

# Wärtsilä 2023

Shaping the decarbonisation of marine and energy





# Safety moment





## Our purpose

Enabling sustainable societies through innovation in technology and services



# This is Wärtsilä

- Wärtsilä is a global leader in innovative technologies and lifecycle solutions for the marine and energy markets.
- We emphasise innovation to help our customers continuously improve environmental and economic performance.
- Our passionate team of 17,500 professionals in more than 240 locations in 79 countries shape the decarbonisation transformation of our industries.



# Global leader

in decarbonising marine and energy

Founded in

**1834**

Our personnel

**17,581**

Country presence

**79**

Figures from 2022

Net sales, MEUR

**5,842**

Nationalities

**127**

Locations worldwide

**242**



# The decarbonisation transformation is accelerating

The world is changing.

We will see an unprecedented rate of change in maritime in the coming decades. Driven by regulatory frameworks and the demand for greener transport, the move towards decarbonisation will only accelerate.

The energy sector is undergoing a massive transformation: renewables and the critical need to decarbonise are fundamentally going to change the way energy is generated.

Wärtsilä is in key position in shaping the decarbonisation of marine and energy.





# Marine will move with unprecedented speed towards decarbonisation

## Policies and regulations

- IMO target: -50% GHG emissions from shipping by 2050
- Access to capital: EU taxonomy, Poseidon principles and ESG
- Cost of carbon: carbon certificates e.g., EU Fit for 55, IMO carbon levy, and local green policies
- Demand for green sea transport, driven by companies' environmental commitments to their customers and investors' push for sustainability targets

## Technology

- Focus on carbon neutral and zero carbon fuels. However, carbon fuels will likely be used for many years
- Next steps in abatement technologies, e.g., maritime carbon capture
- Increase in battery systems, hybrid solutions, and energy saving technologies
- Focus on fuel flexibility and upgradeability to increase overall efficiency

## Connectivity and data

- Vessels as data pools - system complexity increasing
- Optimisation solutions based on a holistic view of the entire transport system
- Performance-based agreements with a focus on uptime, reliability, and fuel efficiency
- Cyber security growing in importance
- Various degrees of autonomous operations



# Energy is moving towards a 100% renewable energy future

## Policies and regulations

- EU: Carbon neutral by 2050
- USA: carbon free electricity production by 2035, net zero emissions by 2050
- China: Carbon neutral by 2060
- Country climate pledges to become more progressive
- RePower EU, The Inflation Reduction Act, Just Energy Transition partnerships

## Technology


- Wind and solar growing rapidly as the dominant source of energy
- Intermittent sources requiring balancing power
- Sustainable fuels for balancing power
- Digitalisation will create opportunities for optimising energy costs
- Cyber security growing in importance

## Growing energy demand

- Electricity generation would need to grow by 3X, renewables by 8X to reach Net Zero targets by 2050 (Source: IEA World Energy Outlook 2022, Net Zero Emissions Scenario)
- Gradual replacement of baseload fossil fuelled energy generation
- Renewables expected to become the largest source of global electricity by early 2025 (Source: IEA Renewables 2022 report)
- Power systems becoming increasingly complex with different types of generation assets







“ We accelerate the decarbonisation of the marine and energy industries through innovation, focused investments, and selective partnerships, while at the same time decarbonising our own operations.”

**Håkan Agnevall**  
President & CEO

# THE WÄRTSILÄ WAY



## Purpose

Enabling sustainable societies through innovation in technology and services



## Target position

Shaping the decarbonisation of marine and energy



## Strategic priorities

Roadmap to improve performance and reach the Target position



## Values and Leadership

Customer Success, Passion, Performance



# Our values guide our priorities and decision-making in everyday situations

Customer success

Passion

Performance



# We are shaping the decarbonisation of marine and energy



## Lifecycle power solutions

Expansion into propulsion, services acquisitions

2002–2010



## Becoming a total solutions provider

Expansion into environmental solutions, acquisitions in Electrical & Automation

2011–2015



## Smart marine and 100% renewable energy

Digital solutions, end-to-end value chains, divestments

2016–2020



## Shaping the decarbonisation of marine and energy

Customer & services focus, technology leadership, organic growth, continuous improvement

2021



## Our strategy is based on two key themes

**1 Transform**  
Decarbonisation creates new business opportunities

**2 Perform**  
On a path to deliver the set targets



# Transform – Decarbonisation creates new business opportunities

- 
- The decarbonisation transformation is accelerating, and it creates new business opportunities both in marine and energy.
  - This transformation will be made possible by numerous new technologies and alternative fuels.
  - We are set for performance and have significant value creation potential to drive this transformation as a technology leader.
- World-leading Sustainable Technology Hub opened to accelerate marine and energy decarbonisation
  - Next-generation Wärtsilä 31SG Balancer launched to enable renewables at lower cost
  - Launch of Wärtsilä 25 engine paving the way towards maritime decarbonisation
  - 500 vessels of Anglo-Eastern's fleet connected with Wärtsilä's Fleet Optimisation Solutions platform
  - Maritime Carbon Capture test installation successfully running at 70% CO<sub>2</sub> capture rate



# Perform – On a path to deliver the set targets

## #1-3 in global markets

### Financial targets:

- 5% annual organic growth
- 12% operating margin

### Set for 30 decarbonisation targets:

- carbon neutral in our own operations by 2030
- a product portfolio ready for zero carbon fuels by 2030

### Focus on:

High performing teams  
Performance excellence and robust execution  
Continuous improvement  
Cost structure – actions taken whenever and wherever necessary

## Growth through:

- Clear financial targets and strong commitment to realise them
- Robust capital allocation principles and active portfolio management
- Notable opportunity in retrofits and conversions
- Extensive service network, positioned for growth both in transactional services and performance-based agreements

## Our strategic priorities

- 1 Excel in creating customer value
- 2 Develop high performing teams that make a difference
- 3 Drive decarbonisation in marine and energy
- 4 Capture growth in services
- 5 Continuously improve our end-to-end value chain



# Our financial and decarbonisation targets

## Net sales

### Target

5% annual organic growth

## Profitability

### Target

12% operating margin

## Set for 30 decarbonisation targets

- A product portfolio ready for zero carbon fuels by 2030
- Carbon neutral in our own operations by 2030

## Capital structure

### Target

Gearing below 0.50



# Wärtsilä has a significant role in decarbonisation transformation



## 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 our 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 is being driven by regulations and the demand for green transport. The aim is for shipping to achieve a 50% GHG reduction by 2050.

