

# Wärtsilä erfaring med Tier III motorer

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Senior sales manager



## Significant value creation potential

### PURPOSE

ENABLING SUSTAINABLE SOCIETIES THROUGH INNOVATION IN TECHNOLOGY AND SERVICES



## COMMITTED TO TARGETS

### FINANCIAL TARGETS

- 5% annual organic growth
- 12% operating margin

### "SET FOR 30" – DECARBONISATION

- A product portfolio ready for zero carbon fuels
- Carbon neutral in own operations

## ENERGY

Intermittent sources of energy require balancing solutions. By 2030, the balancing power market is expected to grow >10X.

## MARINE

An unprecedented rate of change driven by regulations and demand for green transport. 50% GHG reduction in shipping by 2050



## TARGET POSITION

SHAPING THE DECARBONISATION OF MARINE & ENERGY



## LEADING OFFERING TO SUPPORT OUR CUSTOMERS IN DECARBONISATION

FUEL FLEXIBLE ENGINES ENABLING DECARBONISATION

BATTERY, ENERGY SAVING, AND EMISSION ABATEMENT TECHNOLOGIES

THERMAL BALANCING AND ENERGY STORAGE

ENERGY EFFICIENCY & POWER SYSTEM OPTIMISATION

THE WIDEST SERVICE NETWORK IN THE INDUSTRY

DIGITAL SOLUTIONS ENABLING OPTIMISED OPERATIONS AND SERVICE

## Global leader

in decarbonisation of Marine and Energy markets

FOUNDED IN

**1834**

REVENUE (EUR)

