

**Marine Solutions:**

# **Setting our course in challenging markets**

**Roger Holm**

**President, Marine Solutions & Executive Vice President**

# The most complete marine offering on earth

We are the leading provider of innovative products and integrated solutions in the marine and oil & gas industries.

As a leader in our fields, we need to continuously develop and transform ourselves to meet changing customer needs.

We have a passion to do right for our customers and the environment.



## Our offering covers all market segments



OIL &amp; GAS



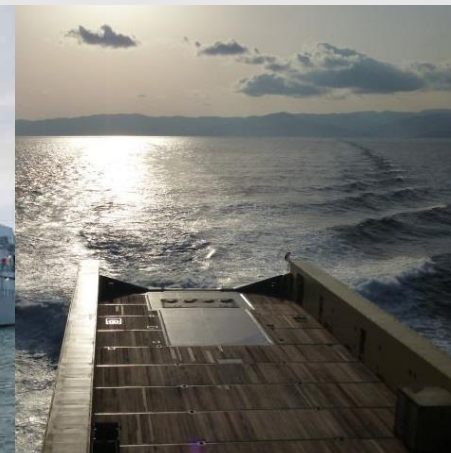
MERCHANT



CRUISE &amp; FERRY



NAVY



SPECIAL VESSELS

LEADER IN:

THROUGH  
OFFERING:

EFFICIENCY • GAS AND DUAL-FUEL SOLUTIONS • ENVIRONMENTAL SOLUTIONS

- **Lifecycle solutions** for ship owners and operators
- **Integrated solutions** for the shipbuilding industry, owners and operators
- The **best customer value and customer experience** in the marine industry



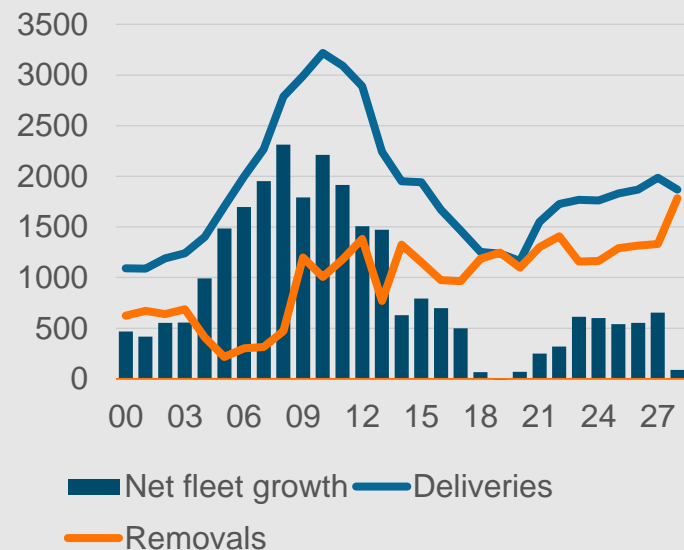
# POTENTIAL IN NICHE VESSEL SEGMENTS DESPITE CHALLENGING MARKET CONDITIONS



# Marine markets heading towards rebalancing, but more is needed

## Seaborne trade impacted by maturing of Chinese economy

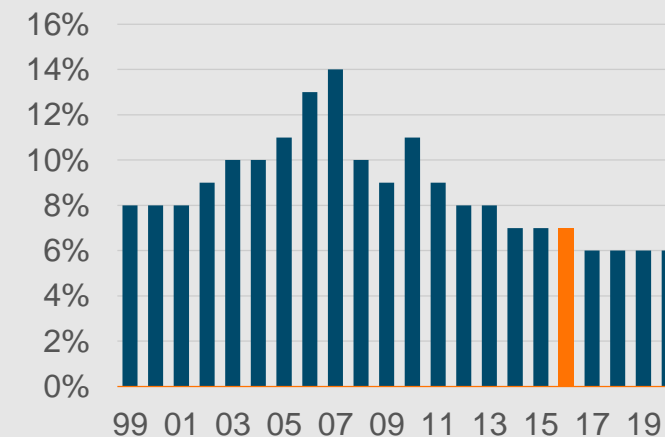
Deliveries, removals, and fleet growth, Number of vessels



World seaborne trade and GDP development



China GDP

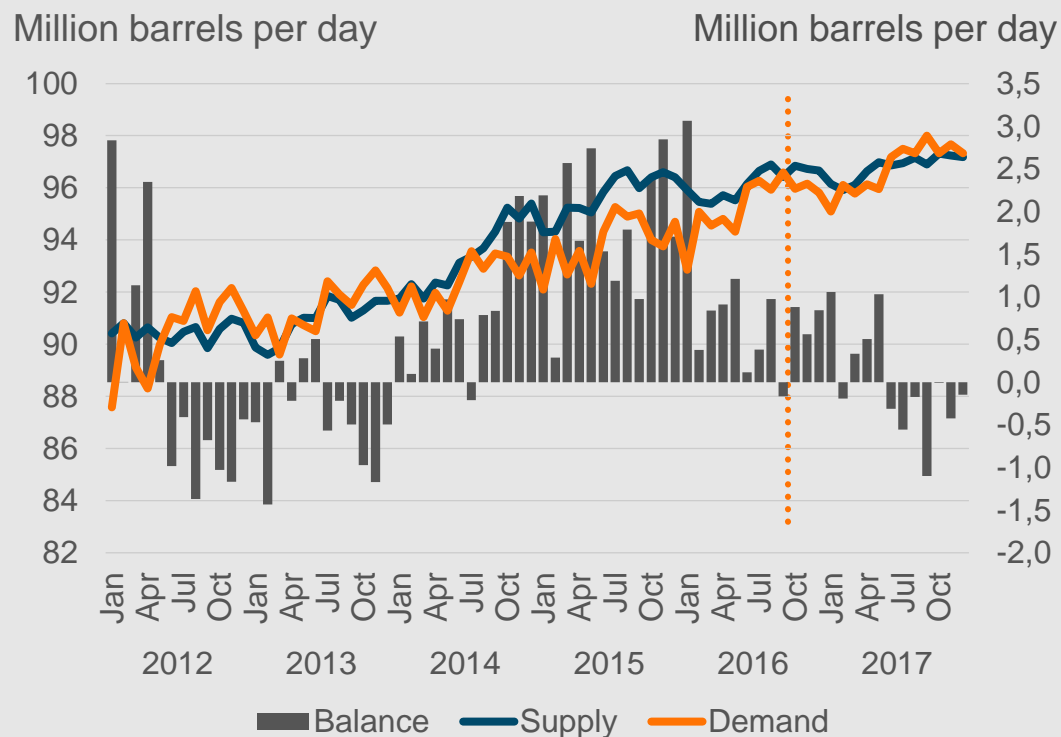


While Chinese driven demand for CAPEX commodities decreases, the **demand for OPEX commodities and personal travel increases**. Cruise, LPG, LNG and tanker sectors benefit from the Chinese transition.

