

**13** Capital  
Markets  
Day HELSINKI  
FINLAND

# 4-STROKE WITH EXCELLENCE

**ROGER HOLM**

Senior Vice President, 4-stroke

## Medium-speed engines



Wärtsilä 20



Wärtsilä 26



Wärtsilä 32



Wärtsilä 38



Wärtsilä 46



Wärtsilä 46F

## Gas engines



Wärtsilä 34SG

## Dual-fuel engines



Wärtsilä 20DF



Wärtsilä 34DF



Wärtsilä 50DF

Wärtsilä 32GD

Wärtsilä 46GD

## Generator sets



Wärtsilä  
Auxpac 20



Wärtsilä  
Auxpac 26



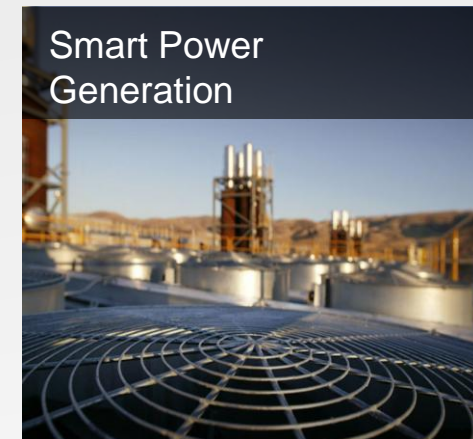
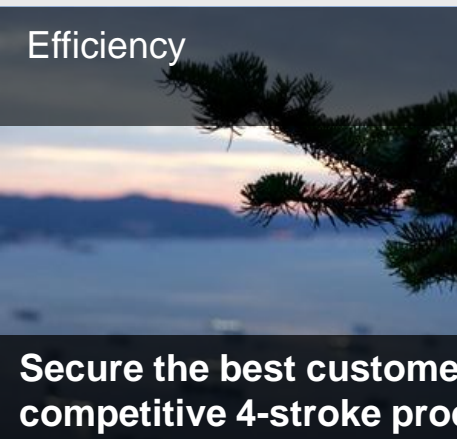
Wärtsilä 50SG

