WÄRTSILÄ

WÄRTSILÄ CORPORATION

This is Wärtsilä

2020

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Wärtsilä is a global leader in smart technologies and complete lifecycle solutions for the marine and energy markets. By emphasising sustainable innovation, total efficiency and data analytics, Wärtsilä maximises the environmental and economic performance of the vessels and power plants of its customers. In 2019, Wärtsilä's net sales totalled EUR 5.2 billion with approximately 19,000 employees. The company has operations in over 200 locations in more than 80 countries around the world. Wärtsilä is listed on Nasdaq Helsinki.

PURPOSE
Enabling sustainable societies with smart technology

VALUES
Energy, Excellence, Excitement

"As a result of the need to significantly raise efficiency levels and comply with tightening environmental legislation, there is a rapid transformation taking place in both the marine and energy sectors. Wärtsilä has taken a leading position in enabling this transformation process through its Smart Marine and Smart Energy visions, where the latest technologies are being developed and employed to meet the evolving needs in both these end markets."

JAAKKO ESKOLA, PRESIDENT & CEO

NET SALES
5,170
EUR MILLION

PERSONNEL
18,795
EMPLOYEES

INSTALLED BASE
176
GW

Net sales by market area, % of Wärtsilä's total net sales

Americas 21%

EUR MILLION
1,098

2,016
EMPLOYEES

Europe 33%

EUR MILLION
1,690

11,618
EMPLOYEES

Africa 4%

EUR MILLION
222

702
EMPLOYEES

Asia 38%

EUR MILLION
1,968

4,341
EMPLOYEES

In other areas, net sales totalled EUR 192 million and the number of employees was 118.

Business areas

Wärtsilä Marine Business

Wärtsilä is on a mission to create a Smart Marine Ecosystem – one in which the maritime industry uses only the cleanest available fuels. One where on-board power production is optimised, and routes are precision-planned to avoid navigational hazards, traffic congestion, and unexpected waiting times. Through our know-how, integrated product portfolio, and full lifecycle solutions – all supported by the market's most extensive service network – we are committed to being the main driving force in sustainable shipping.

Wärtsilä Energy Business

Wärtsilä leads the transition towards a 100% renewable energy future. We help our customers unlock the value of the energy transition by optimising their energy systems and future-proofing their assets. Our offering comprises flexible power plants, energy management and storage systems, as well as lifecycle services that enable increased efficiency and guaranteed performance.

Market drivers

Wärtsilä Marine Business

The global demand for new vessels is mainly driven by developments within the global economy, and the resulting impact on trade and transportation capacity requirements. Other factors, such as shipyard capacity, newbuild prices, decommissioning and scrapping, fuel prices and availability, as well as interest and freight rates, also affect decisions related to the building of new vessels. The main driver for Wärtsilä's service business within the maritime industry is the size and age profile of the installed base, paired with the running hours of such equipment. The commitment that the industry has taken towards decarbonisation via the International Maritime Organization's greenhouse gas (GHG) reduction targets is increasingly affecting choices being made for newbuilds and all aspects related to operations, including needs for retrofits and upgrades.

Wärtsilä's strengths

- Strong knowledge and presence in all major maritime segments
- The broadest portfolio of reliable and high performing equipment and software in the industry
- Ability to support our customers on the journey towards decarbonisation, with solutions in all needed areas to reach GHG targets, i.e. the use of data, energy efficiency, and fuels
- A unique software platform solution (Fleet Operations Solution) to connect ship-to-shore and to use data to optimise voyage planning, fleet use, and operations
- A complete lifecycle service offering supported by an unmatched global service network and technical support
- The capability to lower operational risks for our customers and guarantee asset performance

Wärtsilä Energy Business

Economic growth, improving standards of living, and consequential electrification are jointly resulting in increased electricity consumption in non-OECD countries. The development of a more sustainable energy infrastructure is being driven by climate policies and economics. Tightening emissions legislation is forcing the closure of ageing capacity, with carbon-intensive energy sources being replaced by low carbon fuels, such as natural gas and renewable power sources. Investments in renewable generation are growing as solar and wind become increasingly cost competitive. This, in turn, is decreasing the running hours of conventional thermal capacity and creating a substantial need to add flexibility into power systems through energy storage and flexible capacity. Gas as a fuel is seen as having a key role in providing flexibility to the system. In the future, gas will be more and more carbon neutral as power-to-gas technologies utilising renewable energy to produce synthetic fuels penetrate the markets. New data, along with platform-based business models and solutions, enable system level integration and asset base optimisation throughout the entire lifecycle.

Wärtsilä's strengths

- Competitive capital cost and engineering, procurement and construction (EPC) capability
- Unique operational and fuel flexibility
- The most proven software platform for the optimisation of renewable energy sources
- Strong track-record in operations and maintenance, optimising operating costs and increasing plant availability and efficiency throughout the plant's life
- Global technical support capabilities and know-how

Strategy

Wärtsilä's purpose is to enable sustainable societies with smart technology.

The demand for clean and flexible energy and the need for efficient and safe transportation are increasingly affecting the way that customers operate. This forms the basis for Wärtsilä's Smart Marine and Smart Energy visions.

Wärtsilä's profitable growth ambitions are supported by its strong presence in key markets and a superior global service network. An integrated portfolio of services, systems, and products that covers customer needs throughout the full lifecycle positions Wärtsilä well to respond to the demand for energy efficient and innovative solutions. Emphasis is given to optimising performance through upgrades, modernisations, fuel conversions, and safety solutions, and to using data analytics and artificial intelligence to support customer business decisions. The utilisation of connectivity and smart technologies plays a key role in the optimisation of assets and in providing strategic input to customers in order to enhance their business growth. Asset management will drive future growth in lifecycle solutions and enable new "as-a-service" business models.

Wärtsilä's digital transformation provides enhanced customer value through an increased focus on collaboration and knowledge sharing. With its flexible production and supply chain management, Wärtsilä constantly seeks new ways to maintain high quality and cost efficiency — often in co-operation with customers and leading industrial partners. Investments in research and development, and specifically in digitalisation, create a strong foundation for securing and strengthening the company's position at the forefront of market innovation.

This innovative culture, together with a constant emphasis on safety, diversity, and high ethical standards, attracts skilled and committed people and creates the basis for a high performing organisation. The focus on operational excellence ensures that Wärtsilä is a company easy to do business with and drives increased productivity and efficiencies for its customers.

Sustainability

Economic

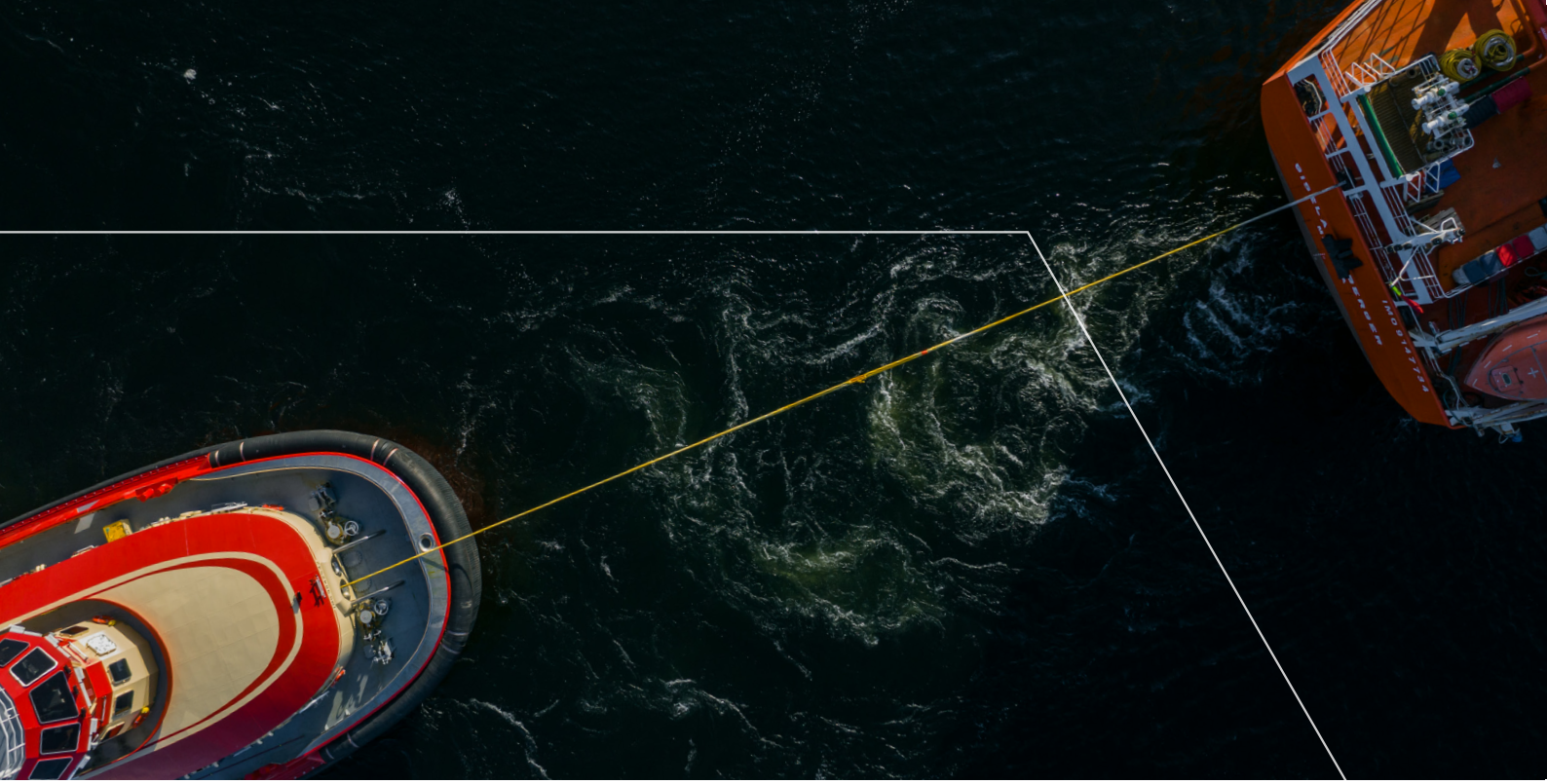
Wärtsilä aims to meet shareholder expectations and contribute towards the well-being of society. This requires efficient, profitable, and competitive company operations. Good economic performance establishes a platform for the other aspects of sustainability – environmental and social responsibility.

