Investor visit to STH: Wärtsilä Energy

Flexible and competitive solutions, end-to-end innovation, a strong position for sustainable growth

15 May 2025

Investor visit to STH: Wärtsilä Energy

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Anders Lindberg, President, Wärtsilä Energy

Profitable growth in the Energy business and opportunities in a fast-moving market

2

Erik Jungner, Director, Technology

Energy’s future-proof product portfolio and strong culture of innovation

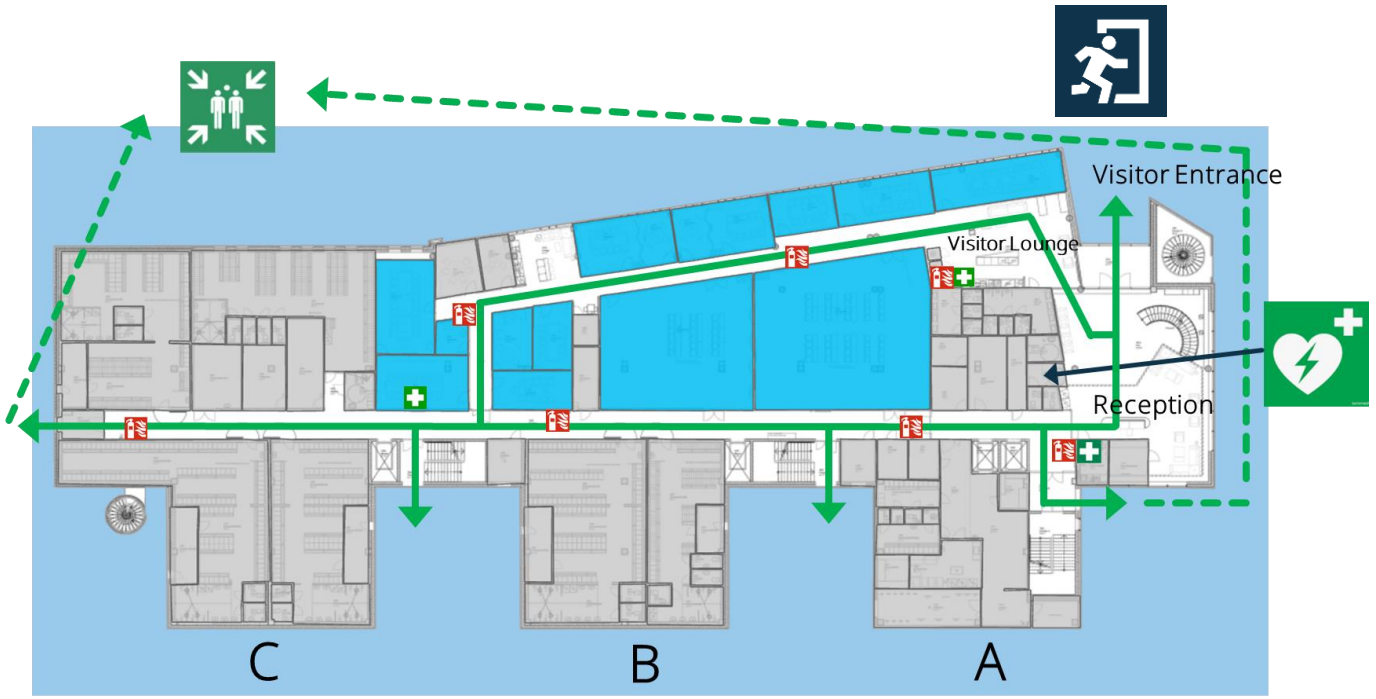
3

Juha Kytölä, Director, R&D and Engineering

The STH expansion, Marine and Energy synergies, and a flourishing research ecosystem

Safety in STH Office (1st floor)

- Location of the nearest **emergency exits** and emergency meeting place
- **Emergency number 112**, always inform reception in case of emergency
- Keep the visitor badge visible during the whole visit
- Photographing is not allowed except for designated photo locations



Profitable growth in the Energy business and opportunities in a fast-moving market

Anders Lindberg
President, Wärtsilä Energy

Wärtsilä Energy is well positioned for growth in a shifting market

In this event: Wärtsilä Energy

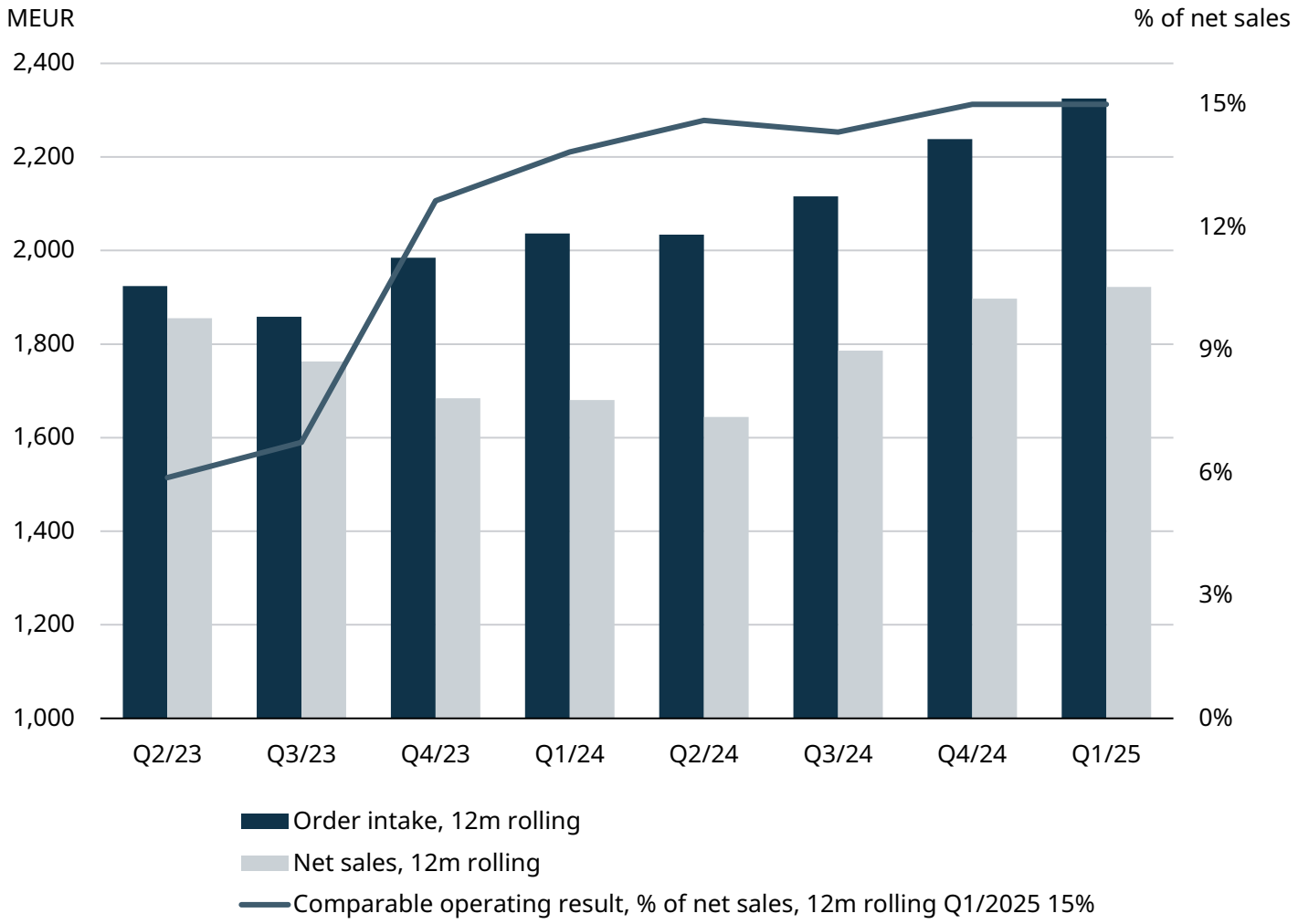
- Today's focus areas will be the end-to-end Energy business, its product portfolio, and research and development
- Energy Storage is now a separate reporting segment and will not be discussed today

Key reflections

- Focus on excellence in project execution, balance between risk and reward
- Global installed base with growth opportunities in balancing and baseload
- Future-proof product portfolio with excellent balancing capabilities
- Strong operational synergies between Energy and Marine

Engine Power Plants shows end-to-end profitable growth

Growing order intake, higher comparable operating result margin



+17% order intake and improved profitability
FY 2023–LTM Q1/2025

+27% total equipment sales
FY 2023–LTM Q1/2025

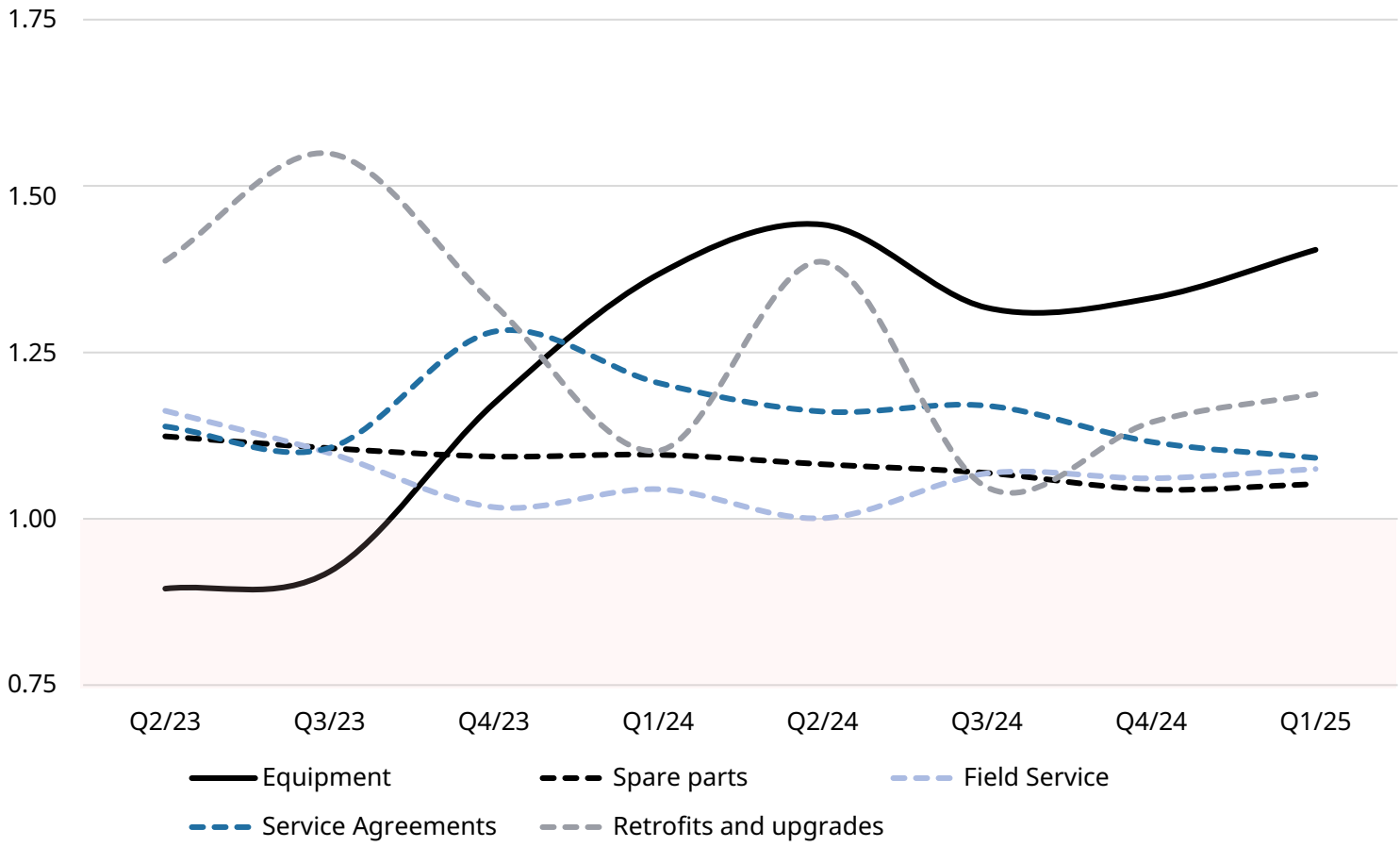
LTM profitability drivers

- Solid risk-reward balance and project selection criteria
- Continuous improvement and higher operating leverage
- Growth in service sales

LTM: Last twelve months (LTM Q1/2025 refers to Q2/2024 – Q1/2025)

Book-to-bill shows growth for both equipment and services

12M rolling book-to-bill ratios, Energy



Market trends are generally positive, but rising protectionism creates uncertainty

