This is Wärtsilä

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CEO review

Growth in order intake and net sales
The year 2018 was marked by positive momentum in ordering activity in our marine related businesses, and growth in net sales. The latter was primarily due to increased newbuild marine and energy deliveries, which, in combination with slower than anticipated development in transactional service volumes and higher costs related to research, development, and digitalisation, burdened profitability.

Well positioned in challenging markets
In the energy markets, economic development, geopolitical uncertainty, and currency fluctuations resulted in a slowdown in customer decision-making, which adversely affected ordering activity. Although the competitive environment is demanding, our offering is well positioned to respond to the prevailing market trends. The costs of solar and wind power continue to decrease, and it has become increasingly economical to replace traditional baseload capacity with renewables and flexibility. This expansion of renewable energy was evidenced with major contracts from Australia and the USA being awarded to us. At the same time, the continued need for reliable capacity to support economic growth and alleviate power shortages is supporting power plant investments in the emerging markets.

The pace of recovery in the marine markets has been slower than anticipated, thus burdening the newbuild market and causing many customers to limit their service spend to essential repairs and maintenance. Overcapacity and geopolitical uncertainty are the primary sources of concern. Our broad market exposure has once again served us well, as vessel contracting activity has favoured the more specialised segments such as cruise and ferry and LNG carriers. Our customers' appetite for service in these segments has also remained healthy. Environmental considerations emerged as a key theme in the marine markets. For Wärtsilä, this was reflected in a significant growth in demand for exhaust gas cleaning systems in both the newbuild and retrofit markets, as customers sought to prepare themselves for compliance with the approaching IMO 2020 global sulphur cap.

Progress towards realising our vision for the marine and energy markets
Maximising renewable generation is essential in ensuring a sustainable and profitable future for the energy industry. In this context, Wärtsilä launched a new vision for the energy market during the year. Our ambition is to lead the industry's transformation towards a future that utilises 100% renewable energy, with flexible capacity as the enabler. The introduction of new solutions for the integration of renewables and storage, such as the Wärtsilä Hybrid Solar and GridSolv, an advanced modularised energy storage solution, represents concrete examples of the steps we have taken in realising this vision.

The marine industry is being transformed through increasing connectivity, new business models, and a stronger focus on environmental compliance. We are committed to supporting our customers by taking a leading role in this transition. This forms the basis for our Smart Marine vision, which emphasises leveraging the opportunities offered by digitalisation to promote safety, alleviate environmental impact, and improve efficiency. A key milestone for the year was further strengthening our offering of smart solutions through the acquisition of Transas, a leader in marine navigation solutions, training and simulation services, as well as ship traffic control. Other examples of progress made in the field of intelligent shipping include the successful testing of our automated dock-to-dock concept, and a project initiated to develop an autonomously navigated harbour tug.

With the growth in digital solutions, cyber security has become vital to the operation and management of many safety, security, and protection systems in the shipping environment. With this in mind, we entered into a partnership with Templar Executives, a specialist cyber security company, to establish a cyber academy offering courses designed to support and enhance the collective cyber maturity of the wider shipping community. The partnership has also resulted in the introduction of a new international cyber intelligence and incident support platform, MCERT, that enhances cyber resilience for the maritime ecosystem.
Emphasising collaboration, new ways of working, and responsible business conduct

Attracting and retaining personnel is key for safeguarding our future success. Our aim is to foster an inclusive corporate culture, emphasising diversity and high ethical standards, and safe working conditions. In this context, we are committed to supporting the UN Global Compact and its principles with respect to human rights, labour, the environment, and anti-corruption. In 2018, the lost-time injury frequency increased slightly to 2.50 (2.48). After successive years of improvement in this area, we are disturbed to see even this small increase. We will re-double our efforts towards achieving our goal of zero time lost through injuries.

Our organisation is developing along with its transformation into a technology services company. Collaboration and knowledge sharing, both within the Group and externally with partners, suppliers and customers, is central to aligning ourselves to changing market requirements and for developing the smart technologies needed. In this, we emphasise new working methods and sustainable development throughout the organisation. Our focus on these areas is enhanced with our move during the autumn into state-of-the-art office premises in Helsinki, wherein the latest smart real estate technologies are incorporated, and with our decision to build a new centre for research, development and production, in Vaasa, Finland. When finalised in 2020, this Smart Technology Hub will enable more agile and efficient testing, development, and production of solutions for the maritime, oil and gas, and energy industries. We also opened an Acceleration Centre in Singapore, focusing on areas such as intelligent vessels, connected smart port operations, cyber-physical security, and digital acceleration with start-ups. This represents yet another example of our commitment to promoting innovation and collaboration within our operating sphere.

Looking ahead

We enter the year with a new organisation formed around two business areas that incorporate both newbuild activities and services. With this structure our primary focus is to enhance the value that we deliver to customers through a stronger emphasis on lifecycle solutions that are tailored to specific market needs, increased flexibility, and even faster response times. I am confident that this change will enable us to develop stronger partnerships with our customers and ensure the continued rapid development of innovative solutions, thereby accelerating our progression towards the long-term target of profitable growth.

Market conditions in 2019 are expected to be largely in line with those seen during the previous year. The pace of recovery in the marine markets will remain slow, and, while the need for flexible power capacity supports activity in the energy markets, the competitive environment remains a concern. For these reasons, the demand outlook for both our businesses is solid. To stay competitive in the current market environment, we must initiate actions to increase customer value and secure profitable growth. This is the basis for the group-wide realignment program announced in January 2019. In addition to reviewing our cost structure, planned actions include an increased focus on targeted sales activities, developing the agreements-based and “as-a-service” business, and optimising the business portfolio.

I would like to take this opportunity to thank the entire Wärtsilä personnel for its commitment to furthering our common goals, our customers for your trust in our solutions and services, and last but not least, our shareholders for your confidence in Wärtsilä’s future development.