Environment

Wärtsilä's aim is to be a forerunner in sustainable innovation and furthermore reduce emissions in our customer's operations and in societies overall. Wärtsilä supplies smart technologies and services that help to mitigate climate change and protect our oceans and seas. We continuously work on achieving high environmental standards in our operations, and improving the environmental performance and efficiency of our products and solutions through R&D, collaboration, partnerships, and active engagement in ecosystems. In doing this, we help our customers and society at large to meet the goals of the tightening global environmental regulations and guidelines.

Social

We have high ethical standards and we care about the communities in which we operate. Our business operations and relations with our stakeholders are governed by our Code of Conduct. Wärtsilä is a responsible employer, and we seek to offer our employees an interesting and exciting workplace where openness, respect, trust, equal opportunities, and scope for personal development prevail. A further aim is to offer a hazard-free working environment to our employees and contractors, and to minimise the health and safety risks associated with the use of our products and services. Through effective supply chain management and continuous development we strive to ensure that our values expressed in the Code of Conduct are promoted in our whole value chain.



Smart Marine

Wärtsilä's aim is to lead the industry's transformation towards a Smart Marine Ecosystem. Building on the sound foundation of being a leading provider of innovative products, integrated solutions, and lifecycle services to the marine and oil & gas industries, we aim to unlock new sources of customer value through connectivity, digitalisation, and use of smart technologies.

The maritime industry faces the challenge of realising decarbonisation by the end of the century. In order to do so, the industry will have to collaborate to introduce new technologies, legislations, and fuels (e.g. bioLNG, synthetic gases, hydrogen, ammonia). Industry players are faced with major sources of inefficiency that impose a significantly negative impact on business operations, environmental performance, and profitability. The three most notable of these are overcapacity, inadequate port-to-port fuel efficiency, and time wasted waiting when entering ports and other high traffic areas. Eliminating these inefficiencies forms the basis of Wärtsilä's marine strategy towards decarbonisation and ecosystem thinking.

Wärtsilä is ideally positioned, together with its customers and partners, for positive disruptive development and to lead the transformation into a new era of shipping. Building on our extensive offering portfolio, and our vast installed base and industry know-how, we will continue to develop the smart technologies, business models, and competences needed to create a Smart Marine Ecosystem.

By applying smart technology and performance optimisation services, Wärtsilä aims to deliver greater efficiencies, minimised climate impact, and a higher level of safety to the shipping industry. This will result in more sustainable, safe, and profitable operations for ship owners and operators around the world. The ultimate goal is to enable sustainable societies with smart technologies.

Smart Energy

The energy landscape is in transition towards more flexible and sustainable energy systems. Wärtsilä envisions a 100% renewable energy future. Wärtsilä Energy's objective is to be its customers' most trusted partner in unlocking the value of an optimised energy transition by providing all the essential technologies, services, and solutions for sustainable, reliable, and affordable power systems.

The transition from traditional inflexible baseload generation to renewable dominated energy is driven by the decreasing cost of new technologies. The operating environment is becoming more complex, and new players are entering different parts of the value chain. Storage technology is changing old design principles, and the importance of flexible gas is increasing. Simultaneously, the role of consumers is gradually gaining importance in power production and as a source of flexibility. Digitalisation throughout the industry brings new opportunities for predicting consumption and maintenance needs and can deliver improved competitiveness.

Wärtsilä is at the very core of future energy systems. The company's flexible power generation solutions and energy storage systems provide a unique combination of energy efficiency as well as fuel and operational flexibility in baseload, balancing, and peaking applications. These solutions provide the needed backup for existing high renewable content power systems or can later be shifted from baseload or intermittent operations to backup mode, as the energy transition proceeds. The aim is to continuously develop optimal and environmentally sound solutions for customers by focusing on Wärtsilä's core competences: market and system understanding, EPC capabilities, system optimisation, and lifecycle support.

Wärtsilä's energy services provide a broad range of high-quality services and solutions to enhance business performance of power generation companies. The solutions range from spare parts and maintenance services to ensuring maximised operational life, increased efficiency, and guaranteed power plant performance. Wärtsilä maintains and optimises power plant performance with comprehensive lifecycle solutions encompassing technology, software, and service expertise, as well as a holistic view and understanding of installations on a system level. Our goal is to secure our customers' investments with guaranteed power plant availability and reliability.

Sustainability

As a global leader in complete lifecycle solutions for the marine and energy markets, we play a key role in providing our customers with sustainable solutions and services that maximise their environmental performance. This is the cornerstone of our commitment to sustainability, and it is supported by our strong focus on responsible business conduct.

Wärtsilä's sustainability approach

Our commitment to sustainability and responsible business is based on our purpose and strategy, which along with our sustainable development objectives create the framework for developing the company's activities and products. Wärtsilä's strategy is based on three key areas, energy efficient solutions, lifecycle optimisation, and innovative solutions, all of which contribute to a more sustainable future in both the energy and the marine industry.

Our strength is our technological leadership and therefore technology plays a central role in our sustainability work. Wärtsilä Energy Business and Marine Business focus on developing and providing sustainable solutions and services for the industries in which they operate. The utilisation of lifecycle data analytics will enhance our efforts on enabling sustainable societies with smart technology.

Wärtsilä identifies and assesses its sustainability risks on an annual basis. Based on the current assessment, the sustainability risks are considered to be at a moderate level, and sustainability forms an opportunity for Wärtsilä.

Innovating for sustainability

The call for climate action, together with the world's growing energy demand and scarcity of natural resources, is increasing the need to speed up the transition towards clean and flexible energy and low-emission and smart transportation. Wärtsilä continuously invests in developing technologies for a 100% renewable energy future and a Smart Marine Ecosystem. Sustainable innovation and product development, added with our strong emphasis on digitalisation and smart technologies, are essential for meeting current customer needs, future requirements, and for remaining an industrial frontrunner.

Wärtsilä develops sustainable solutions across a broad front, including technologies related to efficiency improvement, fuel flexibility, the reduction of gaseous and liquid emissions, waste treatment, noise abatement, hybrid and energy storage systems, as well as effluent and ballast water treatment. Our proactive approach to meeting future demand has resulted in the development of both primary and secondary abatement technologies and has broadened the range of usable fuels. Moreover, we actively develop digital innovations and advanced data analytics systems for the maritime and energy sectors. We offer intelligent digital solutions and services to collect, analyse, monitor, and report data in order to optimise operations and reduce emissions. Our commitment to investing in research and product development benefits our customers as well as the environment, both in the short term and over a longer time span.

The key features of Wärtsilä's environmentally sound solutions include:

- Compliance with environmental regulations
- Lifecycle support and optimisation
- Reliability, safety, and a long lifespan
- High efficiency
- Digital intelligence
- Low emission levels
- Renewable energy integration with engines and storage systems
- Fuel flexibility
- Dynamic capabilities
- Low water consumption

Emphasising social responsibility

Wärtsilä's aim is to provide the best value and service to its customers by continuously developing its competences and way of working. The strategic goal of Wärtsilä's social responsibility and people strategy is to bring the business strategy alive by developing Wärtsilä's people, organisation, competences and ways of working to meet the evolving business needs.

Our aim is to have energetic, competent, and motivated personnel with exciting and meaningful jobs and career opportunities led by excellent leaders. Good performance is recognised and diversity respected. By applying high standards of occupational health and safety, Wärtsilä strives to offer a hazard-free workplace to its employees, contractors, and others working in different parts of the corporation.

Good corporate citizenship is accomplished through active co-operation, open communication, and good relationships with stakeholders. Wärtsilä's operations and relations with its stakeholders are based on the company's Code of Conduct, with which each Wärtsilä company and individual is required to comply.

Sustainability highlights in 2019

11.2. Wärtsilä and Aalto University signed a partnership agreement to broaden cooperation on challenges related to climate change, scarcity of natural resources and digitalisation.