Viking Grace - the largest passenger ferry operating on liquefied natural gas

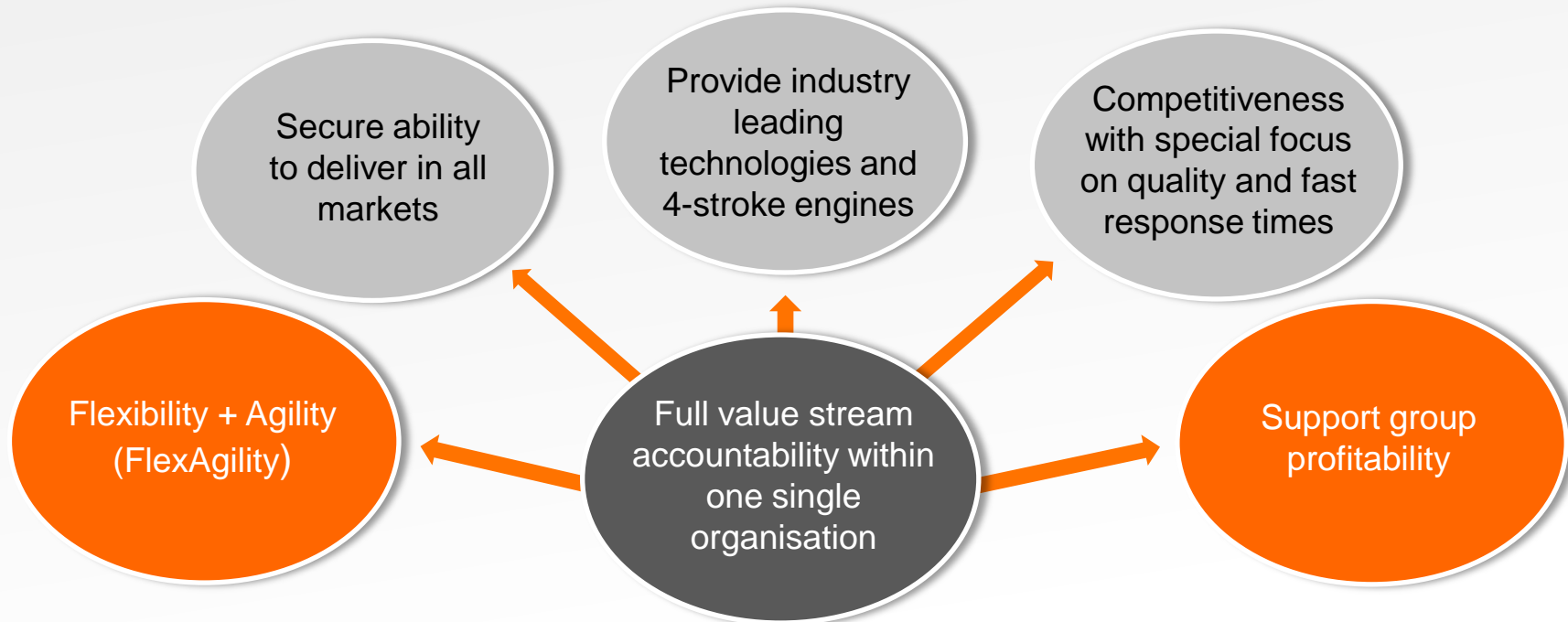


> 70% of Power Plants' deliveries gas based

# The 4-stroke business environment

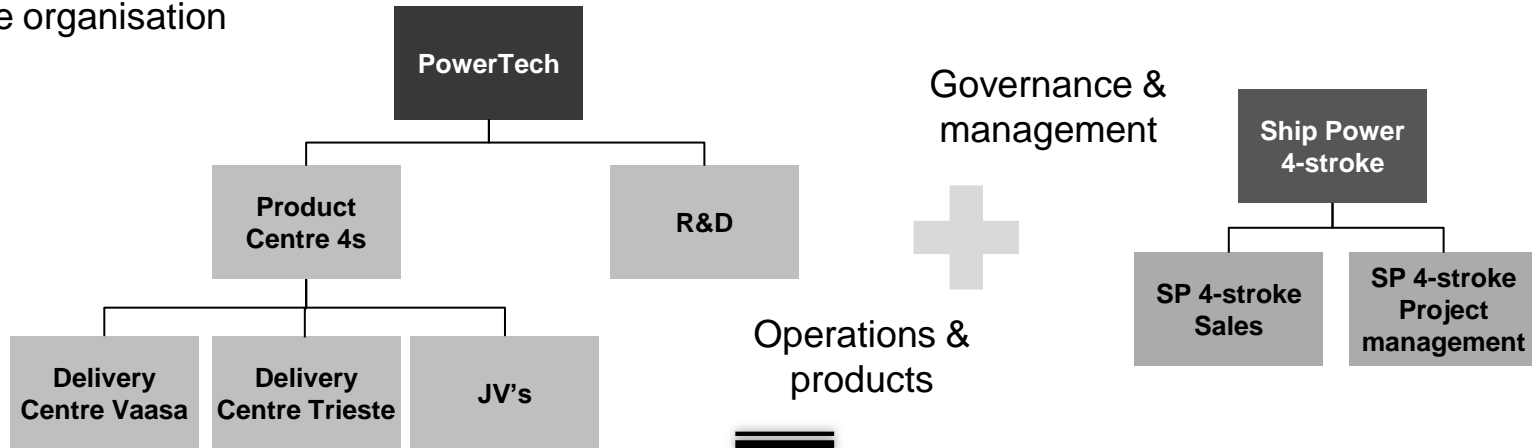


## KEY OBJECTIVES

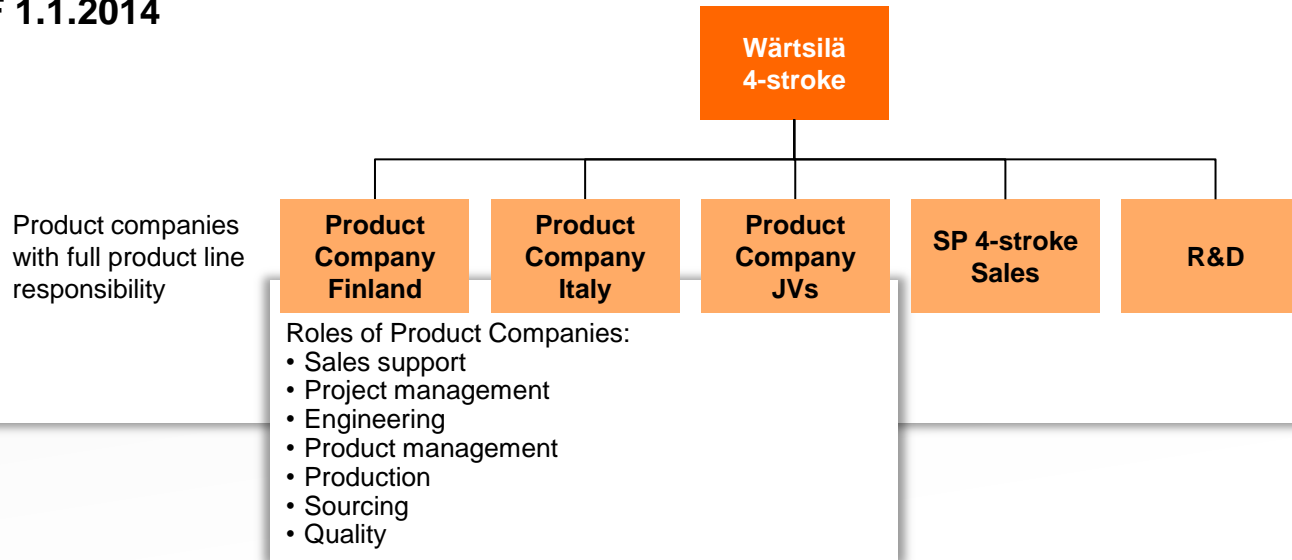


Sales | Sales Support | Project Management | Sourcing | Manufacturing | R&D