## TARGET POSITION

Shaping the decarbonisation of marine and energy



## Leading offering to support our customers in decarbonisation

Fuel-flexible engines enabling decarbonisation

Hybrid and battery solutions for maritime

Energy saving technology for improved vessel performance

Emission abatement technologies including maritime carbon capture

Grid balancing engine solutions and energy storage

Power system modelling & optimisation

Decarbonisation services

The broadest service network for marine and energy industries

Digital solutions enabling optimised operations and service



## Delivering customer value in marine

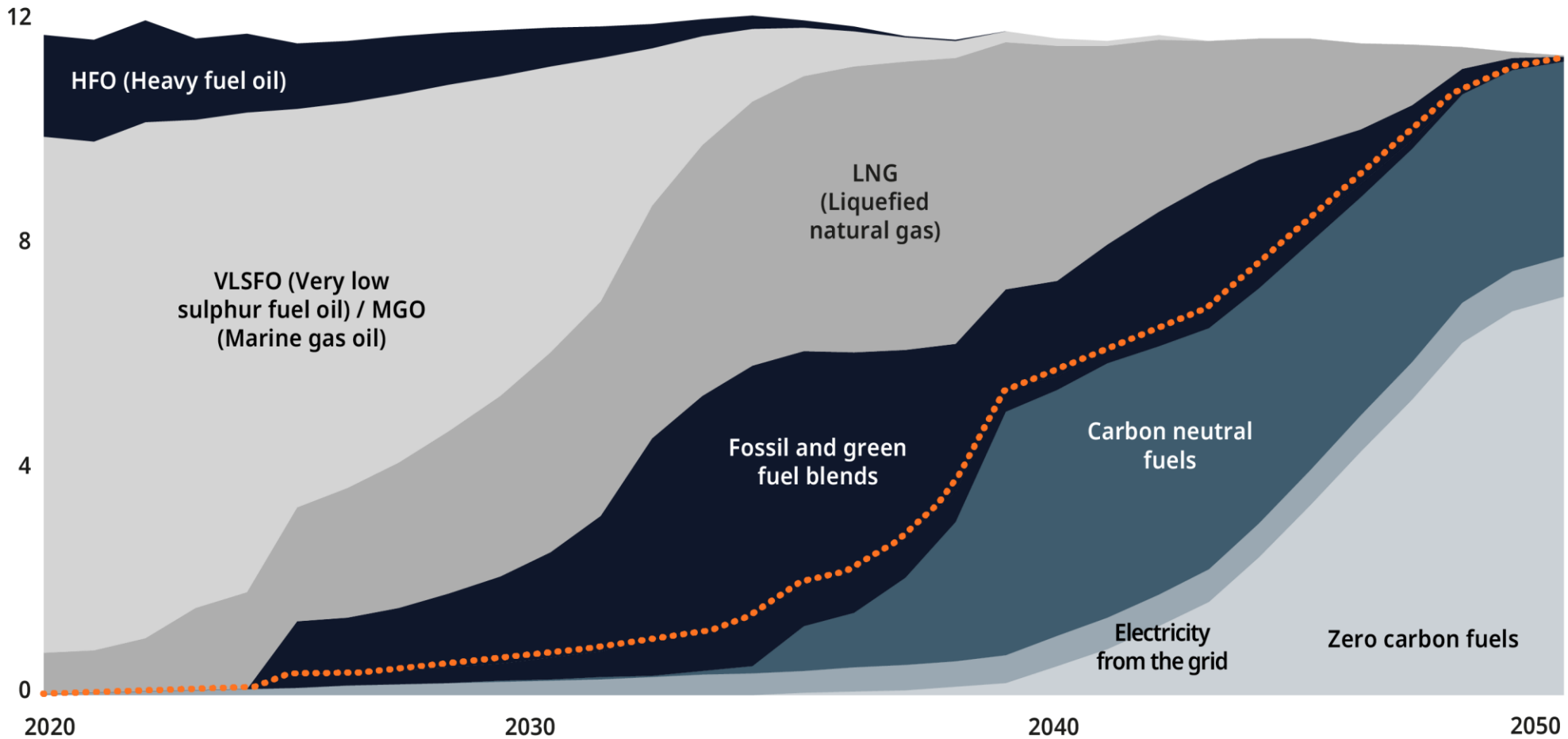
- We are well-positioned to **support our customers in the decarbonisation transformation** with fuel flexibility, efficiency optimisation, emission abatement technologies, and digital services.
- With our **multifuel technology**, ranging from transition fuels to 100% green fuels, our customers have a **viable upgrade path** for the future.
- Our **fleet optimisation and safety solutions** helps achieving optimised routing and port operations with **tangible fuel savings**.

### 2022

- **Methanol milestone with the launch of Wärtsilä 32 engine**
- **Supplying world's largest hybrid vessels**
- **Taking marine safety to the next level**

# Moving from a single-fuel industry to a multi-fuel one

Distribution of fuel types for Decarbonisation 2050 (1.5c scenario), EJ



..... Carbon neutral and zero carbon fuels in maritime  
 Source: DNV Maritime Forecast 2050 model, Wärtsilä internal estimates



## Delivering customer value in energy

- We are a global leader in flexible power plants, energy storage solutions and system optimisation. We provide balancing power and lifecycle services to support an **optimised and reliable transition to renewable energy.**
- Our **market-leading technologies** allow our customers to increasingly add renewables to their power system safely, to futureproof their assets, and to reduce emissions.
- With our deep understanding of power systems and future generation technologies, we support our customers on their **path towards decarbonised operations.**

### 2022

- **Supplying world's largest solar-plus-storage project portfolio**
- **World's first: Wärtsilä engine runs on 25vol% hydrogen blend in a commercially operated power plant**
- **Introducing Decarbonisation Services to support customers aiming at net zero CO<sub>2</sub> emissions**



# The key steps to front-load net zero

Curtailment of increased use of renewable energy sources being caused by system inflexibility.  
+  
Decrease running hours of legacy power plants.

Continue adding renewables supported by flexibility.

Utilise Power-to-X and flexible balancing engine power plants to provide carbon neutral long-term storage.

5

Phase out fossil fuels

4

Convert to sustainable fuels

3

Phase out inflexible power plants

2

Add balancing engines and energy storage

1

Add renewables





## Delivering customer value in service

- Our **portfolio of services** ranges from spare parts and technical expertise to performance-based agreements.
- Our **industry leading service network** is a key enabler for superior uptime, reliability and total lifecycle solutions, all of which ensure customer success.

### 2022

- Introducing decarbonisation services for the marine and energy sectors
- Extensive service agreement to optimise performance of Brittany Ferries' RoPax vessel
- Operations & Maintenance agreement with Termocabo S.A. for long-term performance guarantees
- Modelling decarbonisation path to speed up fleet sustainability with Companhia Brasileira de Offshore (CBO)



# Moving up the service value ladder

1X\*

- Transactional
- Spare parts
  - Field services

Optimised maintenance

Retrofits AND upgrades

2-5X\*

Agreements AND Performance-based agreements

Moving up the service value ladder

\*Customer spending ratio EUR/kW



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

- A broad array of solutions is needed to decarbonise marine and energy.
- We will continue developing our core technologies, and through partnering, we can ensure even broader solution offering for our customers.
- We will continue to invest a stable ~3% of net sales in R&D.