6.3. Wärtsilä completed the installation and operational staff training for its Vessel Traffic Service solutions project to increase efficiency of two Portuguese ports.

8.3. Wärtsilä contracted to supply dual technology option for Ballast Water Management Systems for Eletson's full fleet of 23 carriers.

20.3. Wärtsilä contracted to supply solutions for new state-of-the-art Wasaline ferry built in Finland, creating world class efficiency and eco-friendliness.

16.4. Wärtsilä announces Engine+ Hybrid Energy solution in support of storage and renewable energy adoption.

7.5. Wärtsilä emissions reducing solutions recognised with White Snow, Clean Air award. The award is in recognition of Wärtsilä's solutions that reduce emissions from gas flaring at oil drilling and production sites.

20.5. Wärtsilä and LUT University signed a research agreement on strategic power system modelling to collaborate on research for 100% renewable energy systems.

18.6. The Leanships collaboration project with Wärtsilä and partners designed an Energy Saving Device (ESD) suitable for use by ships with Controllable Pitch Propellers (CPPs), achieving 3.5% fuel savings.

25.7. Wärtsilä signed a 100 MW/100 MWh energy storage system project deal in South East Asia.

3.9. The Wärtsilä 31DF engine, featuring unprecedented efficiency with fuel and operational flexibility, made entry to the energy industry.

23.9. Wärtsilä joined "Getting to Zero 2030 Coalition", where along with 74 organisations Wärtsilä committed to collaboration to make commercially-viable zero emission vessels a reality by 2030.

26.9. Wärtsilä and Q Power signed a strategic cooperation agreement to support the development of renewable fuels.

7.10. Wärtsilä power plant in Kibuye, Rwanda, using 'killer lake' gases, was recognised among Project Management Institute's (PMI) Top 10 Renewable Energy Projects of the last 50 years.

11.10. Wärtsilä announced an order for hybrid upgrades saving fuel and reducing greenhouse gas emissions for two offshore supply vessels owned by the Norway-based operator Atlantic Offshore.

14.11. Wärtsilä and PSA Marine agreed to collaborate in creation of smart technologies for the marine sector to achieve clean energy shipping.

2.12. Wärtsilä was contracted to provide a full energy storage solution for integrating renewable energy in one of the largest power hybrid projects at the off-grid Fekola Mine in Mali.

Future-proofing customers' investments

In the autumn of 2018, Wärtsilä redesigned its organisation to boost the lifecycle value that the technology group brings to its customers. Wärtsilä Marine Business and Wärtsilä Energy Business began operating at the start of 2019, covering both equipment sales and services for their respective markets.

In addition to responding to customers with better speed and agility, the new structure aids the implementation of Wärtsilä's Smart Marine and Smart Energy strategies.

"Developing stronger partnerships with our customers and providing them with greater value is essential for reaching our long-term target of profitable growth," Jaakko Eskola, Wärtsilä's President & CEO, commented when announcing the reorganisation.

Wärtsilä's leadership team were confident that the redesign would lead to more rapid development of innovative solutions and services and further strengthen Wärtsilä's position as a global leader in lifecycle solutions for the marine and energy markets.

By the end of the first quarter of 2019, the company had already reported the initial benefits of the reorganisation in the form of improved cooperation within the business areas in developing full lifecycle offerings.

To revisit the rationale behind the change, two senior executives weigh in with their views on the significance of the new structure to their respective business areas' operations.

"By and large, our customers have been wanting this change and expecting it. I think they will sense a more unified and responsive organisation," says Björn Ullbro, Vice President of Energy Services at Wärtsilä.

"This change is designed to serve the customer," states John Sydney, Vice President for the Middle East and Asia in Wärtsilä's Marine Business. "Our customers have expected us to behave as one company from the beginning, so the Marine Business coming together as one organisation is a development that fulfils their demands."

A consultant and partner

"When we consider what customers value, we need to examine it from the perspective of the customer's pipeline. When they invest millions of dollars to build an asset, that investment must perform its task. It needs to work according to their business plan," asserts Sydney.

He explains that in certain segments of the maritime industry, Wärtsilä's customers treat the company as an equipment supplier delivering products or components for vessels, while in others, the company has a more valued standing.

"In offshore, cruise, and LNG carriers, for example, what we supply needs to function in a technologically superior, much more efficient, and more cost-competitive fashion. In those segments, we often take a consultative, partnering role with the customer. They listen to us and they value our opinion," Sydney says.

To illustrate, Sydney describes customers' keen interest in Wärtsilä Marine Business' solutions, ranging from hull designs and machinery that reduce vessels' emissions and enable compliance with the Energy Efficiency Design Index (EEDI), to predictive maintenance technologies utilising artificial intelligence.

"Our customers want to know how we're positioning ourselves in the market with our solutions, because in many cases there's no other company that can supply the scope of services that we do. We have ship design specialists and segment experts who work with our customers' teams in determining the naval architecture of their newbuild vessels based on the latest innovations for ships today."

According to Sydney, having one integrated business taking responsibility for selling projects and providing after-sales support brings immeasurable benefits for the customer.

"It means that whatever we sell, we have to take care of for the next 20 years – or for however long the customer decides to keep that asset. To put it in a radical way, what we sell, we have to honour to deliver and look after. That in itself is already a big positive," Sydney emphasises.

A single point of contact and effective feedback loop into product development

"What very few of our competitors have is the ability to combine technological edge with the lifecycle angle," says Ullbro, shifting attention to the Energy Business.

"We are the only organisation that has a fully-owned network that serves customers from start to finish. We have a distinct advantage in being able to harmonise our go-to-market strategy and present one offer for the entire investment case," Ullbro underscores.

Generally, in the energy business, one organisation sells new equipment, and then local agents or distributors handle the after-market side. "This can mean there's very little incentive, or even possibility, for the equipment manufacturer to provide guarantees in the lifecycle phase. In our case today, one person is ultimately responsible for what happens in the customer relationship. Our customers can have one meeting where all of their needs or concerns are dealt with," Ullbro says.

"Another extremely important aspect that we've gained advantage of by taking full ownership over the whole lifecycle is the feedback loop into product development," he points out. "A shorter feedback loop makes us more attentive and faster to adapt to evolving markets."

Understanding the customer's changing business case

"Our ability to understand their business case as it changes is fundamental to our understanding of what our customers value," continues Ullbro.

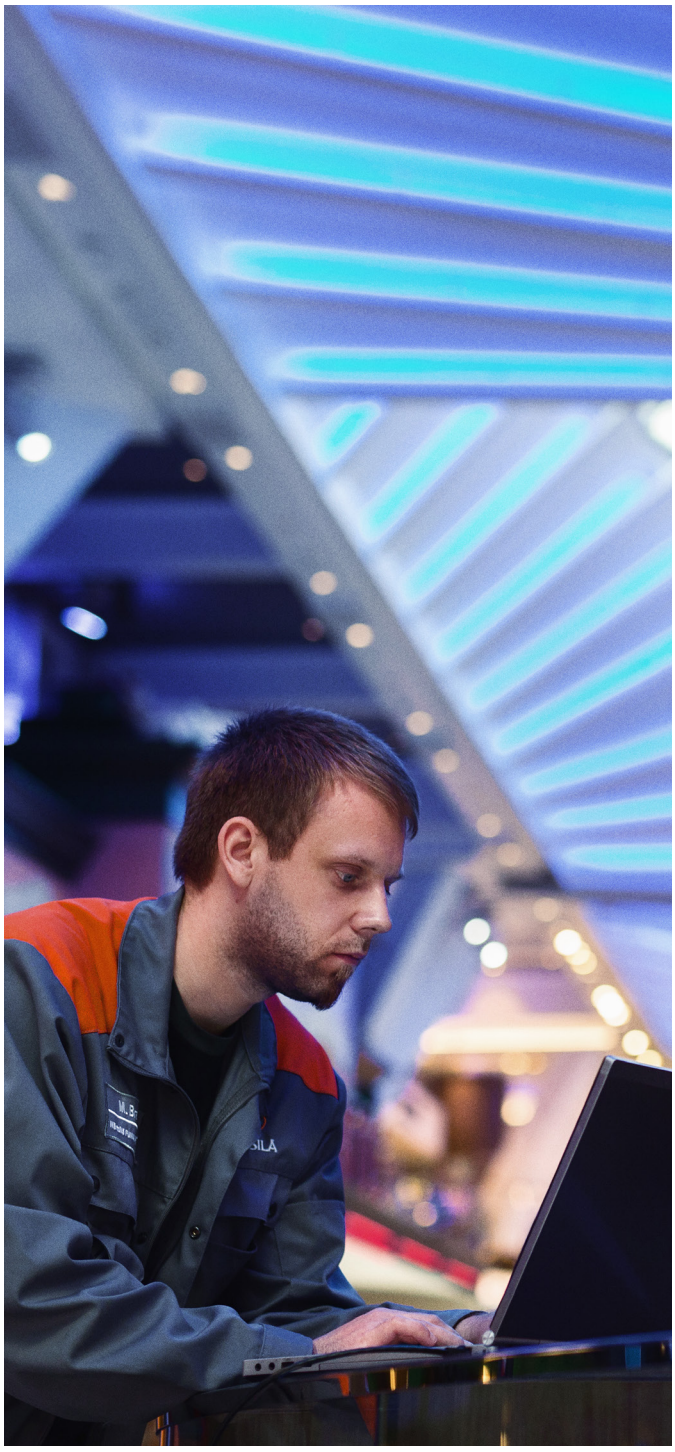
He outlines the scenario faced by many of Wärtsilä Energy Business' customers from different parts of the globe operating in today's energy landscape. Power companies are striving to keep pace with growing demand for electricity, while at the same time, renewables such as wind and solar are steadily on the rise.

