

SUSTAINABILITY TALKS

# SHAPING THE DECARBONISATION OF MARINE AND ENERGY

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## Purpose of the event

- Give deeper insight on how Wärtsilä can make a difference in the decarbonisation of the marine and energy markets
- Elaborate on the rationale for our decarbonisation targets
- Continue the decarbonisation dialog with external stakeholders



# 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



# MARKET FUNDAMENTALS

## MARINE will move with unprecedented speed towards decarbonisation

### Policies & regulations

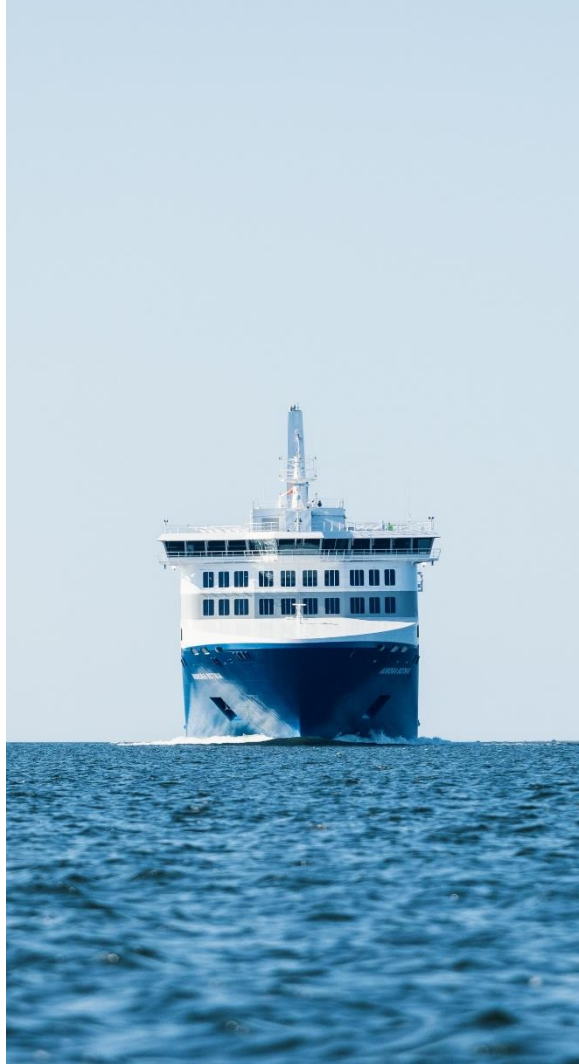
- IMO target
- Access to capital
- Cost of carbon
- Demand for green sea transport

### Technology

- Carbon neutral and zero carbon fuels
- Carbon fuels for many years, still
- Abatement technologies
- Battery systems, hybrids & energy saving devices
- Fuel efficiency & flexibility

### Connectivity & data

- Vessels as data pools
- Optimisation solutions
- Performance-based agreements
- Cyber security
- Autonomous operations



## ENERGY is moving towards a 100% renewables future

### Policies & regulations

- EU: Carbon neutral by 2050
- USA: carbon free electricity production by 2035, net zero emissions by 2050
- China: Carbon neutral by 2060

### Technology

- Wind and solar growing rapidly
- Intermittent sources requiring balancing power
- Sustainable fuels for thermal balancing
- Digitalisation
- Cyber security

### Growing ENERGY demand

- By 2050, electricity generation expected to grow by 3X, renewables by 8X <sup>1)</sup>
- By 2030, balancing power market to grow by 10X <sup>2)</sup>
- Gradual replacement of coal
- Power systems increasingly complex



1) IEA World Energy Outlook 2021 (Net Zero Emissions Scenario)  
2) Bloomberg New Energy Outlook 2020, Wärtsilä estimates