**241 MEUR**

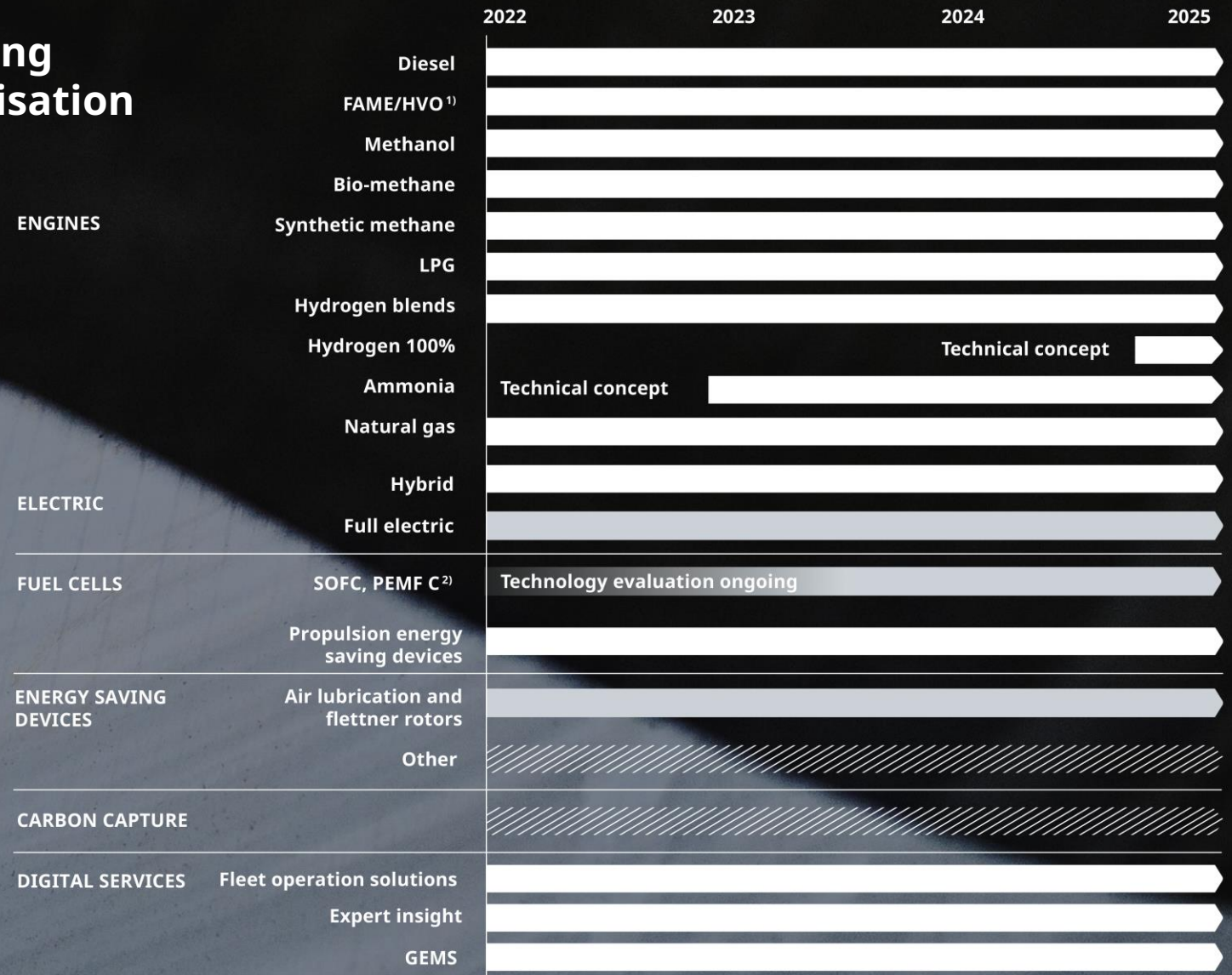
invested in R&D in 2022, which represents 4.1% of our net sales.

**2,850**

patents and applications in January 2023.



# Broad solution offering to support decarbonisation



OWN TECHNOLOGY
  Through partnering
  Both in house development and partnering

<sup>1)</sup> FAME, HVO: biodiesel <sup>2)</sup> SOFC: solid oxide fuel cell, PEMFC: proton exchange membrane fuel cell



## Financial highlights 2022

Order intake

**6,074** MEUR

Order book at the end  
of the period

**5,906** MEUR

Net sales

**5,842** MEUR

Operating result

**-26** MEUR

Operating result,  
% of net sales

**-0.4%**

Basic earnings/share, EUR

**-0.11**







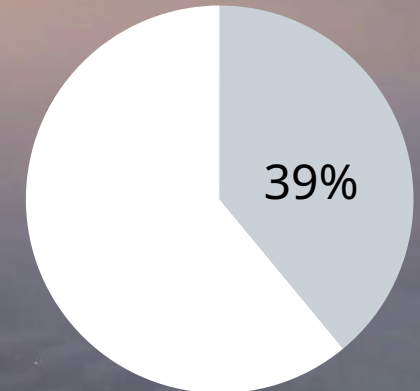
# Wärtsilä Energy



## Wärtsilä Energy

- Wärtsilä Energy leads the transition towards a 100% renewable energy future.
- We help our customers in decarbonisation by developing market-leading flexible technologies and services.
- These cover future-fuel enabled grid balancing power plants, hybrid solutions, energy storage and optimisation technology, including the GEMS Digital Energy Platform.
- Wärtsilä Energy's lifecycle services are designed to increase efficiency, promote reliability and guarantee operational performance.

Share of total net sales



4,980  
Personnel



# We optimise your power system for a renewable energy future



Engine power plants



Energy storage



Lifecycle services



Energy system optimisation



# Wärtsilä Energy in numbers

**GLOBAL TOP  
PLAYER**

For engine power plant &  
energy storage installations

**110+**

Energy storage  
installations

**4 900+**

Employees

**180**

Countries  
delivered to

**17.8 GW**

Under service  
agreements

**76 GW**

Power plant  
capacity delivered





# Market trends in the energy sector

The growing electricity demand, increased need for energy security and decarbonisation targets all shape the energy market today.