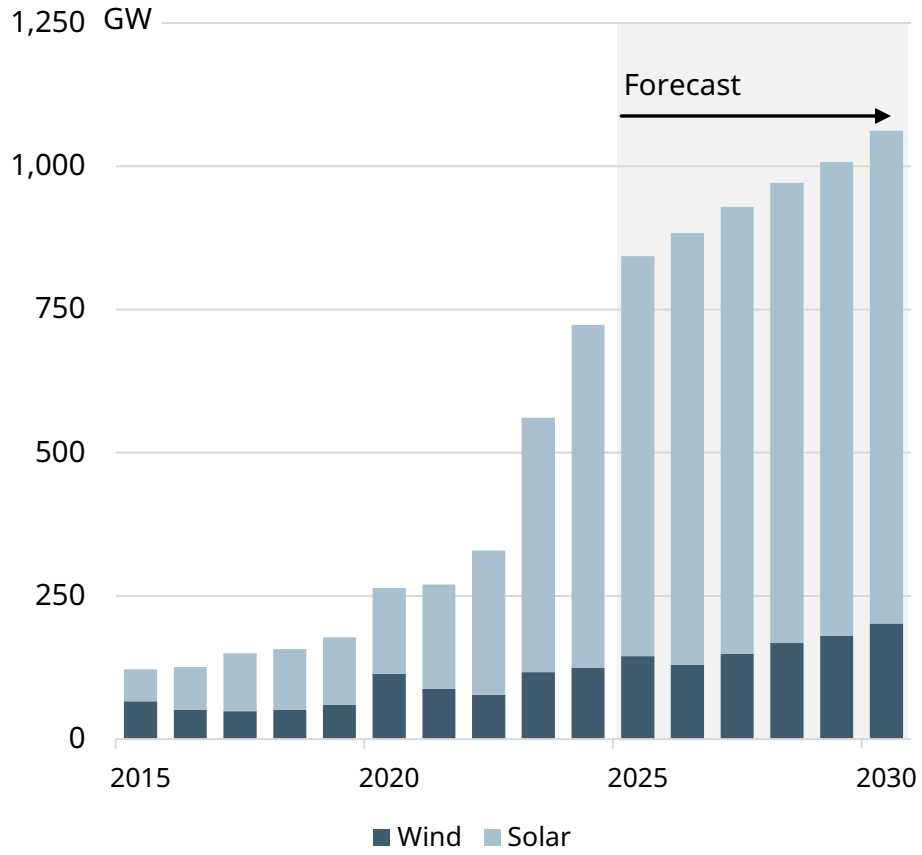
Opportunities and tailwinds

- **The energy transition is still accelerating**, with renewables capacity forecasts at record levels
- **Renewables remain the least expensive** way to generate electricity, driving balancing demand
- **Electricity demand growth** requires new build power assets
- **Growing data centre demand** offers a promising baseload opportunity
- **Regulatory changes are largely supportive** of thermal balancing

Uncertainties and headwinds

- **Tariffs causing uncertainty in the global economy** – direct and indirect impact mitigated in part by partners' local content and contractual design
- **Rising protectionism** and increased use of industrial policy

Renewables capacity additions



Forecasts from BNEF: 1Q 2025 Global PV Market Outlook and 2H 2024 Global Wind Market Outlook

The need for thermal balancing is driven by increased renewable penetration

Balancing and the energy transition

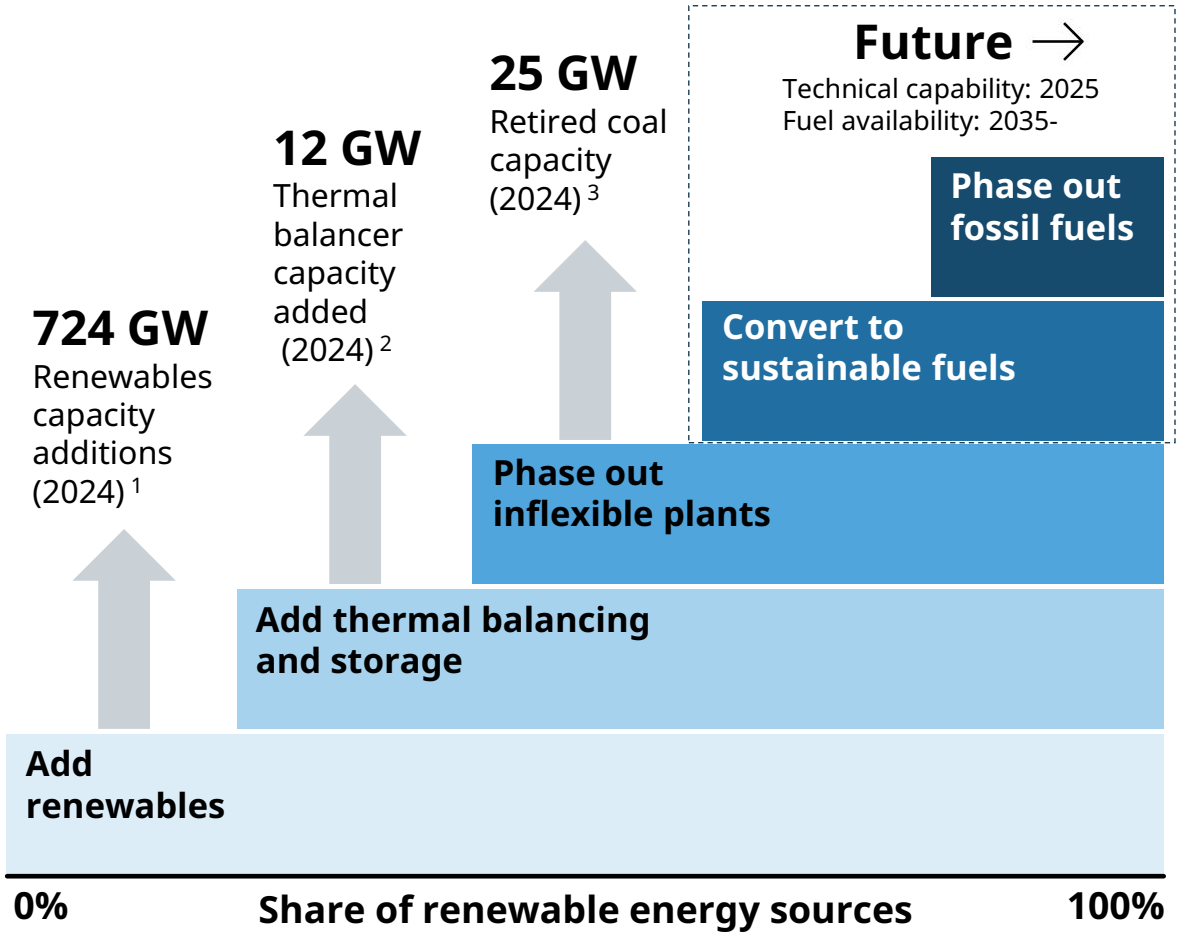
Creating the need for balancing

- The increasing penetration of intermittent renewables creates a need for thermal balancing, while switching off coal drives demand for dispatchable capacity
- Using inflexible power plants leads to curtailment – sufficient balancing power ensures maximum utilisation of renewables
- Engines support power grids on a minute, hourly, daily, and seasonal basis, and react quickly to changes

Revenue triggers and market examples

- Thermal balancing provides high value to the power system, but plants must also be profitable investments for owners
- 5-minute intervals for dispatch and price settlement improve power systems' ability to balance renewables
- Capacity mechanisms or payments for ancillary services and reserves can also incentivise balancing and flexibility

Optimal path to decarbonising the global energy industry



1) BNEF: 1Q 2025 Global PV Market Outlook and 2H 2024 Global Wind Market Outlook 2) Internal calculations based on McCoy Power Reports, collected data 3) Global Energy Monitor

The ongoing shift to shorter resolution periods is supporting investment in flexibility

Dispatch intervals

- Shorter settlement periods improve operational flexibility and provide more accurate price signals, essential for integrating renewables
- Contracts for 15 to 30-minute intervals allow for finer adjustments in electricity supply and demand
- These products are increasingly common in markets with a higher share of renewables
- Leading indicators of how the market will likely develop: the US, Europe, Japan

15-minute markets in Europe

- Most of Europe, including Nord Pool in Finland and Sweden, is shifting to 15-minute settlement periods
- The most important of these are the European day-ahead (SDAC) and intra-day (SIDC) markets
- This takes the system one step closer to becoming a real-time electricity market; support for 5-minute markets is growing
- **The increased value of flexibility in Europe will benefit the market for thermal balancing**

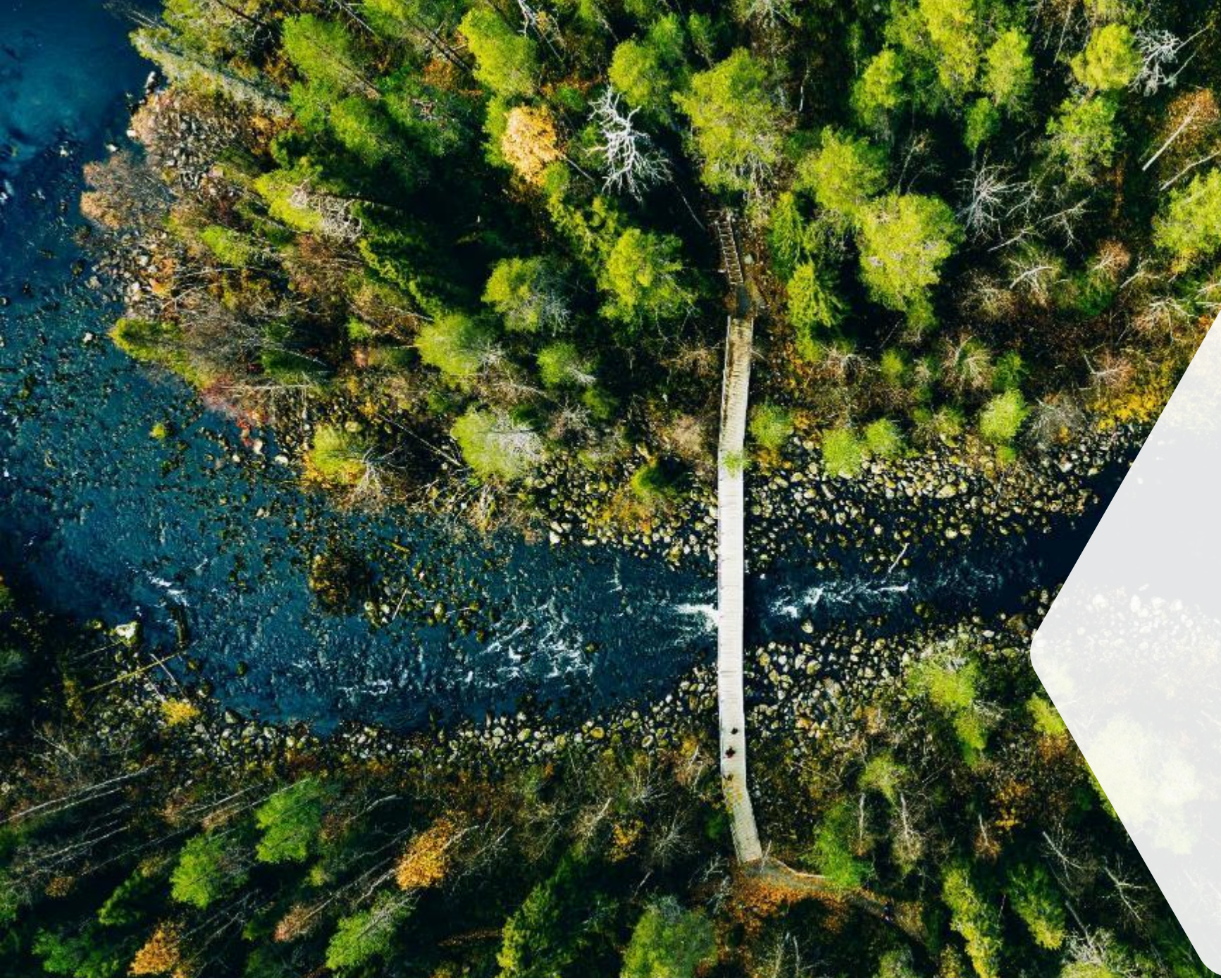
WÄRTSILÄ

European day-ahead (SDAC) market coverage

27
countries

30
Transmission System Operators (TSOs)

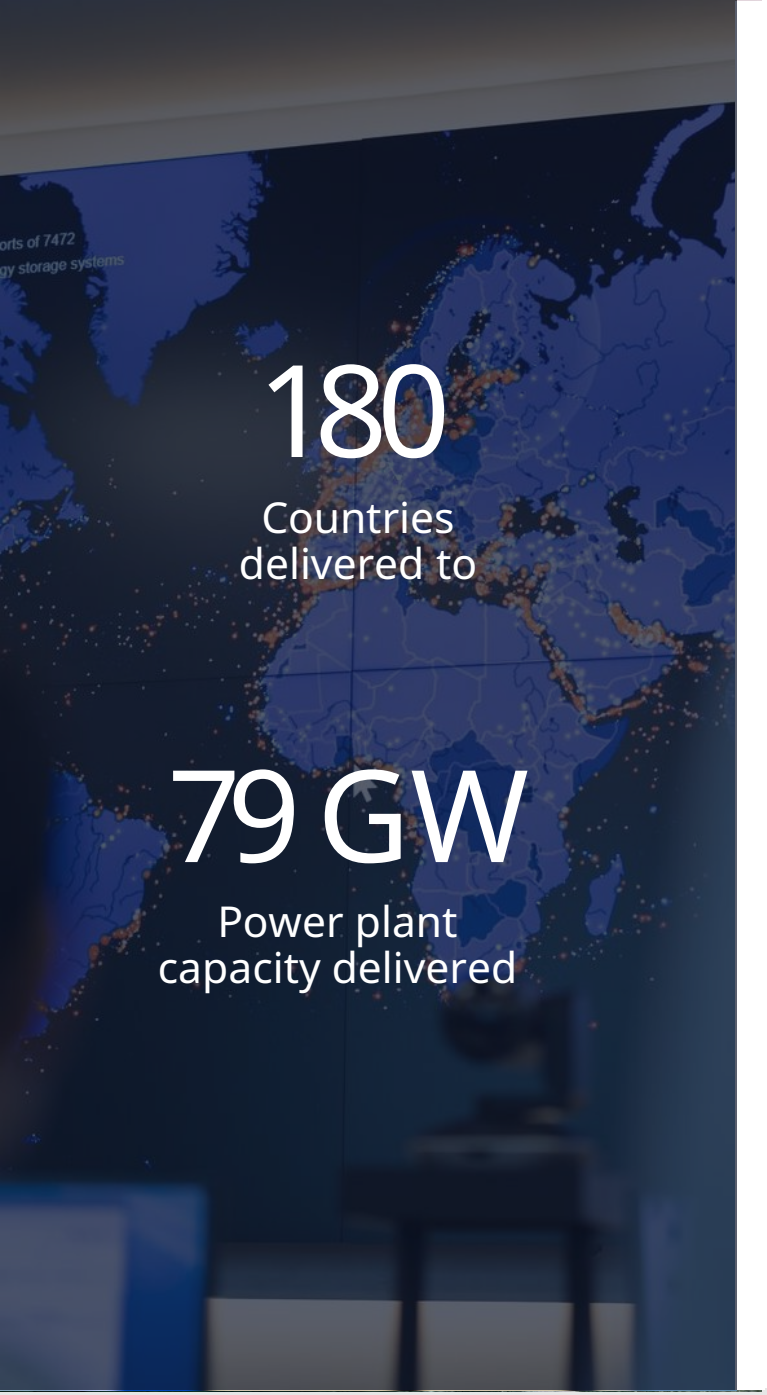
61
bidding zones



Tornion Voima – Finland

With a total capacity of about 43 MW, the engine power plant will be Finland's first to provide balancing capacity to the power system and will allow Tornion Voima to guarantee electricity production during various disturbances and varying weather conditions.