**~5BN**

ACTIVE IN

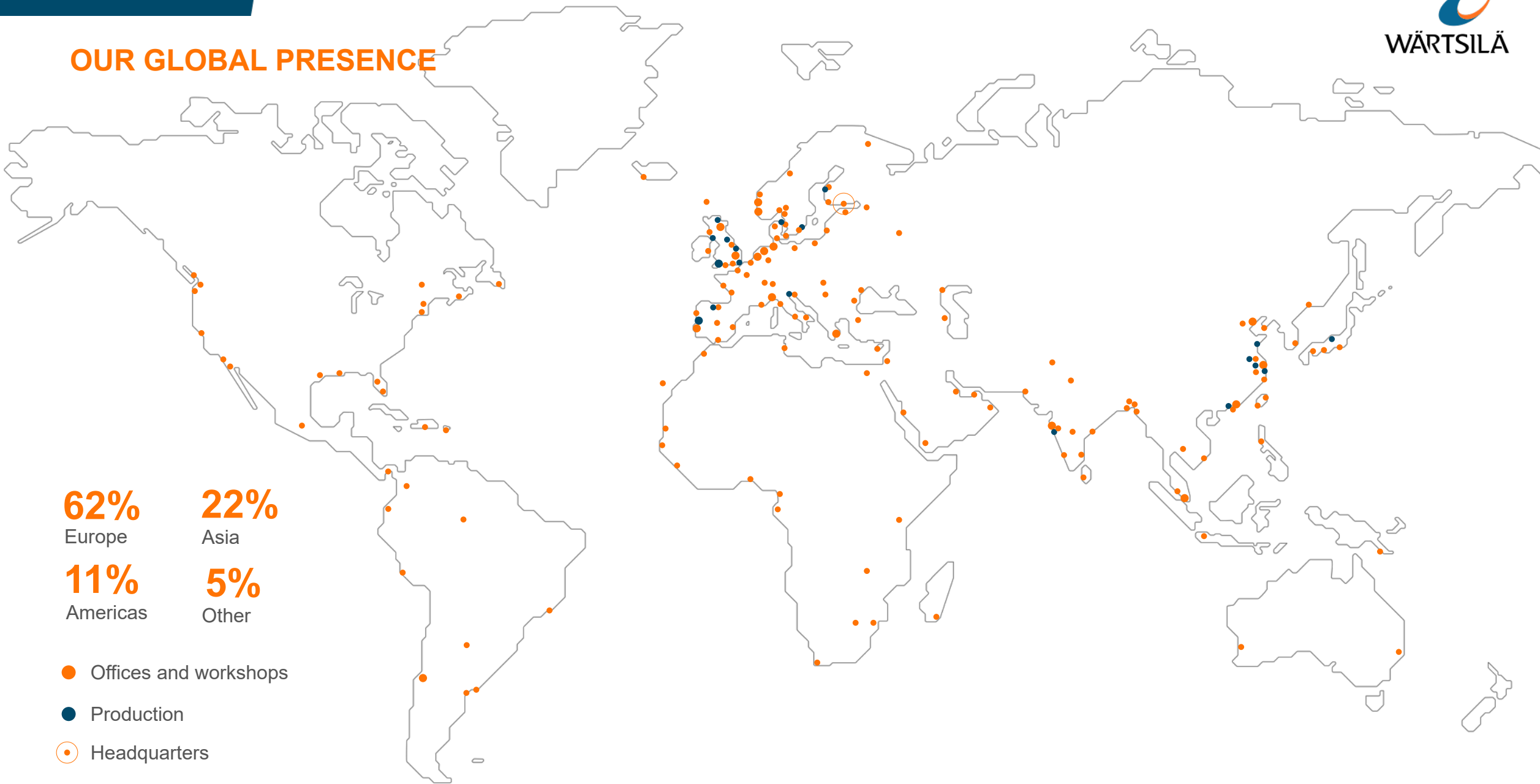
**68 countries**

OUR PERSONNEL APPROX.

**17,000**



## OUR GLOBAL PRESENCE



## Delivering customer value through leading R&D and partnerships

- We believe that the shift to new technologies will be gradual, and there will be a need for a broad array of solutions to decarbonise marine and energy.
- Our focus will remain in developing our core technologies and through partnering we can ensure a broad solution offering for our customers.
- Wärtsilä will continue to invest a stable ~3% of net sales in R&D.