Electrification of transport, buildings and industrial sectors



Increased need for balancing solutions



Need for energy security



Gradual replacement of coal



Energy storage technologies grow and develop rapidly



Digitalisation to optimise increasingly complex energy systems



Renewables becoming main source of power




Development and increasing use of sustainable fuels



New regulations and policies to accelerate decarbonisation





## Towards a 100% renewable energy future

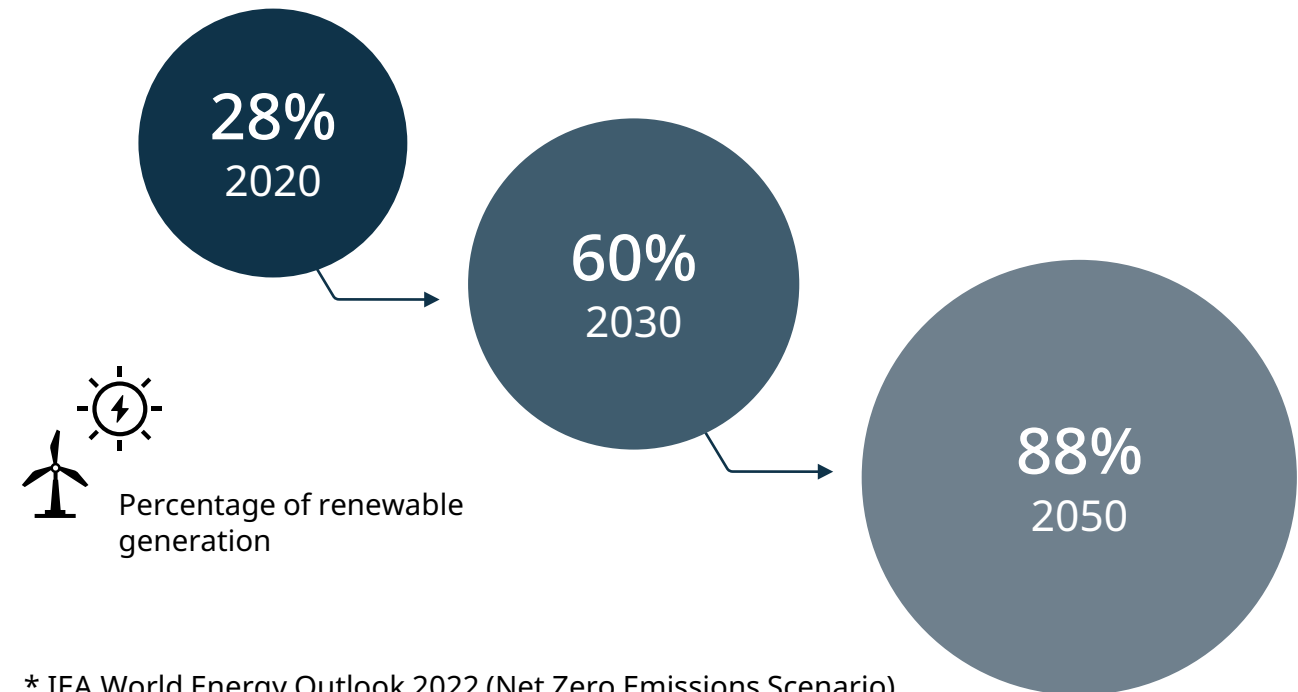
The energy landscape is in transition towards more flexible and decarbonised energy systems. We envision a 100% renewable energy future.



## The future of energy is renewable – balancing solutions will make the transition a reality

Renewable energy capacity is expected to grow 8x by 2050. To achieve the *Net Zero Emissions Scenario*\* by 2050, renewables should provide 88% of the world's energy supply.

As the share of renewables increases in power generation, the volatility of the system will surge. Balancing solutions are needed.



\* IEA World Energy Outlook 2022 (Net Zero Emissions Scenario)



# Decarbonisation is feasible with current technologies

## Technologies needed for a net zero power system



Wind and  
solar



Engine power  
plants



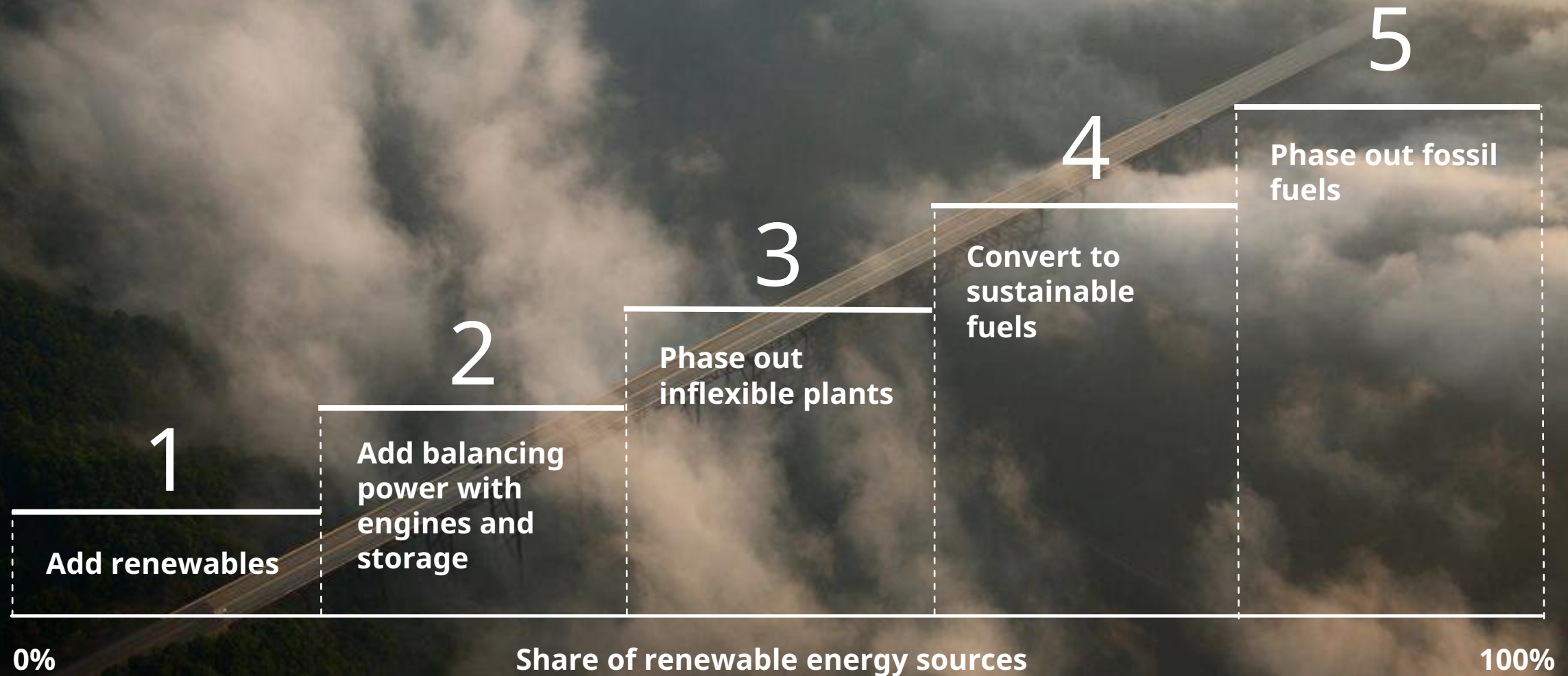
Energy  
storage



Sustainable  
fuels

# What are the steps for regions worldwide to reach net zero?

The path is similar everywhere.





# Our power system modelling demonstrates a cost-optimal, reliable and rapid energy transition

We model the cost-optimal path towards 100% renewable energy systems for customers, cities and entire countries.

Wärtsilä has already modelled over 180+ power systems across different countries and regions.

## BENEFITS AND GOALS:

- Understand operations and fundamentals of power systems
- Quantify system level benefits of different generation and storage technologies
- Understand and promote high quality modelling