Jaakko Eskola
President & CEO
## Key figures

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<tbody>
<tr>
<td>Net sales</td>
<td>5 174 MEUR</td>
<td>1 532 MEUR</td>
<td>1 330 MEUR</td>
<td>1 246 MEUR</td>
<td>1 066 MEUR</td>
<td>4 911 MEUR</td>
<td>4 801 MEUR</td>
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<td>Services</td>
<td>2 426 MEUR</td>
<td>737 MEUR</td>
<td>572 MEUR</td>
<td>582 MEUR</td>
<td>535 MEUR</td>
<td>2 407 MEUR</td>
<td>2 190 MEUR</td>
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<td>Energy Solutions</td>
<td>1 517 MEUR</td>
<td>431 MEUR</td>
<td>451 MEUR</td>
<td>368 MEUR</td>
<td>267 MEUR</td>
<td>1 401 MEUR</td>
<td>943 MEUR</td>
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<tr>
<td>Marine Solutions</td>
<td>1 232 MEUR</td>
<td>384 MEUR</td>
<td>307 MEUR</td>
<td>296 MEUR</td>
<td>264 MEUR</td>
<td>1 104 MEUR</td>
<td>1 667 MEUR</td>
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<tr>
<td>Depreciation, amortisation and impairment</td>
<td>-130 MEUR</td>
<td>-37 MEUR</td>
<td>-31 MEUR</td>
<td>-31 MEUR</td>
<td>-30 MEUR</td>
<td>-134 MEUR</td>
<td>-138 MEUR</td>
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<tr>
<td>Comparable operating result¹</td>
<td>577 MEUR</td>
<td>226 MEUR</td>
<td>141 MEUR</td>
<td>123 MEUR</td>
<td>88 MEUR</td>
<td>576 MEUR</td>
<td>583 MEUR</td>
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<tr>
<td>Comparable operating result¹, %</td>
<td>11.2%</td>
<td>14.7%</td>
<td>10.6%</td>
<td>9.8%</td>
<td>8.3%</td>
<td>11.7%</td>
<td>12.1%</td>
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<tr>
<td>Profit before taxes</td>
<td>502 MEUR</td>
<td>194 MEUR</td>
<td>130 MEUR</td>
<td>102 MEUR</td>
<td>76 MEUR</td>
<td>491 MEUR</td>
<td>479 MEUR</td>
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<tr>
<td>Earnings per share, EUR²</td>
<td>0.65</td>
<td>0.25</td>
<td>0.17</td>
<td>0.13</td>
<td>0.10</td>
<td>0.63</td>
<td>0.60</td>
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<tr>
<td>Order intake</td>
<td>6 307 MEUR</td>
<td>1 874 MEUR</td>
<td>1 372 MEUR</td>
<td>1 553 MEUR</td>
<td>1 507 MEUR</td>
<td>5 644 MEUR</td>
<td>4 927 MEUR</td>
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<tbody>
<tr>
<td>Balance sheet total</td>
<td>6 059 MEUR</td>
<td>6 059 MEUR</td>
<td>5 880 MEUR</td>
<td>5 906 MEUR</td>
<td>5 632 MEUR</td>
<td>5 648 MEUR</td>
<td>5 391 MEUR</td>
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<tr>
<td>Interest-bearing liabilities, gross</td>
<td>823 MEUR</td>
<td>823 MEUR</td>
<td>874 MEUR</td>
<td>893 MEUR</td>
<td>726 MEUR</td>
<td>619 MEUR</td>
<td>629 MEUR</td>
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<tr>
<td>Cash and cash equivalents</td>
<td>487 MEUR</td>
<td>487 MEUR</td>
<td>221 MEUR</td>
<td>245 MEUR</td>
<td>282 MEUR</td>
<td>379 MEUR</td>
<td>472 MEUR</td>
</tr>
<tr>
<td>ROI, continuing operations, %</td>
<td>18.1%</td>
<td>18.1%</td>
<td>18.6%</td>
<td>18.9%</td>
<td>19.7%</td>
<td>18.5%</td>
<td>17.1%</td>
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<tr>
<td>Gearing</td>
<td>0.14</td>
<td>0.14</td>
<td>0.28</td>
<td>0.29</td>
<td>0.21</td>
<td>0.10</td>
<td>0.07</td>
</tr>
<tr>
<td>Order book, end of period</td>
<td>6 186 MEUR</td>
<td>6 186 MEUR</td>
<td>5 918 MEUR</td>
<td>5 904 MEUR</td>
<td>5 490 MEUR</td>
<td>5 100 MEUR</td>
<td>4 696 MEUR</td>
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<tr>
<td>Year-end market capitalisation</td>
<td>8 222 MEUR</td>
<td>8 222 MEUR</td>
<td>9 935 MEUR</td>
<td>9 959 MEUR</td>
<td>10 621 MEUR</td>
<td>10 375 MEUR</td>
<td>8 418 MEUR</td>
</tr>
<tr>
<td>Personnel, number at end of period</td>
<td>19 294</td>
<td>19 294</td>
<td>19 420</td>
<td>19 231</td>
<td>18 182</td>
<td>18 065</td>
<td>18 011</td>
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1 Figures exclude items affecting comparability.
2 The share issue without payment (share split) approved by Wärtsilä Corporation’s Annual General Meeting on 8 March 2018 increased the total number of Wärtsilä shares to 591 723 390. Share related figures in the comparison periods have been restated accordingly.
3 Figures for comparison period 2017 have been restated due to the adoption of IFRS 15 and an internal transfer of service activities.
Sustainability highlights

23.1.
Wärtsilä listed among the “2018 Global 100” Most Sustainable Corporations in the World. The recognition took place in Davos as an aside to the World Economic Forum. Selected from a pool of 5,994 publicly listed companies, the Global 100 companies represent 22 countries and encompass all sectors of the economy.

19.3.
Wärtsilä acquires Transas to accelerate its Smart Marine Ecosystem vision. Wärtsilä’s Smart Marine Ecosystem is a vision whereby smart vessels connect with smart ports and beyond to deliver efficiency, minimised environmental impact, and safety and security.
20.3.
Wärtsilä delivers the world’s largest solar hybrid power plant to Burkina Faso, reducing annual CO\textsubscript{2} emissions by as much as 18,500 tons. By hybridising an existing 57 MW diesel power plant with the new solar PV plant and related hybrid plant controls, the plant’s performance has been significantly enhanced.

26.3.
Wärtsilä contracted to supply VOC recovery systems for two new shuttle tankers, saving tons of fuel each year. The ships will operate on Liquefied Natural Gas (LNG) as the primary fuel, but VOC – the gas evaporating from the oil cargo tanks – will also be utilised as fuel by mixing it with the LNG.
25.4.

Wärtsilä contracted to supply a 130 MW Flexicycle power plant to Senegal, enabling lower energy costs and the integration of more renewable energy. The Malicounda power project will provide the flexibility needed to facilitate the integration of intermittent renewable energy into the country's network.