According to Wärtsilä modelling, integrating 2 GW of firm and flexible balancing power to the Finnish market would reduce electricity costs by 10%, equivalent to EUR 1.3 billion, and enhance system stability.



Customers in different markets worldwide have unique needs and investment drivers

Industrials
Captive generation for industry, including mining, manufacturing, and data centres

- Reliability and trust
- Running costs (OPEX)
- Integration of on-site assets

Utilities
Public- and investor-owned utilities providing electricity to customers

- Portfolio integration and grid stability
- Regulatory fit and sustainability
- Reliability and affordability

Independent power producers (IPPs)
Private entities generating electricity for sale to utilities or other end users

- Investment profitability
- Revenue from flexibility & optimisation
- Competitiveness

Note: A fourth segment, “Other”, includes all projects that are not captured by these three segments

Mercuria Pecos Power Plant – USA

The 225 MW plant will operate with twelve Wärtsilä 50SG engines running on natural gas, and will provide needed support to the ongoing transition towards a decarbonised power sector.

"In contrast to conventional turbines, these fast-start engines — designed with modularity to optimise existing transmission capacity and offering superior heat rates in open-cycle operation — allow us to respond rapidly to grid fluctuations and ensure the delivery of reliable power when it is needed most."

Martin Parizek, Managing Partner, Peak Reliability/Mercuria

The Data Centre power market is shifting, with new thermal baseload opportunities in specific markets

Historical: backup power

20-100 MW

typical power need

Grid interconnections immediately available

- Customer focus: CAPEX and power availability
- Segment typically served by high-speed engines and energy storage
- High risk in case of strict availability guarantees (99.999…%)
- Limited lifecycle service opportunity

Emerging: off-grid demand

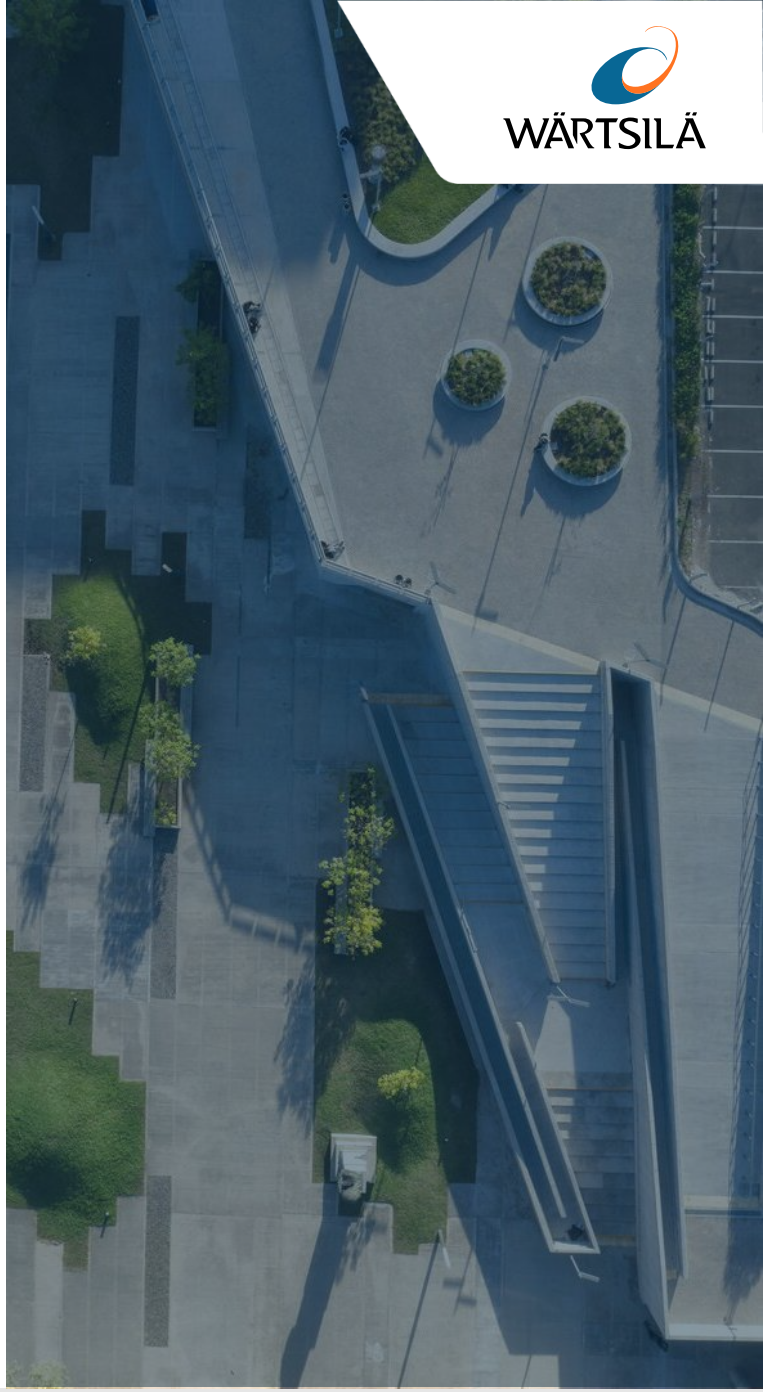
in addition to the increase in grid-connected Data Centre power demand

50-400 MW

typical power need

Grid interconnection times up to 5-7 years in some markets

- Customer focus: delivery time, OPEX, emissions
- Typically requires medium-speed engines or gas turbines as part of a wider portfolio of assets
- High lifecycle sales potential



Wärtsilä's sweet spot in the Data Centre segment is in the off-grid baseload power plants segment with high lifecycle value

- Baseload Data Centre power plants provide an opportunity for **profitable new build orders and high-value service contracts**
- Wärtsilä's advantages include **shorter delivery times and modularity** compared to larger units
- Wärtsilä's **fuel-efficient solutions** and sustainable fuel development support DC customers in their emission commitments

United States

- **US market is developing rapidly,** and on-site power is often needed while awaiting grid connection
- **Key Customer segments** are Data Centre Developers and IPPs
- **Targeted applications** include i) off-grid DCs, ii) behind-the-meter Data Centres connected to a utility
- **Active discussions are ongoing** with multiple customers in the DC Developer and IPP segments

Europe

- **Partnership model** in Europe has offered operational efficiency with lower risk in the emerging market
- **Wärtsilä's scope** is to provide the engineered equipment and maintenance support
- **Three Energy Centre projects** are under execution in Europe

DC: Data Centre

Wärtsilä Energy has a strong track record in 180 countries around the world

Americas

Power plants delivered:
19.7 GW

Europe

Power plants delivered:
10.9 GW

Africa

Power plants delivered:
7.6 GW

Middle East & Asia

Power plants delivered:
40.8 GW

180
Countries delivered to

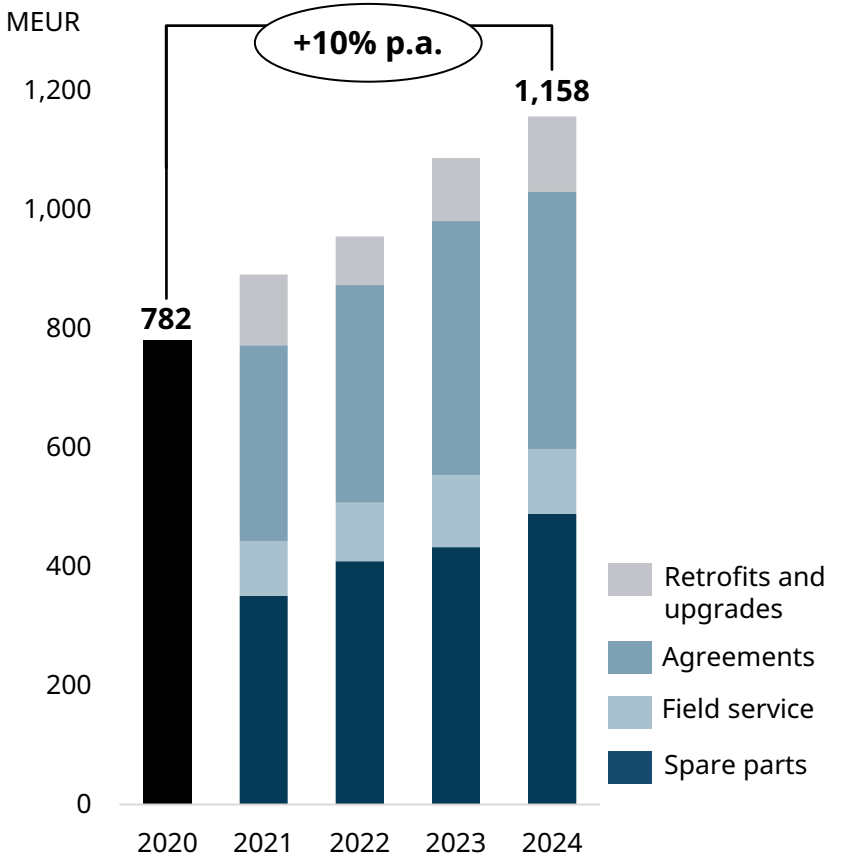
1 000 +
Upgrade projects delivered to Energy customers

31 %
Of operating installed base under service agreements

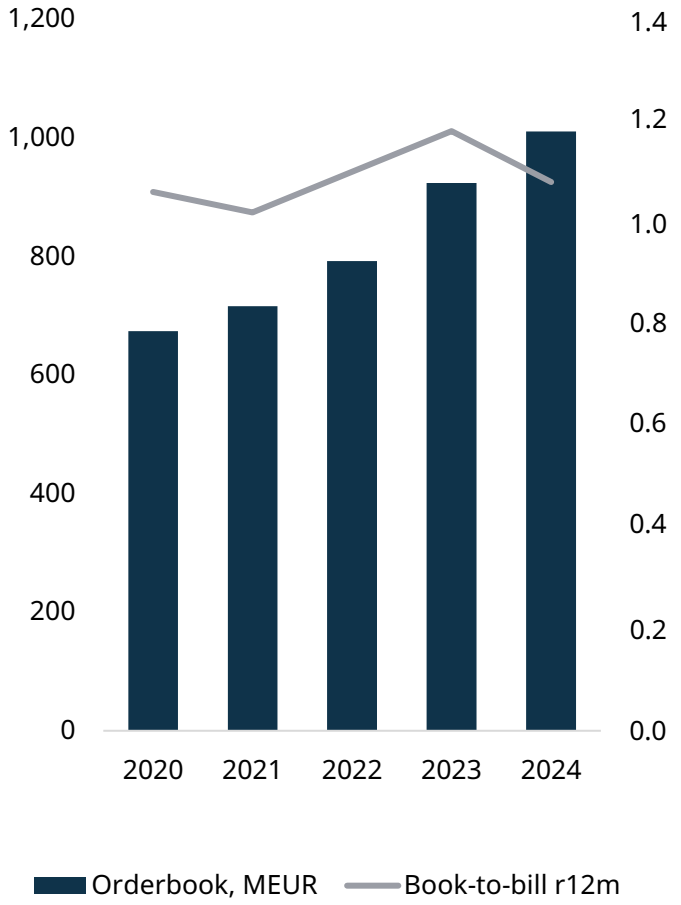
*contracted, under construction, operational

Solid services performance continues

Growing Service net sales



All time high orderbook & strong book-to-bill



+22% total Services sales
FY 2022–LTM Q1/2025

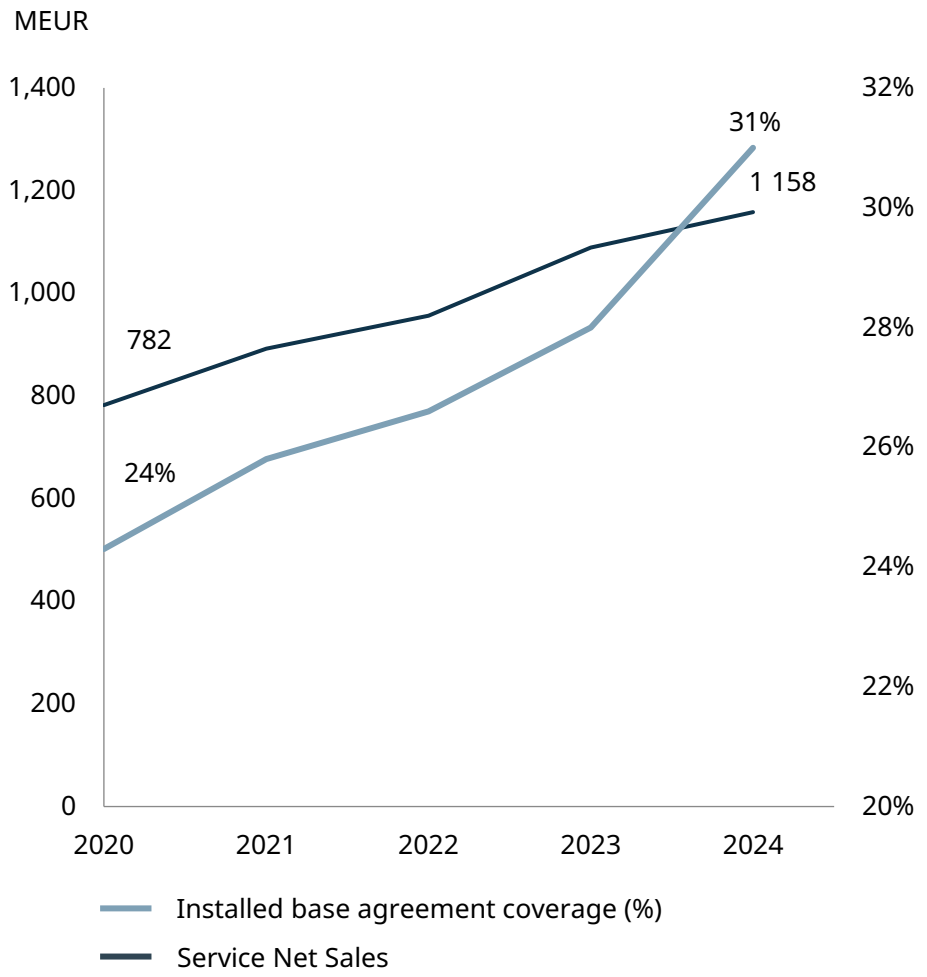
+57% Service upgrades sales
FY 2022–LTM Q1/2025