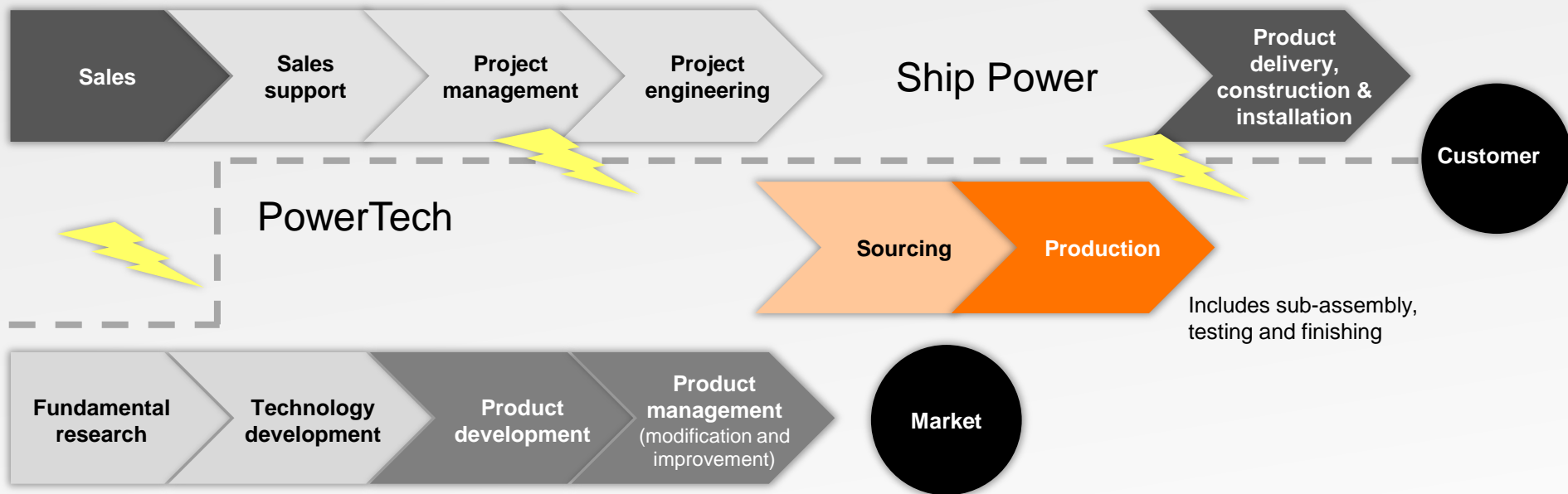
## 4-stroke organisation AS-IS



## 4-stroke organisation AS OF 1.1.2014

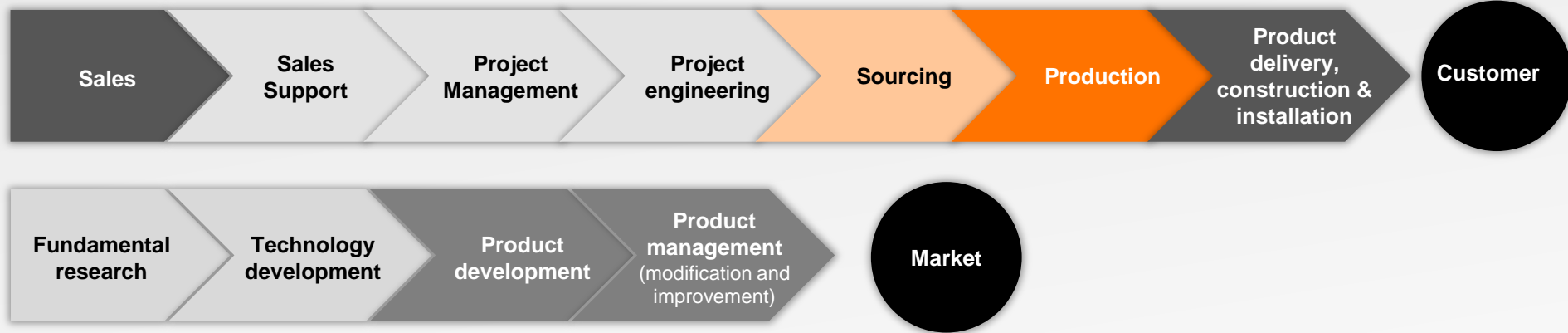


# A need to change the 4-stroke value stream...



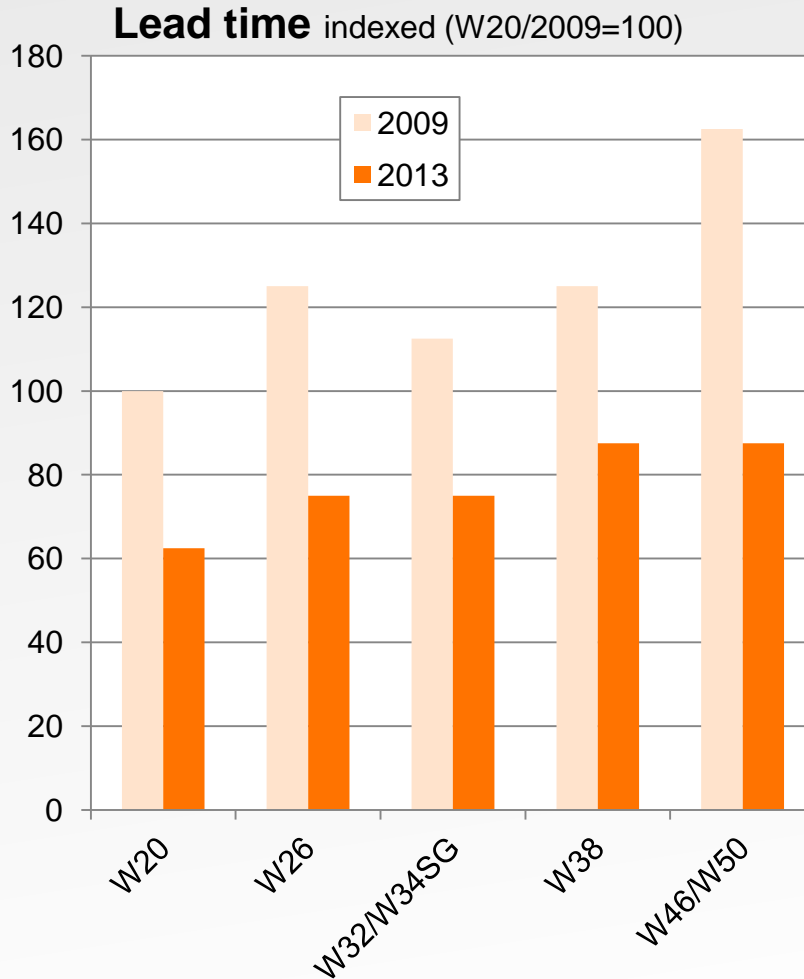
Conflict of interest typically occurs at the interfaces between organisations