# Wärtsilä Marine Power





## Decarbonisation transformation



Decarbonisation will transform the marine industry at an unprecedented pace

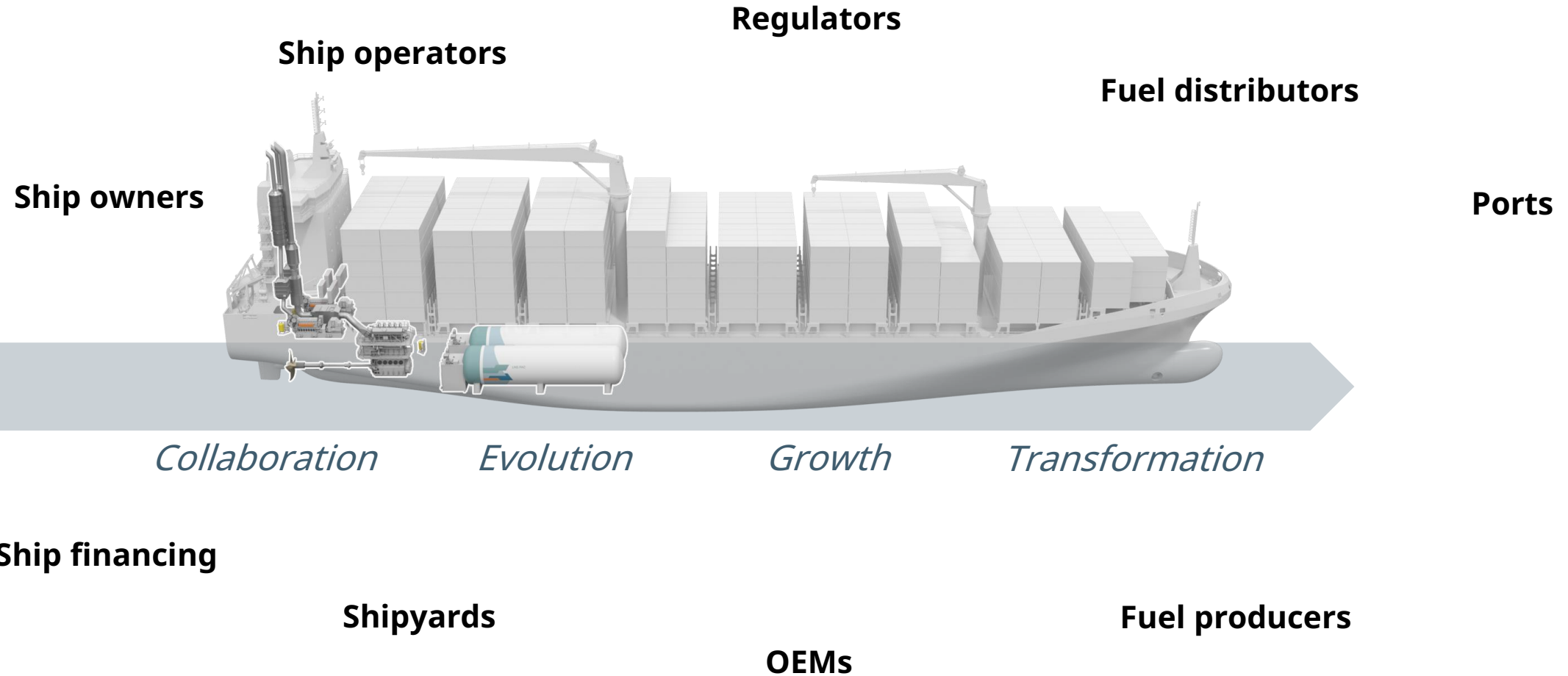


Fuel flexible engine technology allows for an opportunity balancing decarbonisation targets with financial viability



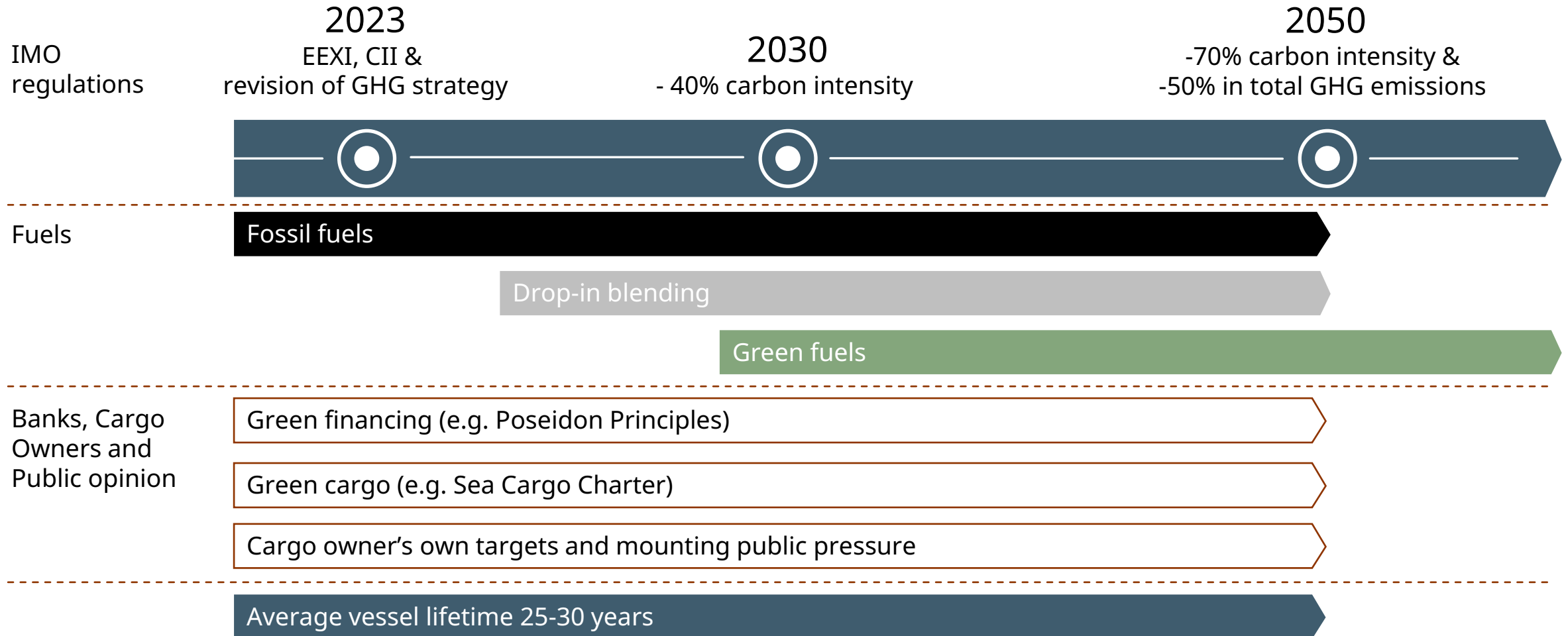
Collaboration and partnership are essential in resolving the challenges we will face in upcoming decades

# Our entire marine ecosystem needs to evolve





# Decarbonisation targets are shaping the future of our industry – banks, cargo owners and public opinion have increasing influence in the speed of change