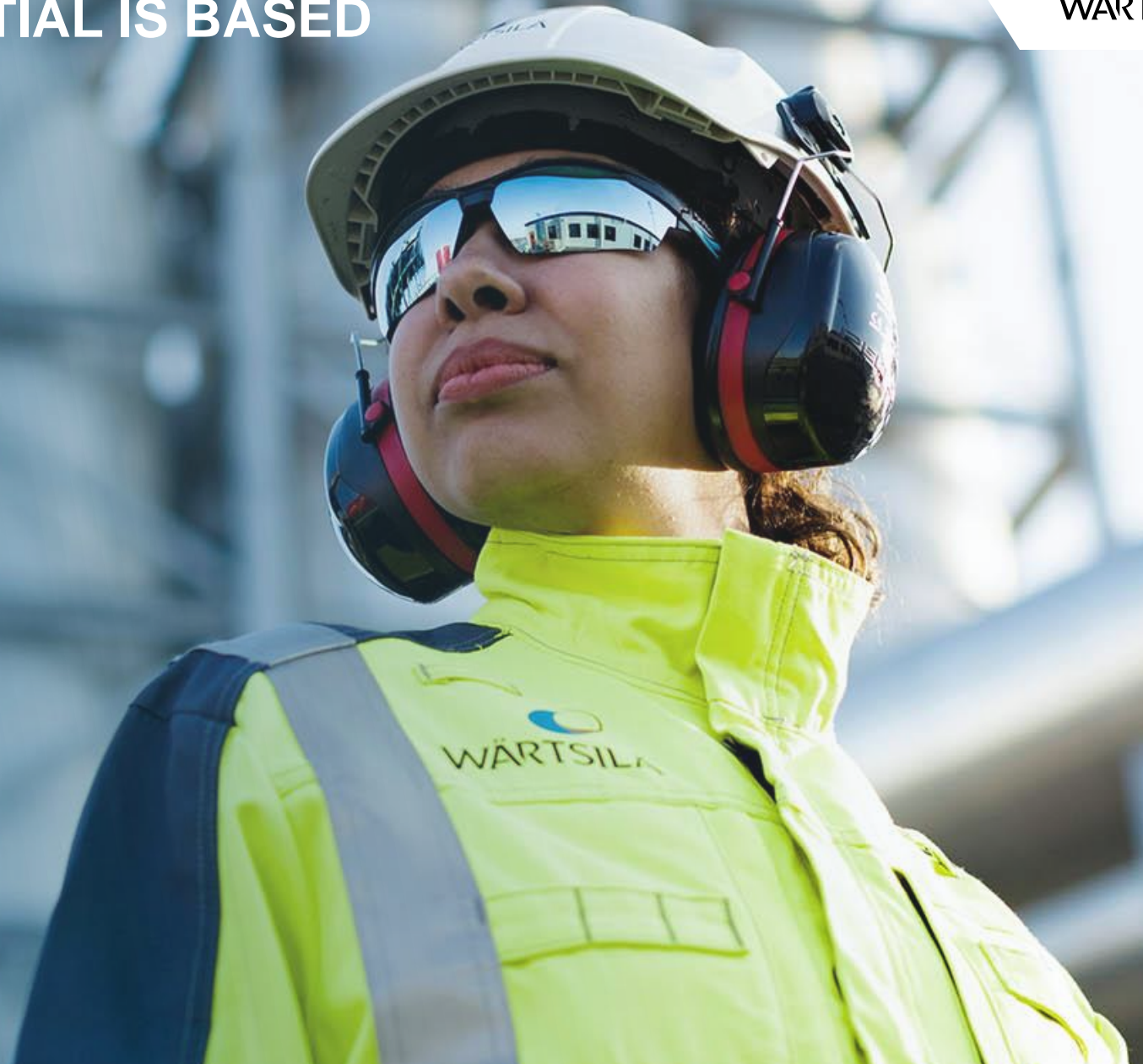
# OUR VALUE CREATION POTENTIAL IS BASED ON TWO STRATEGIC THEMES

**1 TRANSFORM**  
Decarbonisation creates  
new business opportunities

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**2 PERFORM**  
Leverage market  
recovery and growth

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# TRANSFORM

Decarbonisation creates new business opportunities

- Maritime is going through an unprecedented rate of change, which is accelerated by regulations and the demand for green transport.
- Also, the energy sector is undergoing a massive transformation as decarbonisation and renewables are fundamentally going to change the way energy is generated.
- We are set for performance and have significant value creation potential to drive this transformation as a technology leader.