## Integrating governance, management and operations



Securing a more seamless organisation helps to

1. Enable faster customer responsiveness with shorter lead times
2. Increase efficiency
3. Increase FlexAgility
4. Reduce cost
5. Improve final product quality



Lead times address internal order lead times and apply for standard engines

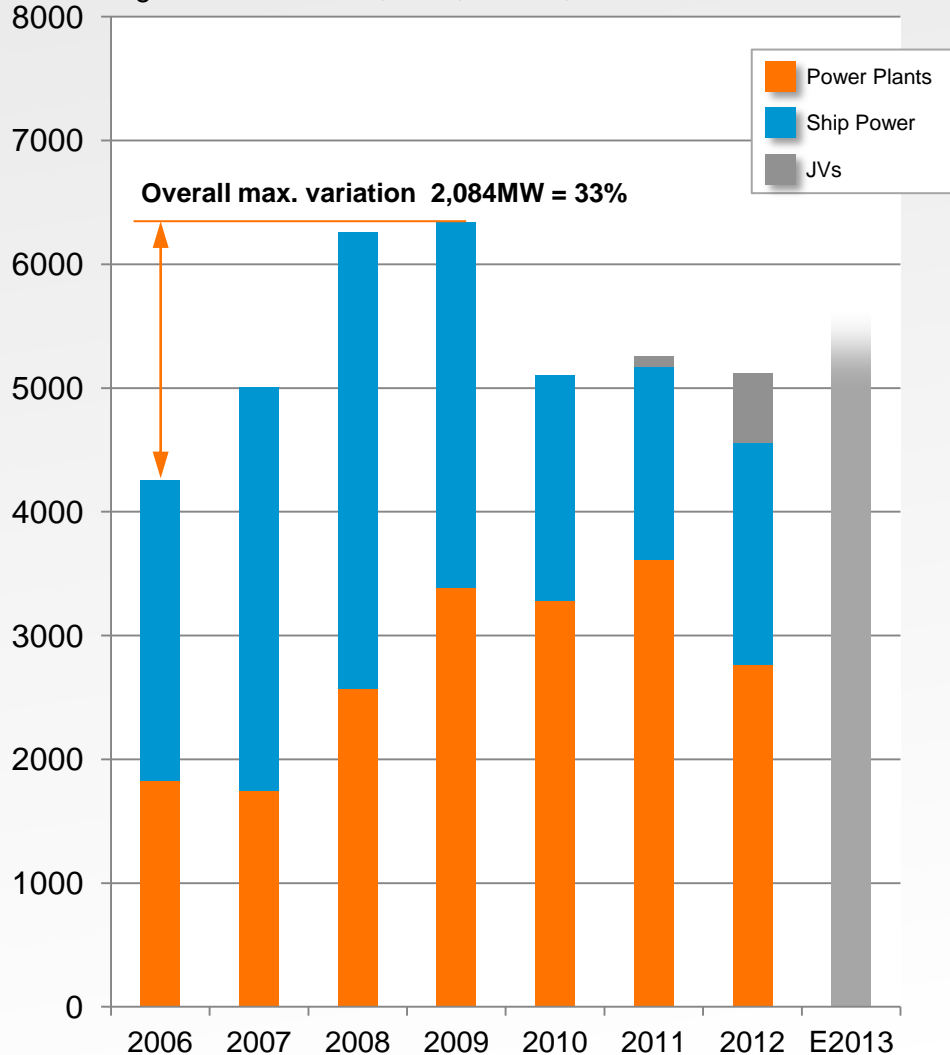
Shortened lead times improve:

- flexibility
- reaction speed
- ability to capture orders

The new 4-stroke organisation will enable the best lead times in the market, generating more sales and improving internal efficiency