# Sustainable solutions are available – today

## Methanol

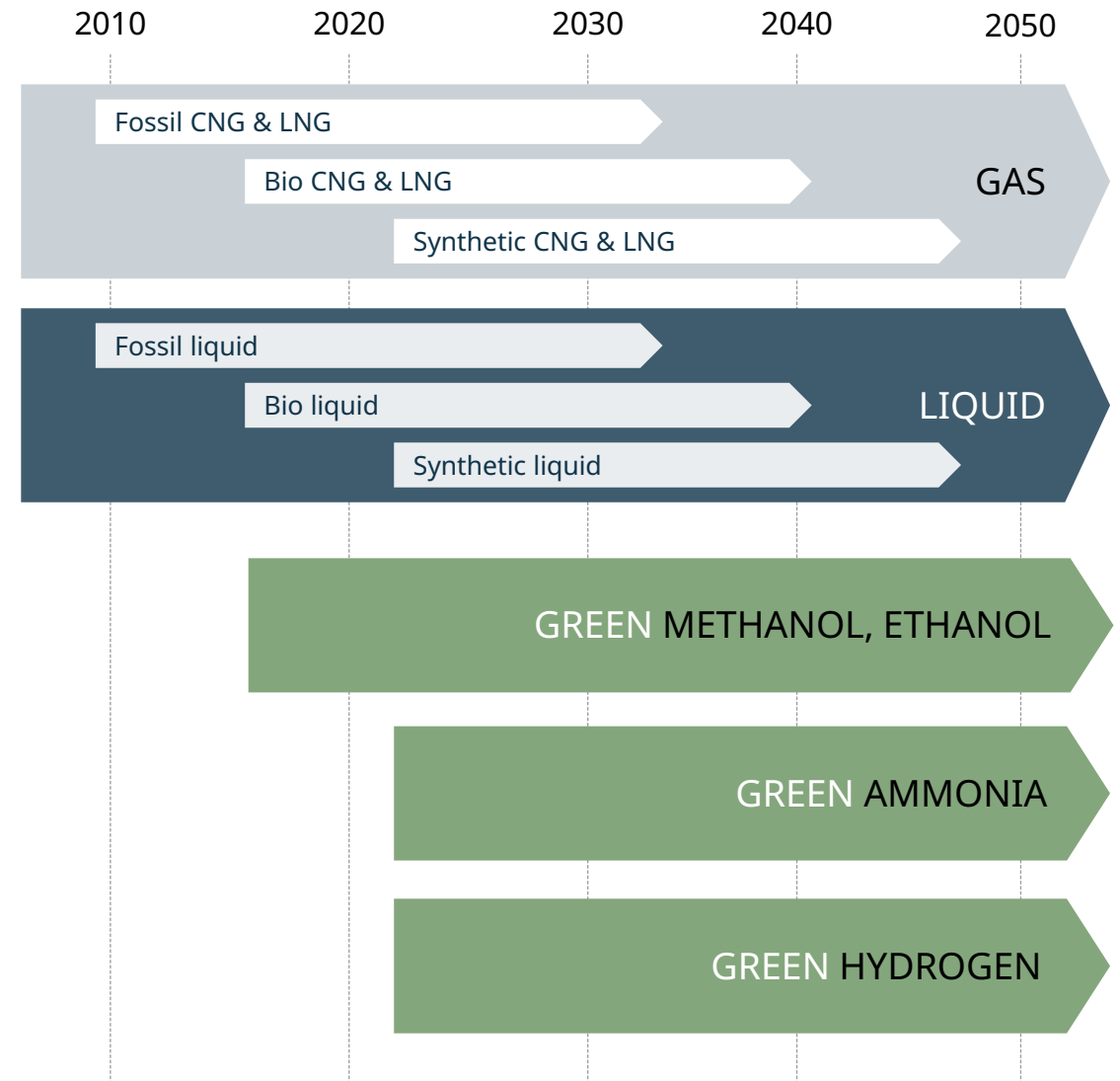
- March 2015, ZA40 retrofitted for Methanol operation
- January 2022, W32 Methanol launch
- 2023 serial production

## Ammonia

- Combustion concept maximises engine performance, developing safety technologies
- 70% Ammonia blend achieved

## Hydrogen

- Wärtsilä gas engines blend up to 25%-vol hydrogen in natural gas, combustion concepts aim for 100% hydrogen
- Pure Hydrogen operation achieved





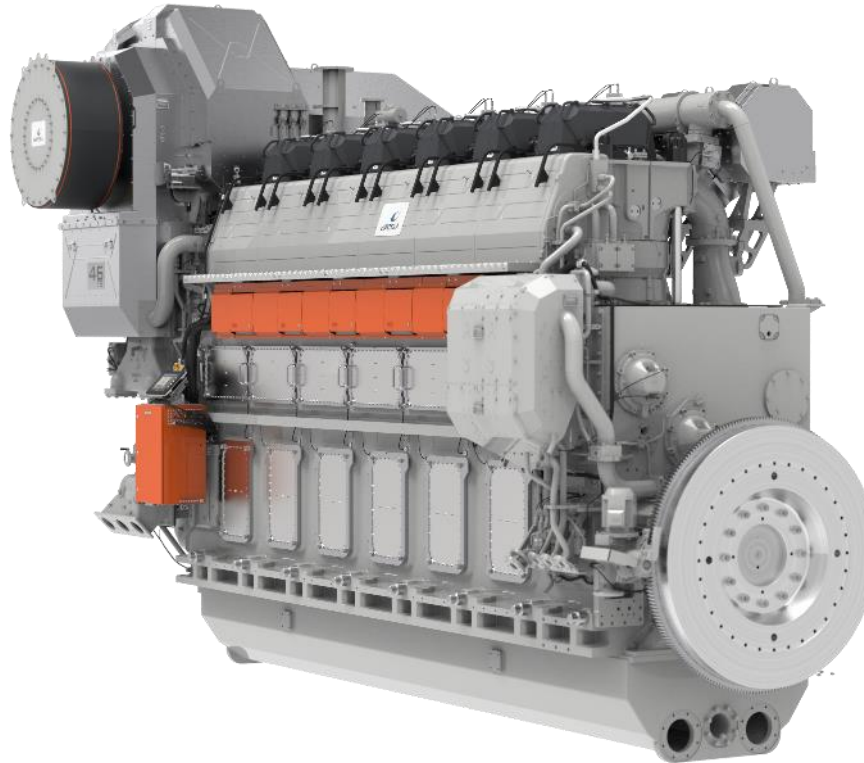
# Multifuel combustion engines let you adopt green fuels at your own pace

Technical feasibility enables progressive adoption of green fuels

Drop-in  
▼  
Drop in the tank compatible biofuels e.g. LNG and liquid bio-methane

Blending  
▼  
Injecting different fuels e.g. fuel oil and green ammonia into the engine

100% Pure



Best Total Cost of Ownership makes transition financially viable <sup>1)</sup>

- Low CAPEX and vessel-long lifespan
- Predictable operational and maintenance costs
- Upgradeable, modular structures mean faster conversions

Source: 1) DNVGL Maritime Forecast ed. 2020 and Lloyd's Register Techno-Economic Assessment of Zero Carbon Fuels ed. 2020

# Technology development for 100% green fuels

Upgradeability through multifuel technology innovation

## Methanol

- 2015: First engine conversion ZA40S
- 2023: Delivery of first Wärtsilä 32 methanol engines. Multiple engine releases for both newbuilds and conversions

## Ammonia

- 2022: Combustion, performance and optimisation testing
- 2023: Release of the first engines for both new build and conversions

## Hydrogen

- 2022-2023: Combustion testing on blends up to 100%
- 2025: Hydrogen concept launch

## Sustainable Technology Hub

- STH in Vaasa, Finland will deliver the world's first ammonia and hydrogen 4-stroke medium-speed engines
- Holding the industry's most comprehensive development programme for sustainable fuel technologies



# The right solution for each vessel



Engine optimisation  
& fuel flexibility



Electrification







Energy saving  
devices











Lifecycle  
solutions

Wärtsilä Marine Power provides upgradable solutions for a net-zero future, and is well-positioned for the maritime decarbonisation