+28% total orderbook
Q4/2022–Q1/2025

Energy services growth drivers remain solid

- Increasing agreement coverage
- Growing installed base
- Upgrades & sustainable fuel conversion demand
- Growth potential in outcome-based and decarbonisation agreements
- Stable total running hours

Increasing agreement coverage is supporting growth



Increasing share of agreement customers in our installed base
31% agreement coverage[1]

High agreement renewal rate for existing customers
>90% renewal rate[2]

Sales to installations under agreement account for
56% of net sales[2]

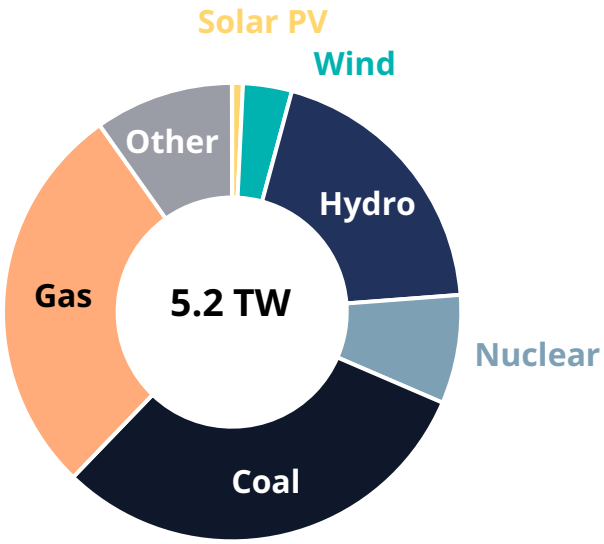
1) End of 2024
2) LTM Q1/2025

Energy’s future-proof product portfolio and strong culture of innovation

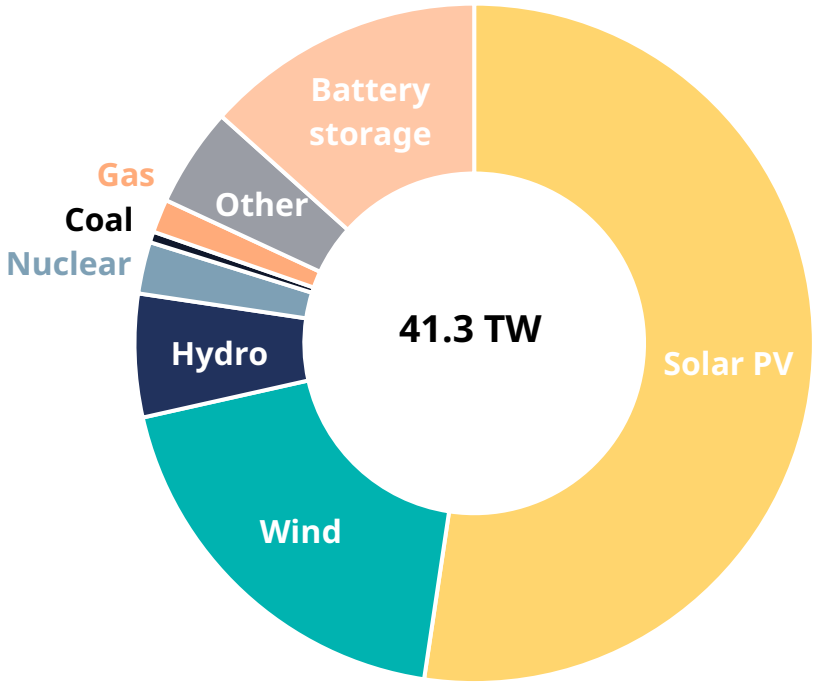
Erik Jungner
Director, Technology

The power system is set to transform completely, and simultaneously multiply many times over

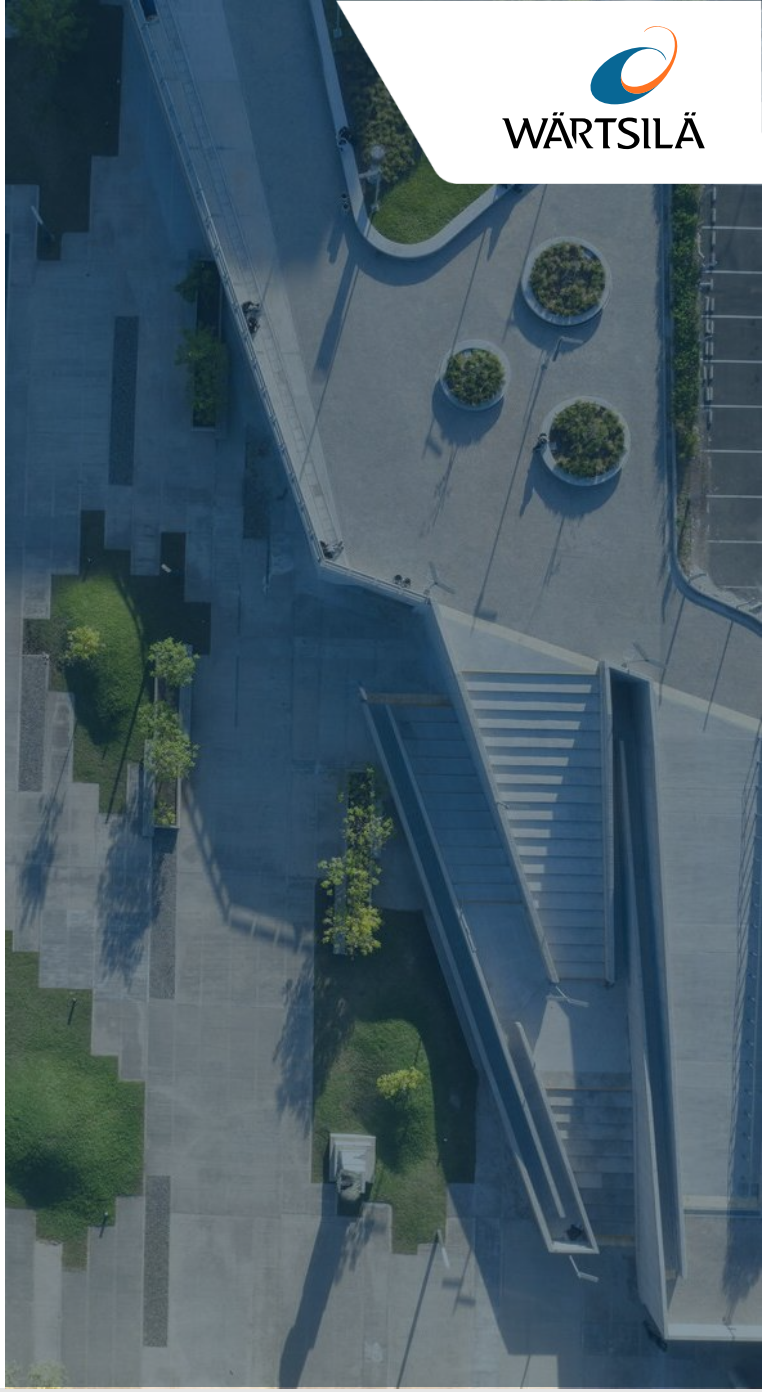
Power mix 2010



Power mix 2050 (Net Zero Scenario)

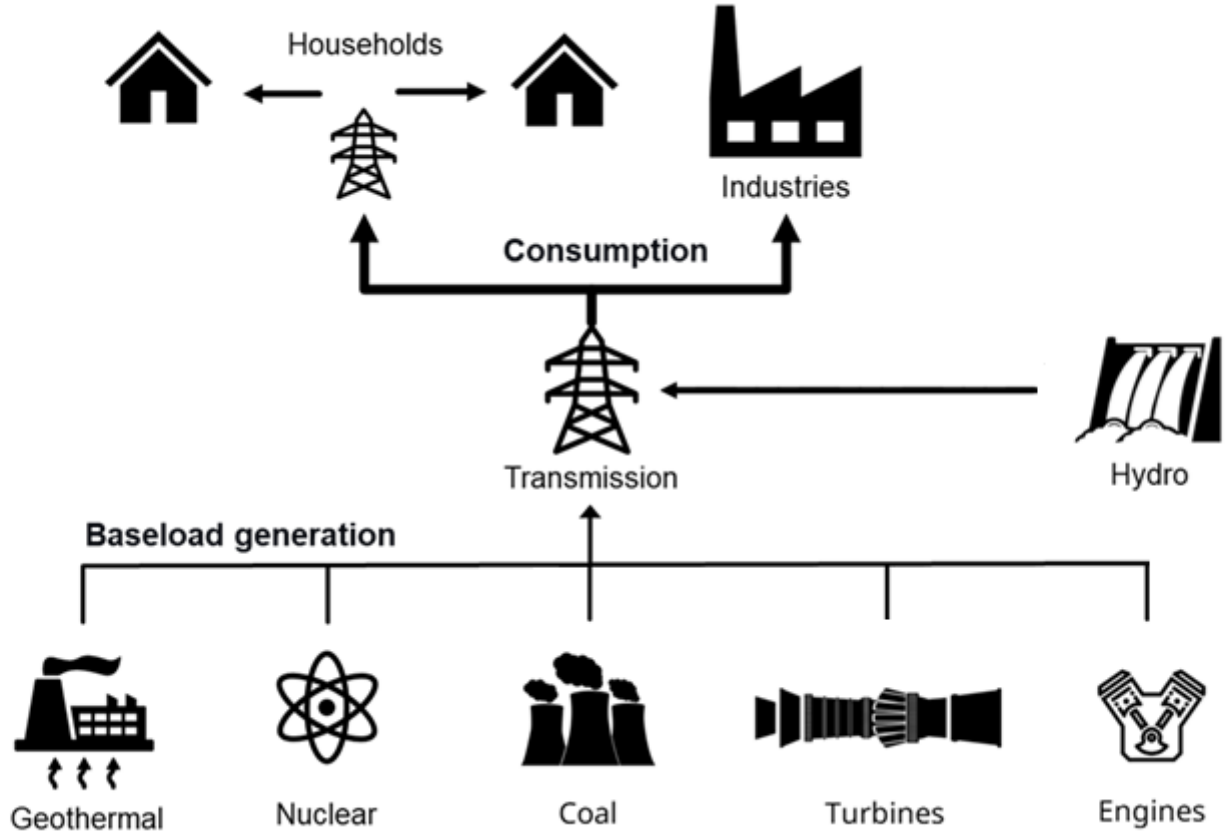


Source: IEA World Energy Outlook 2024, License: CC BY 4.0



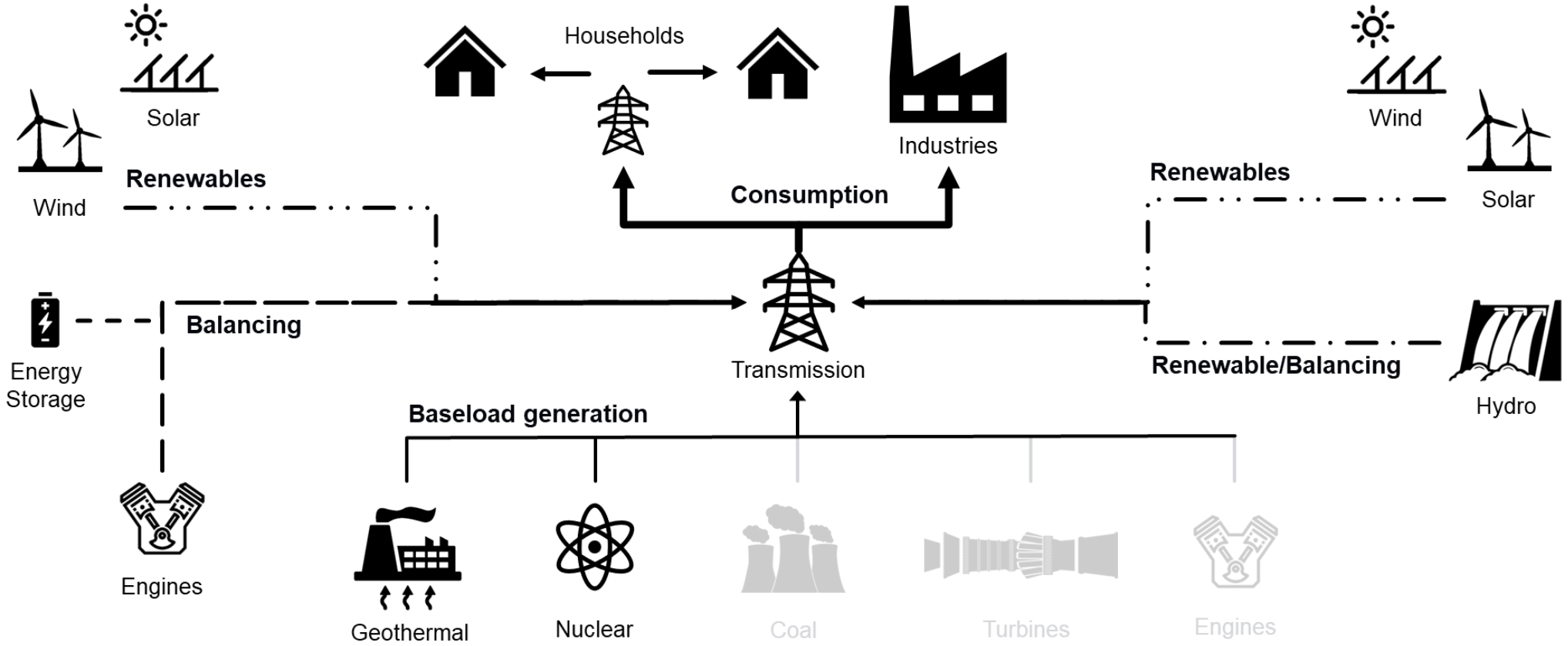
The power grid is the interconnected network between energy producers and consumers

The power system used to be highly centralised



The power grid is the interconnected network between energy producers and consumers

The power system is becoming more decentralised



Why engine power plants drive the energy transition

Flexible operations

With unbeatable flexibility, engine power plants can go from start-up to full load in as little as two minutes without minimum uptime or downtime. Unlimited starts and stops have no impact on maintenance.