## 4-stroke MW delivered by Wärtsilä

Figures include DCV, DCT, WHEC, WQDC



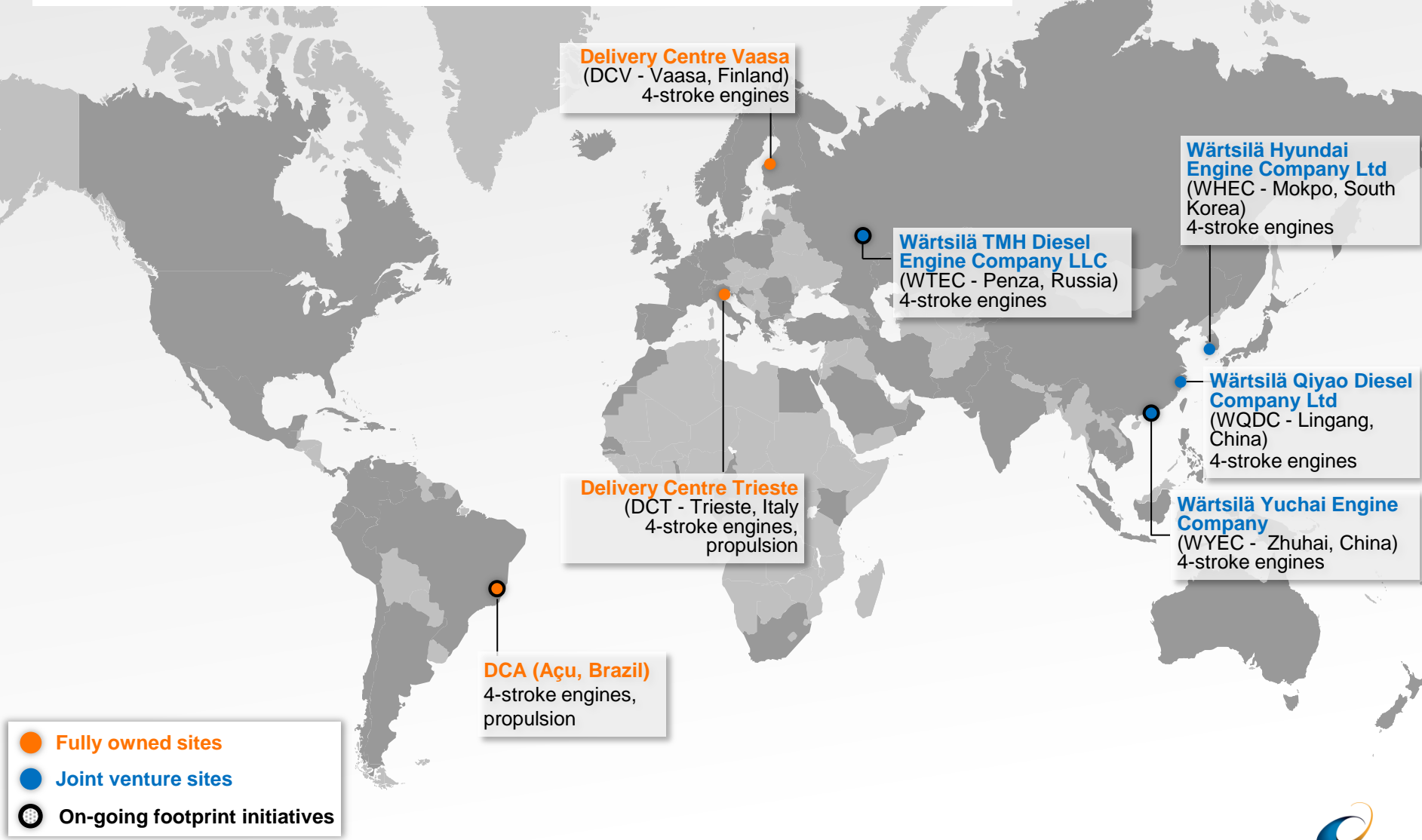
## Different demand drivers in Ship Power and Power Plants markets

- ▶ Complementary effect with regards to volume variations
- ▶ Buffering the need for capacity flexibility in the 4-stroke business
- ▶ Reduced risk exposure

Remaining volume fluctuations are handled with built-in production flexibility capabilities