"What happens to our customer's operating profile? What happens to the price of their fuel? And their competitors? It's a long time from when they start up their commercial operations to when the plant is decommissioned. A lot can change in those decades. If we look back just 10 years, the world was a very different place then. Today, there is more risk as well as more volatility coming in," Ullbro explains.

It is amidst this uncertainty – with energy systems increasingly powered by renewable energy and supported by flexibility and storage solutions – that Wärtsilä is leading the energy system transition by designing, building, and servicing optimal power systems.

"We believe that our customers, by choosing Wärtsilä, will simply be better off. They'll have a better earnings trajectory, a lower risk on their investment, and a better night's sleep."

"It's easy to assume that plant efficiency is always the number one priority. It isn't anymore, not for all customers. What's increasingly important is that the power plant starts when they press the button," Ullbro sums up.



Island of Bonaire improves energy security and use of wind power

As part of a project to fully modernise the energy grid of the Caribbean island of Bonaire, Wärtsilä delivered an energy management and storage system that nearly doubles the island's renewable energy penetration.

Completed in only a few months, Wärtsilä deployed a 6 MW / 6 MWh energy management and storage system in June 2019 for its customer ContourGlobal on Bonaire, a Caribbean island of 19,000 inhabitants.

After concluding this first phase, the island no longer curtails excess energy losses from its wind resources, increasing wind penetration from an average of 20% to 33%. The system is now prepared for additional capacity to accommodate peak demand during tourist season.

ContourGlobal's entire island grid is overseen and operated by the Greensmith Energy Management System (GEMS) advanced software platform.

"A big hurdle for utilities today is figuring out where to begin when it comes to modernising traditional thermal-based systems to allow the integration of more renewable generation assets without compromising reliability. Bonaire provides a real-time case study for how it can be done in a phased approach," says Sampo Suvisaari, Regional Director, Latin America North and the Caribbean at Wärtsilä Energy Business.

This is the beginning of a longer-term plan to fully modernise the island's energy system and add additional capacity and renewable energy generation to the grid, while setting Bonaire on the path to achieving its 100% renewable target.

Wärtsilä's energy management and storage system eliminates the island's previous dependency on heavy fuel oil (HFO) and delivers environmental benefits, decreasing fuel consumption by 5% and CO_2 emissions by 8%.

GEMS software enables optimisation

The phased approach on Bonaire allows time for system operators to add new hybrid solutions and spread out costs, and leaves room for new technologies to come online. The GEMS energy management software offers Bonaire access to the full potential of renewable energy resources, enabling intelligent applications that increase resilience and efficiencies. The software can be supported by a power producer's existing grid infrastructure. It is able to synchronise every kind of power asset within a hybrid system, and new resources can easily be integrated.

To optimise the system, GEMS now factors in real-time asset performance, as well as load and renewable energy forecasts. With phase one complete, GEMS can balance Bonaire's resources and seamlessly optimise thermal, wind, and energy storage assets.

"During our commissioning tests, several load rejections were tested, including loss of wind, loss of engines, and loss of demand. In every circumstance, GEMS instantaneously tracked and maintained the quality of the generation, avoiding the load shedding of the grid," says Giorgio Narminio, Caribbean assets COO of ContourGlobal.

"This is just one example of how this project will improve operations through automation, while helping the island avoid blackouts, achieve greater efficiencies, and use more wind power," Narminio adds.

Towards a 100% renewable future

The existing ContourGlobal power plant runs on five HFO engines and three back-up diesel engines. In the next phase of the Bonaire project, the outdated thermal technology will be replaced with five new engines, and additional wind and solar energy will be added to the power generation mix.

According to Suvisaari, as the island grid increases in size, the GEMS software will enable further renewable penetration and lower the cost of energy.

"GEMS machine learning and AI capability will incorporate weather, electricity demand, and other variables and data into its forecasting models. Automated decisions related to managing ContourGlobal's entire fleet will be based on this data," he concludes.

An ultra-low emission maritime future is on the horizon

Estimates state that marine transport emits about 3% of global greenhouse gas (GHG) emissions, a figure that is still growing. In the last two to three years, governing bodies and industry members have begun to advocate more intensely for a change of course towards a more sustainable future for shipping.

One pivotal event was the long-awaited adoption of an initial strategy to reduce shipping emissions by the International Maritime Organization (IMO) in April 2018. The UN agency set out a vision to reduce GHG emissions from international shipping and phase them out "as soon as possible in this century".

The wording of the IMO's statement is among the reasons why Andrea Morgante, Vice President for Strategy and Business Development in Wärtsilä's Marine Business, refers to the colossal task of decarbonising the marine industry as "the challenge of the century".

"Maritime transport has played a vital role throughout humankind's history, making our evolution and development possible. What we're now doing is defining the road the industry will take for the rest of the century and in the future to come," Morgante says.

The IMO's initial strategy prescribes that international shipping reduce its CO_2 emissions by a minimum of 40% compared to 2008 levels by 2030 and cut its total annual GHG emissions by at least 50% by 2050. The IMO set these targets in 2018, and the world has listened. In September of the same year, Wärtsilä launched the SEA20 initiative, an ambitious global call to action exhorting maritime cities to band together to confront the impact of climate change. SEA20, a non-profit initiative, calls on cities to collaborate in using innovative ideas from the marine, energy, and digital sectors to create a sustainable and connected infrastructure for the shipping industry. Helsinki, Hamburg, Rotterdam, the State of Washington, Trieste, Luleå, Vaasa, and Genoa have all joined the charge.

"It really is the best time to be in maritime because the industry is about to change," says Morgante, a veteran who has worked in the sector for 17 years.

"We've always had a fairly traditional environment, but at the moment there's so much discussion, activity, and possibility. The conversations we have with our customers today are very different from those we had in 2017. They are aware that these changes are happening," he relates.

Fuel-flexible combustion engines – a future-proof technology

For much of the industry, the IMO targets served as a starting point. But long before the IMO announced its initial strategy and targets, Wärtsilä had already set its sights on a radically greener future for maritime.

In November 2017, the technology group announced its vision to harness connectivity and digitalisation to lead the transformation towards a Smart Marine Ecosystem – a new era of high efficiency, environmental performance, and safety built on Wärtsilä's existing solutions and close collaboration among industry stakeholders. Of Wärtsilä's strides to transform the sector, this was perhaps among the most definitive and furthest reaching.

To expedite the realisation of its vision, Wärtsilä Marine Business has committed to testing the compatibility of alternative future fuels with existing and emerging combustion engine technology. Wärtsilä champions the switch to Liquefied Natural Gas (LNG) as a ship's main fuel, making the case for LNG – a lower carbon fuel that is already accessible today – to be utilised in combination with a dual-fuel engine, a flexible solution that can be retrofitted in the future.

"We are certain that we will be able to reach the IMO's 2030 goals with the technology that exists today," says Morgante. "But in order to reach the 2050 goals, something bolder will have to happen – a new breed of fuels must come to the market."

In an environment that will evolve in what is a relatively short time from the perspective of a vessel's life, investing in combustion engines today means that Wärtsilä Marine Business' customers will be able to benefit from further decarbonisation options as they gradually become obtainable. And as the pioneer that developed dual-fuel engines, Wärtsilä has a convincing point in its favour.

"We are the company who brought fuel flexibility to the market. This makes us the most credible partner to state that if you select a Wärtsilä engine, for example a dual-fuel engine running

on LNG, we can support you with retrofits as other fuel alternatives become available in the future."

The well-to-wake approach as a standard

In September 2019, more than 70 senior leaders from different parts of the maritime, energy, infrastructure, and finance ecosystems formed the Getting to Zero Coalition. Wärtsilä was among the players that joined this alliance, which pledges to lead the push to decarbonise international shipping. The coalition is just one of many movements that have come to life after the IMO took a stand and defined industry targets. And according to Morgante, the role the agency plays in instigating and shaping change will continue to be crucial in the years ahead.

In his view, there are two areas in particular where the IMO is expected to take a decisive role. The first is in refining emissions targets and how they are calculated, as well as making the targets mandatory. Today, emissions are calculated at the funnel. Morgante stresses the need for industry to espouse a well-to-wake approach, or in other words, a method of examining GHG emissions that takes the full lifecycle of the fuel, battery, or other energy source into account. This would call attention to the way that the energy source is produced, and not limit the focus to how it is transformed into mechanical energy.

The second area has to do with finding effective means to incentivise the innovation and adoption of technologies that bring ultra-low emission shipping within reach.

"The change has to start now. We cannot wait," says Morgante. "These are areas where the IMO has to bravely go because it's important that the solutions are global. The IMO is working on both topics. The question is how long it will take for the organisation to come together on this."