22.5.

Wärtsilä LNGPac passes 100th order milestone. First introduced in 2009, the Wärtsilä LNGPac has played an important role in establishing the viability of LNG as a marine fuel. The system comprises a bunkering station, the LNG fuel tank and related process equipment, as well as the control and monitoring system.
Wärtsilä joins the Climate Leadership Coalition (CLC), a network of leading Finnish companies, research organisations and cities, aiming for the mitigation of climate change. The CLC believes that business solutions are central in tackling climate change, which is in line with Wärtsilä’s purpose and strategy.

Wärtsilä introduces its new hybrid solar PV and storage solution. The Wärtsilä Hybrid Solar integrates solar PV generation and storage to deliver a true “renewables as baseload” solution that is climate-friendly, increases resilience and efficiencies, and which can be supported by a power producer’s existing grid infrastructure.
3.9.
Wärtsilä’s Aquarius EC Ballast Water Management System endorsed with the United States Coastguard (USCG) Type Approval. This approval verifies that the product has met the specified regulatory, technical, and safety requirements, and represents an endorsement of its design and efficiency principles.

5.9.
Wärtsilä announces ‘An Oceanic Awakening’ – a global initiative focused on the radical transformation of the world’s marine and energy industries into one supremely efficient, ecologically sound, and digitally connected ecosystem.
13.9.
Wärtsilä once again included in the Dow Jones Sustainability Indices.

25.9.
Greensmith Energy, a Wärtsilä company, releases GridSolv, the company’s first standardised energy storage solution. This innovative and standardised architecture supports both standalone energy storage deployments, as well as integrated hybrids with thermal or renewable generation assets.
17.10.
Wärtsilä inaugurates its new Hybrid Centre, the first of its kind in the world, to boost sustainable shipping. The facility in Trieste, Italy, enables further development and deployment of the Wärtsilä HY hybrid power module, and also provides customers with the possibility to experience the benefits of the Wärtsilä HY.

13.11.
Wärtsilä, Finland’s Lappeenranta University of Technology (LUT), and Nebraska Public Power District (NPPD), sign a Memorandum of Understanding (MoU) for the study of the development of a business case for the use of alternative fuels, aiming towards a future with energy produced from 100% renewable carbon free sources.
28.11.

Wärtsilä achieves notable advances in automated shipping through testing its automated dock-to-dock solution. In the presence of the Norwegian Maritime Authority (NMA), the autonomously operated ferry ‘Folgefonn’ successfully visited all three ports serviced by the ship.

4.12.

Wärtsilä introduces a lifeboat for buildings, a product that should never exist, at Slush Helsinki 2018. This hypothetical lifeboat, conceptualised and designed by Wärtsilä Ship Design, is a way for Wärtsilä to amplify the critical need to move climate change discourse to action.
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 our Smart Marine and Smart Energy visions. With an integrated portfolio of services, systems, and products that covers customer needs across the full lifecycle, we are well positioned to respond to the demand for energy efficient and innovative solutions. Strong emphasis is given to optimising installation performance, using data analytics and artificial intelligence to support customer business decisions. Wärtsilä’s digital transformation will provide enhanced customer value through an increased focus on collaboration and knowledge sharing. A strong presence in key markets and a superior global service network support our profitable growth ambitions.

With our flexible production and supply chain management, we constantly seek new ways to maintain high quality and cost efficiency - often in co-operation with customers and leading industrial partners. The investments in R&D and the focus on 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 implementation of operational excellence ensures that we are easy to do business with, and drives increased productivity and efficiencies for our customers.

Smart Energy

Wärtsilä creates optimal paths towards 100% renewable energy systems. Our objective is for customers to recognise the company as the leading energy systems integrator, providing all the essential technologies, services, and solutions for sustainable and reliable power systems.

The energy market landscape is in transition and is moving towards more flexible energy systems with a rapidly increasing share of renewable energy, declining inflexible baseload generation, and wider applications of storage technology. The declining cost of renewables has begun to reduce new investments in coal and other inflexible baseload technologies, and this transition will eventually enable renewables to become the new baseload, which will require flexibility and storage to ensure reliable generation.

Our solutions are at the very core of the energy systems of the future. We understand the role that different technologies play in our customers’ power systems, and enhance the assets of the customer through software, EPC offerings, and global service capabilities. Wärtsilä’s engine power plants act as a stepping stone for the ongoing energy industry transition, and provide a unique combination of energy efficiency, and fuel and operational flexibility throughout all its phases. Our energy storage and integration solutions handle second and daily level variations in supply, which is the key for renewables penetration.

Wärtsilä provides asset and lifecycle management services that optimise the performance of our customers’ installations through upgrades, modernisations, fuel conversions, and safety solutions. Asset Management targets energy supply reliability and optimisation. With connectivity, we optimise asset performance throughout the lifecycle and provide strategic input to customers in order to enhance their business growth through smart technologies. Asset management will drive future growth in lifecycle solutions and enable new “as-a-service” business models. To secure future growth and profitability, the main focus will be on optimising the current business and building a solid foundation for developing future business models.
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 customer values through connectivity, digitalisation, and smart technology.

The marine industry is moving towards a future that is increasingly connected. The opportunities offered through smart technology will foster a new era of collaboration and knowledge sharing with customers, suppliers, and partners. Industry players are faced with major sources of inefficiency that impose a significantly negative impact on business operations and profitability, the three most notable of these being 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 ecosystem thinking. We have identified four primary forces that will re-shape the industry. Shared capacity will improve fill rates and reduce unit costs; big data analytics will optimise both operations and energy management; intelligent vessels will enable automated and optimised processes; and smart ports will result in smoother and faster port operations.

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.

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.
Wärtsilä’s strategy

SMART ENERGY
leading the path towards a 100% renewable energy future

SMART MARINE
leading the industry transformation towards a smart marine ecosystem

Wärtsilä as a Service

- Enabling sustainable societies with smart technology
- High performance culture
- Innovative solutions
- Energy efficiency
- Operational excellence
- Strong presence in growth markets
- Lifecycle optimisation

Enablers

This pdf is composed of selected elements from Wärtsilä’s Annual Report and may deviate from other generated documents. To view the report in full, please visit www.wartsila.com/ar2018.
Targets

Financial targets

Net sales

TARGET

Wärtsilä’s target is to grow faster than global GDP.