**Technology**

-  Multi-fuel engines
-  Propulsion systems
-  Catalyst systems
-  Fuel gas supply systems

**Services**

-  Hybrid systems
-  Electrification solutions
-  Voyage and fleet optimisation
-  Port optimisation and simulators
-  Spare parts
-  Maintenance services
-  Performance based agreements
-  Upgrades & retrofits





# The value of the Wärtsilä Lifecycle Agreements

Supporting 700+ ships worldwide with 90% of issues resolved remotely



## Reduced downtime

Decrease the risk of unplanned maintenance and costly downtime



## Fuel savings

Reduce fuel consumption and reduce OPEX - know your maintenance costs years ahead



## Lower emissions

Cut CO<sub>2</sub> emissions and improve the cost of compliance in your journey towards decarbonisation



## Voyage optimisation

Integrated onboard solution for route planning, optimisation and monitoring

# Wärtsilä supports vessel upgrades to meet decarbonisation targets



Wärtsilä supports vessel upgrades to meet decarbonisation targets



Vessels built 2010-2030 will need to evaluate options for use of alternative fuels

## Our offering

- Limited power & speed
- Engine optimisation & fuel flexibility
- Electrification
- Energy Saving Technologies





## We have proved to our agreement customers that up to 5% fuel consumption savings are achievable

The global fuel bill for the maritime industry <sup>1)</sup>

**EUR 141bn**



Up to 5% annual fuel saving equals

**EUR 3.5bn**  
**40+ Mtons CO<sub>2</sub>**

**Fuels will be more expensive in the future:**  
maximising fuel efficiency will be of paramount importance

Delivering guaranteed performance is a journey with our customers

## Key facts



The world's most extensive network of maritime expertise across over **200** locations and over **50** countries



Wärtsilä's biggest business **2 Bn EUR** Net Sales, over **43,000** equipment installed in **18,000** vessels



**70,000** transactions for Parts and **3.8 million** man hours billed for Field Services each year



Market leader in medium speed main engines **69 GW** of engines installed base, **17.5 GW** under agreement



Leading the path towards **decarbonisation** by developing state of the art technology and enabling adoption of clean fuels



Top player in ECDIS (**11,000+** vessels), VTS (**350+** ports), simulators (**45%** market), controllable pitch propellers, waterjets, steerable thrusters



# Strengths

Delivering the world's most efficient integrated powertrain system

Pioneering research & development of new technologies

Unrivalled know-how in alternative fuels & fuel flexibility

Increasing customer value through lifecycle solutions

Subject matter experts with a passion to make a difference



# Wärtsilä Marine Systems



## Marine Systems

- We at Wärtsilä Marine Systems support our customers with high quality products and lifecycle services related to the
  - gas value chain
  - exhaust treatment
  - shaft line & underwater repair
- We are committed to providing the latest and most efficient solutions, in line with Wärtsilä's vision for a safe and sustainable future for our customers, our communities and our planet.

Share of total net sales






13%

1,564  
Personnel

# Solutions for our customers decarbonisation and optimisation journey

## SHAFT LINE SOLUTIONS

Shaft line product and service provider, offering capabilities required to provide complete integrated shaft line solutions from its global factories and service locations to customers in its core market segments: navy, merchant and cruise.

-  Zero leakage
-  Lifecycle services and support
-  Reliability optimisation

## GAS SOLUTIONS

Service provider for the gas value chain, covering cargo handling systems for gas carriers, liquefaction and gasification systems. Renewable gas systems with solutions for biogas upgrading and liquefaction.

-  Decarbonisation
-  Lifecycle services and support
-  Remote monitoring
-  Operational efficiency

## EXHAUST TREATMENT

Our Exhaust Gas Cleaning technologies are the most economical and sustainable way to reduce harmful emissions from traditional fuels, while futureproofing compliance with upcoming regulations.

-  Decarbonisation
-  Lifecycle services and support
-  Digital solutions
-  Reliability optimisation



# Wärtsilä Exhaust Treatment

## Onboard Carbon Capture and Storage (OCCS)

- Our technology has the immediate potential to enable marine decarbonisation for existing and newbuild vessels, reaching current 2050 decarbonisation targets as early as 2030.
- At our test facility in Norway, we are currently running the system at 70% capture rate on a commercially viable energy cost.
- A full-scale pilot project will commence in 2023 on the 21,000 cbm ethylene carrier Clipper Eos. This industry-first leads the way for product launch in 2025.



# Wärtsilä Gas Solutions



**LPG, LNG, LEG, ammonia, CO<sub>2</sub>**  
 Designer and supplier of advanced cargo handling and reliquefaction system to gas carriers of all sizes



**LNG, LPG and future fuels**  
 We provide several options of cleaner fuels; LPG-, LNG- and ammonia as fuel.



**Reliquefaction**  
 Our reliquefaction system is used to control LNG tank pressure by liquefying boil-off gas (BOG)



**Regasification, LNG to Power**  
 LNG regasification- and reliquefaction technology for FSRU's and FSU's for newbuilds and conversions.



**Biogas**  
 We provide robust and efficient solutions for biogas upgrading and liquefaction.



**VOC**  
 The Volatile Organic Compound (VOC) recovery system prevents harmful compounds from being emitted to the atmosphere



**Offshore inert gas package**  
 Our inert gas generator system ensures the correct atmosphere in the cargo tanks



**Services**  
 Lifecycle services & digital offerings



## Wärtsilä Shaft Line Solutions

Services that maximise the lifetime of the shaft line

### Wärtsilä Underwater Services

As the first global operator in the underwater services market with a team of certified diver technicians and propulsion experts, we are uniquely positioned to carry out upgrades or overhauls under the water on a global scale.

### Wärtsilä Shaft Line Repair Services

In the event of a minor or major shipping incident, this interdisciplinary offering brings customers a comprehensive overhaul and upgrade for shaft lines and associated equipment.

### Wärtsilä Shaft Field Services

Our highly skilled Field Services team is ready to respond worldwide to in-situ commissioning, repairs and overhauls to help ship operators decrease downtime and eliminate the need for dry-docking.





# Wärtsilä Portfolio Business



## Portfolio simplification

Portfolio Business was established to focus on a stronger and simpler core Wärtsilä offering and to unlock the potential value for the divested entities