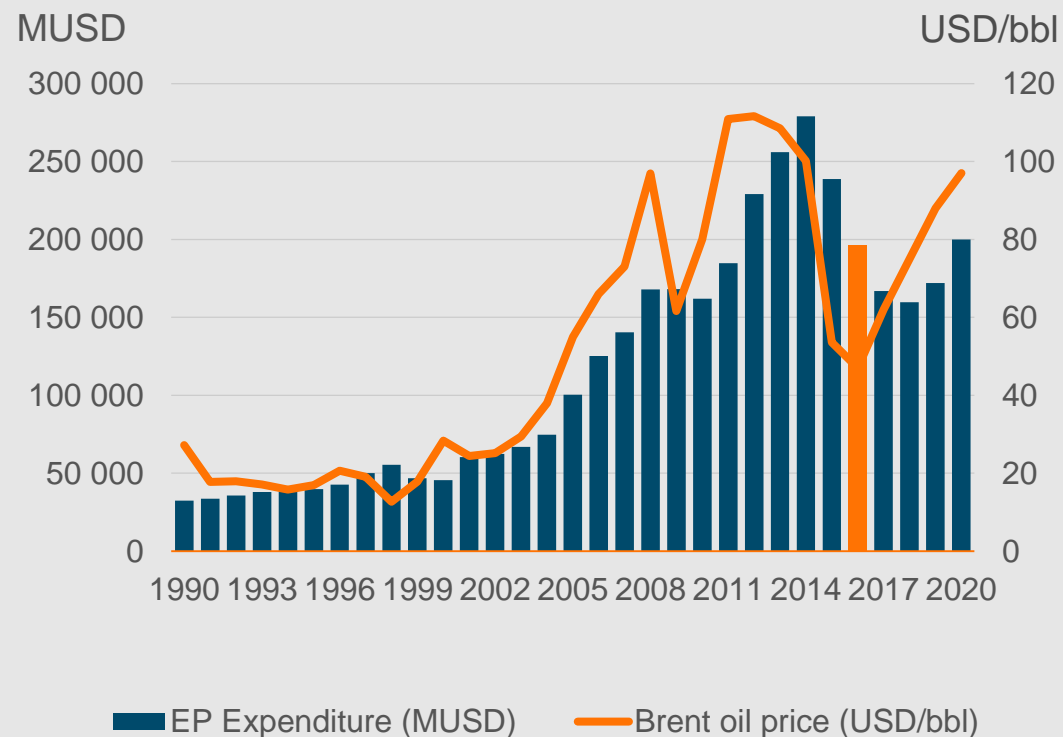
Source: Clarksons Platou, IMF, Goldman Sachs

# Oversupply in the world oil market continues – However the balance is expected to tighten in 2017, while producers drive cost

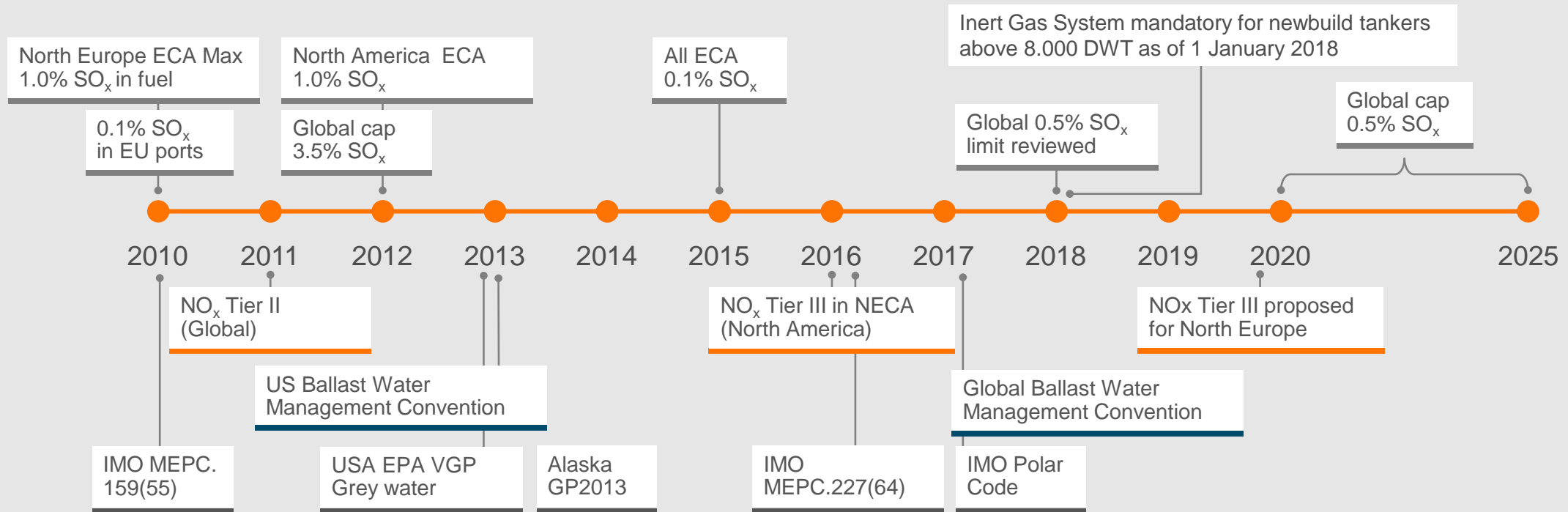
## Crude oil supply and demand



## Offshore E&P Capex and Brent oil price



Source: EIA, Bloomberg, Clarksons Platou, Rystad Energy



## SO<sub>x</sub> legislation:

- Current cost of low sulphur fuels have reduced the pressure to consider alternative solutions
- LNG gaining popularity

## NO<sub>x</sub> legislation:

- Only North American waters affected from 1.1.2016
- NO<sub>x</sub> reducing techniques such as selective catalytic reduction (SCR) or exhaust gas recirculation (EGR) are needed