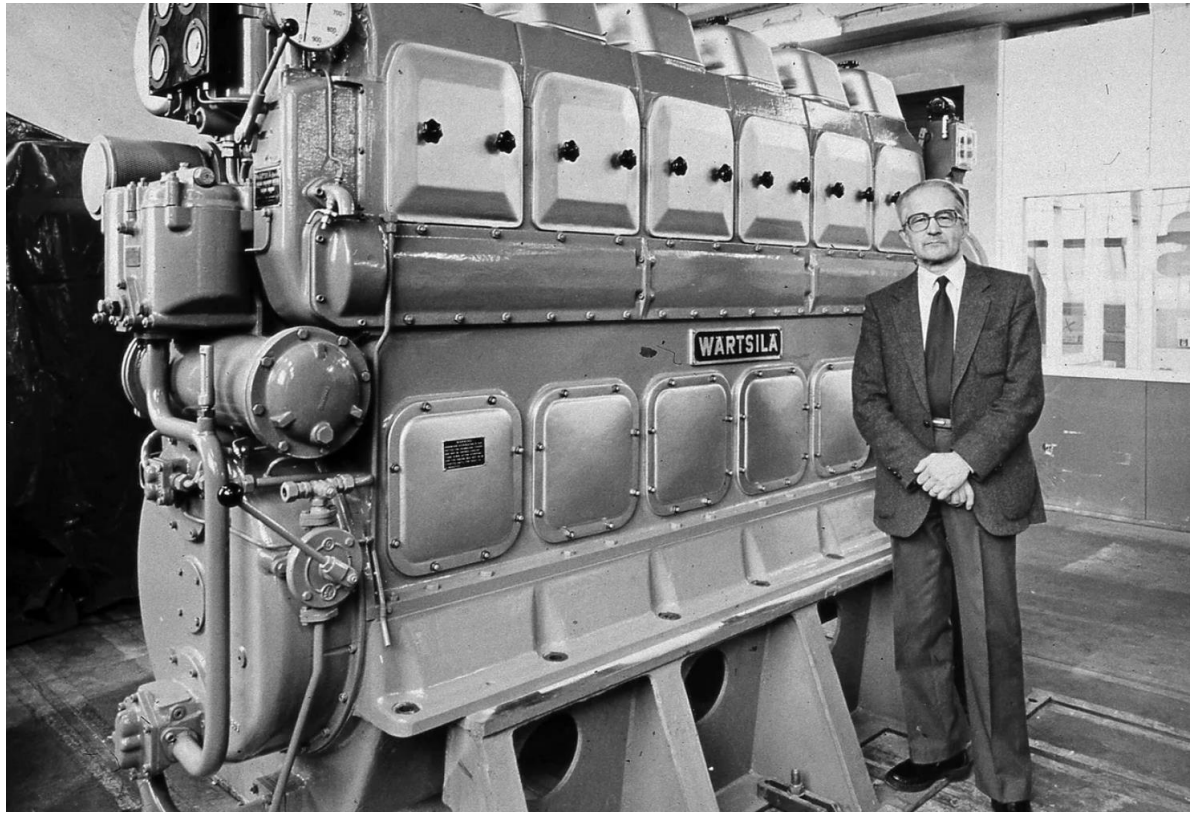
High performance

We offer the highest available simple cycle energy efficiency of current technologies, 50% or more. With our technology, you can operate your plant on any operating profile without compromising efficiency

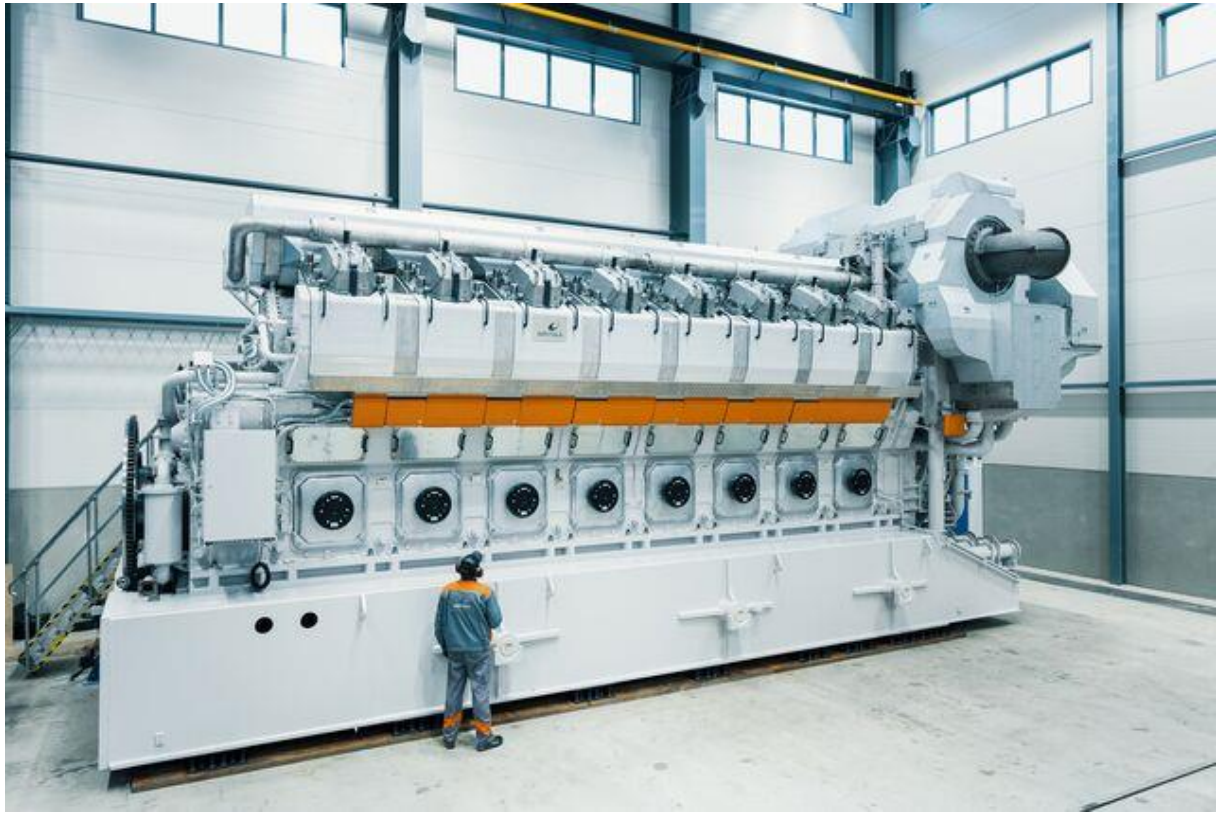
Future-proof solutions

Engine power plants will operate on sustainable fuels to enable the final step towards a 100% renewable energy future. We constantly evolve our solutions offering to include upgrades, conversions and modernisation options

The engine has its roots in a long-standing historical heritage, and poses infinite potential for opportunities for adaptation to new industry environments



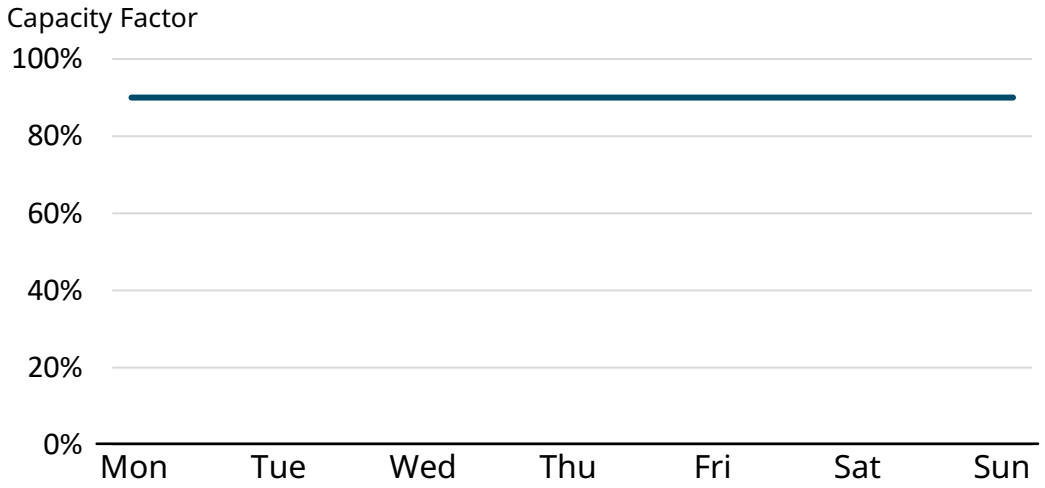
Wärtsilä Vasa Type 14, 1959



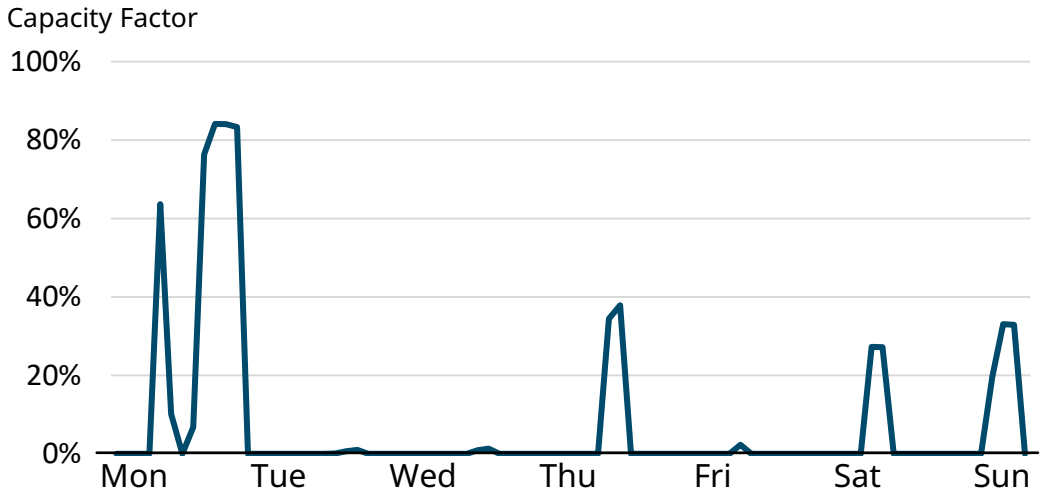
Wärtsilä 46TS, 2024

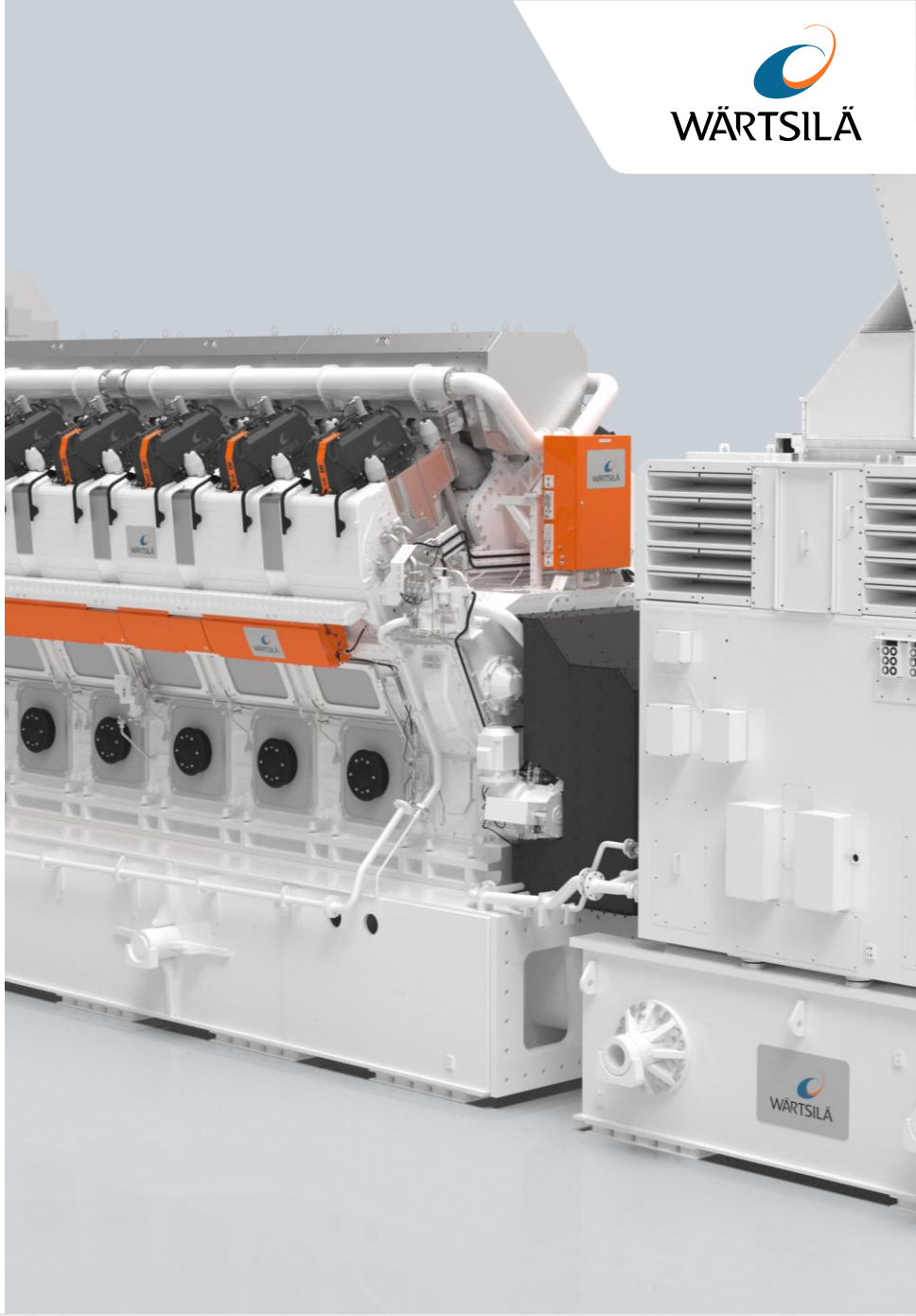
In Energy, the role of the engine is about to change