**1** Major test programme launched, 100% ammonia concept in 2023, 100% hydrogen in 2025



**2** Extensive service network, positioned for growth both in transactional services and performance-based agreements



**3** First Wärtsilä GridSolv Quantum delivered in the USA



**4** First real-life digital port call with Wärtsilä Navi-Port



**5** Wärtsilä selected to supply world's largest bioLNG production plant



**6** Hitting methanol milestone with first newbuild engine order



**7** Ensuring optimal performance and minimal carbon footprint for world's most environmentally friendly ferry

# PERFORM

We are ready to leverage market recovery and growth

#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



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

## Focus on:

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

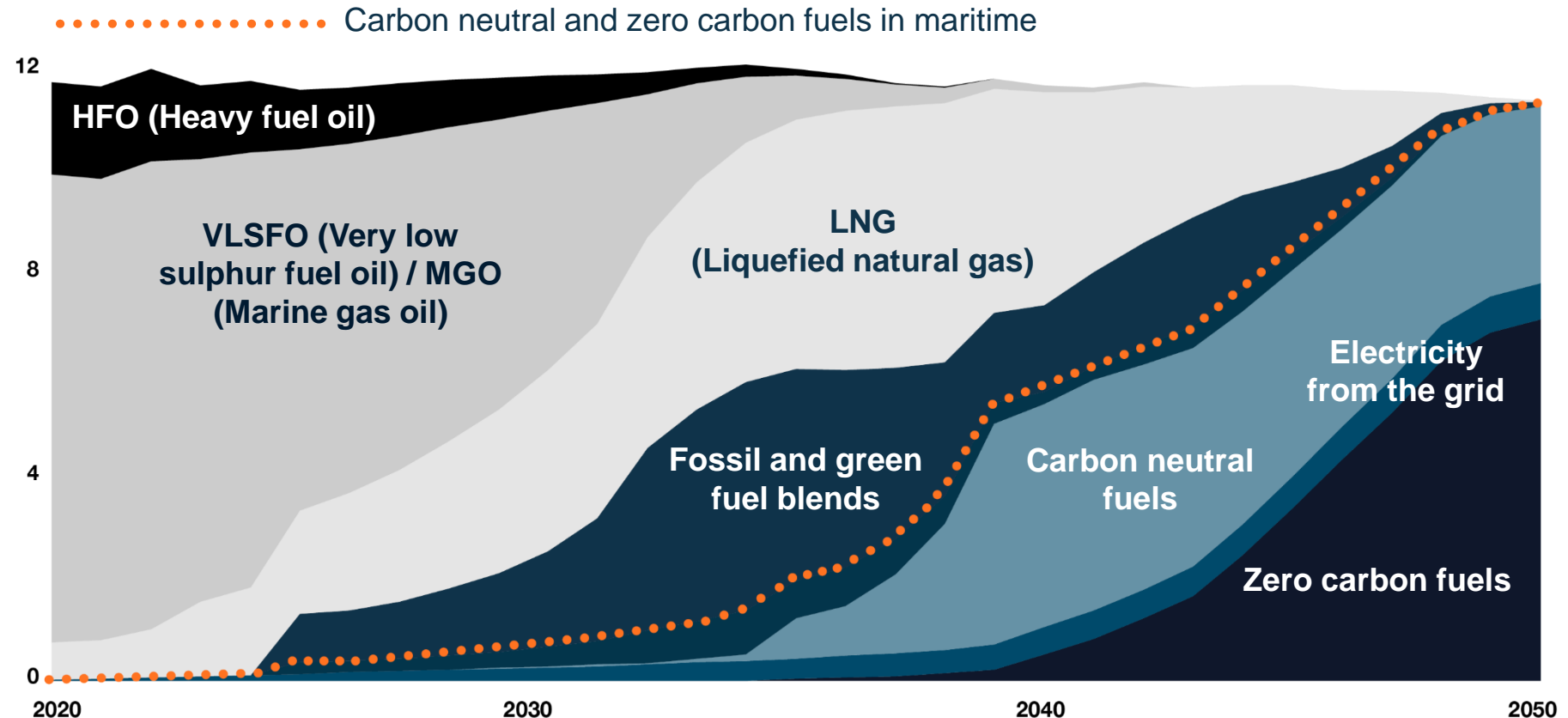
# SUPPORTING DECARBONISATION IN MARINE

## OWNERS WILL DECIDE ON TECHNOLOGY PARTNERS NOW:

- Vessel life is 25-30 years
- Critical decision criteria:
  - Multifuel capabilities for blending with green fuels
  - Conversion capabilities for future fuels