Impactful innovation

Wärtsilä's Smart Marine Ecosystem envisions a maritime industry collaborating to address critical challenges and generating solutions towards a sustainable future. This cooperation among stakeholders will leverage digital innovations and advanced data analytics to eliminate waste caused by overcapacity, inadequate port-to-port fuel efficiency, and waiting times. Vessels will be able to interact with ports in real-time and take advantage of digital services that make voyaging more efficient and more sustainable, not to mention safer.

To a large extent, Wärtsilä's vision of a Smart Marine Ecosystem is shared by the SEA20 cities. Morgante believes that this vision will also be a major part of the solution that satisfies the IMO's 2050 targets.

Expounding further on the topics of innovation and collaboration, he highlights Anglo-Eastern's decision to partner with Wärtsilä to digitalise its fleet operations as a landmark deal for the Marine Business. To achieve it, Wärtsilä combined its established position and knowhow in bridge, automation, and electrical systems, alongside energy management, analytics solutions, and marine navigation technologies gained from its recently acquired companies. In addition to showcasing Wärtsilä Marine Business' expertise, Wärtsilä's Fleet Operations Solution (FOS) also offers a platform through which the company can deploy additional applications to provide different levels of service to customers.

"FOS is a Solution as a Service. This is something new for Wärtsilä, and it's also a big deal for the industry because we provide the customer with a solution that transforms the role of hardware and enables a new range of services for a subscription fee. This is a major shift from the way the industry has traditionally thought about these things, and we believe it's going to open opportunities for more "as a service" businesses. It's a first step in the transformation of the industry."

FOS is cloud connected, creating a continuous link between ship and shore, thereby increasing transparency while also allowing the deployment of new services. New information from the cloud enables the subscribing customer to activate and take advantage of different modules using a service structure that is reminiscent of a typical software business model.

In practice, Wärtsilä's Fleet Operations Solution (FOS) optimises a vessel's speed, planning, and weather routing. It also facilitates ship-to-shore reporting and fleet performance management to reduce fuel consumption. Once it is rolled out to Anglo-Eastern's fleet of more than 600 vessels, FOS will reduce the workload for crews, enhance fuel efficiency, and increase navigational safety.

"What customers need today are solutions that improve transparency, reduce the need for training, that put the crew in a position where they are better able to perform their duties, and increase their ability to operate in difficult situations. This was one of the objectives of our Smart Marine Ecosystem vision – to shift the focus from being about products to being about outcomes and the value we bring to our customers," Morgante underscores.

Just-In-Time arrival benefits both the environment and the bottom line

Another approach Wärtsilä is employing to tackle inefficiencies while also saving fuel and CO_2 is Just-In-Time (JIT) arrival. The company redoubled its efforts to raise awareness of JIT in the industry in 2019.

The concept, which the Marine Business is piloting with a few customers, connects ship captains with ports in real-time, enabling better coordination so that vessels can adjust their speed and reduce, among other things, fuel consumption and unnecessary anchoring time.

Most ports today are not equipped with centralised platforms for exchanging data with vessels. Typically, information is still transmitted by radio communication or email – methods that are highly vulnerable to limitations. With ships arriving too early and having to wait at anchor for berthing slots, precious time and other resources go to waste – a scenario Wärtsilä Marine Business strives to make into a thing of the past.

As Morgante points out, "We believe in the purpose of JIT, which is why we're investing to make it possible. Awareness has increased a lot, and it will be easier to implement this going forward. All the new navigation solutions we are sending out are JIT-enabled. It's a big benefit, particularly when you consider that the cost is relatively small. This is what I call impactful innovation, because it benefits both the environment and our customers' bottom line."

"The reality of the industry is that if the cost of decarbonisation is at the expense of the company, then there's a reluctance to invest," Morgante explains. "The best solutions that we can take to the market right now are those that create an advantage for the company while also bringing a clear benefit to the environment," he emphasises.

Mapping the route towards zero-emission shipping

Focusing on the bunkering logistics of cleaner fuels, the ZEEDS initiative is a concrete example of how the maritime industry can play its part in meeting the climate targets set out by the Paris Agreement.

Introduced in June 2019, the Wärtsilä-led ZEEDS (Zero Emission Energy Distribution at Sea) initiative was set up by six forward-leaning companies to accelerate the shift towards zero-emission shipping. The coalition aims to address challenges related especially to the supply, storage, and distribution of clean, alternative fuels.

"Imagine a network of clean energy hubs placed near the world's busiest shipping lanes, capable of supplying and distributing clean fuels to the world's fleet. It sounds ambitious, but if we are truly serious about managing climate change, we need big ideas and bold action," says ZEEDS spokesperson Cato Esperø, Sales Director for Wärtsilä's Marine Business, Nordics and Baltics.

He acknowledges that achieving zero-emission shipping represents an enormous challenge but insists that every idea the ZEEDS partners have so far explored is grounded in existing technologies.

"Different ideas present various technical and engineering challenges, but this is not beyond the strong capabilities of our industry. We believe that achieving zero-emission shipping is not only possible, but necessary," Esperø states, adding that cooperation and transparency between partners are integral to the formation of a smarter, cleaner maritime ecosystem and a sustainable bunkering infrastructure for the ships of tomorrow.

Transparent collaboration

Besides Wärtsilä, the ZEEDS coalition includes the offshore engineering and technology company Aker Solutions, the energy company Equinor, the shipping and logistics company DFDS, the ship owner and operator Grieg Star, as well as Kvaerner, a specialist in engineering, procurement, and construction.

Matthew Duke, CEO at Grieg Star, says that the biggest revelation of the project has been how the knowledge and technology related to zero-emission shipping are already here, and not just in the distant future.

"Of course, we need to test that the different technologies will work together as planned, but that is still far better than having to come up with something completely new. Also, it has been astounding to see how these companies and people have so willingly shared their knowledge with us," Duke enthuses.

Considering the future success of the initiative, Duke says that it is necessary to attract even more partners to share their expertise.

"We need support from authorities and genuine interest from investors. If we manage to prove the concept in Northern Europe, it should be possible to replicate in most parts of the world. If so, we will have come a long way."

A diverse range of partners

In the view of Margaret Mistry, Strategy & Innovation Manager at Equinor, the most valuable experience of the project has been hearing the different perspectives of partners and understanding how it is important to listen to the shipowner's needs when tackling the challenge of moving from vision to reality.

"As an offshore wind and energy provider, as well as having our own fleet of supply vessels and a large shipping customer, Equinor has an interest in all aspects of the project. At Equinor, we already have some initiatives looking at potential growth in offshore wind and the future of hydrogen and ammonia, as well as shipping technology development," Mistry says.

She sees that ZEEDS has the potential to provide focus and tangible business opportunities for the various protagonists actively seeking ways of creating a new "blue economy" in the ocean.

"As the next step, the initiative needs to work on some pilot projects to demonstrate how this future value chain could work," Mistry points out.

Cato Esperø says that the project has already generated a lot of publicity and contacts from various prospective partners. Accelerating the transition to clean fuels and a new energy infrastructure requires broad collaboration between stakeholders also outside shipping, from governments and regulators to port authorities and cities.

"So far, the response has been even better than expected, and we are excited to see all the potential business perspectives and unique views that different operators can offer," Esperø concludes.

The power of many

Collaboration is a chief component in Wärtsilä's efforts to scale up Power-to-X technologies. In a continuously evolving energy market, Wärtsilä has committed to the role of leading the global transition towards a future powered entirely by renewable energy. A key factor in attaining this vision is Power-to-X technology. But what exactly is Power-to-X? And how does Wärtsilä plan to harness it?

Sometimes referred to as P2X, Power-to-X is an umbrella term for methods that use electrochemical conversion to transform surplus electricity into a certain X. This X could take the form of a liquid or gas energy carrier – for instance, hydrogen, methane, or methanol – and be stored for later use. An example of a Power-to-X process would be the generation of synthetic fuel from hydrogen and excess CO_2 emissions.

As an emerging concept, Power-to-X shows immense promise and is especially important within the scenario of a future where a high share of energy is produced from renewable sources. Because energy generated through Power-to-X technologies can be stored, it can be accessed when needed – in other words, during times when the sun is not shining, or the wind is not blowing.

"Many companies in Europe are making their first investments in Power-to-X today, and I'm happy that we are one of the first ones to drive this change and talk about the opportunities," says Matti Rautkivi, Director of Strategy and Business Development in Wärtsilä's Energy Business.

"A couple of years ago, we could see the direction the world was taking, particularly when we looked at the evolving energy market. It was at around that point when we launched our vision to lead the transition towards 100% renewable energy systems. One part of this vision – the missing piece of the puzzle – is Power-to-X and how to actually produce synthetic fuels," he relates.

"When we were thinking about our vision and where we should take the business, we recognised that it is vital for us to produce energy with the resources that we have here in the atmosphere, and that in the future, fuel should no longer be taken from underground," Rautkivi says. "This is why we are developing Power-to-X as an essential part of the power system that will become a reality in the coming years."