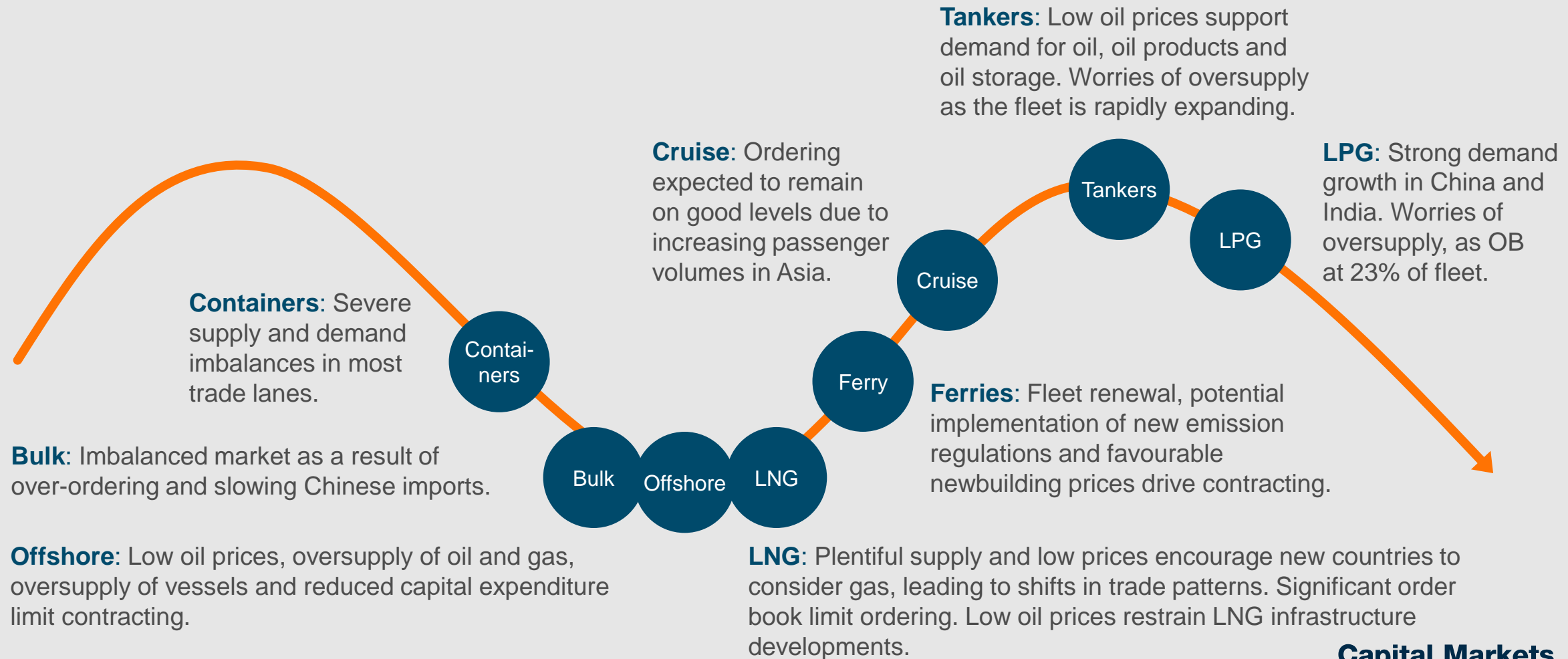
## Ballast Water Convention:

- The Convention will enter into force on 8 September 2017
- Applies for all vessels above 400GT in operation and newbuild

## Black and grey water:

- Regulations being developed locally
- Non-discharge zones and port facilities compete with onboard cleaning
- EU Inland water ways 2013 Black and grey water

## Drivers vary in different vessel segments



Source: Marine Solutions BI internal analysis, Clarkson Platou & IHS.