### Businesses for divestment

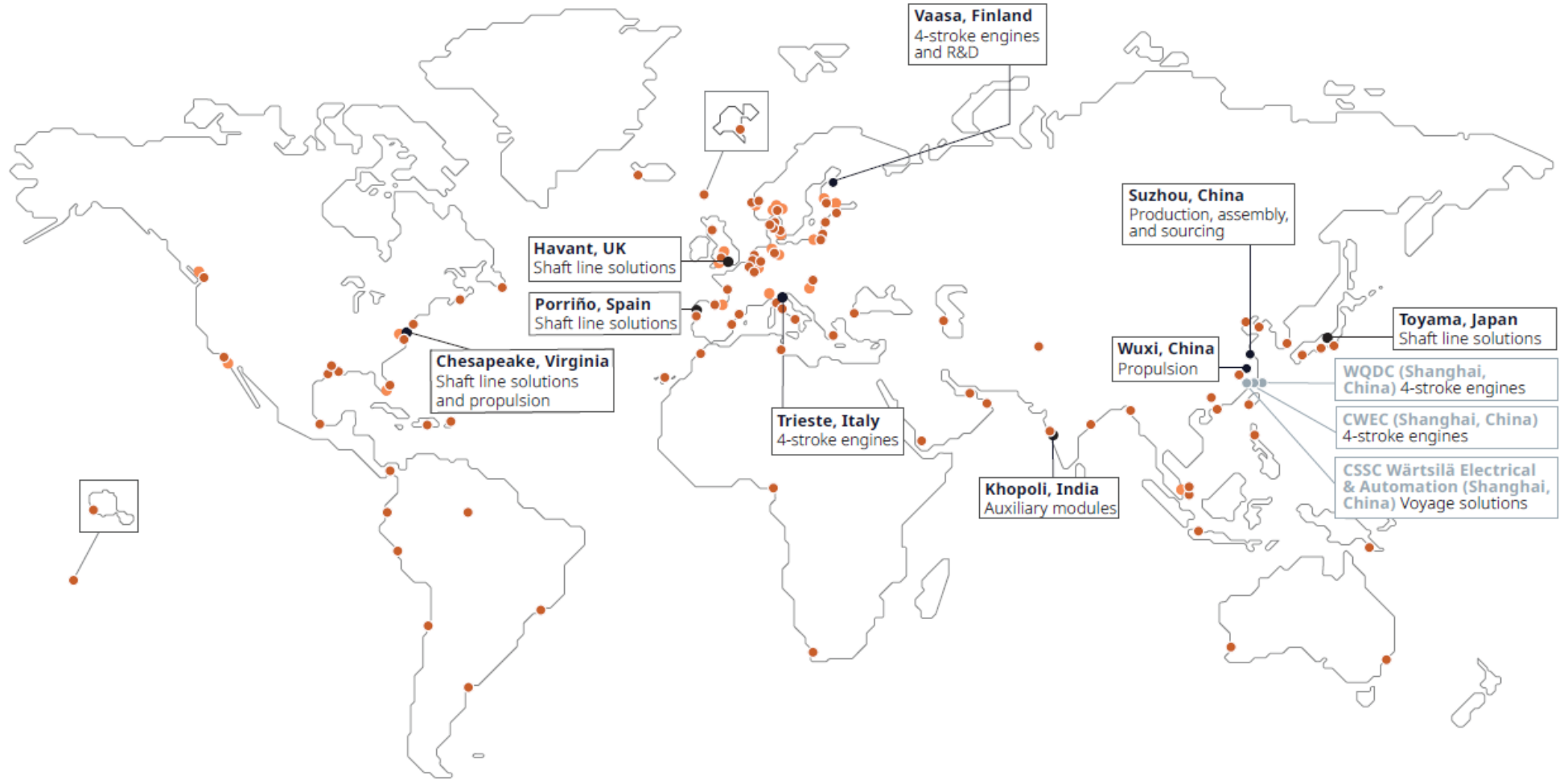
- Automation, Navigation and Control Systems (ANCS)
- Marine Electrical Systems
- Water & Waste

### Businesses divested

- American Hydro
- Valves
- Jovyatlas
- ELAC Nautic Business
- Euroatlas
- Entertainment Business
- Tank Control Systems



# Wärtsilä's position as a global company is reflected in the geographical breakdown of our net sales



Net sales, geographical



Europe 29%    Americas 35%  
Asia 25%    Other 10%

● Sites with engineering, R&D (fully owned)    ● Sites with sizeable manufacturing (fully owned)    ● Joint venture sites    ● Service locations



# Financial highlights

<b>MEUR</b>	<b>2022</b>	<b>2021</b>	<b>2020</b>	<b>2019</b>	<b>2018</b>
Order intake	<b>6,074</b>	5,735	4,359	5,327	6,307
Order book at the end of the period	<b>5,906</b>	5,859	5,057	5,878	6,166
Net sales	<b>5,842</b>	4,778	4,604	5,170	5,174
Operating result	<b>-26</b>	314	234	362	543
% of net sales	<b>-0.4</b>	6.6	5.1	7.0	10.5
Comparable operating result	<b>325</b>	357	275	457	577
% of net sales	<b>5.6</b>	7.5	6.0	8.8	11.2
Basic earnings/share, EUR	<b>-0.11</b>	0.33	0.23	0.37	0.65

## Ambitious decarbonisation targets for 2030

Provide a product portfolio which will be ready for zero carbon fuels

Become carbon neutral in our own operations



# We have a systematic approach to managing sustainability

## **Sustainability strategy and targets**

Strong focus on decarbonisation

## **High ethical standards**

Values and Code of Conduct program

## **Defined processes**

Management systems, tools, and practices

## **Transparent reporting**

Sustainability reporting according to GRI standards

## **External recognitions**

Such as DJSI and FTSE4Good indices





# Core elements of Wärtsilä decarbonisation actions



**Products and services**  
Offering innovative technologies and lifecycle solutions with high efficiency and low emissions



**Operational measures**  
Targeting carbon neutrality and continual environmental improvements



**System level solutions**  
Improving and optimising overall efficiency and lowering emissions at system level



**R&D**  
Developing sustainable and future proof technologies



**Collaboration**  
Joining forces with stakeholders in promoting climate and environmental actions



## Shaft line solutions

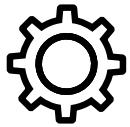
Specialists in designing, manufacturing and servicing propulsion shaft lines for the marine market. Shaft Line Solutions offers a comprehensive portfolio of products, integrated Shaft Line Solutions, underwater services and complete aftermarket services.

### KEY FACT

Underwater Services is a unique lifecycle offering from Shaft Line Solutions.



Reliability



Lifecycle support



Zero leak



# Gas solutions

Wärtsilä's gas solutions bring carbon neutral or transition fuels to the market and minimise emissions from the gas value chain. By doing so, Wärtsilä helps customers on the journey towards a sustainable future through a focus on lifecycle support innovation, and digitalisation.

## KEY FACT

**500** gas solution projects, almost **3,000** inert gas systems and **45** biogas solutions delivered by Gas Solutions



Decarbonisation



Lifecycle solutions



Remote monitoring



Operational efficiency





# Exhaust treatment

Wärtsilä Exhaust Treatment provides abatement technologies for the marine industry and is the market leader. We develop solutions that go beyond the current marine sector regulatory framework addressing current and future environmental challenges.

## KEY FACT

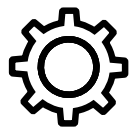
**650 exhaust gas cleaning** projects delivered by Exhaust treatment



Decarbonisation and towards zero emission



Optimisation for reliability



Lifecycle services



Digital solutions






# Marine Power offers customers a solution to present challenges and an upgrade path to the future

## CORE STANDALONE PRODUCTS

 Engines

 Propulsion


## KEY COMPLEMENTARY TECHNOLOGIES

 Catalysts (NOx reduction)

 Fuel Gas Supply Systems

 Electrical & Power Management Systems

## LIFECYCLE SOLUTIONS


 Part services  
Field & workshop services

Retrofit & upgrade services


Maintenance agreements

Performance based agreements

## AN UPGRADE PATH TOWARDS DECARBONISATION

 Fuel flexibility

 Hybrid power

 IMO target compliance