The missing piece of the puzzle

It was in June 2018 that Wärtsilä first launched its Smart Energy vision aspiring towards a 100% renewable energy future. But while it was the Energy Business that brought Power-to-X into the picture for the technology group, the concept is relevant to the Marine Business, too, as Rautkivi explains:

"In both the Energy and Marine businesses, we have efficient engines that provide flexibility and which can also be used with renewable systems. Our engines themselves are already more than capable of fulfilling these requirements, but how do we produce fuel for them?"

It was through Wärtsilä's link with its long-standing research partner, Lappeenranta-Lahti University of Technology (LUT), that the company first came into contact with the Power-to-X concept. Since then, a number of the Energy business' investments have been steered by an ethos of engaging partners with the best insight into the topic.

"Collaborating with LUT, an organisation conducting in-depth research, has helped us understand the Power-to-X concept and its potential. Eventually, when it became clear that Power-to-X is a promising field that we wanted to invest in, we began partnering with our customers on the concept," Rautkivi points out.

To illustrate, in late 2018, Wärtsilä, together with LUT, signed a memorandum of understanding with the Nebraska Public Power District (NPPD), the US state of Nebraska's largest electric utility. The three parties agreed to develop a business case for using alternative fuels in Wärtsilä generating sets with a view towards finding a viable solution that will enable NPPD to generate energy from fully renewable, carbon-free sources on an industrial scale.

The following spring, Wärtsilä and LUT signed an agreement on strategic power system modelling to examine and develop pathways towards 100% renewable energy systems.

Innovation over competition

"Our approach really has to do with innovation. It involves trying out new business models," says Rautkivi, who suggests that the willingness to work collaboratively comes from a particular mentality: "We need to value innovation over competition because the market still needs to be developed. Currently, there is no market for Power-to-X. The whole ecosystem will change, and we cannot do it by ourselves. We shouldn't try to do it by ourselves."

In January 2019, Wärtsilä recruited another ally in Carbon Recycling International (CRI), an Icelandic firm that bested nearly 70 other start-ups competing in Wärtsilä's SparkUp Energy Challenge. The competition aimed specifically at scouting enterprises with promising Power-to-X technologies. Rautkivi points to the contest as an opportunity that Wärtsilä's Energy business took to enlist a partner that would help the company better understand the process of methanol synthesis.

It was CRI's innovative solution for producing synthetic methanol, along with their expertise in commercialising their solution, that set them apart from the rest. Vulcanol, CRI's renewable methanol product, is already in use in Europe and China. Furthermore, up to 4,000 metric tonnes of synthetic methanol can be produced at the company's George Olah Renewable Methanol Plant in Grindavik, Iceland, per year.

Not long after CRI's SparkUp Challenge win, in spring 2019, Wärtsilä agreed to fund Finland-based start-up company Soletair Power. Soletair has developed a revolutionary technology that captures CO_2 from the air in buildings, combines it with hydrogen, and converts it into multifunctional hydrocarbons used to produce, among other things, synthetic renewable fuel.

As in the case of CRI, Soletair, along with its proprietary technology, supports Wärtsilä's strategy of leading the transformation of the energy sector.

"If we want to go beyond our existing business, we need to look outside. We will not be able to get the best ideas from our organisation alone," stresses Rautkivi. "We are investing in resources and openly sharing and supporting different kinds of players because we all share the same goal."

Creating a market for synthetic renewable fuel

The pattern of partnering and co-creation has continued to emerge in Wärtsilä's efforts to understand Power-to-X and scale up its development. In September 2019, Wärtsilä recruited yet another valuable partner on the road to a fully renewable-powered future.

The technology group signed a cooperation agreement with Q Power, a company with a patented technology for producing biomethane from hydrogen and carbon dioxide. Considered a Finnish pioneer in biomethanisation, Q Power has joined forces with Wärtsilä to further speed up the development of renewable fuels and capture opportunities to market them globally.

"Power-to-X is a novel market that presents immense possibilities, and we are constantly reviewing all of these prospects," Rautkivi concludes.

"One thing we know for certain is that collaboration is essential for us on the path towards our target of a 100% renewable energy future. Our role now is to accelerate this transition and scale this significant opportunity," he asserts.

Read more Wärtsilä stories

- The IntelliTug project – one step closer to autonomous shipping
- A new fully mobile asset management hub for Wärtsilä customers
- Academia offers rich ground for joint research into sustainable solutions
- Collaboration produces breakthrough energy-saving solution for ships
- Boosting asset reliability with proactive high-level support

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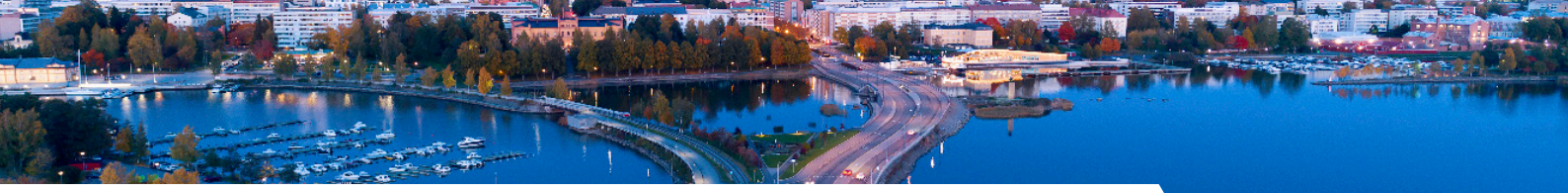


Financials 2019

During 2019, the increase in both marine equipment deliveries and service volumes resulted in stable net sales for Wärtsilä. The operating result was, however, burdened by project cost overruns in a handful of complex marine and energy projects and the decline in energy equipment deliveries.

Vessel contracting fell short of initial forecasts, largely due to concerns related to the implications of geo-political developments on seaborne trade. In this context, we can be pleased with the level of equipment orders received in the Marine Business, which was supported by continued activity in specialised vessels, such as cruise ships and gas carriers. In the energy sector, the demand for new, gas and liquid fuelled power generation capacity declined significantly during the year, as macroeconomic uncertainty and the ongoing energy transition delayed investment decisions. While equipment orders in the Energy Business were below that of the previous year, energy service orders developed well, thanks to a record high order intake for service agreements.

In 2020, our focus will be on securing project execution quality and better upfront identification of risks and opportunities, as well as on improving operational efficiency and optimising our portfolio in order to strengthen the focus on core businesses. Looking further ahead, we have a solid basis for future performance thanks to our sizeable order book and service opportunities arising from our large installed base. Furthermore, we have the means and the solutions, through our broad offering of flexible technologies and strong in-house capabilities, to enable growth in the adoption of renewable energy sources, and to contribute to the decarbonisation of the maritime industry.

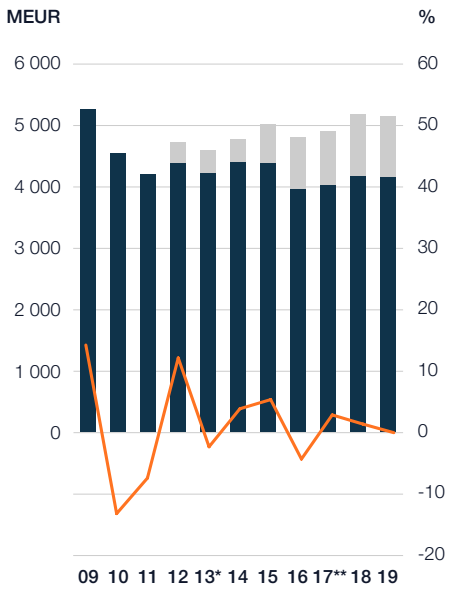
Key figures

MEUR	2019	10-12/2019	7-9/2019	4-6/2019	1-3/2019	2018
Net sales	5 170	1 684	1 118	1 217	1 151	5 174
Marine	3 330	1 020	776	801	733	2 815
Energy	1 840	664	342	416	418	2 359
Depreciation, amortisation and impairment	-180	-39	-58	-42	-41	-130
Comparable operating result[1]	457	202	39	113	102	577
Comparable operating result[1], %	8.8	12.0	3.5	9.3	8.9	11.2
Profit before taxes	315	153	-0	83	78	502
Earnings per share, EUR	0.37	0.17	-0.01	0.11	0.10	0.65
Order intake	5 327	1 555	979	1 377	1 416	6 307

MEUR	2019	31.12.2019	30.9.2019	30.6.2019	31.3.2019	2018
Balance sheet total	6 398	6 398	6 360	6 198	6 337	6 059
Interest-bearing liabilities, gross[2]	1 096	1 096	1 365	1 132	1 162	823
Cash and cash equivalents	369	369	374	383	501	487
ROI, %	11.5	11.5	12.8	17.2	18.2	18.1
Gearing[2]	0.30	0.30	0.44	0.33	0.29	0.14
Order book, end of period	5 878	5 878	6 294	6 470	6 330	6 166
Year-end market capitalisation	5 828	5 828	6 080	7 547	8 512	8 222
Personnel, number at end of period	18 795	18 795	19 018	19 239	19 225	19 294

[1] Figures exclude items affecting comparability.
[2] The increase in net interest-bearing debt is partly related to the inclusion of lease liabilities on balance sheet as a result of the new IFRS 16 standard.