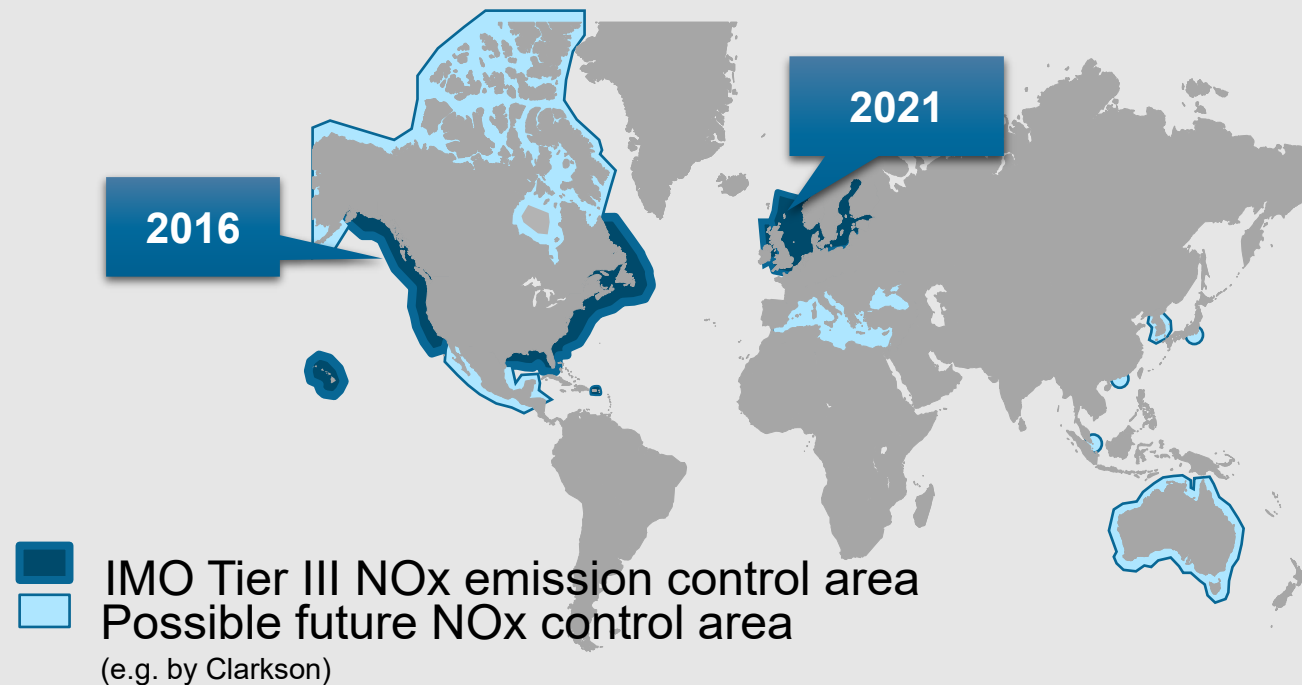
### 175 MEUR

In 2021, R&D investments amounted to 175 MEUR, representing 3.7% of net sales.

### 2,800

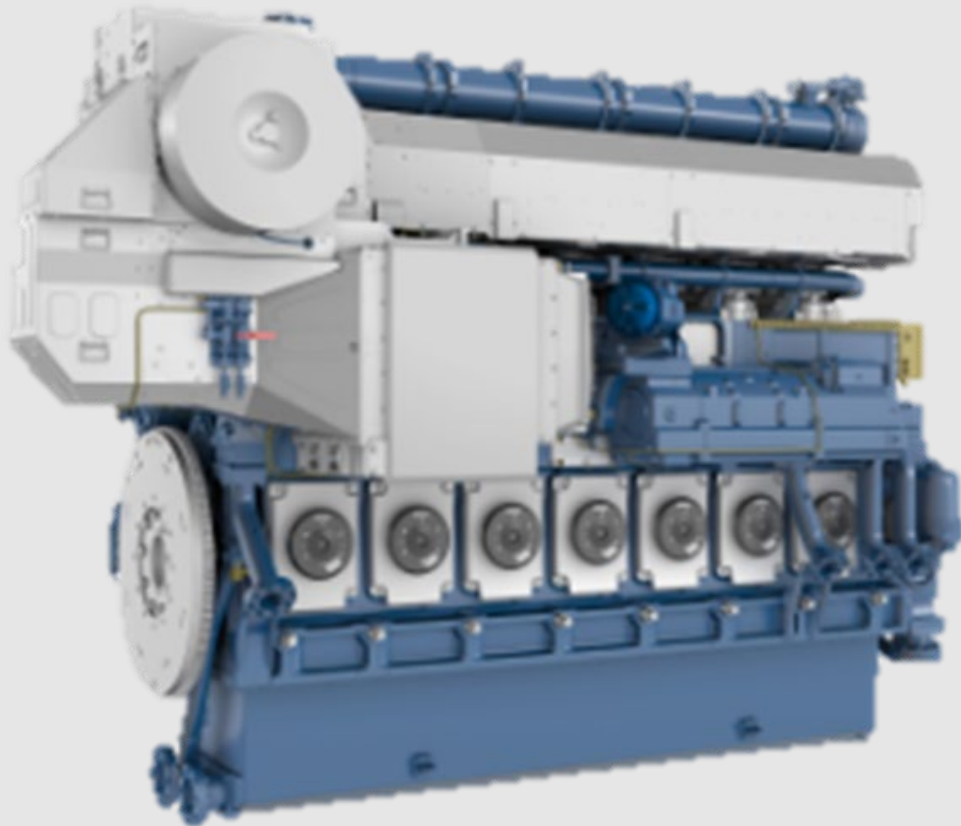
Patents and applications.  
Current patent portfolio in 2022: approx. 2,500 patents and 300 patent applications in 50 countries.