DEVELOPMENT

In 2018, net sales increased by 5% to EUR 5,174 million.
Profitability

TARGET

Wärtsilä’s operating profit margin (EBIT%) target is 14% at the peak of the cycle. At the trough of the cycle, the target is to keep the operating profit margin above 10%.

DEVELOPMENT

In 2018, the comparable operating result was EUR 577 million, which represents 11.2% of net sales.

Capital structure

TARGET

Wärtsilä’s target is to maintain gearing below 0.50.

DEVELOPMENT

In 2018, gearing was 0.14.
**TARGET**

Wärtsilä's target is to pay a dividend of at least 50% of earnings over the cycle.

**DEVELOPMENT**

The Board of Directors proposes that a dividend of EUR 0.48 per share be paid for the financial year 2018, which represents 73.7% of operational earnings.

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* * Restated due to IFRS 15.
  † Proposal of the Board

Dividend/share and earnings/share for comparison periods have been restated to reflect the increased number of shares.
Sustainability targets

Sustainable power systems

TARGET
Contribute to the development of an affordable, reliable, sustainable and modern power system worldwide.

DEVELOPMENT
In 2018, Wärtsilä announced its energy vision of leading the energy market’s transition towards a 100% renewable energy future. Some 2860 MWs of new modern, highly efficient, and flexible gas and liquid fired Smart Power Generation plants were sold during the year. Wärtsilä also released several innovative solutions, including the standardised energy storage solution GridSolv, Wärtsilä Hybrid Solar a hybrid solar PV and storage solution, and the latest generation of Wärtsilä’s advanced energy management software platform GEMS 6.

Small-medium scale LNG solutions

TARGET
Establish Wärtsilä solutions as an important link in the global LNG value chain. This develops opportunities, and builds the infrastructure for clean-burning LNG to replace liquid fuels.

DEVELOPMENT
In 2018, Wärtsilä had three LNG terminal projects in Finland. A ground-breaking ceremony for the new Hamina LNG terminal was held, and the tank slip forming and lifting of the roof were completed. At the Tornio Manga LNG Terminal, most of the performance tests were completed, and availability testing was started. At Raahe, the installation and commissioning work was completed, and the terminal was handed over to the customer.
### Solar and hybrid solutions

**TARGET**
Solar and solar hybrid power plants to provide cleaner energy and fuel savings. Delivery of 200 MW solar power by the end of 2018.

**DEVELOPMENT**
During 2018, Wärtsilä delivered a 15 MWp solar hybrid power plant to Essakane Solar SAS in Burkina Faso, reducing annual CO₂ emissions by 18,500 tons. In addition, under construction was a 52 MWp solar photovoltaic (PV) power plant at AM Solar BV/Jordan. Altogether, 163 MWp worth of deals were announced during the review period 2017-2018.

### Climate change

**TARGET**
By 2020, the aim is to reduce greenhouse gas (GHG) emissions from gas engines by 15% from 2015.

**DEVELOPMENT**
During 2018, Wärtsilä released its Wärtsilä 31SG gas engine to the market, and was able to reduce greenhouse gas emissions from gas engines by 8% from the baseline year.
Decarbonisation of transport

**TARGET**

Contribute to the development of more sustainable transportation through gas based and other technologies.

Schedule: 2020

**DEVELOPMENT**

In 2018, Wärtsilä inaugurated the world's first real-scale hybrid centre in Trieste (Italy), successfully tested the world's first automated dock-to-dock solution, and launched important new solutions. These included the Skylight 3.0 for fleet performance monitoring, and the Wärtsilä 14, the first Wärtsilä-branded high-speed engine. In addition, Wärtsilä presented its end to end concept to optimise vessel speed and trim based on weather conditions, traffic, and berth availability at ports.

Climate change

**TARGET**

Reduce more than 300,000 tons of CO₂ annually from vessels with the help of Eniram solutions.

Schedule: 2020

**DEVELOPMENT**

The estimated reduction in CO₂ emissions in 2018 was approximately 197,000 tons. This was a 13% increase in savings compared to the previous year.
Energy savings

TARGET

Reduce energy consumption by at least 7% in terms of absolute consumption (GWh) from 2015 levels by 2025.

Schedule: 2025

DEVELOPMENT

By the end of 2018, energy savings of 2.9 GWh were achieved, representing 9.8% of the final target.

Ethical behavior

TARGET

Ensure commitment to the Code of Conduct throughout the organisation (Code of Conduct training coverage to be 100%).

Schedule: 2020

DEVELOPMENT

Training records are continuously monitored. At the end of 2018, the Code of Conduct training programme coverage was 89.8% of all employees.
**Occupational safety**

**TARGET**
Reach the long-term goal of zero injuries.

**Schedule:** 2020

**DEVELOPMENT**
In 2018, the corporate lost-time injury frequency rate was 2.50, which was 1% higher than in 2017 and above the internal target for the year (2.3). However, Wärtsilä managed to increase the focus on proactive measures, and near miss/hazard reporting increased by 19% compared to 2017. By the end of the year, 3,200 Wärtsilä leaders had completed a “Leader in Safety, Leader in Business” safety workshop.

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**Climate change**

**TARGET**
Prepare an analysis of the impact of the Paris Climate Change Agreement on Wärtsilä.

**Schedule:** 2018

**DEVELOPMENT**
During 2018, Wärtsilä continuously monitored the proceedings of climate negotiations covering both the marine and energy sectors. In addition, the preparation of a technology strategy programme covering solutions for reducing greenhouse gas emissions was initiated.
Well being at work - careers

TARGET
Establish a balance between external and internal recruitments, with more than 50% of the open vacancies filled from the internal applicant pool, including promotions and lateral moves.

DEVELOPMENT
In 2018, 40% of all open vacancies were filled through internal selections for job levels 3 and up, and 60% through external selections.

Schedule: 2020

Personnel development

TARGET
Complete 100% coverage for development discussions.

DEVELOPMENT
By the end of 2018, altogether 96.1% of the company’s employees had completed development discussions.

Schedule: 2020

Diversity

TARGET
Increase the share of female employees to 20%.

DEVELOPMENT
In 2018, the share of female employees was 17%.

Schedule: 2020
**Supplier lifecycle management**

**TARGET**

Risk-based supplier assessment and management process in use by 2018:

- Phase I: new suppliers by 2017
- Phase II: existing suppliers by 2018

Schedule: 2018

**DEVELOPMENT**

The new risk-based Supply Relationship Management Tool was taken into use for new suppliers during 2018. The tool will be taken into use for existing suppliers in 2019. All existing suppliers are required to submit a self-assessment by the end of 2020.