Baseload



Balancing





Wärtsilä's sweet spot is in 50 - 400 MW plants

Engine technologies

High-speed engines

- Low capex and low efficiency
- Best suited for backup and low running hours applications

Wärtsilä medium-speed engines

- High efficiency due to multiple modular units
- Faster start-up; can cycle several times per day with no cost impact
- Transparent modelling shows the value of balancing with engines

Most competitive in applications with high numbers of starts/stops and markets that reward flexibility

Gas turbine technologies

Aeroderivative gas turbines

- Lower capex than engines but less fuel-efficient
- More flexible than heavy-duty gas turbines (HDGTs)

Open-cycle gas turbines (OCGTs)

- Low efficiency; poorly suited for balancing
- Competitive mainly in peaking applications with low amount of starts/stops

Combined-cycle gas turbines (CCGTs)

- High efficiency, but high capital costs
- Best suited for large-scale baseload applications

CCGTs cannot compete with engines in renewables balancing, even with an assist from batteries

Technology comparison

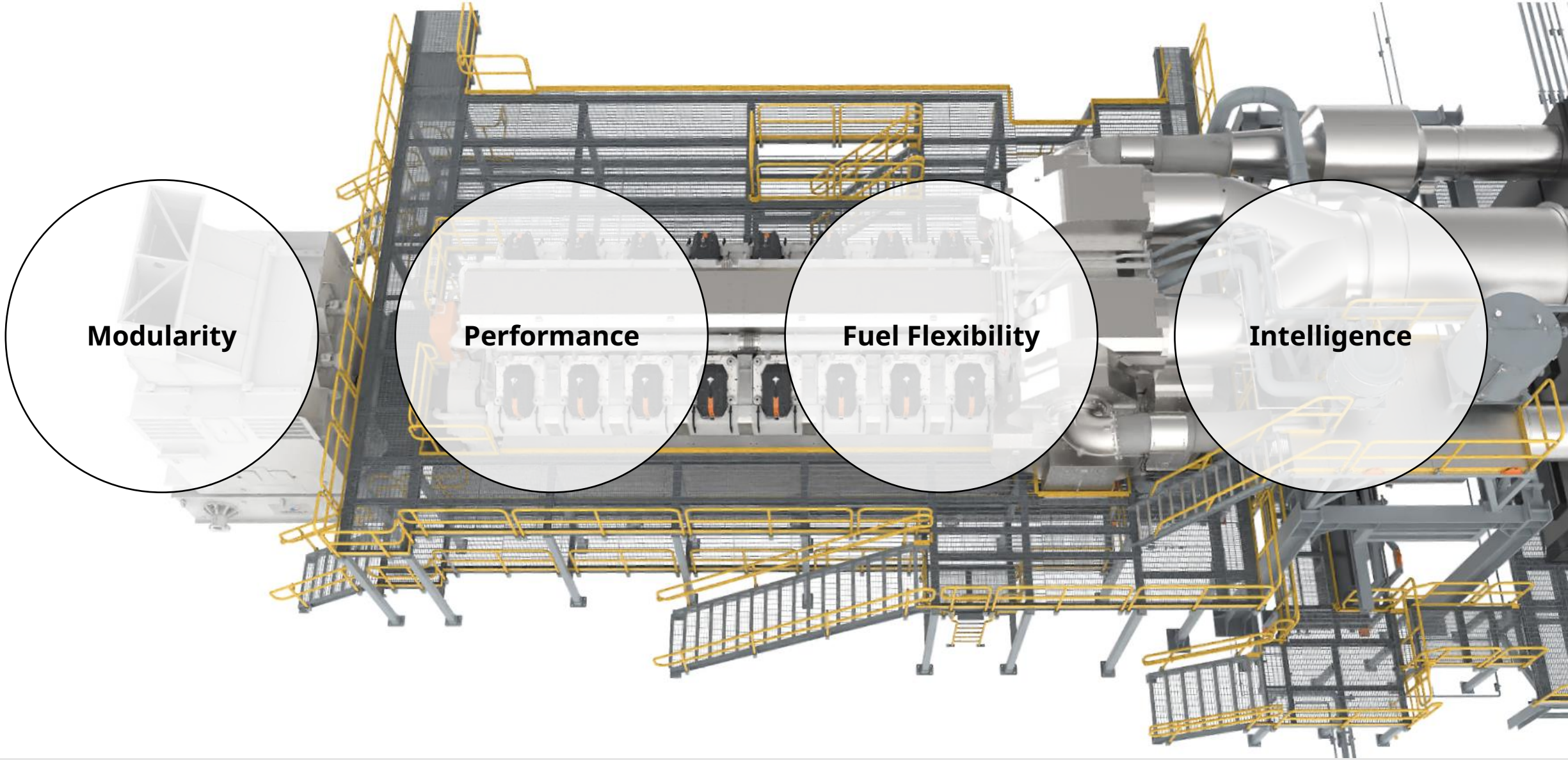
	Startup Time (min)	Startup Cost (USD/MW)	Minimum Load (%)	Minimum Uptime (min)	Minimum Downtime (min)
CCGT, average	60 – 240	55	40 – 50%	240	120
CCGT, flexible	30 – 180	55	20 – 40%	240	120
MS ICE, average	5	< 1	20% (per unit)	< 1	5
MS ICE, flexible	2	< 1	10% (per unit)	< 1	5

CCGTs struggle to balance renewables

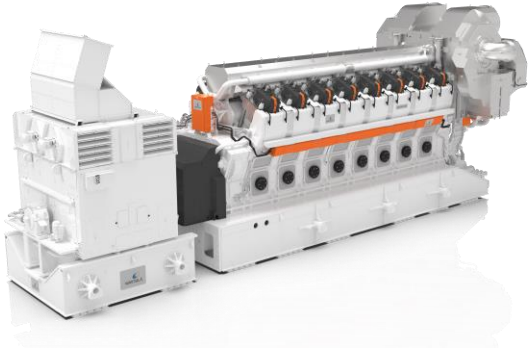
- **CCGTs have difficulty in systems with high levels of renewables**, with lower capacity factors and more emphasis on flexibility
- CCGTs are still **significantly slower than engines**, and have major limitations, such as high minimum load and minimum up and down times
- New **CCGT plants are in large-size baseload applications**, and are highly concentrated in just 10 countries
- Adding **batteries to a CCGT** in a hybrid installation can improve operational flexibility but is **substantial and costly**, with questionable reliability
- **Wärtsilä medium-speed engines remain a superior technology** to balance intermittent renewables

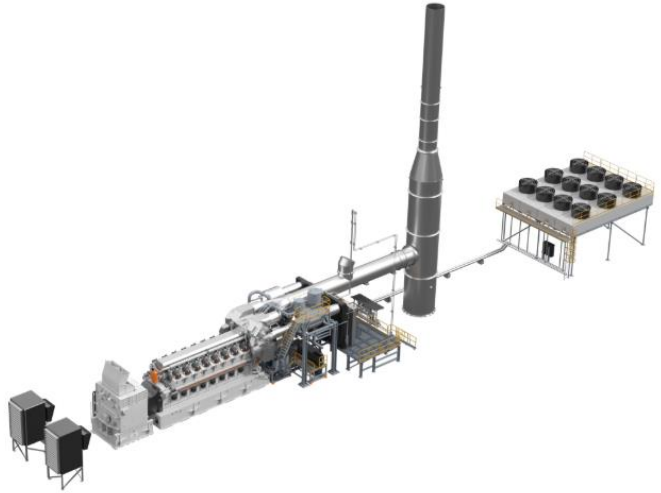
Source: : IRENA, Flexibility in conventional power plants

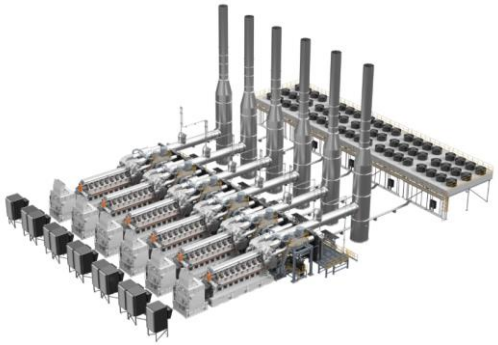
R&D is essential to responding to the evolving operating environment

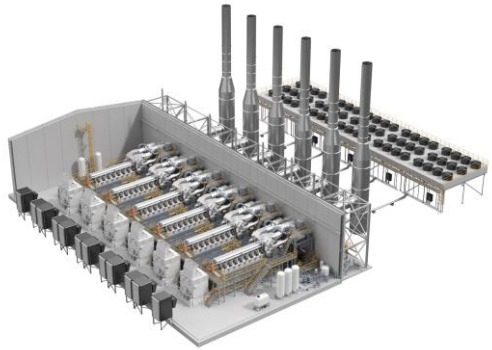


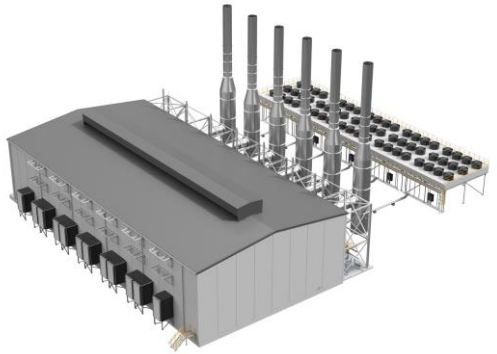
Modularity drives the design of Wärtsilä engine power plants, enabling superior flexibility for both equipment and lifecycle service offerings











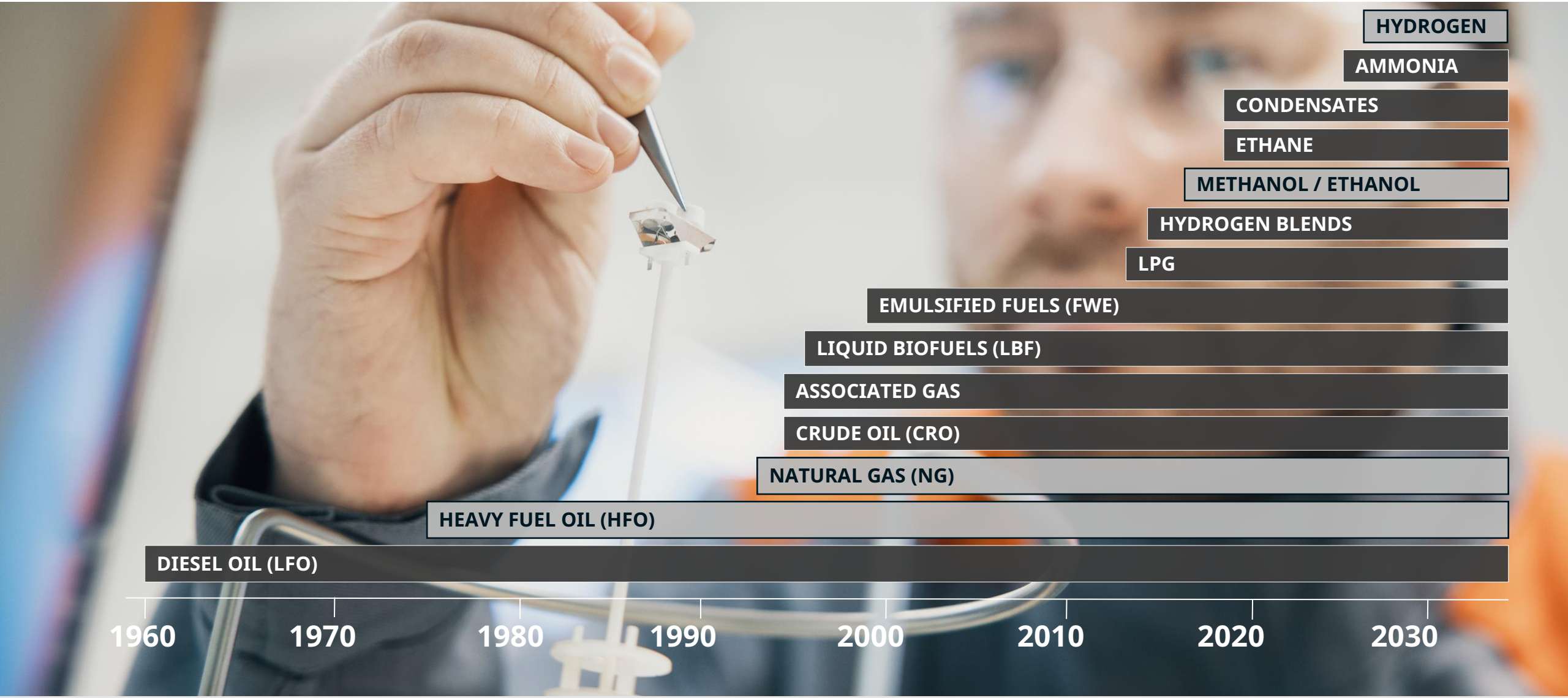
Type: Wärtsilä 46TS Modular Power Plant

The new Wärtsilä 46TS offers a step-change increase in performance

- The Wärtsilä 46TS is a new large-bore engine designed for balancing renewables and providing cost-efficient baseload
- A significantly increased power output (23.4 MW/unit) with superior power density enables fewer engines to meet demand
- Higher efficiency (51.3%) conserves fuel and reduces emissions
- Excellent performance in extreme ambient conditions and at high altitudes (-50° C to +50° C[1] without derating)
- Rapid response to fluctuations with fast ramp-up time (2 minutes), plus no minimum up or downtime requirements.
- The Wärtsilä 46TS has been designed to operate on various gaseous and liquid fuels, including natural gas, biogas, and hydrogen blends up to 25%