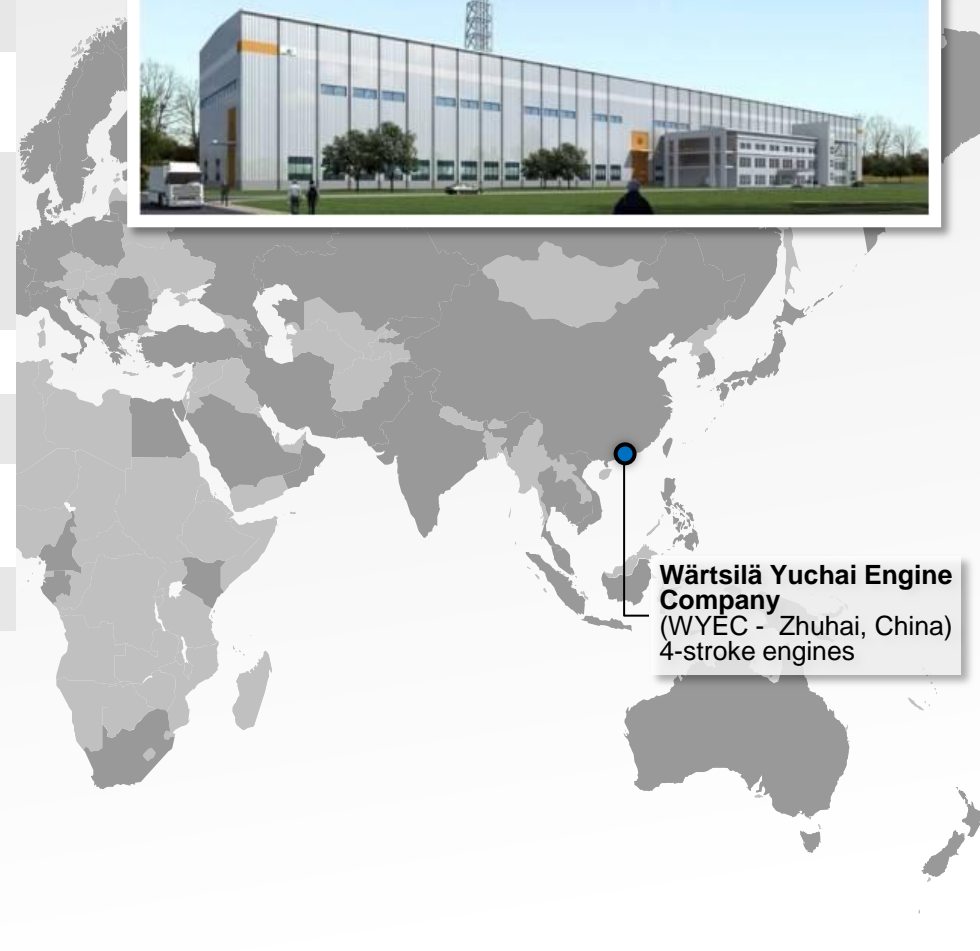


## Securing the ability to deliver in all markets



## Key facts

<b>Partner</b>	<ul style="list-style-type: none"><li>• Yuchai Marine Power Co., Ltd. (already a 2-stroke licensee for Wärtsilä)</li></ul>
<b>Ownership</b>	<ul style="list-style-type: none"><li>• Equally owned factory in the Zhuhai Fushan Industrial Park</li></ul>
<b>Objective</b>	<ul style="list-style-type: none"><li>• Enabling Wärtsilä to develop its brand awareness, broaden its customer base, and further expand its market share in China</li></ul>
<b>End markets</b>	<ul style="list-style-type: none"><li>• Marine and offshore applications</li></ul>
<b>Products</b>	<ul style="list-style-type: none"><li>• W20, W26 and W32 engines</li></ul>
<b>Key dates</b>	<ul style="list-style-type: none"><li>• Planned inauguration and first engine delivery mid 2014</li></ul>
<b>Annual capacity</b>	<ul style="list-style-type: none"><li>• ca 400 units</li></ul>



**Wärtsilä Yuchai Engine Company**  
(WYEC - Zhuhai, China)  
4-stroke engines

## Key facts


<b>Partner</b>	<ul style="list-style-type: none"><li>• Transmashholding</li></ul>
<b>Ownership</b>	<ul style="list-style-type: none"><li>• 50% Wärtsilä, 50% Transmashholding</li></ul>
<b>Objective</b>	<ul style="list-style-type: none"><li>• Further strengthen industrial foothold in Russia and broaden Wärtsilä's business into the rail market. Export potential also to CIS countries.</li></ul>
<b>End markets</b>	<ul style="list-style-type: none"><li>• Russian and CIS medium-speed diesel engine market</li><li>• Locomotive market</li></ul>
<b>Products and scope</b>	<ul style="list-style-type: none"><li>• W20L for shunter locomotives and W20 for marine applications</li></ul>
<b>Key dates</b>	<ul style="list-style-type: none"><li>• Plan to open the factory in Q4 2013</li></ul>
<b>Annual capacity</b>	<ul style="list-style-type: none"><li>• 250-300 units</li></ul>



