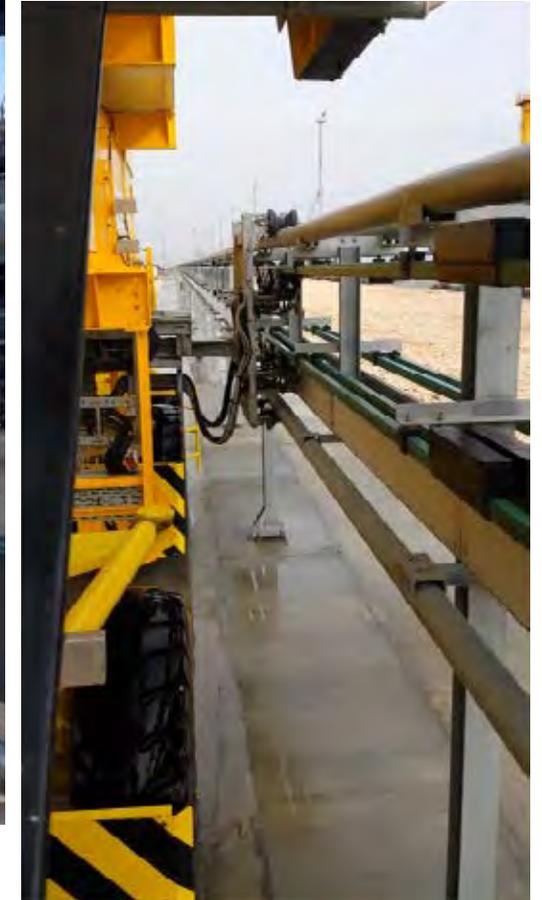


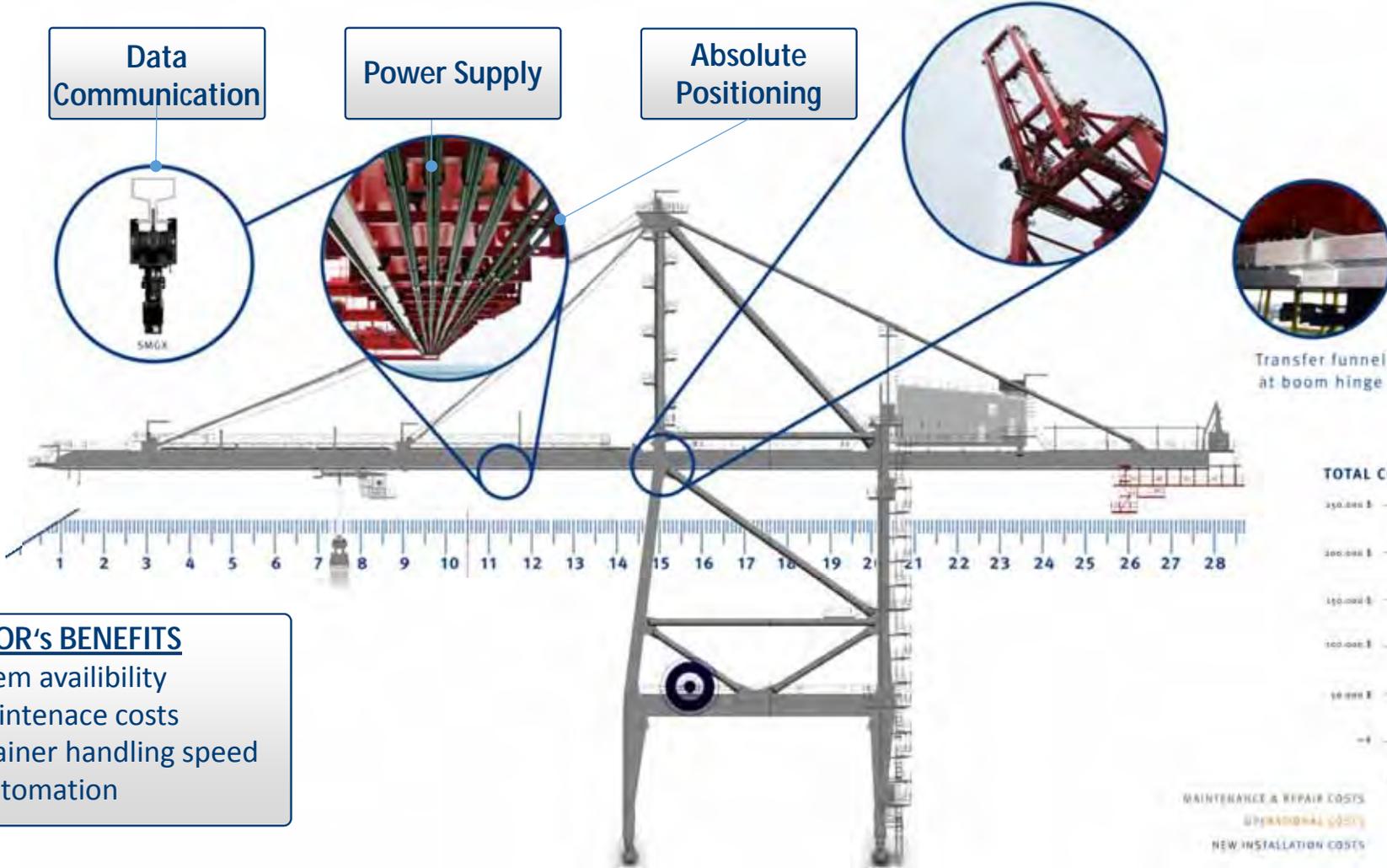


Steering in Low Speed Move
Minimum Distance as 15 cm

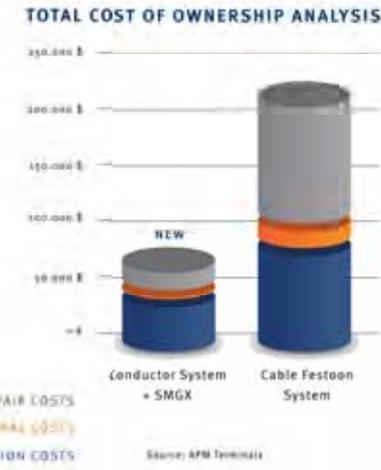


Steering in High Speed Move
Tested in Asya Port with 160 M/min





- OPERATOR'S BENEFITS**
- Highest system availability
 - Reduced maintenance costs
 - Fastest container handling speed
 - Ready for automation





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