**Supplier monitoring**

**TARGET**

Achieve the following rating coverage for suppliers:

- 96% of direct global supplier spend rated
- 70% of indirect supplier spend rated
- 75% of local supplier spend rated

Schedule: 2020

**DEVELOPMENT**

In 2018, Wärtsilä achieved its rating coverage targets. The rating coverage of direct global supplier spend was 97%, 77% of indirect supplier spend and 82% of local supplier spend. For the year 2018, the supplier rating target level for local suppliers was raised to 80% from the original 75%. Nevertheless, this target was also achieved.
Wärtsilä Energy Business

Wärtsilä Energy is leading the transition towards a 100% renewable energy future. As an energy systems integrator, we understand, design, build and serve optimal power systems for future generations. Our offering includes flexible internal combustion engine-based power plants, hybrid solar power plants, energy storage and integration solutions, as well as gas to power systems. We support our customers throughout the lifecycle of their installations with services that enable increased efficiency and guaranteed performance. Wärtsilä’s solutions provide the needed flexibility to integrate renewables and ensure the reliability of power systems.

We serve three main customer segments

Wärtsilä’s three main customer segments in the energy markets are utilities, independent power producers (IPPs), and industrial customers.

Utilities supply electricity and gas to residential, commercial, and industrial end users. They invest in various types of power generation and storage assets to ensure adequate load coverage, and the right palette of cost-effective and reliable products and services for their customers.

IPPs are financial investors investing in power generation and storage assets, and who then sell the generated power to utilities, or directly to end customers. Their investments are return driven, and as with utilities, their technical requirements are application driven.

Industrial customers are mainly private companies with energy intensive production operations. By investing in captive power, they are able to achieve lower energy costs and can be prepared for any grid reliability issues, thus ensuring security of supply. Wärtsilä serves the top end of this customer group, i.e. large industries requiring a relatively high electrical load, such as data centres, and cement and mining facilities.

Our offering is based on flexibility and lifecycle support

Wärtsilä’s energy solutions are used for a wide variety of applications. These include baseload generation, capacity for grid stability, peaking and load-following generation, and for the integration of wind and solar power. We provide our customers with a comprehensive understanding of energy systems, including fully integrated assets and advanced software, complete with value adding lifecycle services.

Our engine power plants are tailored according to the specific requirements of the customer, utilising modular products and services. The delivery scope ranges from equipment deliveries to complete engineering, procurement and construction (EPC) projects, supported by superior project management capabilities. Wärtsilä’s solutions provide the best means for supporting power systems by offering the highest degree of flexibility, enabling major savings, and creating an optimised response to rapid changes in intermittent generation. Combined with our offering of energy storage, hybrid solutions, and advanced software for energy management, we enable the transition to a sustainable, reliable, and affordable low carbon power system.

With services ranging from spare parts and basic support to full operations and maintenance services, we maximise the life and increase the availability of power plants, while providing a lifecycle cost guarantee. The performance of our customers’ installations is optimised through upgrades, modernisations, fuel conversions and safety solutions. As business models change, the need for asset management services is increased, which drives opportunities for using real time monitoring and analytics to optimise the business performance of our customers.

Market drivers

In the energy markets, the main drivers for Wärtsilä are:

- Economic growth, electrification, and improving standards of living
- Rapidly increasing use of renewables
- Decentralised energy
- Increasing role of flexible gas
Emerging storage technologies
Data and digitalisation

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, energy security, 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 source solutions. 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, and in the future gas will be more and more carbon neutral. New data and platform-based business models and solutions enable system level integration and asset base optimisation.

Competitive landscape and market position

Wärtsilä’s main competitors in larger gas-fired projects are gas turbine manufacturers, such as GE, Siemens, and Mitsubishi Hitachi Power Systems. When competing against gas turbines, Wärtsilä’s combination of high efficiency, greater fuel flexibility, and superior operational flexibility enables better value propositions to many customer projects. In smaller gas power plants, and in the liquid fuel power plant market, the competitors are mainly other internal combustion engine suppliers, such as MAN Energy Solutions, Caterpillar (MAK), and Rolls-Royce, as well as high speed engine manufacturers. Wärtsilä’s advanced gas and dual-fuel engine technology, optimised modular power plants, superior project management capabilities, and the global service support provided throughout the lifecycle of installations, have led to Wärtsilä’s market leading position in the gas and liquid fuel combustion engine power plant markets.

When looking at energy system integration, software and battery storage systems, the competition comes from companies such as Fluence, NEC and Tesla, among others. Competition within maintenance activities is fragmented in nature and consists mainly of local players with a limited offering scope. The competition for lifecycle solutions comes from a few regional players capable of offering plant operational services. In asset performance management related services there are both new and more established competitors that provide software and analytics across industries, while some utilities are establishing these skills and knowledge in-house.

Wärtsilä’s strengths:

- Competitive capital cost and engineering, procurement and construction (EPC) capability
- Unique operational and fuel flexibility
- Value adding hybrid solutions for existing and new customers
- The most proven software platform for integrating renewable energy sources
- Systems integration offering with lifecycle support
- Global technical support capabilities and know-how
- Strong track record in operations & maintenance, optimising operating costs, and increasing plant availability and efficiency
Wärtsilä Marine Business

Wärtsilä has a strong position in the marine and oil & gas industries. By providing solutions and services that are optimised, and environmentally and economically sound, we enhance the viability and profitability of maritime operations and enable the development of sustainable societies. Our reputation is based on an in-depth understanding of our customers’ businesses, technological leadership, a broad product portfolio, and the industry’s most extensive service network.

Serving ship owners, shipyards and ship management companies

Wärtsilä’s marine customer base covers all the main segments, including traditional merchant vessels, gas carriers, cruise & ferry, navy, and special vessels. In the oil & gas industry, we are active in serving offshore installations and related industry vessels, as well as land-based gas installations.

Our customers comprise ship owners, shipyards and ship management companies; the needs and demands of which differ significantly. Ship owners require safe and efficient operations, reliability and support, as well as the availability of services. Their decision-making is also impacted by freight rates, interest rates, and the capital and operating costs of the ship. Both ship owners and operators are increasingly taking other factors, such as environmental compliance and fuel flexibility, into consideration in their decision-making. Ship management companies provide ship owners and operators with technical management and the maintenance of ships. Among other things, they also provide the crews and take care of commercial operations on behalf of the owner or operator. The decision-making process of shipyard customers is typically affected by product prices, delivery times and reliability, project management, ease of installation, and the supplier’s ability to manage large delivery scopes.