## MOVE FROM A SINGLE-FUEL INDUSTRY TO A MULTI-FUEL ONE

Distribution of fuel types for Decarbonisation 2050 (1.5°C scenario), exajoule

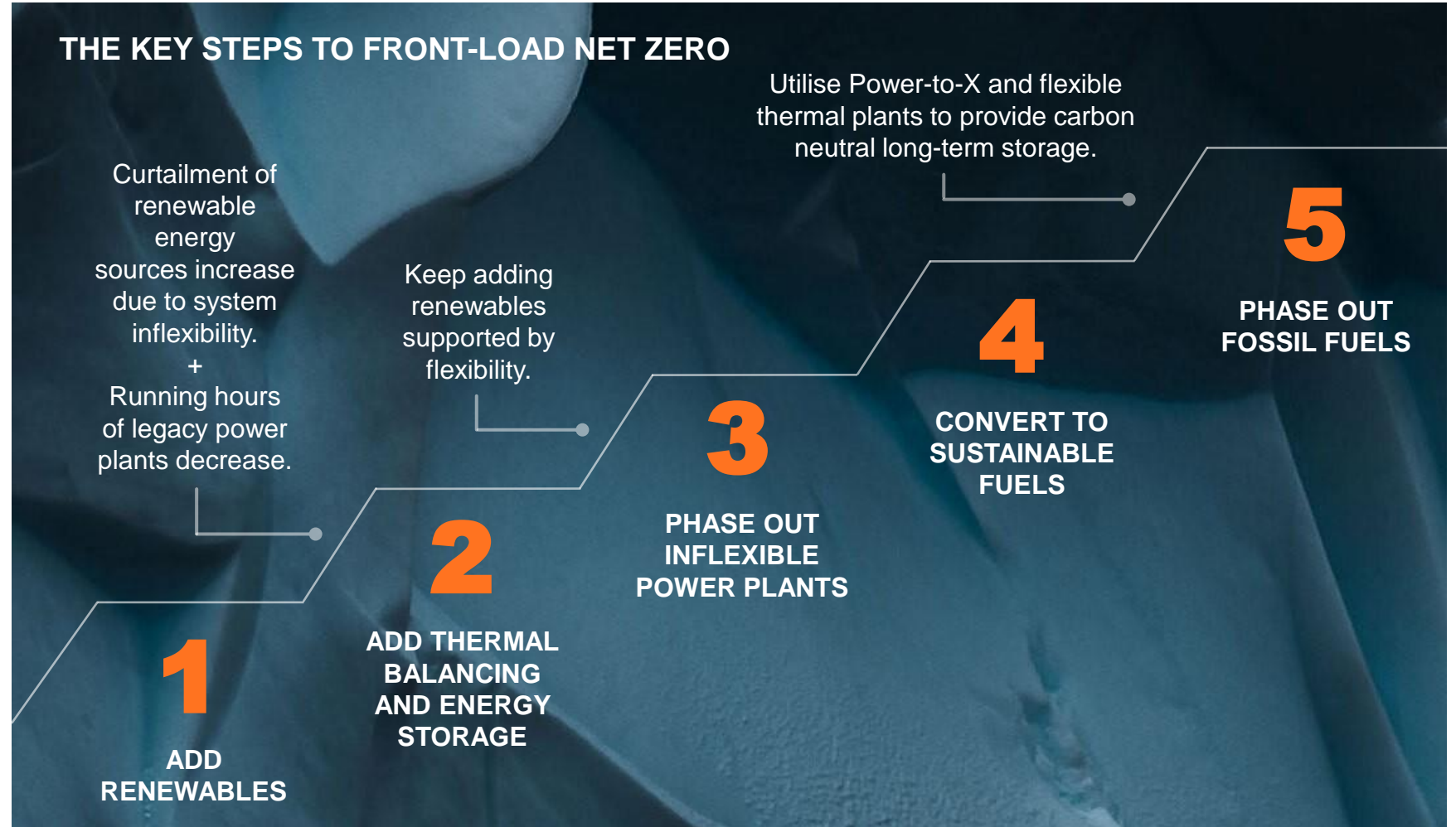


Source: DNV Maritime Forecast 2050 model, Wärtsilä internal estimates



# SUPPORTING DECARBONISATION IN ENERGY

- Wind and solar are intermittent power sources
- Flexible balancing power needed to stabilize the power system: balancing power market expected to grow by 10X <sup>1)</sup>
- Reciprocating engines ideally suited to provide balancing power
  - Energy efficient
  - Fast ramp up/ramp down
  - Fuel flexible
- Today running on gas, tomorrow on green fuels



1) by 2030. Source: Bloomberg New Energy Outlook 2020, Wärtsilä estimates

# LEADING THE DECARBONISATION JOURNEY WITH A STRONG COMMITMENT TO R&D AND THROUGH PARTNERING FOR A BROAD SOLUTION OFFERING



**Proactive dialogue on customers' specific technology roadmap**

**Competence & experience to engage in a credible customer dialogue on "all" technologies**

**Solution offering for "most" technologies**

**Leveraging leadership in core technologies and partnering for complementary technologies**

## KEY TAKEAWAYS

- Working with many of the "new" technologies for decades
- Conversion to new fuels requires only a **limited number of new engine parts**
- Large **technology synergies between Marine and Energy**
- Transformation manageable with a **stable R&D allocation of ~3% of net sales**



# THE WÄRTSILÄ WAY SETS THE SCENE FOR PROFITABLE GROWTH

## THE WÄRTSILÄ WAY



### Purpose

Enabling sustainable societies through innovation in technology and services



### Target position

Shaping the decarbonisation of Marine and Energy

- New financial targets
- “Set for 30” – new decarbonisation targets



### Strategic priorities

Roadmap to improve performance and reach Target position



### Values

Customer Success, Passion, Performance



# DECARBONISING OUR PRODUCTS AND OPERATIONS



# AMBITIOUS DECARBONISATION TARGETS FOR 2030

**1** To provide a product portfolio which will be ready for zero carbon fuels

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**2** To become carbon neutral in our own operations

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# WHERE WILL WE HAVE SIGNIFICANT IMPACT?