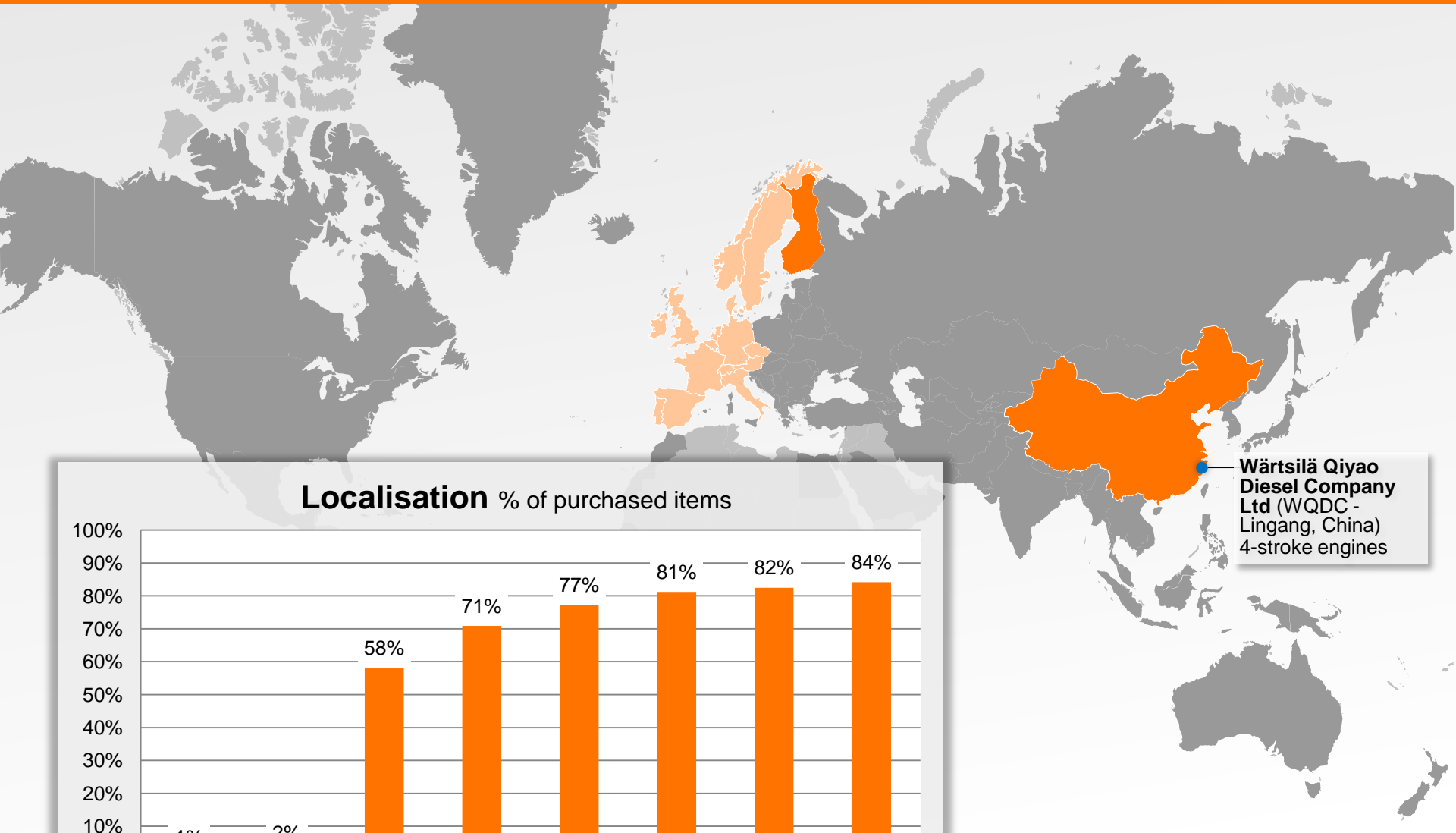


## Key facts

- |                    |  |
|--------------------|--|
| <b>Ownership</b>   | <ul style="list-style-type: none"><li>• 100% Wärtsilä</li></ul>  |
| <b>Model</b>       | <ul style="list-style-type: none"><li>• Multi product factory</li></ul>  |
| <b>Objective</b>   | <ul style="list-style-type: none"><li>• Strengthen presence in Brazil, respond to increasing market demand and meet local content requirements</li></ul> |
| <b>End markets</b> | <ul style="list-style-type: none"><li>• Brazilian local market</li></ul>   |
| <b>Products</b>    | <ul style="list-style-type: none"><li>• Gensets &amp; thrusters</li></ul>  |
| <b>Facilities</b>  | <ul style="list-style-type: none"><li>• Greenfield construction at Açú Portside, 310 km north of Rio de Janeiro</li></ul>                                |
| <b>Key dates</b>   | <ul style="list-style-type: none"><li>• Operational by mid 2014</li></ul>  |

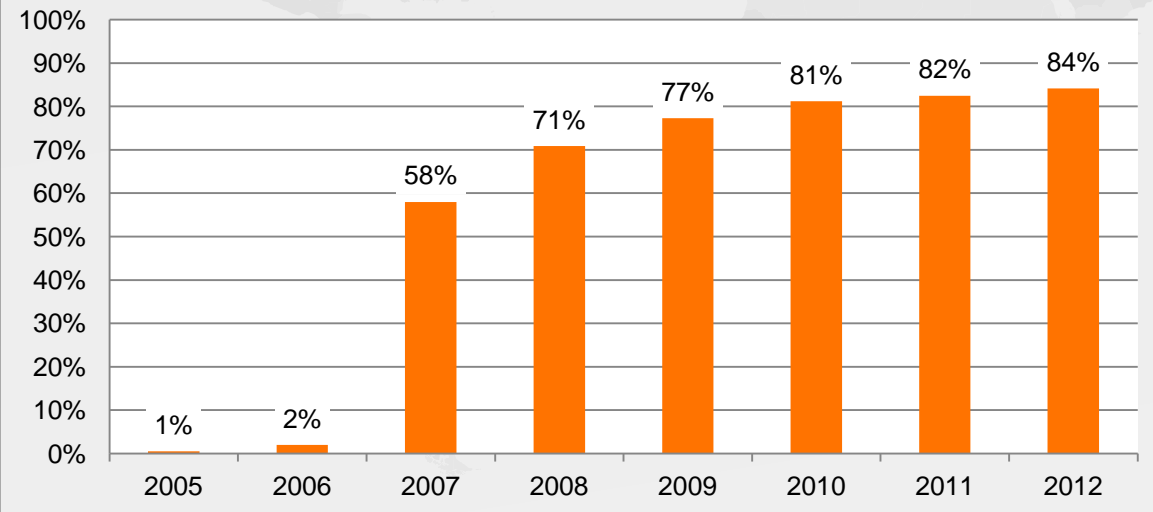


**DCA (Açú, Brazil)**  
4-stroke engines,  
Propulsion



**Wärtsilä Qiyao Diesel Company Ltd (WQDC - Lingang, China)**  
4-stroke engines

**Localisation % of purchased items**



## Emission legislation



- Reducing the environmental footprint
- Compliance with rules and regulations

## Energy efficiency



- Best in class engine and total plant efficiency

## Total cost of ownership



- Lower total cost of ownership
- Competitive price > lower product cost
- Operational efficiency
- Improved fuel efficiency

## Fuel flexibility



- Fuel flexibility and ability to make fuel conversions
- Superior gas engines (with liquid fuel as back-up)

## Operational flexibility



- Superior loading capability with unlimited, fast and reliable starting & cycling (reserve grid support with load following, peaking, wind chasing and baseload)