1: -58° to +122° F

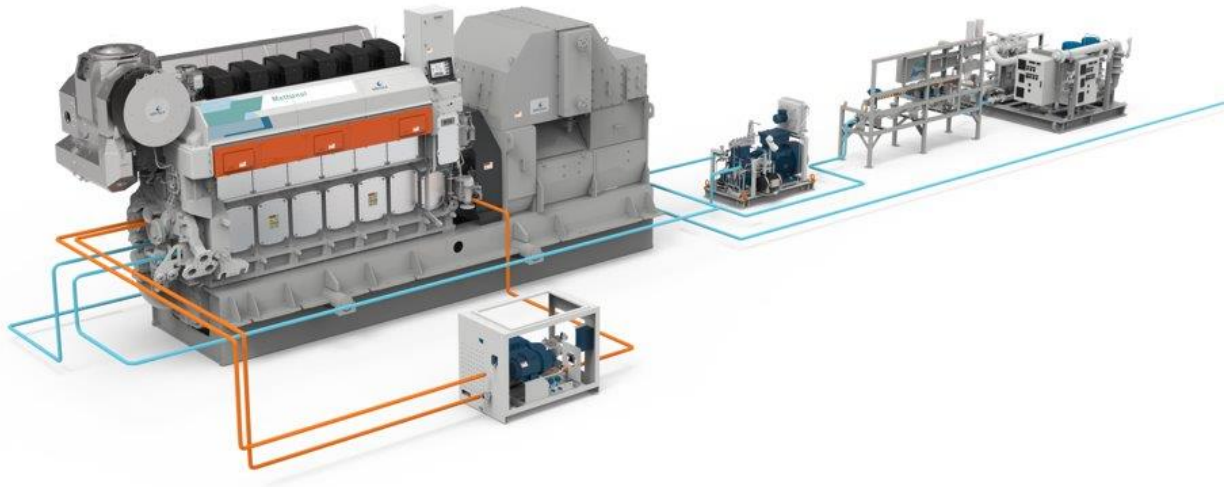
Wärtsilä has a long history of introducing new fuels



The first technology demonstrator to use green ethanol as fuel for clean power generation is in Brazil

Wärtsilä's partnership with Suape

- Wärtsilä Energy has partnered with the Brazilian energy company Energetica Suape II S.A. to conduct a world-first clean energy trial
- This trial will use ethanol, a biofuel mainly produced from sugarcane, to generate clean power
- The trial will take place at the Suape II power station in Recife, Brazil, and will test the world's first ethanol-fuelled engine for large-scale electricity generation
- The project was booked by Wärtsilä in Q1 2025



The Wärtsilä 31 H2-Ready Power Plant was launched in 2024

ZERTIFIKAT ◆ CERTIFICATE ◆ 認證證書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

TÜV SÜD

H_2-READINESS CONCEPT CERTIFICATE

The Certification Body of
TÜV SÜD Industrie Service GmbH
Energy and Systems

certifies, that the hydrogen readiness concept for the bidding phase of newly built and retrofitted power plants using the 31SG engine of the company

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WÄRTSILÄ Oyj Abp
Hiililaiturinkuja 2
00180 Helsinki, Finland

complies with the requirements
as defined in the TÜV SÜD guideline:

Certification Guideline H_2-Readiness of Gas Engine Power Plants,

Edition 2023 Rev.1.

The hydrogen readiness concept meets the requirements for the certification of hydrogen readiness for 100 vol.-% hydrogen.

This Certificate is based on the Audit Report 500604631 Rev.2 dated 07.06.2024.

This Certificate is valid till 10.06.2027.

Certificate – Register-No.: KC/500604631/32/24

Munich, 11.06.2024

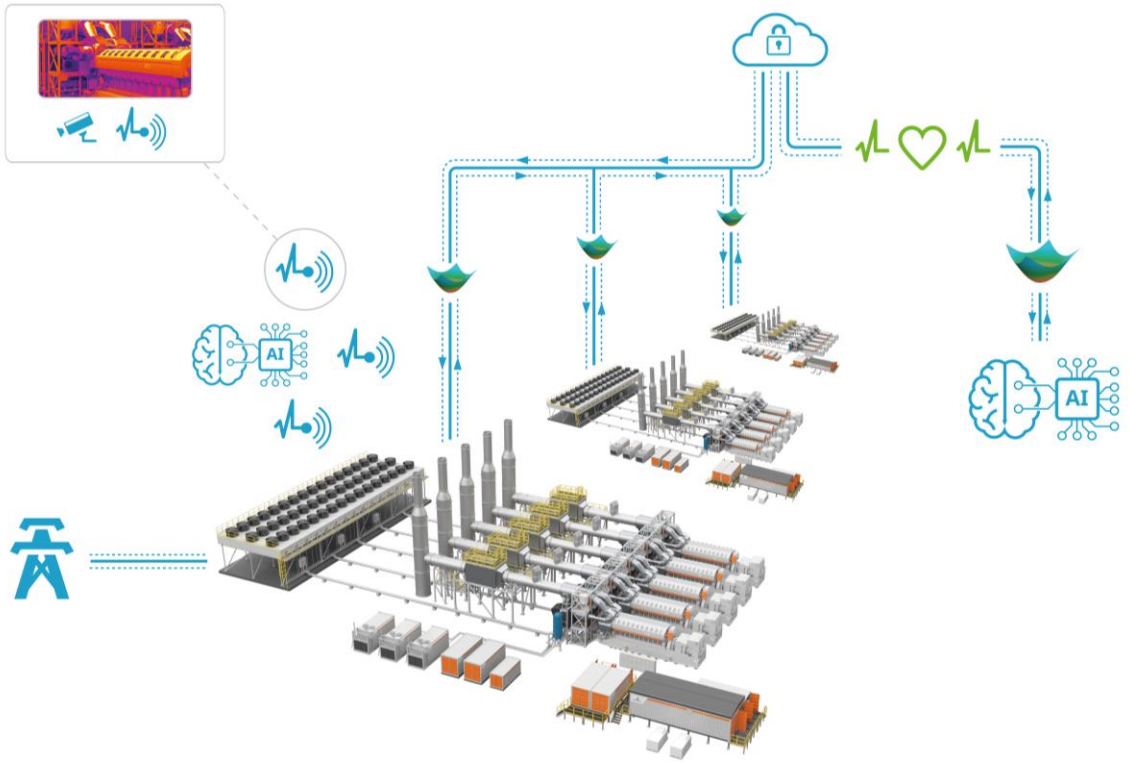
Dr. Thomas Gallinger
Technical Certifier
Certification Body Energy and Systems

Katrin Hausmann
Certification Body
Energy and Systems

TÜV SÜD Industrie Service GmbH · Certification Body Energy and Systems · Westendstraße 199 · D-80686 Munich
Page 1 of 2

Autonomous operations and digital services enable energy predictability and future competitiveness

- An autonomous Wärtsilä power plant can operate **without direct human control**
- **Operational and maintenance tasks are** facilitated by equipment designed for extended maintenance intervals and optimal performance
- The system can **identify and predict anomalies and faults** in both the system and operations
- Decisions and actions can be handled by the **intelligent automation system**, enabling optimised operations



Remote operation & digital operations visibility

Intelligent & predictive operations

Advanced plant health prognostics

Autonomous operations

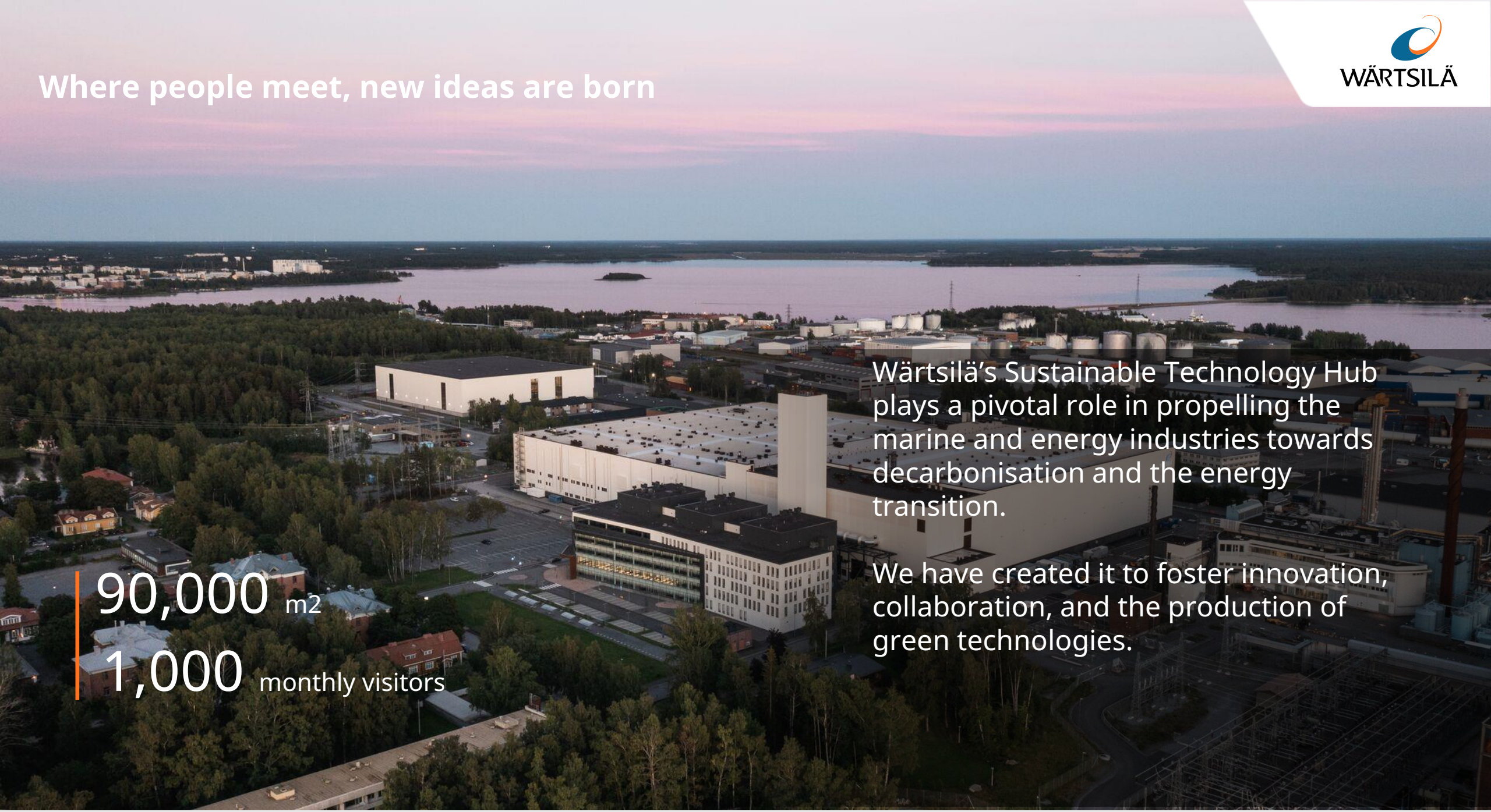
The STH expansion, Marine and Energy synergies, and a flourishing research ecosystem

Juha Kytölä
Director, R&D and Engineering

Sustainable Technology Hub

Welcome to an ecosystem of collaboration

Where people meet, new ideas are born



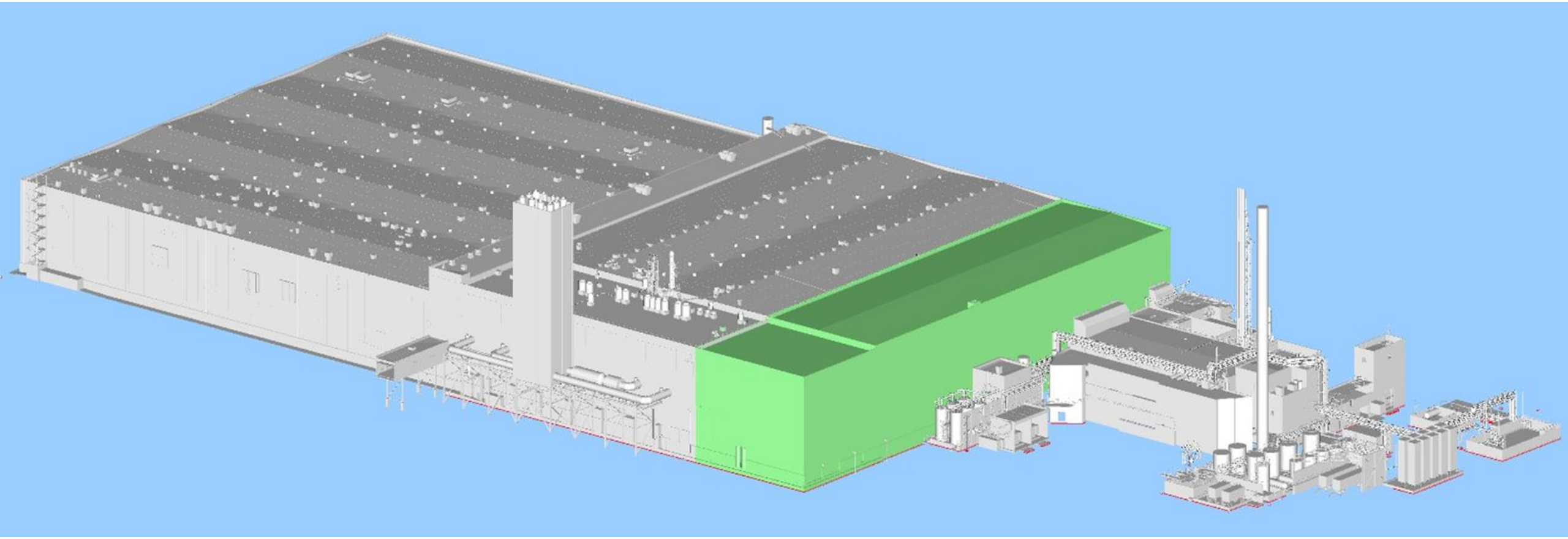
90,000 m2

1,000 monthly visitors

Wärtsilä's Sustainable Technology Hub plays a pivotal role in propelling the marine and energy industries towards decarbonisation and the energy transition.