Wärtsilä shapes the decarbonisation of marine and energy

## Decarbonising the usage of our products

## Decarbonising our own operations



**GLOBAL GREENHOUSE GAS EMISSIONS\***

over 52 Gt CO<sub>2e</sub>

\* Depending on the data source global GHG emissions and the share of the industry GHG emission differs. This data is based on World Resource institutes 2018 data

**GLOBAL EMISSIONS**



**SHIPPING\***  
1,1 Gt CO<sub>2e</sub>  
2 % of global GHG

**OUR SECTOR EMISSIONS**



**WÄRTSILÄ MARINE INSTALLED BASE**  
67 GW: 150-300 Mt CO<sub>2e</sub>  
(estimated)

**OUR CUSTOMER EMISSIONS**



**WÄRTSILÄ'S OTHER INDIRECT GHG EMISSIONS**  
2200 kt CO<sub>2e</sub>  
(estimated)

**OUR DELIVERY CHAIN EMISSIONS**



**WÄRTSILÄ'S DIRECT GHG EMISSIONS**  
57 kt CO<sub>2e</sub>

**OUR OWN EMISSIONS**



**ELECTRICITY AND HEAT\***  
15.6 Gt CO<sub>2e</sub>  
30% of global GHG



**WÄRTSILÄ ENERGY INSTALLED BASE**  
74 GW: 150-340 Mt CO<sub>2e</sub>  
(estimated)



**WÄRTSILÄ'S INDIRECT GHG EMISSIONS**  
54 kt CO<sub>2e</sub>



# DECARBONISING ENERGY SECTOR REQUIRES THERMAL BALANCING POWER

Wärtsilä's offering supports the power system decarbonisation

## 1 NEED

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**GHG emissions from electricity and heat:**  
~15,6 Gt CO<sub>2e</sub>

**National pledges**  
Carbon neutrality and coal phase out targets

**EU**  
55 % GHG reductions by 2030 and carbon neutrality by 2050

## 2 MEASURES

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**Transition from coal to gas**

**Replacement of fossil baseload energy with renewables**

**Installation of thermal balancing capacity and storage**

**Decarbonisation of the molecules**

## 3 WÄRTSILÄ'S ROLE

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### **Portfolio**

Engine power plants and storage supporting the integration of renewables in pathway to 100% renewable power systems.

### **Lifecycle services**

Fuel conversions and performance-based agreements

### **Future-proof technology**

Power plants capable of running on carbon neutral and zero carbon fuels and hybrid solutions

(Thermal capacity is needed in 100% renewable power systems due to changing weather conditions, seasonal changes and capacity optimisation)

# DECARBONISING MARINE SECTOR REQUIRES WIDE RANGE OF MEASURES

Wärtsilä technologies have key role in decarbonising the shipping

## 1 NEED

### Shipping GHG emissions:

~1,1 Gt CO<sub>2e</sub>

### IMO GHG targets

2030: - 40% carbon intensity

2050: -70% carbon intensity

### EU

Fit for 55 regulation package

## 2 MEASURES

### Decarbonisation of the powertrains

### Energy efficiency and savings

### Optimisation of logistic chain

## 3 WÄRTSILÄ'S ROLE

### Future-proof powertrains

Engines capable of running on carbon neutral and zero carbon fuels and hybrid solutions

### Portfolio

Wide portfolio providing energy savings

### Lifecycle services

Retrofits and guarantee of performance

### Digital solutions

Data driven solutions for optimising fleet and vessel operations



# CORE ELEMENTS OF WÄRTSILÄ DECARBONISATION ACTIONS

## PRODUCTS AND SERVICES

Offering innovative technologies and lifecycle solutions with high efficiency and low emissions

## SYSTEM LEVEL SOLUTIONS

Improving and optimising overall efficiency and lowering emissions at system level