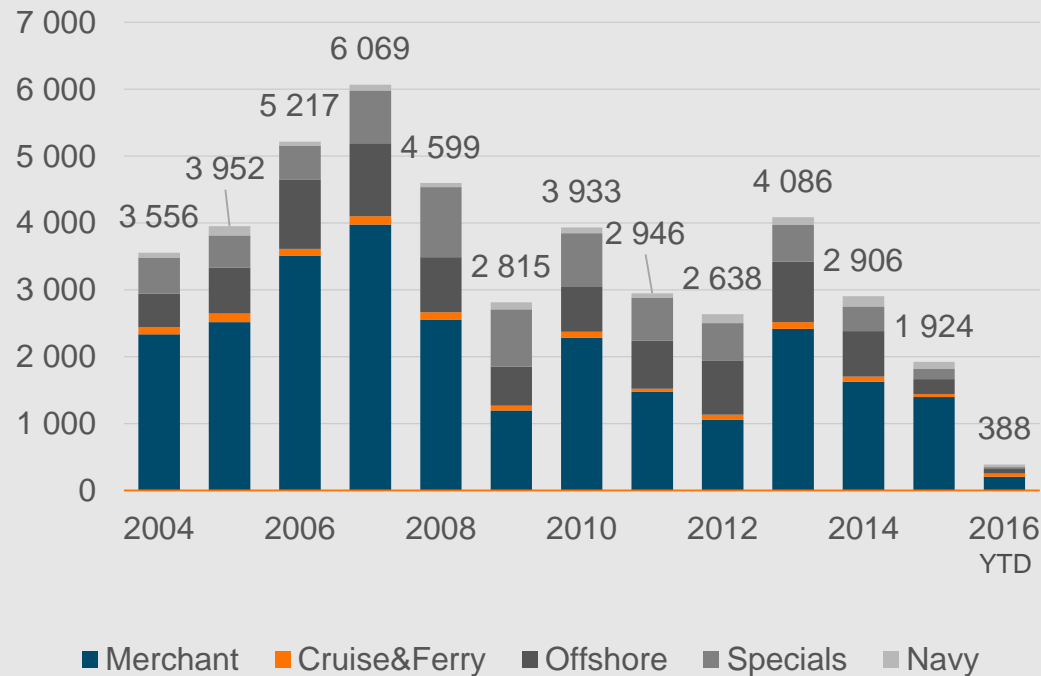
**Capital Markets  
Day 2016**



# General market sentiment remains weak, but activity in selected segments is still resilient

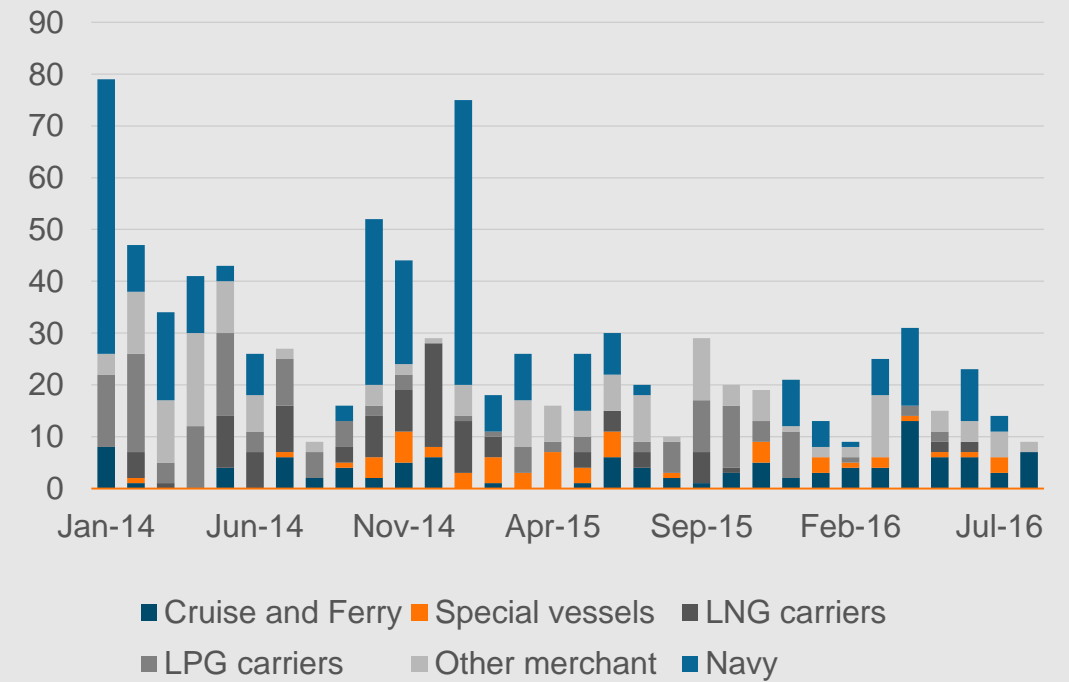
## Total contracting

Number of vessels



## Selected segments contracting

Number of vessels

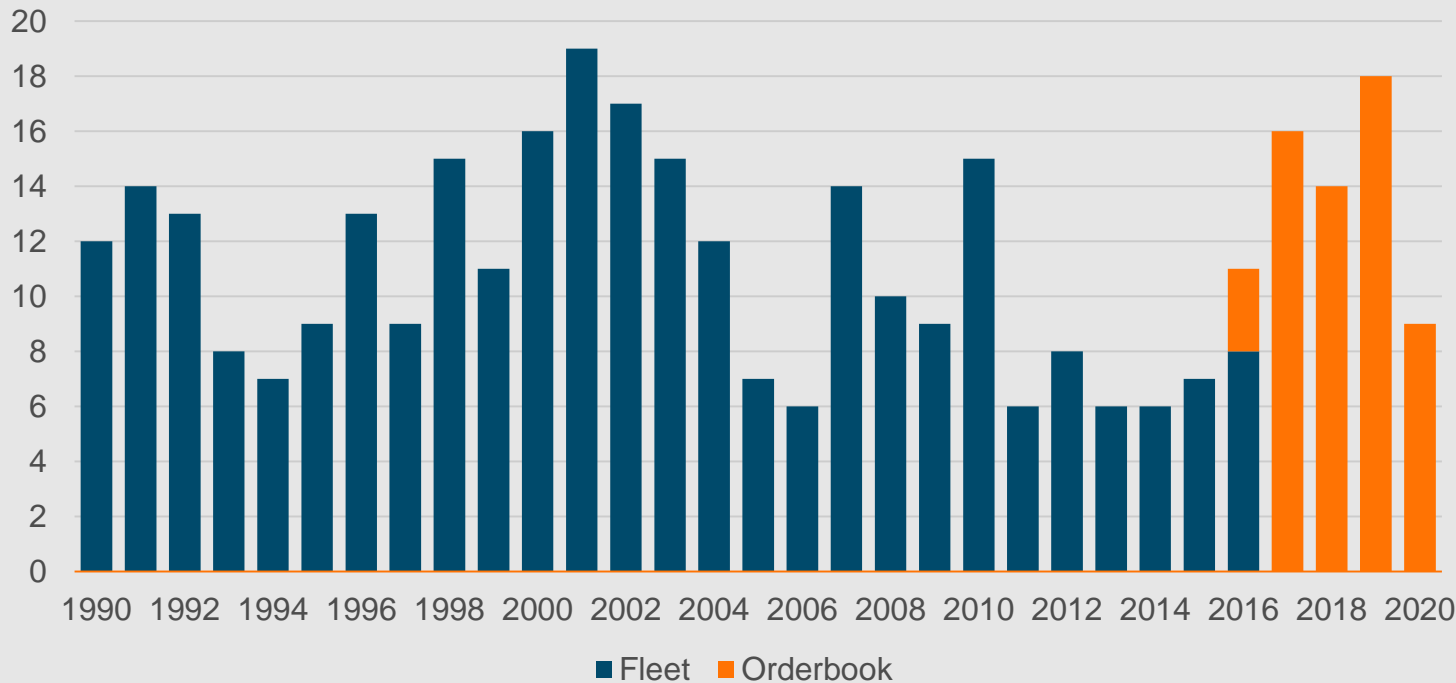


Source: Clarksons Platou. Historical contracting as per September 1st, 2016. Note: Other merchant = MPP, general cargo, RoRo and vehicle carriers.

# Cruise industry booming due to increasing passenger volumes in Asia

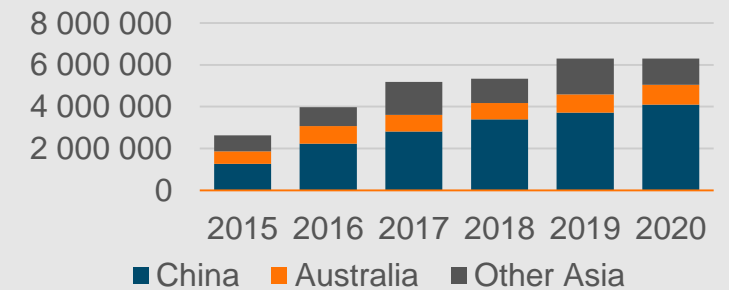
## Cruise vessel deliveries

Number of vessels

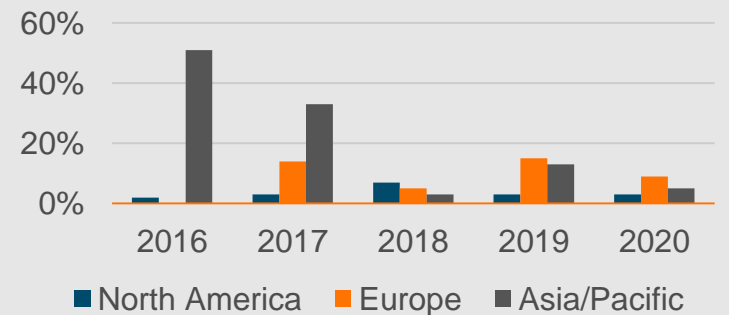


## Asian passenger capacity

China CAGR 2015-2020: 26%



## Annual market capacity growth



Source: Clarksons Platou, Cruise Industry News.