We are committed to meeting the needs of these customer groups. Success is achieved through a comprehensive understanding of their businesses, operating models, and requirements. This understanding, backed by our portfolio and service strengths, enables us to support our customers throughout the lifecycle of their installations with products and solutions that best serve their business interests.

Our offering is the broadest in the industry

Wärtsilä’s market presence, combined with the broadest offering in the industry, enables us to understand the particular needs and requirements related to each of these segments – from initial vessel design choices to everyday operations throughout the vessel’s lifecycle. We provide innovative and competitive products and solutions, delivered efficiently and with high quality.

Through the use of digitalisation and greater connectivity, and by applying smart technology and performance optimisation services, we create greater efficiencies, a minimised environmental impact, and enhanced safety to the shipping industry. In so doing, we enable more sustainable, safe, and profitable operations for ship owners and operators around the world.
Market drivers

In the marine markets, the main drivers for Wärtsilä are:

- Developments in the global economy and their impact on world trade
- Fuel prices and availability
- Environmental compliance
- Technological developments and innovations

The global demand for new vessels in the shipbuilding and shipping industries is mainly driven by developments within the global economy, and the resulting impact on trade and transportation capacity requirements. The global economy also influences fuel prices, which in turn have both a direct and an indirect impact on the marine and oil & gas industries. Price, availability, and demand are the driving factors in the oil & gas industry, while in the general shipping industry, high fuel costs increase the demand for equipment upgrades, the rethinking of operational profiles, and for more efficient vessel designs. Other factors, such as shipyard capacity, newbuild prices, decommissioning and scrapping, as well as interest and freight rates, also affect these industries.

Another important driver is the increasing stringency of environmental regulations and their impact on the demand for optimised vessel efficiency, environmental solutions, and gas as a marine fuel. Our in-depth expertise and system skills make it possible for customers to respond to these demands, and to achieve the performance, cost, and environmental compliance parameters that specifically match their operating profile.

Technological developments and innovations act as an enabler for the marine industry to become more efficient, sustainable, and safe by advancing fleet design, system solutions and operations. Being a main source of differentiation, and a competitive edge provider for owners and operators, they also drive the markets. By partnering with customers, regulators, universities and various other key stakeholders, we are well-positioned to deliver solutions and services that support the specific interests of our customers.

Competitive landscape and market position

Wärtsilä’s field of competitors is extensive due to the broad offering portfolio and global market presence. It includes a variety of Original Equipment Manufacturers (OEM), including engine companies such as MAN Energy Solutions, Caterpillar and HiMSEN, propeller makers such as Schottel and Thrustmaster, and environmental and auxiliary equipment providers like Alfa Laval. Our competitors also include electrical and automation houses, notably Siemens, GE, ABB and Kongsberg, gas system providers, such as TGE Marine, and companies with a broad range of offerings such as Rolls-Royce. In the service market, the main source of competition is from independent service companies operating globally, and local players with a limited offering scope, such as parts traders, repair yards, local workshops, component suppliers for spare parts (non-OEM), and field service businesses. Wärtsilä is recognised as a proven supplier of innovative and sustainable technologies across its portfolio serving the marine and oil & gas markets.

Our extensive offering, experience, and service network gives us a competitive advantage, and a solid foundation for supporting new and existing customers in improving their performance, safety and sustainability.

Wärtsilä’s strengths:

- Strong presence in all major marine and offshore oil & gas segments
- The broadest portfolio of reliable and high performing products, systems, and solutions in the industry
- Fuel efficient solutions that are compliant with the strictest environmental requirements
- The ability to deliver cost efficiencies and to unlock new revenue streams through integration, digitalisation and interconnectivity
- A complete lifecycle service offering supported by an unmatched global service network and technical support
- The capability to deliver operational and asset performance optimisation globally
Manufacturing and R&D

Wärtsilä’s approach to manufacturing emphasises safe, innovative, and digitally connected processes. A strong culture of operational excellence, and a commitment to continuous improvement, form the basis for ensuring on time, cost competitive, and quality deliverables from advanced production environments.

The main manufacturing activities of our digitalised factories are focused on the assembly, testing, and finishing of products, as well as the in-house production of key components. Technology leadership is continuously emphasised in our R&D activities.

A global manufacturing footprint supported by an extensive supplier network

We have a global manufacturing footprint that is continuously optimised for competence, availability, customer presence, and efficiency. Being located close to our customers enables us to provide better service locally, thereby boosting the entire value chain, eliminating waste, and allowing savings in both production and transportation costs. Our assembly-based manufacturing model, which is strongly connected to a broad network of suppliers, guarantees a high level of flexibility in capacity.

Through close co-operation, excellent relations, and the sharing of information with suppliers, we are able to ensure market-conforming lead times for component supplies. We work with numerous suppliers globally. The sourcing strategy is to focus on carefully selected suppliers, with a strong emphasis on performance, innovation, and a presence close to our manufacturing units and joint ventures. The aim is to continuously develop and strengthen the company’s global supply chain with a strong emphasis on quality and cost competitiveness.

Wärtsilä’s sites with more than 50 FTEs

Technology leadership through R&D

The focus of our R&D activities is on digitalisation, smart technologies, and on new products and solutions that are flexible, efficient, reliable, safe, and cost-efficient to operate. It is also essential that they impose a minimal environmental impact throughout their lifecycles. A substantial proportion of the investments we make in product
development is targeted at securing environmental compliancy, providing short- and long-term benefits for our customers, and enabling sustainable societies.

By concentrating on the initial stages of the development process, and by utilising modularity, simulation, virtual testing, and validation, we shorten lead times for new solutions, thereby securing reliability and safety aspects without compromising quality. Validation testing on site with existing installations, in co-operation with the customer, is an important element in furthering the improved performance of existing solutions. It also assists in finding new and better solutions while, at the same time, gaining long-term experience under actual field conditions. A field installation also provides an opportunity to gain valuable learning and insight regarding new technologies and solutions. Only after the product has successfully passed all the validation process steps, both in the laboratory and in the field, and its performance meets Wärtsilä’s high standards, can it be delivered to the market.