We have created it to foster innovation, collaboration, and the production of green technologies.

The STH expansion will add nearly 8,000 square metres to the site and will focus on strengthening R&D testing capabilities

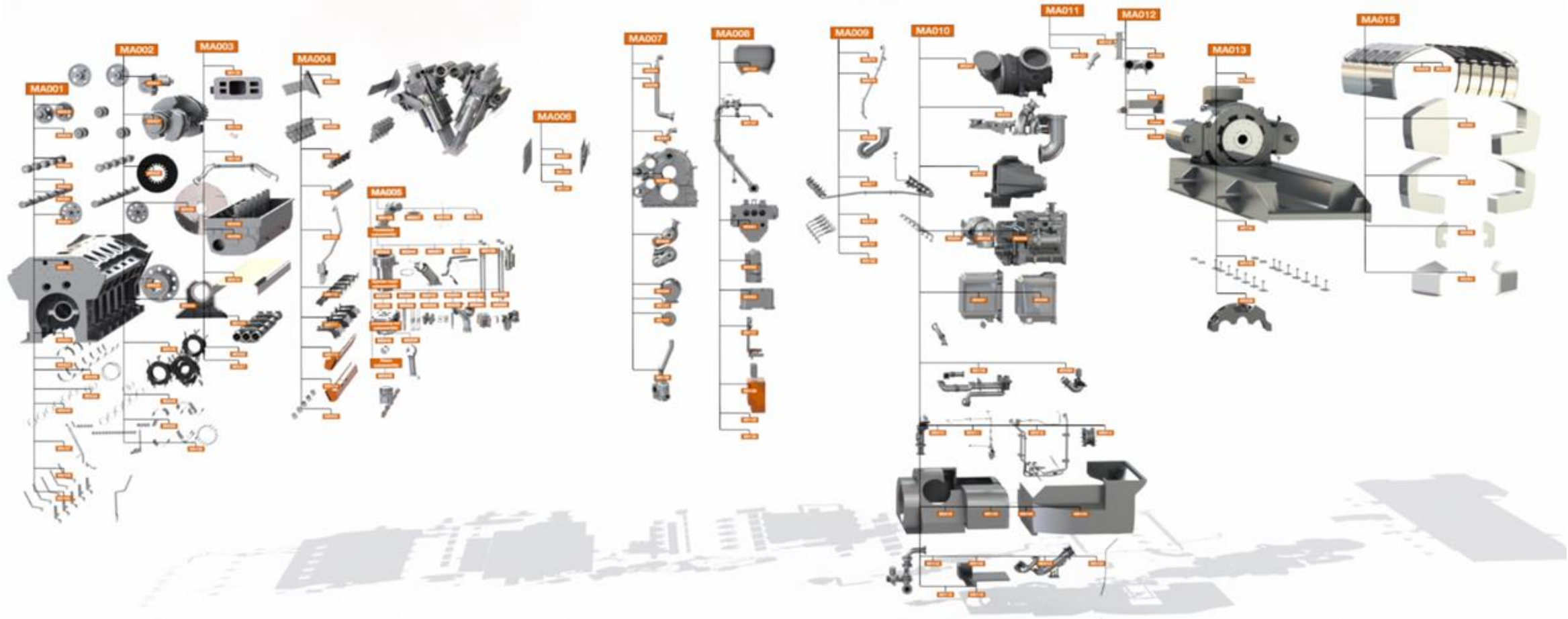


STH HUB

STH extension

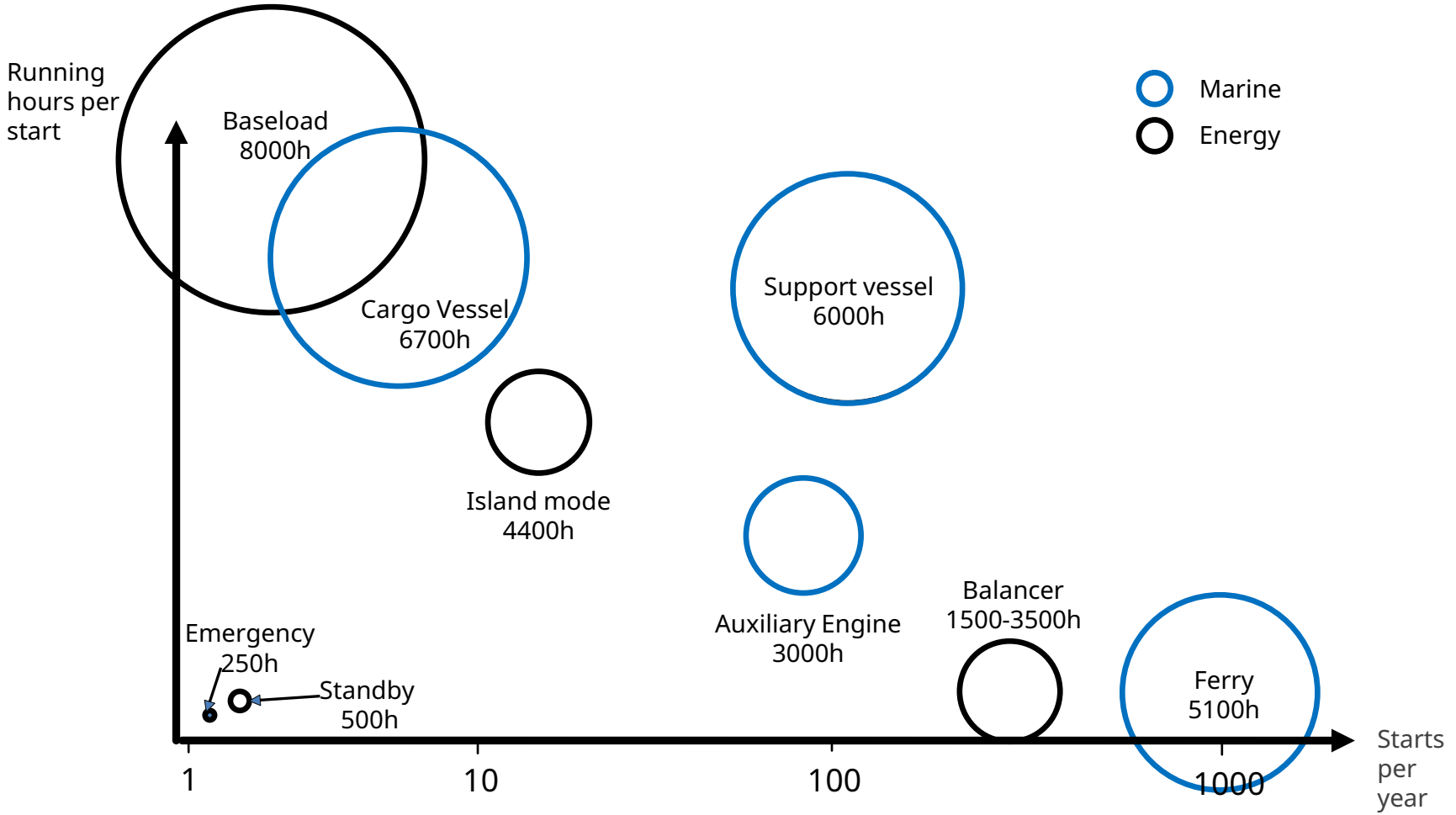
Research laboratory

Wärtsilä engine products are fully modular, with high commonality between Energy and Marine



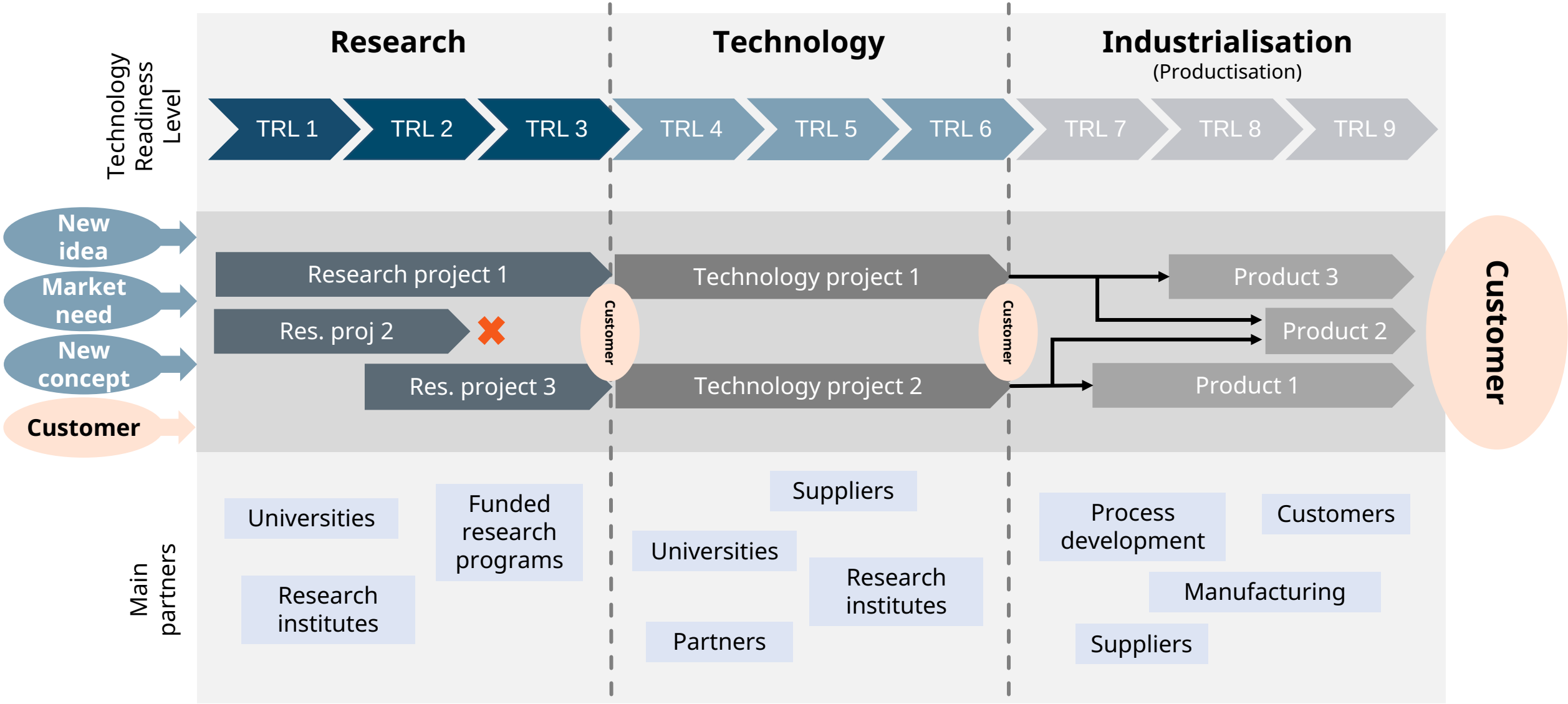
Similar customer needs allow for strong synergies between Energy and Marine

Energy and Marine products have broadly similar requirement profiles



Size of bubble indicates annual running hours

The research & technology value stream moves from research to markets



Wärtsilä has a leadership role in its ecosystem, with active engagement in research and good partnerships

Wärtsilä's ecosystem

- Wärtsilä is engaged in several research programs
- Industrial ecosystems with universities, research institutes, and partner companies are vital
- Skilled people are solving industry challenges and innovating new possibilities
- Ecosystems provide a pipeline for talent recruitment

Partnerships

- Wärtsilä is collaborating with all Finnish and Nordic technical universities and with relevant players in Europe
- Publicly funded programs are a key part of the collaboration
- EU programs involving research partners and customers
- National programs in Norway, the Netherlands, and Italy
- *Veturi* in Finland
  - ZEM
  - WISE

The WISE programme gathers energy players into one ecosystem to develop the energy future of Finland

Autonomous, zero-emission, and driven by sustainable fuels

Autonomous power plants
To enable autonomous operation in power plants through digital, automation, and engine technologies

Clean energy production
To enable CO2-neutral / e-fuel power plants

Services predicting power plant equipment health
To enable system optimisation and operation for on-site operational efficiency and emission reductions

Supporting software and hardware solutions
Digital enabler for future initiatives around efficiency, decarbonisation and autonomy requiring on-site capabilities

Building the underlying digital infrastructure
To enable autonomous operations by predictability and reliability, targeting zero forced outages


Profitable and sustainable growth
A future-proof product portfolio
Strong synergies in operations and research
Diverse customer profiles and a growing installed base


WÄRTSILÄ