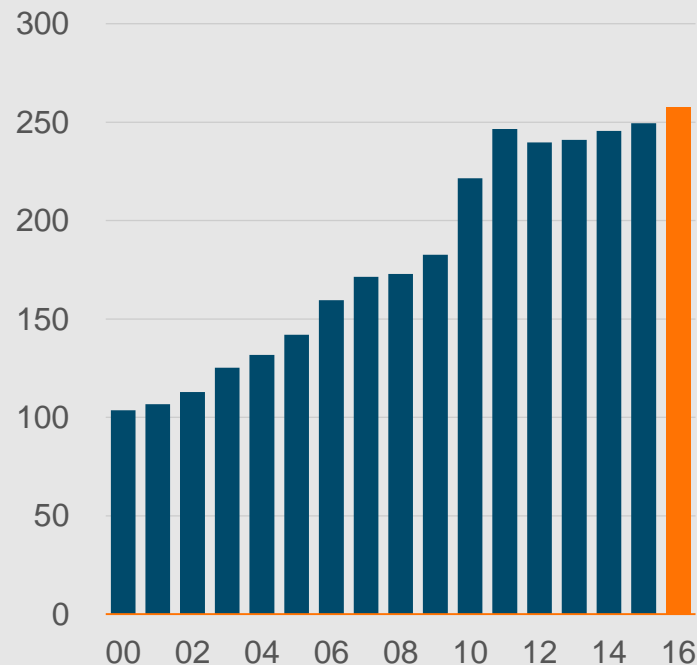
# Abundance and low prices of LNG encourages new countries to consider gas Global LNG supply will surge in 2016 after five years of stagnation

## LNG TRADE

- Global LNG trade estimated to grow by 3% in 2016
- New supply coming online, which will lead to major shifts in trade routes
- Demand for LNG driven by low gas prices and more cost-efficient solutions for regasification
- China, India and ASEAN countries will emerge as key buyers, while demand growth in Japan and Korea weakens

## World seaborne LNG trade

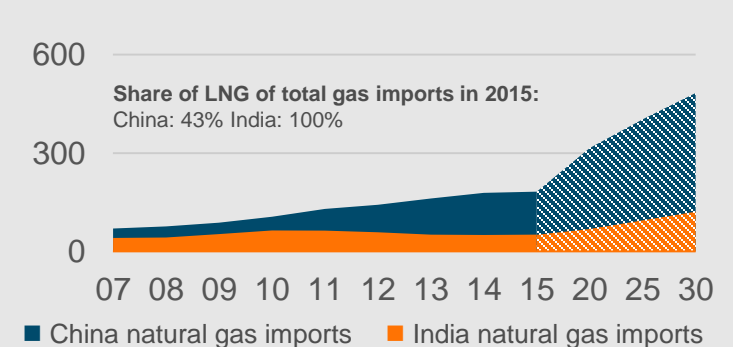
Million tonnes



## FSRU (Floating Storage and Regasification Unit)

- A more cost efficient alternative, expected to gain in popularity over permanent import terminals
- Mobility and flexibility of the asset
- Conversion of modern LNG carriers allows fast deployment

## Natural gas imports: Emerging markets



# OPPORTUNITIES THROUGH OUR BROAD PRODUCT PORTFOLIO AND CONNECTIVITY





## Wärtsilä Gas Solutions



- **Regasification** systems for F(S)RUs, jetty installations and onshore LNG terminals
- **Reliquefaction** systems LNG/LPG for gas carriers and onshore facilities
- **Small scale LNG and biogas** liquefaction
- **Fuel Gas Systems** for LNG and dual-fuel engines
- **Tank Control Systems** for LNG/LPG tank gauging
- **Gas Recovery** capture and safety systems
- **Oil/Water separation technology** for upstream market

### Conversion project Höegh FSRU

Supply of the re-gasification system for an FSRU (Floating, Storage, Re-gasification Unit) conversion project that Höegh LNG plans to carry out on a modern LNG vessel.

**Scope:**  
Regas technology using water glycol as the intermediate medium instead of propane. This provides a more compact solution being some 15 percent smaller and lighter than the propane based system.



Customer: **Höegh LNG**  
Delivery: **Autumn 2017**

## WÄRTSILÄ - YOUR SHORTER ROUTE TO THE GAS AGE



### Exploration & Drilling

- LNG fuel gas systems for OSVs
- Gensets

### Production & Liquefaction

- On- & Offshore small scale liquefaction
- Antiflaring/VOC
- Oil separation
- Gas FPSO

### Transport & storage

- LNG fuel gas systems
- Engines
- Gensets
- LPG, LEG & LNG cargo handling

### Receiving terminals & Regasification

- Jetty & Floating regasification
- Bunkering & barges
- Receiving terminals

### Distribution & transport to the users

- Gas/LNG distribution/logistics
- Feed gas to Power plants





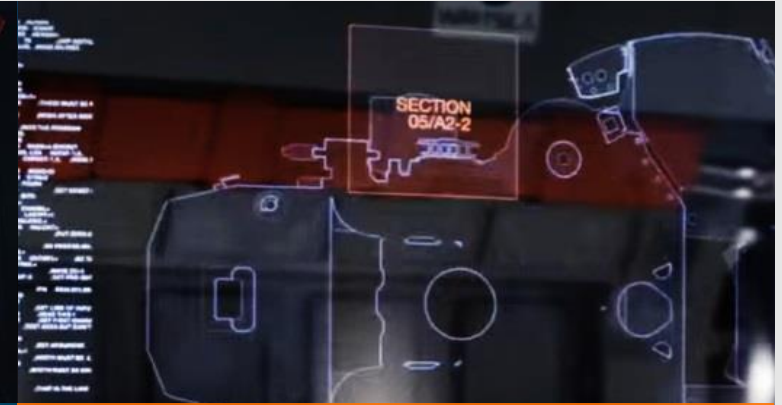
## NACOS PLATINUM

- Full-blown automation, navigation and control system
- Intelligent route planning
- Plug-in software for various applications (also 3<sup>rd</sup> party)
- Remote maintenance and connection
- Advanced security layers against cyber threats



## DYNAMIC POSITIONING

- Enabling future-proof automated concepts



## SENSORS IN OUR CORE PRODUCTS

- Enabling big data generation for onboard and onshore purposes
- An engine example: 178 sensors in W31DF providing a vast range of usage / condition data



**Wärtsilä has developed and delivered sophisticated battery/hybrid systems since 2007. These systems include energy management control, power electronics and battery integrations.**