## R&D

Developing sustainable and future proof technologies

## OPERATIONAL MEASURES

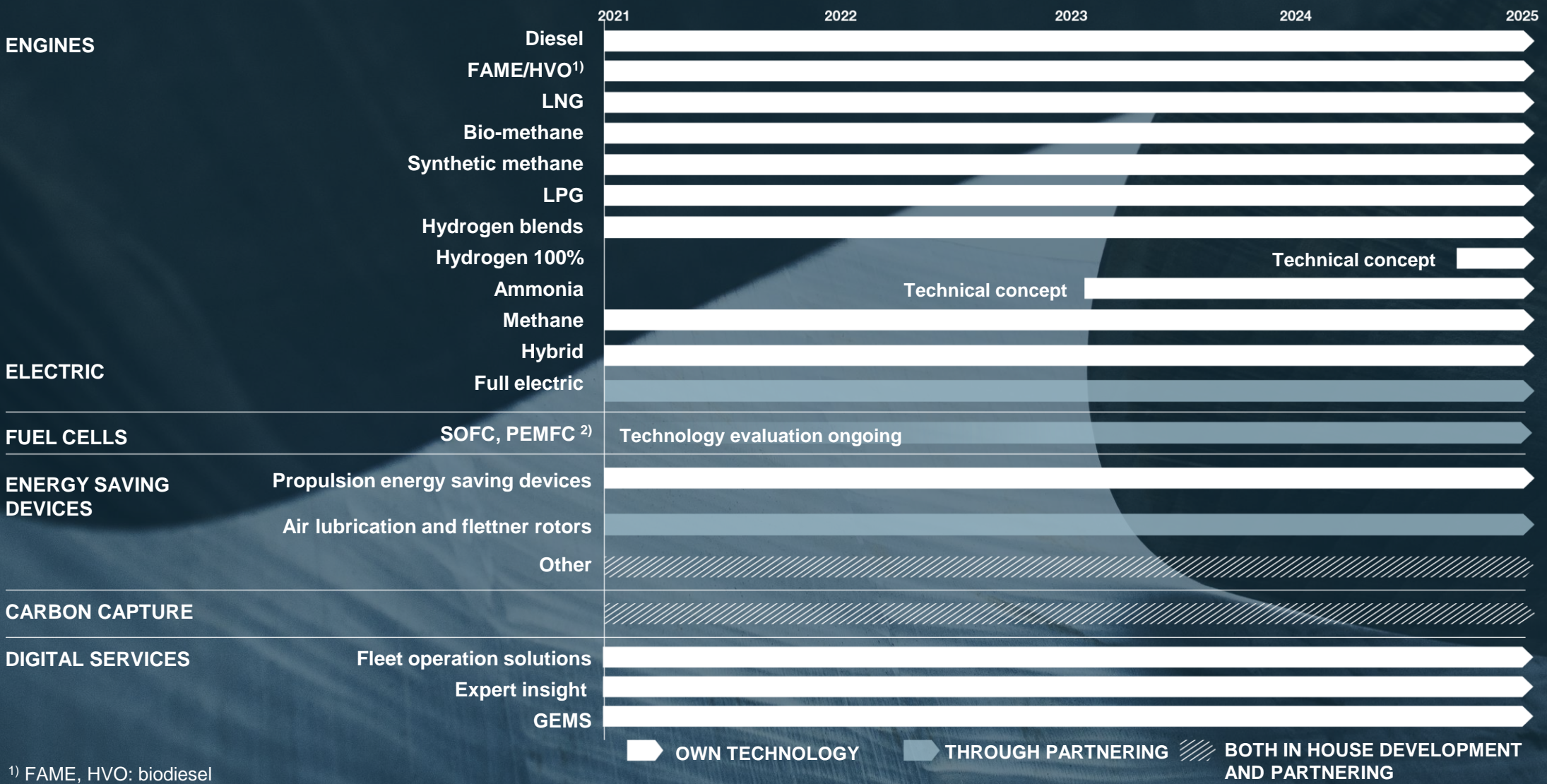
Carbon neutrality goal and continual environmental improvements

## COLLABORATION

Joining forces with stakeholders in climate and environmental action



# FRONT-RUNNER IN TECHNOLOGIES FOR DECARBONISATION



<sup>1)</sup> FAME, HVO: biodiesel

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



# ACCELERATING DECARBONISATION BY COLLABORATING IN AN ECOSYSTEM

## MULTISTAKEHOLDER COLLABORATION

**Zero Emission Energy Distribution at Sea (ZEEDS)** aimed at developing ammonia-powered newbuilds and converting suitable existing vessels.

**EU funded ShipFC project** development of ammonia storage and fuel supply system

**Demo2000 project** testing ammonia in a marine four-stroke combustion engine



## CUSTOMER COLLABORATION

**Wärtsilä and the Korean shipbuilding company Samsung Heavy Industries (SHI)**

- a joint development programme aiming at developing ammonia-fuelled vessels with 4-stroke auxiliary engines

**Wärtsilä and Norwegian ship owner Eidesvik Offshore ASA**

- a landmark cooperation aiming at converting an offshore supply vessel (OSV) to operate with an ammonia-fuelled combustion engine with the required fuel supply and safety system.
- This project will be the first of its kind ever in the world.