## IMO Tier III Emission Control Areas



- **New ships** with keel laying date after the set date (1<sup>st</sup> of January 2016 or 2021)
- **Major conversions**
  - If engine NOx changes

# Wärtsilä 8L32



## Tier II

Marine main engine CP propeller, 4640 kW

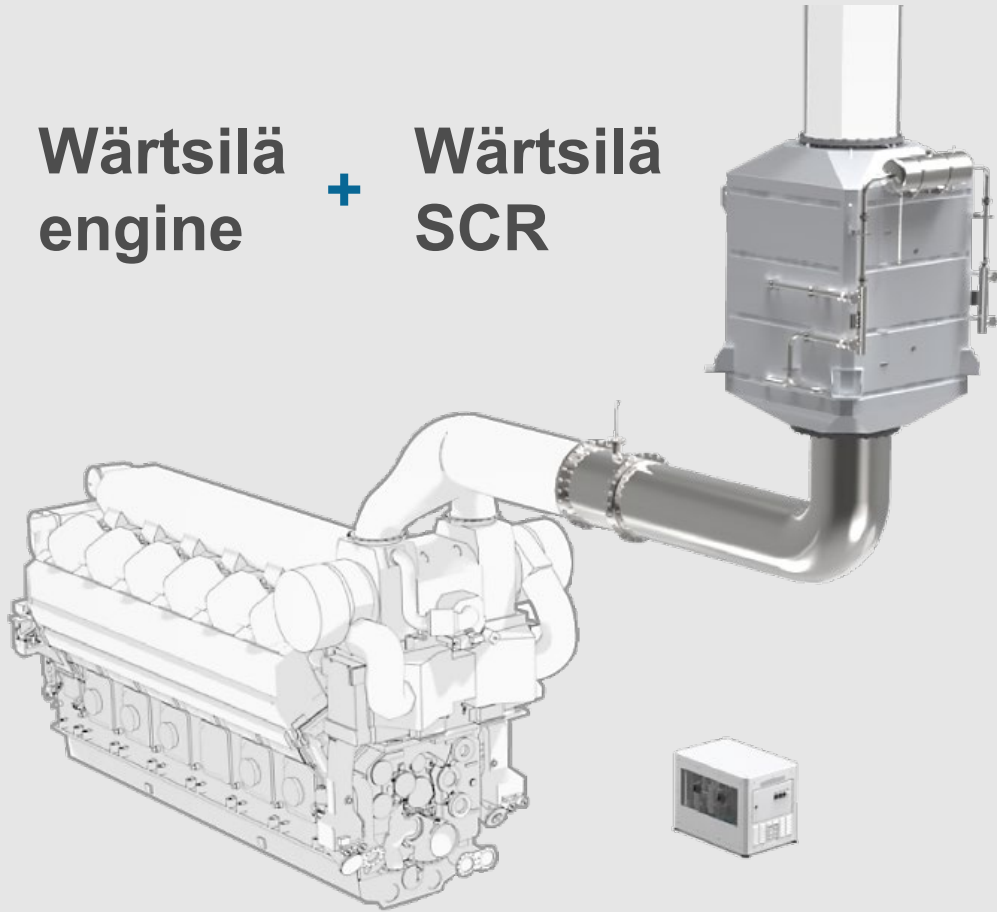
## Tier III

Marine main engine CP propeller, SCR, 4640 kW

	Tier II	Tier III
• Fuel consumption at 100% load (LFO)	184.7	184.7 g/kWh
• Fuel consumption at 85% load (LFO)	179.7	181.0 g/kWh
• Fuel consumption at 75% load (LFO)	179.1	180.6 g/kWh
• Fuel consumption at 50% load (LFO)	179.8	181.9 g/kWh
• Fuel consumption at 25% load (LFO)	201.6	201.6 g/kWh