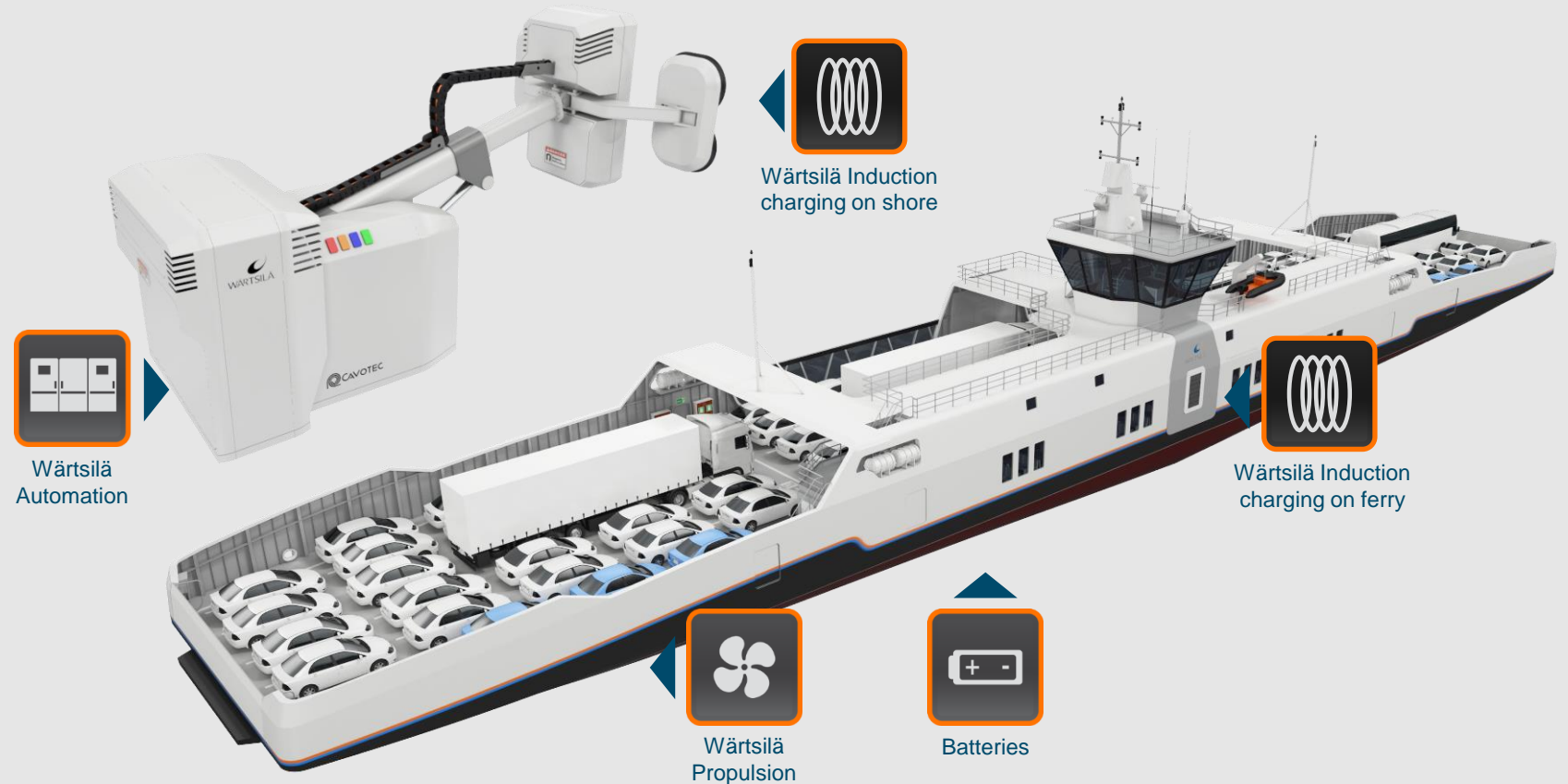
- Fuel savings and reduced emissions
- Optimised engine operation
- Reduced engine transients
- Increased redundancy and efficient operations
- Increased performance

The ferry can run 100% on battery

The new Wärtsilä «On-Air» induction charging system «Top up battery» when loading and unloading the vehicles

Wärtsilä wireless system can transfer up to 1 MW of electricity

Automatic mooring (by Cavotec) and Wärtsilä charging station reduce operation time and avoid waste of ferry energy



# We are well positioned to ride the upcoming ballast water management system retrofit wave

## Wärtsilä equipment and service thought leadership

- Technology choice
  - Aquarius-UV or Aquarius-EC
- Design & Engineering
  - Modular or bespoke design
- Supply, PM & Installation
  - Supervisory → full turnkey
- System integration
- Fleet-wide agreements
- Crew training
- Global life-cycle support

## Legislative drivers



Global minimum standard

Entry into force September 2017



US specific requirements

Entry into force December 2013

## Newbuild market

- Annual opportunity based on vessel contracting
- BWMS included in new ship specifications