**Wärtsilä and Norway based Simon Møkster Shipping**

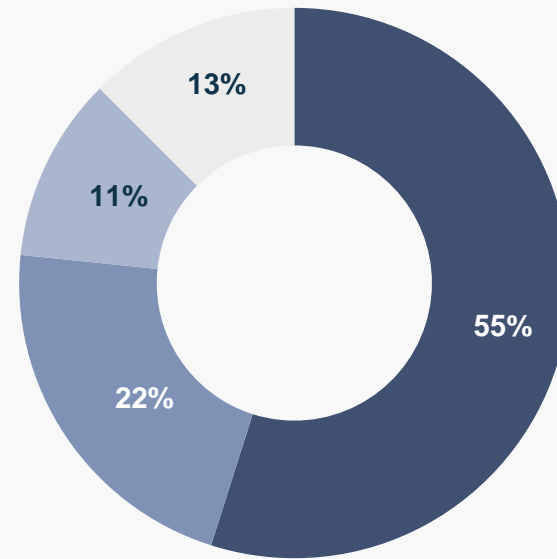
- a collaboration to carry out a feasibility study on utilising ammonia as the main fuel in dual-fuel engines where LNG is the alternative fuel.

# WÄRTSILÄ'S DIRECT GHG EMISSIONS COME MAINLY FROM ENGINE TESTING

GHG emission distribution (2019)

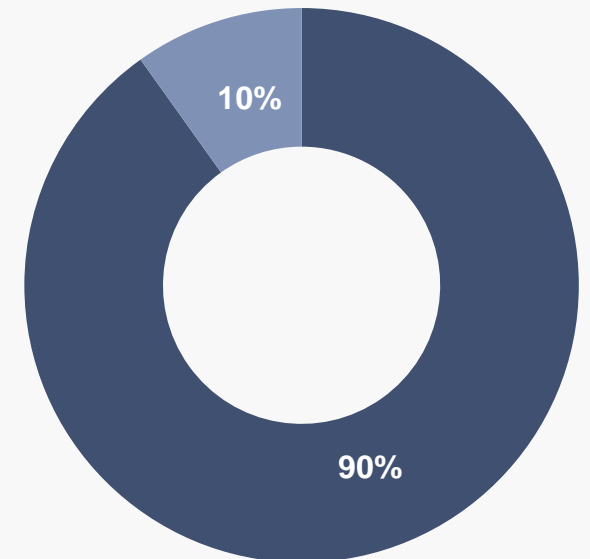
**Goal is to reach carbon neutrality covering scope 1 and 2 by 2030.**

**SCOPE 1 emissions from own facilities and vehicles are 57 KtCO<sub>2</sub>e.**



- Factory engine testing
- R&D testing
- Heating
- Vehicles

**SCOPE 2 emissions from purchased electricity and heat are 54 ktCO<sub>2</sub>e.**



- Purchased electricity
- Purchased heat



# DECARBONISING OUR OWN OPERATIONS REQUIRES ACTIONS ON BROAD FRONT

## OUR DECARBONISATION TOOL BOX



Energy efficiency measures



Low emission company vehicles



Self-generation and green electricity



R&D and factory engine testings – reduced time



Heat pumps in heating



Simulations and other technologies



Replacing fossil fuels with alternative fuels

- During 2022 Wärtsilä starts purchasing green certified electricity in Finland
- Potential to reach SBT1.5 C target level without compensation

# WÄRTSILÄ'S SUSTAINABILITY APPROACH

## PURPOSE

Enabling sustainable societies through innovation in technology and services

## SUSTAINABILITY STRATEGY

### VALUES

- Customer success
- Passion
- Performance

### ECONOMIC

- Meeting customer and shareholder expectations
- Contributing to the well-being of society
- Efficient, profitable and competitive operations

### ENVIRONMENTAL

- Innovative solutions for a low-carbon economy
- Technology leadership through R&D
- High environmental performance and efficiency
- Active engagement in ecosystems

### SOCIAL

- High ethical standards
- Responsible employer
- Interesting and exciting workplace
- Hazard-free working environment
- High product safety
- Supply chain development

### PRINCIPLES

- Code of Conduct
- Corporate policies
- Corporate manual

## SUSTAINABILITY MANAGEMENT

- Sustainability targets
- Sustainability measuring, reporting, external assurance
- Management systems, tools, and practices
- Stakeholder dialogue and collaboration



# STRONG SUSTAINABILITY AGENDA FOCUSING ON 3 CORE THEMES

## TOWARDS CARBON NEUTRALITY

“ Wärtsilä drives to decrease carbon emissions in its’ own operations and products and solutions its delivers.