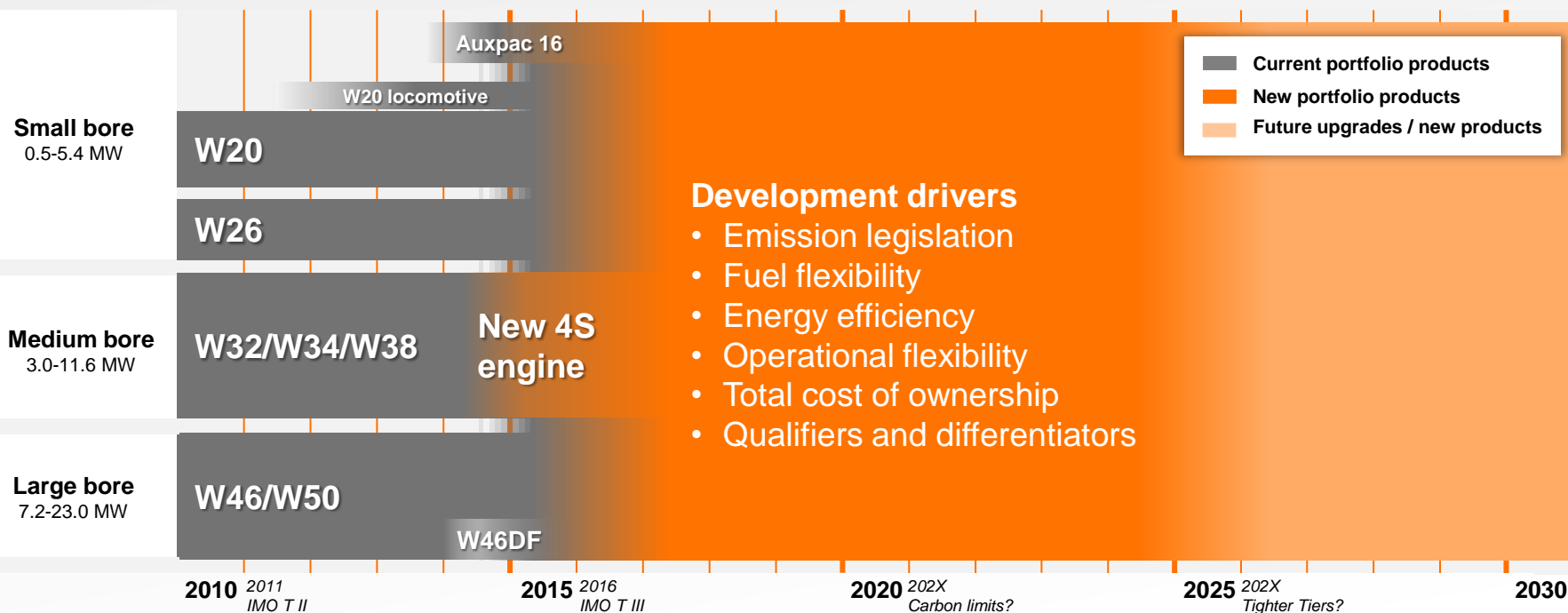
## Base propositions



- Quality
- Reliability
- Competitive product cost
- High power density
- Service-ability

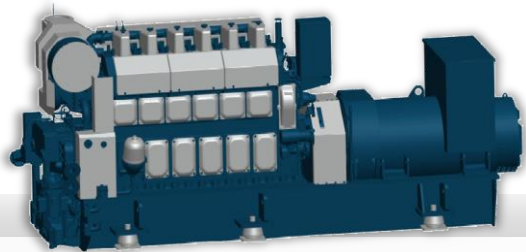
## 4-stroke portfolio program

- Upgrades on existing engines to maintain competitiveness
- Completely new engines and one new engine portfolio



## Auxpac 16

- Small bore genset for marine applications, extends portfolio into lower output segment
- **Standardised genset, easy installation, competitive pricing**
- Joint development with Chinese JV partner SMDERI
- Reliable product designed for efficient manufacturing in China
- Market launch December 2013



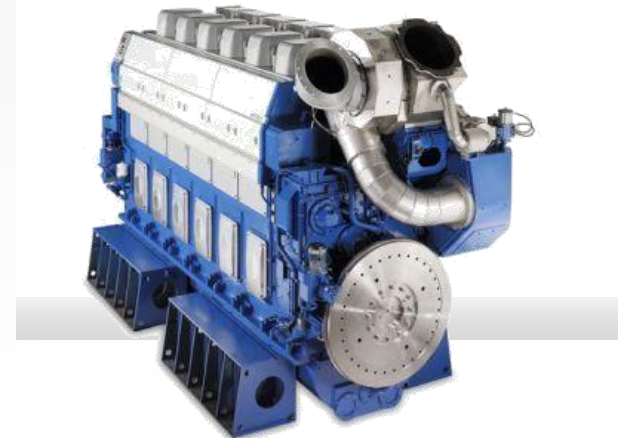
## New 4S engine

- Medium bore engine, first engine type of the newly designed future portfolio
- Meets **future market requirements** through superior technology, which **increases efficiency, decreases emissions** and is **cost competitive**
- Latest technologies for 2-stage turbocharging system, fuel injection systems and inlet valve control and actuations
- First deliveries end 2015




## Wärtsilä 46DF

- Large bore dual-fuel engine for marine applications
- Meets customer demands in a time of volatile fuel pricing and changing regulations
- **Superior performance, fuel efficient and cost competitive**
- Based on existing W46F and success of 50DF
- First deliveries end 2014





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1. Organisation change to maximise customer value
  2. Footprint developments on-going, ready to catch further opportunities
  3. R&D investments provide promise for new products



**WÄRTSILÄ**