## Retrofit market

- ~34,000 ships

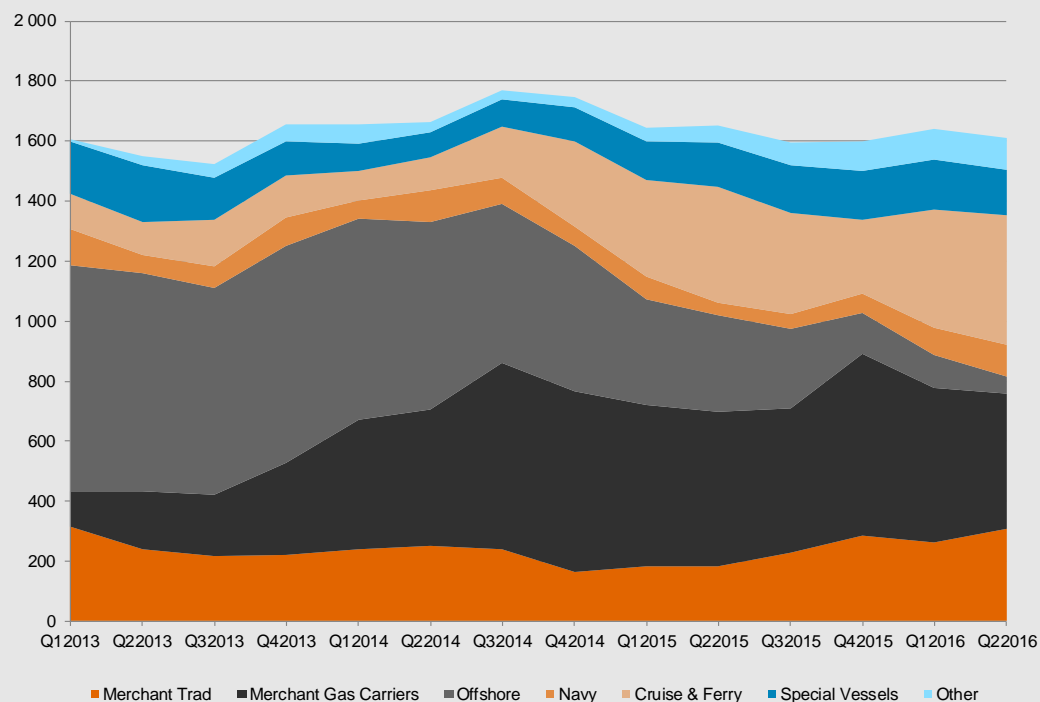
## Competition

- Currently ~50 competitors, expected to reduce to 10-20

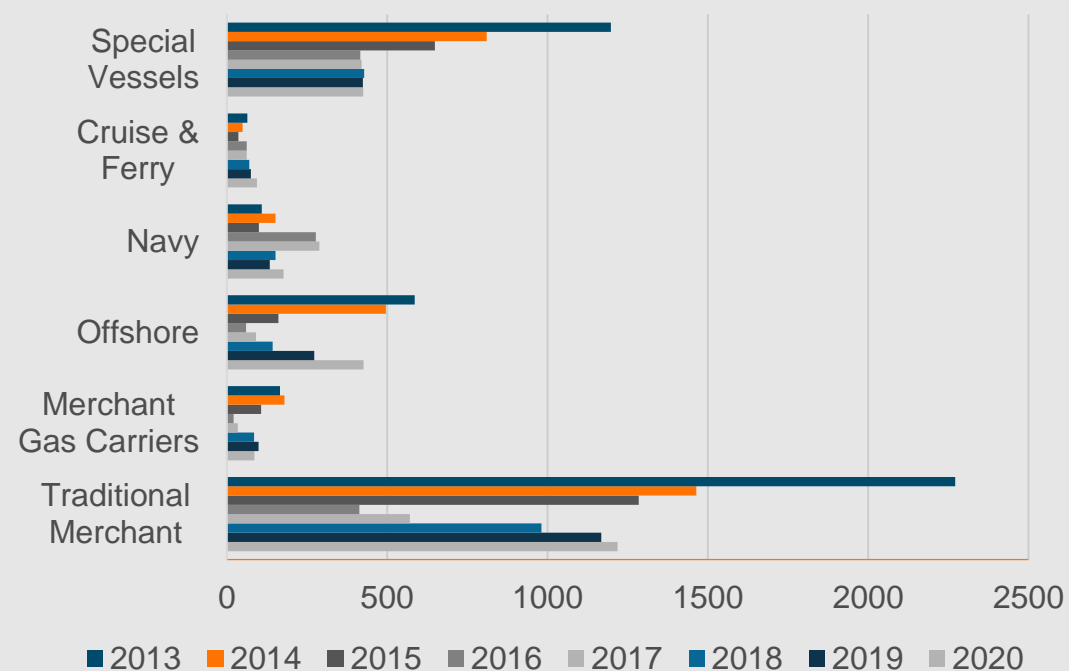


# We benefit from exposure to different vessel segments

Rolling annual order intake per vessel segment, MEUR







Ships contracted 2013-2020 (actual / Wärtsilä forecast), units



Source: Clarksons Platou, IHS, Wärtsilä internal forecast & AMI International (Navy forecast).



# Increasing order value potential across vessel segments

		Earlier scope value	+ Hamworthy	+ MSI	Business potential
	<b>Merchant</b>	1-3 MEUR	1-5 MEUR	1-5 MEUR	1-13 MEUR
	<b>Gas carriers</b>	2-12 MEUR	5-15 MEUR	1-2 MEUR	1-29 MEUR
	<b>FSRU</b>	4-15 MEUR	20-30 MEUR		4-45 MEUR
	<b>Offshore</b>	1-15 MEUR	1-5 MEUR	1-10 MEUR	1-30 MEUR
	<b>Cruise</b>	5-20 MEUR	4-10 MEUR	20-33 MEUR	4-63 MEUR
	<b>Ferry</b>	3-7 MEUR	2-3 MEUR	2-15 MEUR	2-25 MEUR
	<b>Special vessels</b>	1-7 MEUR	1-3 MEUR	1-10 MEUR	1-20 MEUR
	<b>Navy</b>	1-15 MEUR	<1 MEUR	2-15 MEUR	<1-31 MEUR

# WIDE COMPETITIVE LANDSCAPE DUE TO A BRODER OFFERING



E&A

Propulsion

Gas Systems



Engines



Flow Systems



Ship Design

Environmental Solutions



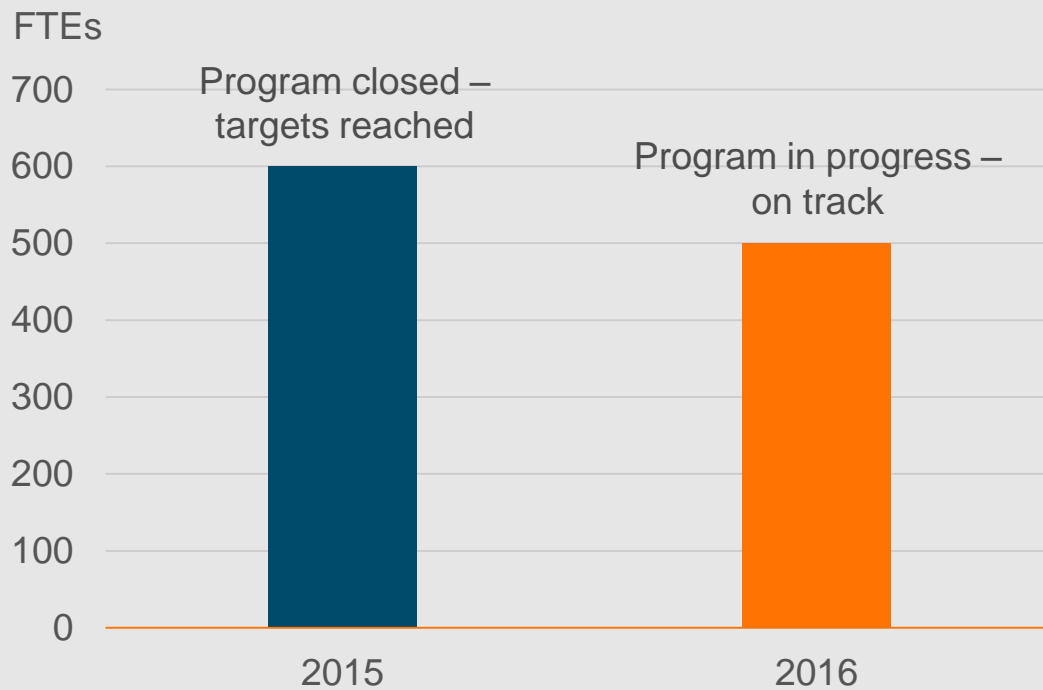
Exhaust Gas Cleaning      Ballast Water Management      Compressors      Inert Gas