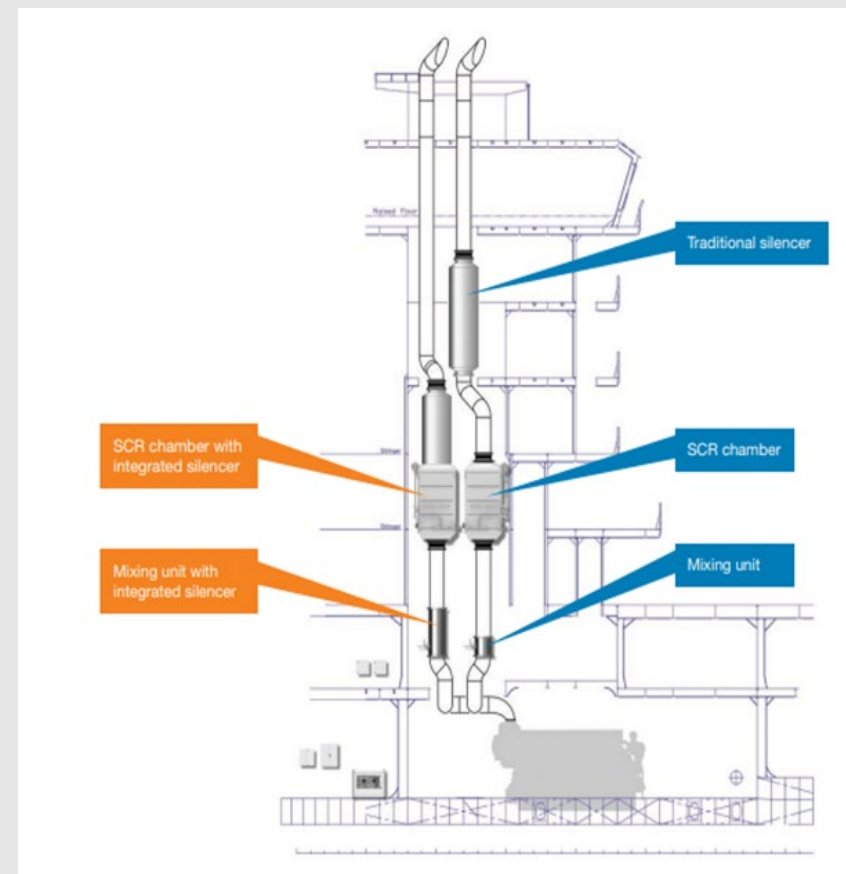
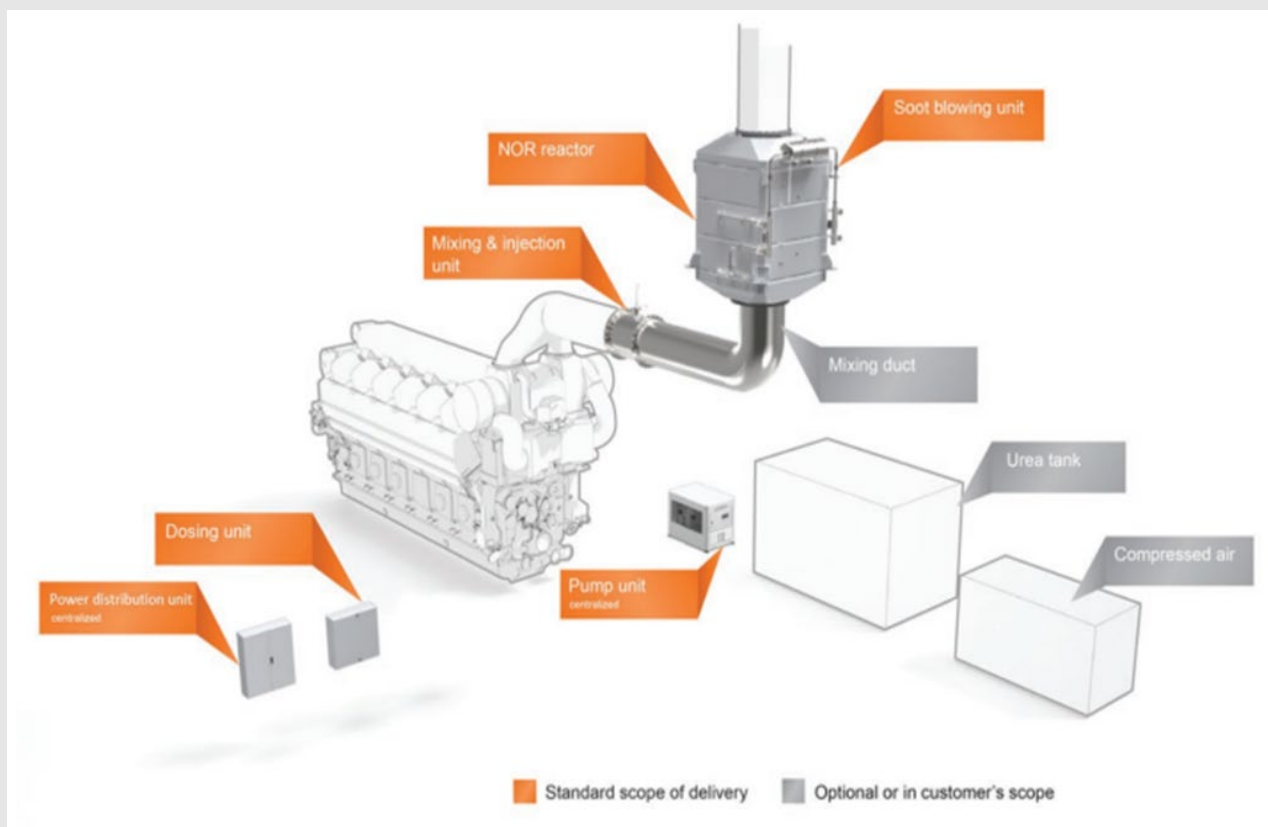
LFO = Light Fuel Oil