### 2021 HIGHLIGHT

Successful engine tests with ammonia (70/30 blend) and hydrogen

## ENHANCING SAFETY, DIVERSITY AND WELLBEING

“ Safety is a top priority for Wärtsilä. Wärtsilä drives to create wellbeing for its employees, business partners and for societies it engages with.

### 2021 HIGHLIGHT

Record low lost-time injury frequency rate (LTIF): 1.55.

## ACTIVE AND RESPONSIBLE MEMBER OF SOCIETY

“ Wärtsilä drives to be a responsible company with high ethical standards. Wärtsilä drives to engage with key stakeholders to create value in valuechains it contributes.

### 2021 HIGHLIGHT

The Code of Conduct training coverage was 94% of all employees.



# NEW EU SUSTAINABLE FINANCE TAXONOMY REPORTING OBLIGATION

Only small parts of our business activities included

- **Wärtsilä has a strong sustainability agenda and is a key contributor for the decarbonizing the Marine and Energy sectors**
- EU Taxonomy outcomes
  - A common classification of economic activities significantly contributing to environmental objectives
  - No acknowledgement of the value chain or system level impacts and benefits
  - 3 new reporting KPIs: Turnover, CapEx and OpEx





# WÄRTSILÄ TAXONOMY ELIGIBLE ECONOMIC ACTIVITIES

Summary of eligible and non-eligible turnover streams, Turnover KPI 2021

## Energy

- Engines ready for carbon neutral fuels running on gas or HFO

## Energy (6.5%)

- Power Plants running on biogas
- Energy storage solutions

## Marine Systems (0.5%)

- Biogas installations

## Voyage (1%)

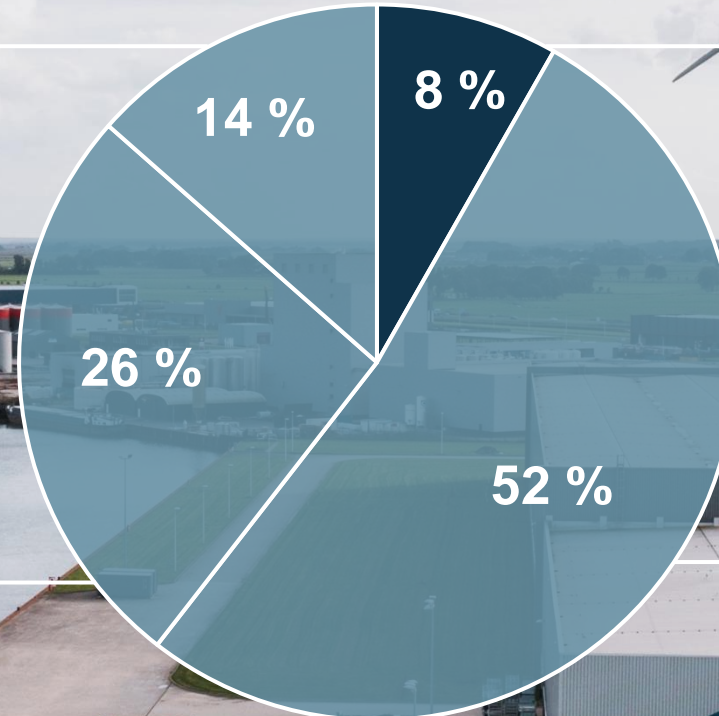
- Smart Vessel solutions
- Connected Marine Solutions

## Only shipbuilding eligible, not marine technology manufacturing

- Marine Power offering (13%)
- Marine Systems offering (9%)
- Voyage and Portfolio Business offering (4%)

## Services (all)

- No service activities are eligible



■ Eligible ■ Non-eligible

KPI	Eligible	Non-eligible
CapEx	22%	78%
OpEx	8%	92%



# WÄRTSILÄ – SHAPING THE DECARBONISATION OF MARINE AND ENERGY

Wärtsilä wide product, solution and service offering is a key contributor for sustainable development

## MARINE

### Propulsion energy saving technology

- Energy saving technologies

### Electrical and Power systems

- Hybrid solutions, shore power, Shaft generators

### Engines

- Future green fuel engines, dual fuel engines and pure gas engines

### Gas Solutions

- Gas recovery systems, LNG solutions
- Biogas solutions

### Exhaust treatment solutions

- Scrubbers

### Navigation and communication systems

- Naviplanner, Fleet Operating Systems

### Services

- LNG and future fuel upgrades



## ENERGY

### Flexible Power Plants

- Gas and DF engine power plants providing balancing for renewable generation
- Future green fuel power plants
- Hybrid Power Plants

### Energy storage and energy management systems

- Supporting the integration of renewables
- Optimising the use of assets

### Lifecycle services

- LNG and future green fuel upgrades







**WÄRTSILÄ**