# TRANSFORMING OUR ORGANISATION TO MEET MARKET REQUIREMENTS

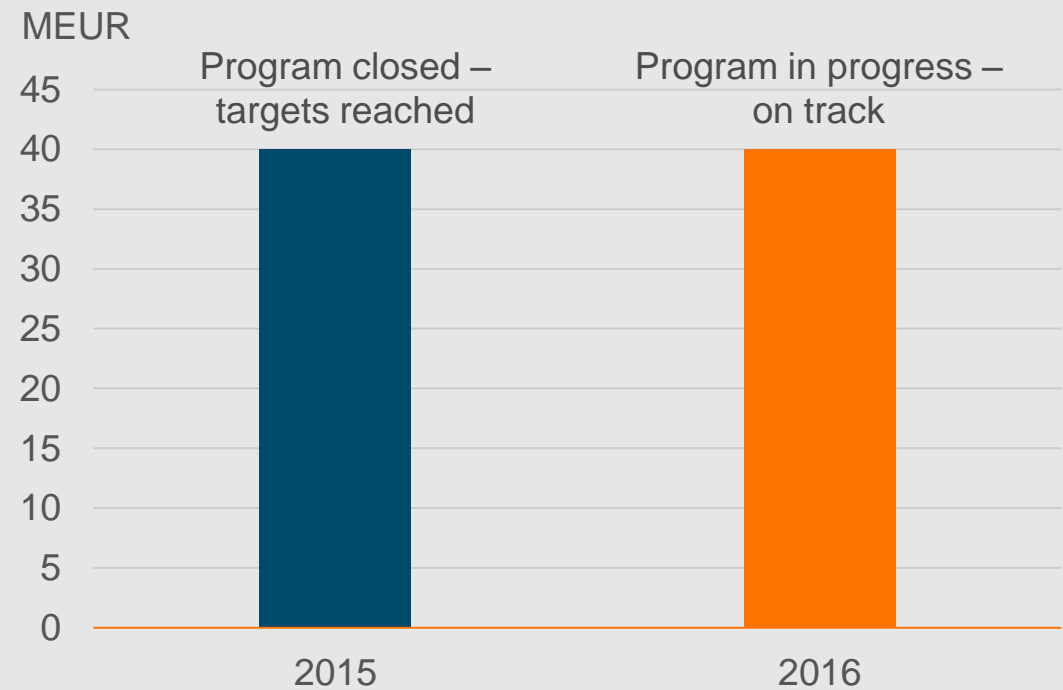


## Restructuring measures taken in Marine Solutions (2015 and 2016 programs)

Announced headcount reductions –  
1,100 in total



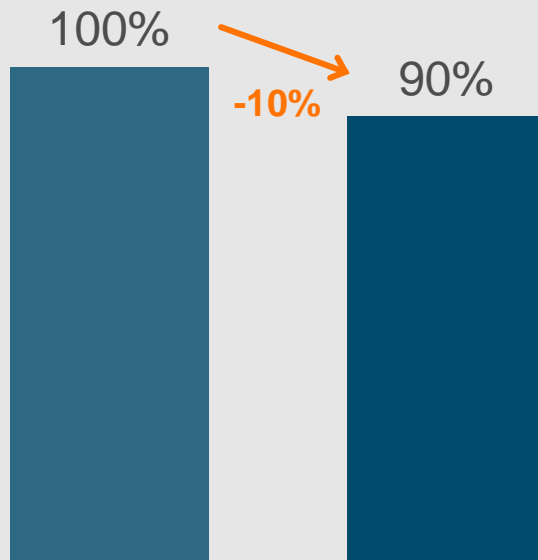
Announced annual savings –  
MEUR 80 in total



## Operational excellence – We are increasingly lean and flexible

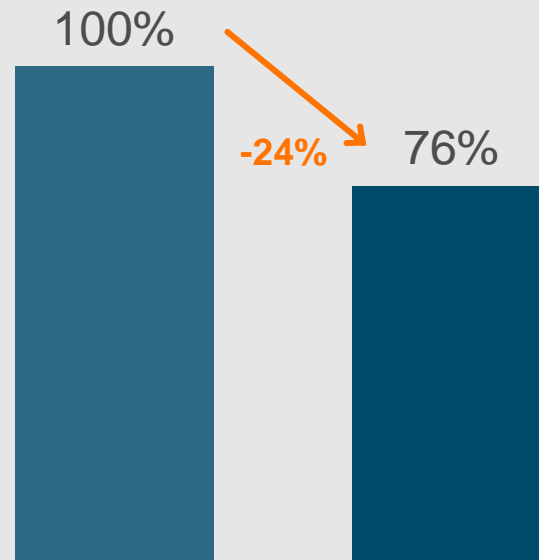
### Capacity cost development

MS level reduction during the past 12 months



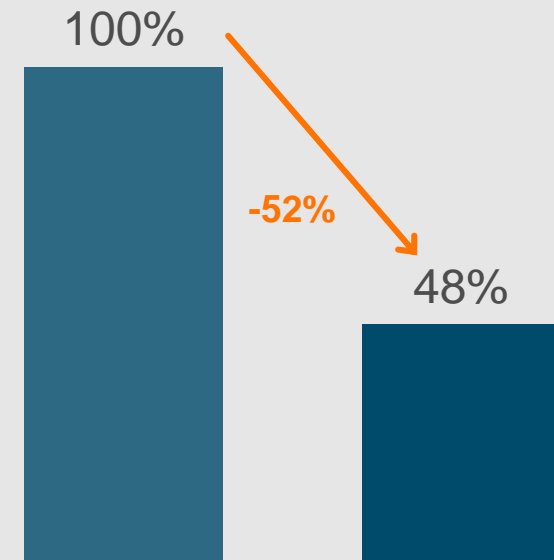
### Engine assembly lead time development

Recent example from one factory and product line



### Engine production WIP inventory reduction

Recent example from one factory and product line

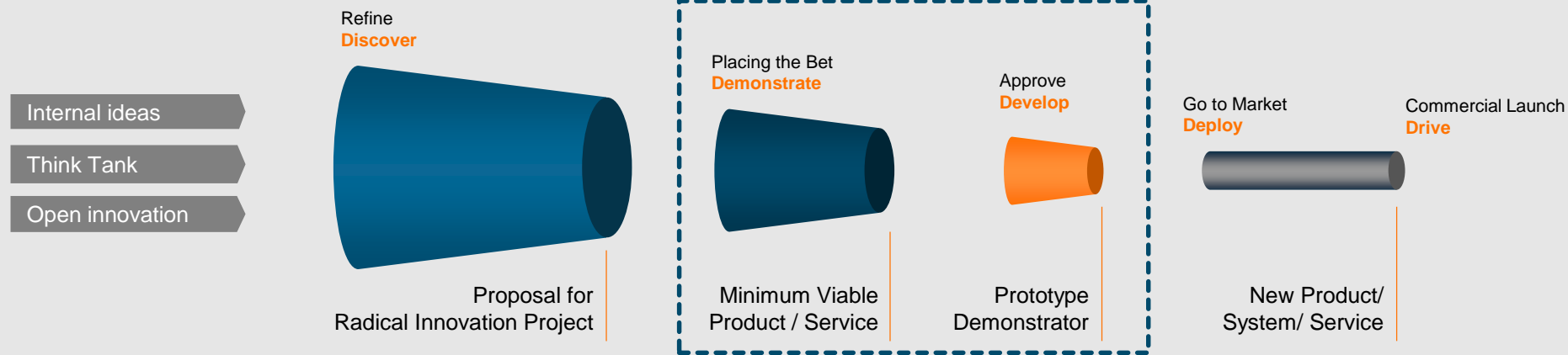




## Thought Leadership



## Innovation Culture



## Market Shaping

- Organise think tanks to accelerate innovative ideation
- Engage in customer innovation workshops
- Scout for trends and new solutions through cooperation with other companies (JV's, universities, start-ups and customers)

# Our broad portfolio supports us in challenging markets

- Contracting continues to be challenging, visibility is shortening
- Opportunities in niche segments: Cruise & Ferry, Specials, RoRo
- Regulatory pressures will attract investments in newbuild and retrofit markets
- We are adapting to an environment of lower demand
- Our recent acquisitions have further strengthened our market position and product portfolio



THANK YOU!



WÄRTSILÄ