Wärtsilä  
engine + Wärtsilä  
SCR



## Maintain IMO Tier III compliancy through the lifecycle

- Secure **availability** of NOx critical components like catalyst elements
- Lifecycle services
  - System **updates**
  - **Troubleshooting** engine and SCR together
  - Help in **reporting** compliancy to authorities



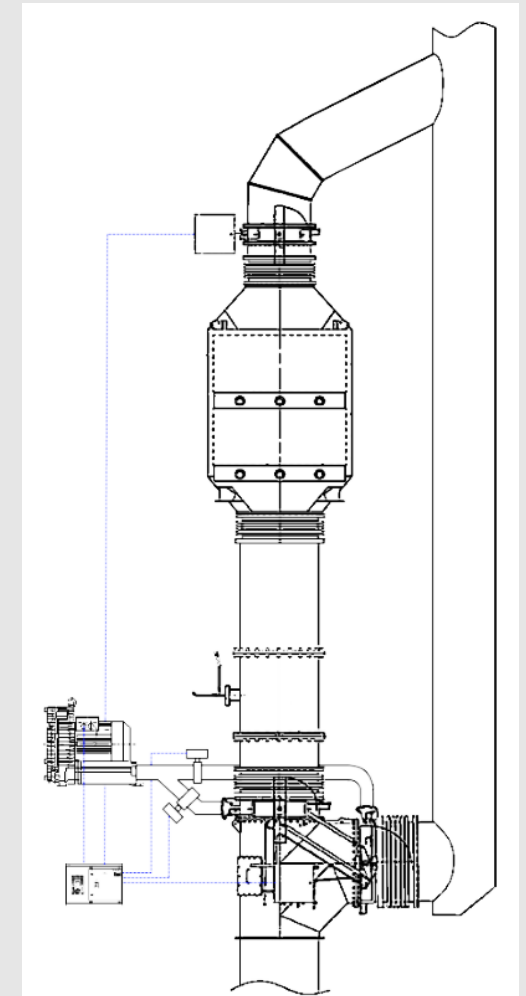
# Optional by-pass

## Possible benefits

- Theoretically little bit longer catalyst element lifetime.
  - Cannot be guaranteed.
  - In many cases it is cheaper to replace catalytic elements than to install, operate, and maintain a by-pass.
- Continuous engine operation at very low engine loads which are below IMO test cycle (e.g. below and around 10% engine load)