Growth over cycle



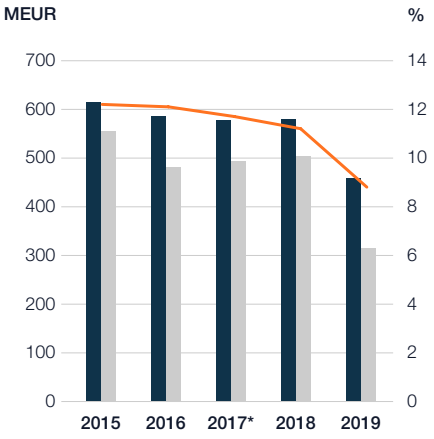
Net sales
Cumulative new acquisitions
Growth, % (incl. acquisitions)

World nominal GDP growth 2009–2019 averages 3.7%, USD denominated (source: IMF)

* Restated, figures include continuing operations

** Restated due to IFRS 15

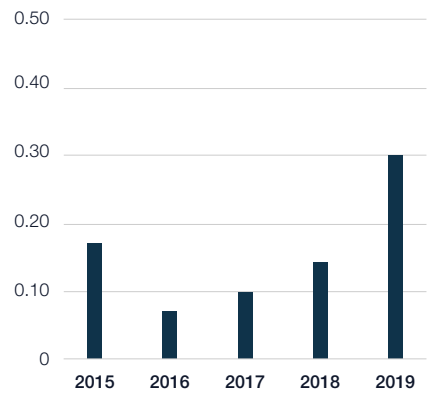
Result



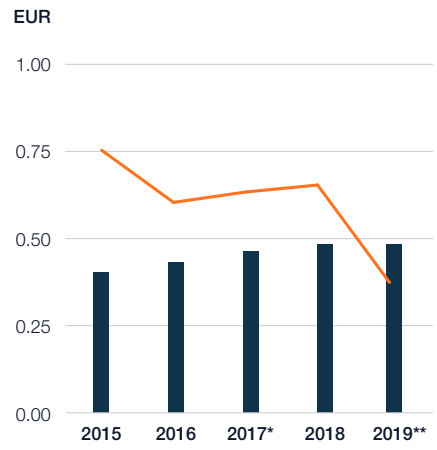
Comparable operating result
Profit before taxes
Comparable operating result, %

* Restated due to IFRS 15

Gearing



Dividend/share, earnings/share



Dividend/share
Earnings/share

* Restated due to IFRS 15

** Proposal of the Board

Dividend/share and earnings/share for 2015–2017 have been restated to reflect the increased number of shares.

Consolidated statement of income

MEUR	2019	2018
Net sales	5 170	5 174
Change in inventories of finished goods & work in progress	137	64
Work performed by the Group and capitalised	18	14
Other operating income	67	80
Material and services	-3 003	-2 852
Employee benefit expenses	-1 260	-1 175
Depreciation, amortisation and impairment	-180	-130
Other operating expenses	-578	-648
Share of result of associates and joint ventures	-9	13
Operating result	362	543
as a percentage of net sales	7.0	10.5
Financial income	27	24
Financial expenses	-74	-65
Profit before taxes	315	502
Income taxes	-97	-116
Profit for the financial period	218	386
Attributable to:		
equity holders of the parent company	217	386
non-controlling interests	1	1
	218	386
Earnings per share attributable to equity holders of the parent company (basic and diluted):		
Earnings per share (EPS), basic and diluted, EUR	0.37	0.65

Consolidated statement of comprehensive income

MEUR	2019	2018
Profit for the financial period	218	386
Other comprehensive income, net of taxes:		
Items that will not be reclassified to the statement of income		
Remeasurements of defined benefit liabilities	-20	-3
Tax on items that will not be reclassified to the statement of income	5	
Total items that will not be reclassified to the statement of income	-16	-4
Items that may be reclassified subsequently to the statement of income		
Exchange rate differences on translating foreign operations		
for equity holders of the parent company	42	-23
for non-controlling interests		-1
Associates and joint ventures, share of other comprehensive income	-1	-1
Cash flow hedges		
measured at fair value	4	-17
transferred to the statement of income	19	-8
Tax on items that may be reclassified to the statement of income		
Cash flow hedges		
measured at fair value		3
transferred to the statement of income	-4	2
Total items that may be reclassified to the statement of income	60	-45
Other comprehensive income for the financial period, net of taxes	45	-48
Total comprehensive income for the financial period	263	338
Total comprehensive income attributable to:		
equity holders of the parent company	262	338
non-controlling interests	1	
	263	338

Consolidated statement of financial position

ASSETS

MEUR	31.12.2019	31.12.2018
Non-current assets		
Goodwill	1 380	1 355
Intangible assets	397	392
Property, plant and equipment	307	324
Right-of-use assets	185	
Investments in associates and joint ventures	42	66
Other investments	18	16
Interest-bearing investments	1	3
Deferred tax assets	155	129
Trade receivables	19	49
Other receivables	15	34
Total non-current assets	2 518	2 369
Current assets		
Inventories	1 365	1 165
Trade receivables	1 237	1 222
Current tax receivables	42	31
Contract assets	515	557
Other receivables	281	228
Cash and cash equivalents	358	487
Total current assets	3 797	3 690
Assets held for sale	82	
Total assets	**6 398**	**6 059**

EQUITY AND LIABILITIES

MEUR	31.12.2019	31.12.2018
Equity		
Share capital	336	336
Share premium	61	61
Translation differences	-114	-155
Fair value reserve	-11	-31
Remeasurements of defined benefit liabilities	-55	-39
Retained earnings	2 178	2 245
Total equity attributable to equity holders of the parent company	2 396	2 418
Non-controlling interests	14	14
Total equity	2 410	2 432
Liabilities		
Non-current liabilities		
Interest-bearing debt	997	748
Deferred tax liabilities	83	99
Pension obligations	155	149
Provisions	45	54
Contract liabilities	38	41
Other liabilities	1	1
Total non-current liabilities	1 317	1 092
Current liabilities		
Interest-bearing debt	99	74
Provisions	278	251
Trade payables	624	596
Current tax liabilities	100	81
Contract liabilities	880	888
Other liabilities	622	645
Total current liabilities	2 603	2 535
Total liabilities	3 920	3 627
Liabilities directly attributable to assets held for sale	68	
Total equity and liabilities	**6 398**	**6 059**

Consolidated statement of cash flows

MEUR	2019	2018
Cash flow from operating activities:		
Profit for the financial period	218	386
Adjustments for:		
Depreciation, amortisation and impairment	180	130
Financial income and expenses	47	39
Gains and losses on sale of intangible assets and property, plant and equipment and other changes	-15	-26
Share of result of associates and joint ventures	9	-13
Income taxes	97	116
Other non-cash flow adjustments	3	-7
Cash flow before changes in working capital	540	625
Changes in working capital:		
Receivables, non-interest-bearing, increase (-) / decrease (+)	9	-22
Inventories, increase (-) / decrease (+)	-213	-130
Liabilities, non-interest-bearing, increase (+) / decrease (-)	74	117
Changes in working capital	-130	-35
Cash flow from operating activities before financial items and taxes	410	589
Financial items and taxes:		
Interest income	4	6
Interest expenses	-13	-14
Other financial income and expenses	-27	-7
Income taxes paid	-141	-104
Financial items and paid taxes	-178	-119
Cash flow from operating activities	232	470
Cash flow from investing activities:		
Acquisitions	-4	-191
Investments in associates and joint ventures		-1
Other investments	-2	-3
Investments in property, plant and equipment and intangible assets	-116	-110
Reduction of share capital in associates and joint ventures		13
Proceeds from sale of property, plant and equipment and intangible assets	25	11
Proceeds from sale of shares in subsidiaries	1	41
Loan receivables, increase (-) / decrease (+), and other changes		1
Cash flow from investing activities	-95	-240
Cash flow after investing activities	137	230
Cash flow from financing activities:		
Proceeds from non-current debt	150	279
Repayments and other changes in non-current debt	-105	-84
Loan receivables, increase (-) / decrease (+)	2	-4
Current loans, increase (+) / decrease (-)	-18	-35
Dividends paid	-284	-274
Cash flow from financing activities	-256	-118
Change in cash and cash equivalents, increase (+) / decrease (-)	-119	112
Cash and cash equivalents at the beginning of the financial period	487	379
Exchange rate changes		-5
Cash and cash equivalents at the end of the financial period*	369	487

* Cash and cash equivalents at the end of the financial period include the cash and cash equivalents pertaining to assets held for sale.

Why invest in Wärtsilä

Wärtsilä's strengths lie in our integrated services and solutions offering, data-driven innovations, close and long-standing customer relationships, and an unparalleled global presence.

Supporting customers with lifecycle solutions

Our business model is based on providing the marine and energy markets with smart technologies and optimised lifecycle services. Our service activities represent approximately 50% of total net sales, providing a good foundation for achieving the long-term target of profitable growth.

The demand for Wärtsilä's services is supported by the increasing technological sophistication of the installed equipment base. Our commitment to investing in digitalisation provides opportunities to further develop our value-adding customer offering, for instance by leveraging advanced diagnostics to optimise performance.