## Other considerations

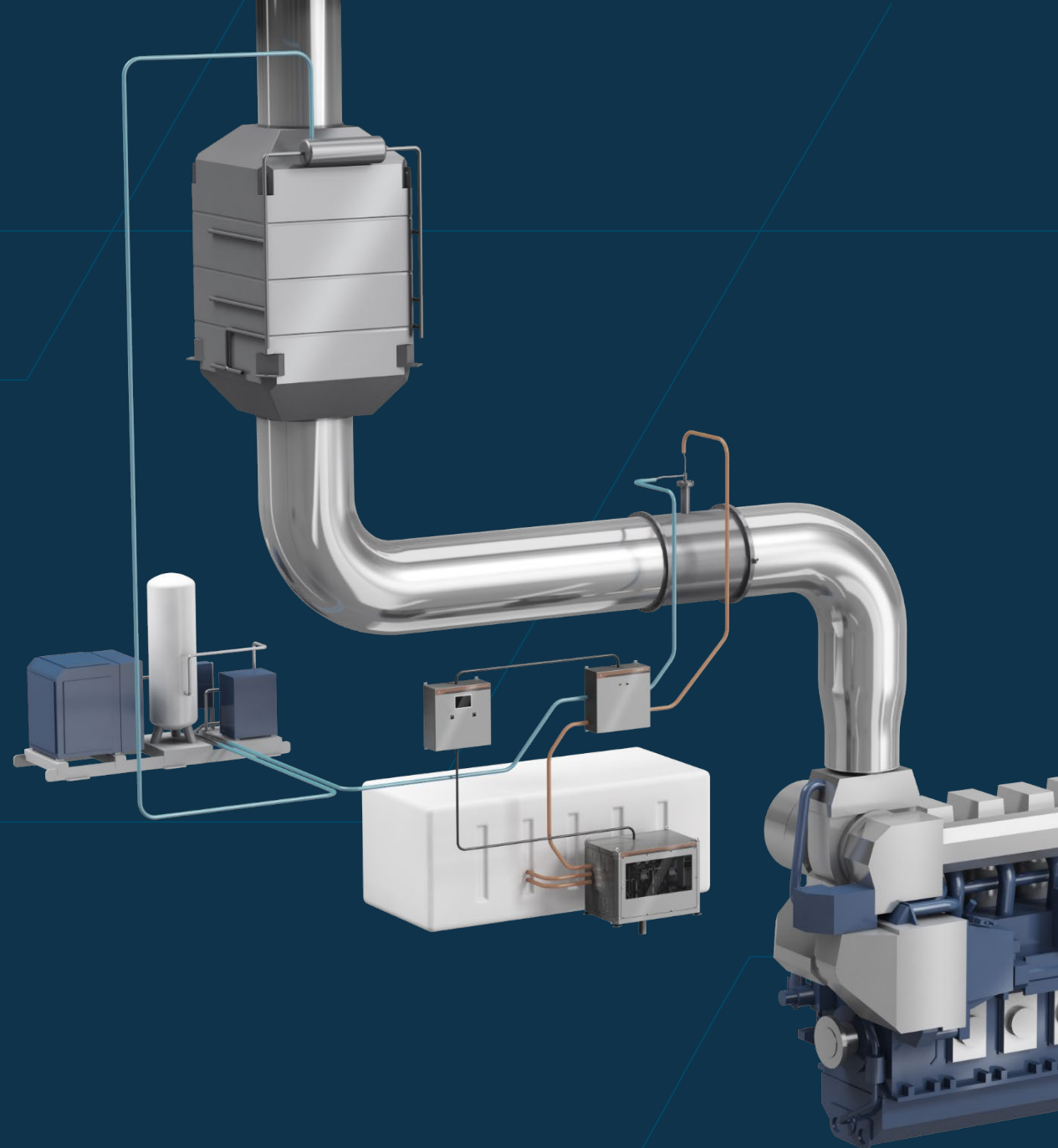
- **Increased complexity** and cost in ship building and in operation.
- Some class societies have strict rules
  - **Safety** and **IMO Tier III compliancy**.  
E.g. 100% gas flow tightness.
- Urea consumption can be saved also without by-pass, just turning off the SCR.
- SCR can also be decommissioned for longer period, i.e. catalyst elements taken away from reactor



# SUMMARY

## SCR - Wärtsilä NOx Reducer, NOR

- Needed for
  - Comply with IMO Tier III
  - Save in local fees and taxes
  - Green image
- Easy, riskless IMO Tier III certification, done by Wärtsilä
- Easy installation, low risk, validated, certified, and **lifecycle supported**
- Possibilities to find fitting solutions



THANK YOU!



WÄRTSILÄ

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