A leader in smart technology for the marine and energy markets

The shift towards clean and flexible energy production, and the need for efficient and safe transportation, form the basis of our offering of smart solutions. As an industry frontrunner, we are committed to responding to the need for innovative and energy efficient solutions. Our digital transformation will provide enhanced customer value through an increased focus on collaboration and knowledge sharing. Continuous investments in research and development are vital for ensuring the competitiveness of our product portfolio and for securing a leading position in sustainable innovation.

A capital-light business model emphasising increased efficiency

Our manufacturing model is assembly-based, with shared production and R&D facilities. This creates flexibility in aligning operations to market conditions and synergies in innovation processes. We focus on continuous process improvement throughout the organisation in order to achieve operational excellence.

Investing in technological leadership and providing shareholder returns

Our sound financial position enables investments in research and development activities and developing the business through acquisitions, while offering solid dividends to our shareholders.

Wärtsilä is included in the following sustainability indices:

FTSE4Good Index

MSCI Global Sustainability Index Series

Ethibel Sustainability Index (ESI) Excellence Europe

ECPI Global Carbon Equity Index & ECPI Global ESG Best in Class Equity Index

OMX GES Sustainability Finland Index

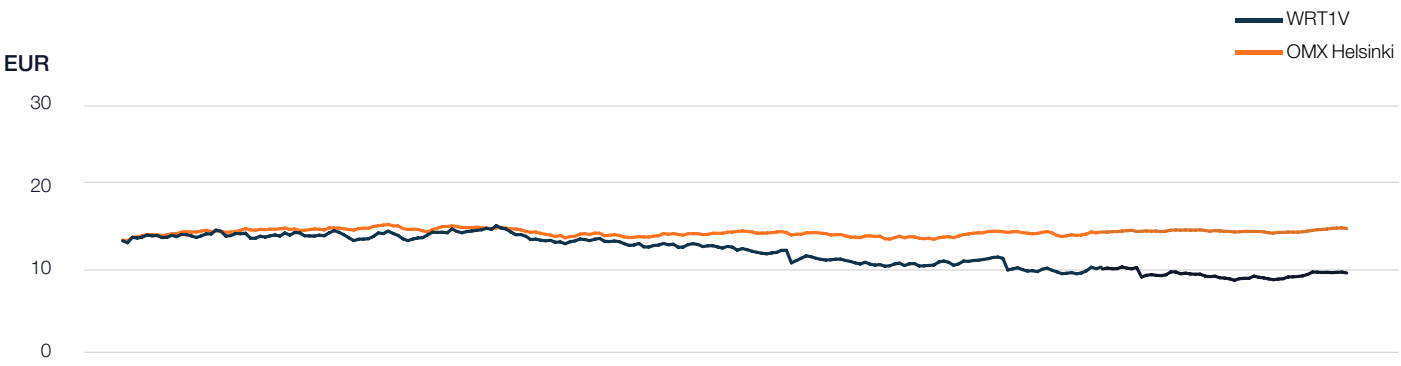
S&P Global, The Sustainability Yearbook

STOXX Global ESG Leaders Index

Dow Jones Sustainability Indices

S&P Europe 350 ESG Index

Wärtsilä's share price development in 2019



Q1
Growth in net sales, good development in profitability

Q2
Stable development in net sales, equipment profitability challenging

Q3
Project related challenges and low equipment demand – services activity remained sound

Q4
Net sales increased, but project challenges still burdened operating result

30.1.
Wärtsilä initiated a formal process to realign its operations and resources to secure future profitability and competitiveness.

11.2.
Wärtsilä and Aalto University in Finland signed a Partnership Agreement that aims at strengthening and broadening their cooperation.

7.3.
The Annual General Meeting was held in Helsinki.

11.3.
Wärtsilä was contracted to deliver a 132 MW dual-fuel power plant to Bahamas on a fast-track, EPC basis.

15.3.
Wärtsilä successfully tested its remote guidance services onboard the RoRo ferry Huckleberry Finn.

18.3.
The first dividend instalment of EUR 0.24 per share was paid.

20.3.
Wärtsilä was awarded a contract to supply an integrated package of products, systems, and solutions to Wasaline's new, efficient and environmentally sustainable RoPax ferry.

20.3.
Wärtsilä selected its first cooperation partners for Smart Partner Campus, a flexible smart marine and smart energy platform.

10.4.
Wärtsilä launched Wärtsilä Online, a new web-based customer platform.

15.4.
Wärtsilä agreed to provide seed funding to Soletair Power Oy, a Finland-based startup company operating in the field of Power-to-X.

16.4.
Wärtsilä launched Engine+ Hybrid Energy, a solution that pairs engines with energy storage.

2.5.
Wärtsilä acquired Ships Electronic Services Ltd, a UK-based company specialising in navigation and communication electronics.

3.6.
Wärtsilä secured the first order for SmartDock, making it the world's first commercially available auto-docking solution.

4.6.
Wärtsilä introduced a digital version of Operim – Operational Performance Improvement & Monitoring, as well as the new Navi-Planner voyage planning and optimisation solution.

13.6.
Wärtsilä launched its Modular Block power plant solution.

17.6.
Wärtsilä secured a 7-year maintenance management and operational advisory agreement for two power plants in Bangladesh.

9.7.
Wärtsilä announced an order to deliver the marine sector's first hybrid installation for a bulk carrier.

3.9.
Wärtsilä introduced the Wärtsilä 31DF multi-fuel engine for the power generation markets.

11.9.
Wärtsilä secured a 5-year extension to a guaranteed asset performance agreement for a combined heat and power plant in Hungary.

12.9.
Wärtsilä announced an order to fit the new Wasaline RoPax ferry with the Nacos Platinum navigation and communication system.

17.9.
Wärtsilä launched the Wärtsilä 31SG pure gas engine for marine applications.

26.9.
Wärtsilä and Q Power Oy signed a cooperation agreement to accelerate the development and commercialisation of renewable fuels.

27.9.
The second dividend instalment of EUR 0.24 per share was paid.

23.10.
Wärtsilä co-founded a global cyber security alliance, which aims to bridge dangerous gaps in security for operational technology and industrial control systems.

24.10.
Wärtsilä appointed Alid Dettke as Executive Vice President, Human Resources.

7.11.
Wärtsilä's autonomous harbour tug (IntelliTug) project proceeded with the successful installation of a first-of-its-kind Dynamic Positioning system onboard a harbour tug.

15.11.
Wärtsilä and Singapore-based PSA Marine agreed to collaborate in the co-creation of smart technologies for the marine sector.

21.11.
Wärtsilä launched its Expert Insight predictive maintenance product.

25.11.
Wärtsilä received a strategically important order to supply its fleet operations solution to Anglo-Eastern's global fleet of more than 600 vessels.

2.12.
Wärtsilä secured an order to provide a full energy storage solution for one of the largest hybrid power projects at an off-grid mine in Mali.

12.12.
Wärtsilä announced the divestment of its ELAC Nautik business.

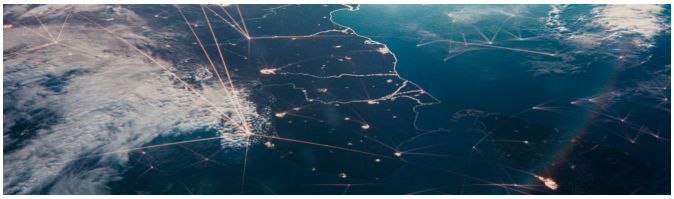
16.12.
Wärtsilä announced the first order of the Wärtsilä Modular Block to be delivered in Mali.

17.12.
Wärtsilä secured an order to supply its Vessel Traffic Service solution to two of France's leading ports, Calais and Boulogne.

Highlights 2019

Committed to research & development

The aim of Wärtsilä's R&D activities is to continuously strengthen our technology leadership position, and to further improve our competitive edge in the global marine and energy markets. We emphasise efficiency improvement, fuel flexibility and the reduction of environmental impact. In 2019, R&D investments amounted to EUR 164 million or 3.2% of net sales.



Developing new digital solutions

Wärtsilä's R&D activities have increasingly turned to developing new digital solutions, with the emphasis on optimising performance through data insights. Advances made during the year include a new online platform that allows our customers to manage their installations more efficiently, and the introduction of Expert Insight, which leverages artificial intelligence and advanced diagnostics to remotely monitor equipment and systems in real time.

Focus on lifecycle solutions

Wärtsilä's organisational structure was renewed in 2019, forming it around two businesses integrating both equipment and services. A central aim of this change is to better enable the tailoring of our lifecycle solutions to specific market needs.

Collaborating with industry stakeholders

Collaboration with industry stakeholders is an essential element in the development of technologies needed to meet the changing market requirements. Among the year's partnership projects were agreements aimed at accelerating the development and commercialisation of renewable fuels in the energy markets, and joint initiatives to promote the decarbonisation of shipping.

Smart Technology Hub

Several major milestones were reached during 2019 with regards to the construction of the Smart Technology Hub, Wärtsilä's new centre of research, product development and production. The project progressed from planning to implementation, with excavation work and construction started in August, and the first partners selected for the Smart Partner Campus.

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