Through close attention to Intellectual Asset Management, and the continuous development of internal key competences, we strive to protect our innovation and competitiveness. Networks and clusters are formed to further extend our know-how, skills, and capabilities by committing to long-term relationships with suppliers, engineering companies, university partners, and with other Original Equipment Manufacturers.

**Increased agility through Open Innovation**

Forming meaningful connections with a wide range of stakeholders, including customers, suppliers, partners, government, academia and start-ups, are the foundation for our Open Innovation activities. By co-creating and collaborating with our ecosystem, we are able to significantly decrease the span of time from innovation to market, and to respond faster to new market needs with the development of holistic solutions. This is amplified by co-creation activities with customers to ensure that all new products and solutions create maximum value, from the assembly line through to the full asset lifecycle.

The Open Innovation approach is promoted through our increased presence in start-up activities globally. We regularly participate in a variety of start-up accelerators and have invited start-up companies to co-create, rapidly prototype, and validate new products and solutions. By working together with start-ups in Wärtsilä’s R&D centres, quick insights into the potential customer values are able to be identified. This collaboration also furthers our efforts towards more agile ways of working.

**The HERCULES programme**

Wärtsilä was involved in the long-term HERCULES R&D programme, which was conceived in 2002 and concluded in 2018. It was set up within the context of the EU’s sixth and seventh Framework programmes. Sharing a joint vision, the major low- and medium-speed engine manufacturers, Wärtsilä, Winterthur Gas & Diesel, and MAN Diesel & Turbo, collaborated with universities, research institutions, and other industrial partners to increase engine reliability and efficiency, while striving to reduce harmful emissions. The programme had a combined budget of over EUR 100 million.

The HERCULES project included the HERCULES A, B and C projects, as well as the fourth phase, the HERCULES-2 project, that was kicked off in 2015. HERCULES-2 focused on the integration of technologies developed in the earlier projects. Many of these technologies have found their way into Wärtsilä products such as the Wärtsilä 31.

**Innovating for sustainability**

Wärtsilä’s purpose is to enable sustainable societies with smart technologies. As a global leader in complete lifecycle solutions for the marine and energy markets, Wärtsilä plays a key role in providing environmentally sound solutions and services that enable its customers to develop their businesses in a sustainable way. This forms the basis of the company’s offering and sustainability approach, and is supported by its strong commitment to responsible business conduct.
Climate change, combined with the world's growing energy needs and the scarcity of natural resources, is increasing the demand for clean and flexible energy and the need for efficient and smart transportation. To secure its leading position at the forefront of sustainable innovation, Wärtsilä continuously invests in developing technologies that benefit the entire power system and marine ecosystem. Innovation and product development, plus the willingness to explore new technologies, are essential for meeting current customer needs, future requirements, and for remaining an industrial frontrunner.

Minimising environmental impact through R&D

Wärtsilä develops smart and sustainable solutions across a broad front, including technologies related to efficiency improvement, the reduction of gaseous and liquid emissions, waste reduction, noise abatement, as well as efficient and ballast water treatment. The company’s 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. Wärtsilä actively seeks to utilise opportunities provided by the digital transformation taking place in the maritime and energy sectors. Wärtsilä’s commitment to investing in research and product development benefits its customers as well as the environment, both in the short term and over a longer time span.

Minimising environmental footprint through R&D

<table>
<thead>
<tr>
<th>Improvements in efficiency</th>
<th>Reducing emissions to air</th>
<th>Reducing emissions to water</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total ship efficiency:</strong></td>
<td><strong>Greenhouse gases (GHG):</strong></td>
<td><strong>Ballast water management systems:</strong></td>
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<tr>
<td>An efficient and low emission system for the entire vessel is achieved by combining optimised ship design with Wärtsilä’s knowledge of automation, machinery, propulsion, and control systems. Wärtsilä has developed numerous century concepts, such as low-loss concept (LLC) and Low Loss Hybrid (LLH). Wärtsilä’s digital solutions enable its customers to maximise efficiency through insights for operations optimisation and asset management. And to cut emissions, Wärtsilä’s engine-based power plants offer the highest single cycle efficiencies from a broad range of fuels with outstanding flexibility, total plant efficiency can further be improved and optimised by adding hybrid solutions (turbines and PV; Flexible™ solutions (scramble combine cycles), combined heat and power (CHP) or trigeneration (power, heat and cooling), Wärtsilä also offers tools for smart integration of energy production and storage at system level.</td>
<td>Wärtsilä focuses on the development of technologies that reduce GHG emissions in numerous ways. These include, among others, gas and dual-fuel engines, environmentally advanced vessel solutions, voyage optimisation solutions, and energy storage solutions. Wärtsilä’s flexible energy solutions enable a transition towards a 100% renewable energy future.</td>
<td>Wärtsilä offers solutions for IMO NOx Tier I and II. Wärtsilä offers solutions for IMO NOx Tier II:</td>
</tr>
<tr>
<td><strong>Power plant efficiency:</strong></td>
<td><strong>SOx emissions:</strong></td>
<td><strong>Selective Catalytic Reduction (SCR)</strong></td>
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<td>Wärtsilä engine-based power plants offer the highest single cycle efficiencies from a broad range of fuels with outstanding flexibility, total plant efficiency can further be improved and optimised by adding hybrid solutions (turbines and PV; Flexible™ solutions (scramble combine cycles), combined heat and power (CHP) or trigeneration (power, heat and cooling), Wärtsilä also offers tools for smart integration of energy production and storage at system level.</td>
<td>Wärtsilä provides several solutions to help customers reduce emissions of SOx and comply with local and global regulations. Wärtsilä’s technology development supports solutions that enable the use of fuels with different sulphur contents, as well as systems that clean sulphur from the exhaust gas, and enable the use of alternative fuels with close to zero sulphur content, e.g., natural gas. Exhaust Gas Cleaning Systems reduce the SOx emissions, as well as remove Particulate Matter and Black Carbon. These systems can be tuned for both the 0.1% limit in Emission Control Areas and the global 0.5% cap agreed within IMO.</td>
<td>Selective Catalytic Reduction (SCR) and Gas engine (dual-fuel gas mode). The NOx emission levels of Wärtsilä’s stationary engine-based power plants are low enough to meet most current environmental regulatory requirements. To comply with even the strictest environmental regulations, Wärtsilä offers solutions such as SCR.</td>
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<tr>
<td><strong>Engine efficiency improvements:</strong></td>
<td><strong>NOx emissions:</strong></td>
<td>**Imo NOx Tier III (Ecocompact), Wärtsilä offers solutions for **</td>
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<tr>
<td>A long-term focus on improving engine efficiency has resulted in Wärtsilä engines having the highest efficiency ratings among existing prime movers. A key success factor has been the development of integrated engine functionalities that enable low emissions and high engine efficiency. The new Wärtsilä 31 has the best 4-stroke engine fuel economy in the world.</td>
<td>All marine Wärtsilä engine portfolio products are IMO NOx Tier I compliant. Wärtsilä offers solutions for IMO NOx Tier II:</td>
<td>the global 0.5% cap agreed within IMO.</td>
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</table>
The key features of Wärtsilä's environmentally sound solutions include:

- Reliability, safety, and long life span
- Low emission levels
- Renewable energy integration with engines and storage systems
- Fuel flexibility
- Efficiency improvement with lower lifecycle costs
- Low water consumption
- Design and operational optimisation of vessels

By combining these key features, and understanding the system level benefits of its offering, Wärtsilä is able to provide solutions that enable the development of sustainable shipping and power systems.

Partnerships and innovations enhancing sustainability

In 2018, Wärtsilä announced several new R&D partnerships, such as with the Maritime and Port Authority of Singapore to promote maritime innovation and R&D, and Hyundai Motor Group to utilise second-life electric vehicle (EV) batteries for the growing energy storage market. During 2018 Eniram, a Wärtsilä company, signed a Memorandum of Understanding (MoU) with Athens-based Arista Shipping to participate in the Project Forward initiative, which aims to develop the cleanest and most efficient fleet of cargo ships in the world. Wärtsilä, together with Finland's Lappeenranta-Lahti University of Technology (LUT) and Nebraska Public Power District (NPPD), the largest electricity utility in the state of Nebraska, also signed a Memorandum of Understanding (MoU) for developing a business case for the use of alternative fuels with Wärtsilä generating sets.

In 2018, Wärtsilä launched Future Innovation Days which comprised a gathering of marine industry stakeholders – ship owners, yards, ports, politicians, scientists, and students. These co-creation events were arranged to jointly solve notable industry challenges, such as zero emissions in shipping, producing, and storing clean energy, implementing smart vessels, ports, and a marine ecosystem, as well as new business models and the future of services. These first design thinking workshops were organized in Stord, Norway, Wuxi, China, and Hamburg, Germany. In Singapore and Shanghai, the events were combined also with the introduction of the An Oceanic Awakening initiative. As a result, 400 people attended, and 70 new idea concepts were co-created. In 2019, some of those ideas will be brought forward, and further developed in new events to be planned in Rotterdam, Seoul, Helsinki, Tokyo, Trieste, Panama, and Oslo. These events will also explore the paths of major cities towards 100% renewable energy.

Wärtsilä, together with three companies; Tieto, St1, and Fortum, as well as the think tank Demos Helsinki, introduced an Innovation Community initiative at the end of 2018. The goals of the community include building a vision and roadmap for accelerating the transition to renewable energy sources, and experimenting and bringing to market promising new initiatives.

During 2018, Wärtsilä developed, tested and launched several products, systems and solutions, which advance the company's realisation of its Smart Marine and Smart Energy Visions. Among other things, Wärtsilä launched a new standardised energy storage solution, GridSolv, which is an advanced design offering maximum flexibility and speed of deployment. Wärtsilä also successfully tested its automated docking solution for vessels, which provides considerable value-adding benefits in terms of better efficiency, greater safety, lower fuel consumption and, therefore, reduced exhaust emissions. Without human intervention, the ferry was able during the tests to leave the dock, manoeuvre out of the harbour, sail to the next port of call, manoeuvre through the harbour entrance, and dock alongside the terminal. Among its other product introductions, Wärtsilä also introduced the first Wärtsilä-branded high-speed engine. The Wärtsilä 14 is a high-speed, compact engine designed to fit requirements for limited space and weight, lower capital expense, compliance with current and future global emissions regulations, and to provide customers with improved efficiency, safety, and environmental sustainability.
Sustainable Innovations in 2018

**Smart Energy Systems**
- Unveiling of an advanced energy storage solution, Griddlax, that is designed to offer maximum flexibility and speed of deployment. This innovative and standardised architecture supports both standalone energy storage deployments as well as integrated hybrids with thermal or renewable generation assets.

**Smart Marine Ecosystems**
- Development of a new shuttle tanker concept by TEEKAY in close co-operation with Wärtsilä, which is expected to reduce annual emissions of CO2 equivalents by more than 40% compared to conventional shuttle tankers.
- Launch of Environ SkyLight 3.0 for fleet performance monitoring, and Environ Mobile to offer real-time decision-making support via mobile notifications. The tool provides the operator with insights into how efficiently a route has been planned. Route report enables fleet-wide optimisations that lead to savings and gaining a competitive edge, while also reducing emissions.
- Successful testing of the world’s first automated dock-to-dock vessel sailing solution. The tests were carried out with the Norwegian ferry, Felafan,®. The vessel is equipped with hybrid propulsion with wireless shore connection capable of fully electric operation, and features numerous other Wärtsilä innovations, including its wireless inductive battery charging solution and energy storage systems.

- Introduction of a new hybrid solar PV and storage solution, Wärtsilä Hybrid Solar, which is climate-friendly, increases resilience and efficiencies, and can be supported by a power producer’s existing grid infrastructure.
- Release of GEMS 6 (Greenworks Energy Management System, version 6), which is the latest generation of the award-winning software platform proven across grid-scale deployments globally.

- Introduction of QuantServ’s robustified laser cladding technology for pipes. The new coating offers environmental efficiency and extends the pipe’s lifespan and time between overhaul (TBO), compared to conventional chromium layers.
- Introduction of the first Wärtsilä-branded high-speed engine. The compact Wärtsilä 14 engine is designed to meet requirements for limited space and weight, lower capital expense, current and future global emissions regulation compliance, and to provide improved efficiency, safety, and environmental sustainability.
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 nearly 50% of total net sales, which provides 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. Digitalisation provides further opportunities to develop a value-adding customer offering. It also enables the leveraging of new technologies to build capabilities that will create a future offering with equipment-as-a-service.

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 well positioned to respond to the need for innovative and energy efficient solutions. Our digital transformation will provide increased customer value through an increased focus on collaboration and knowledge sharing. Continuous investing in research and development is 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. Achieving operational excellence by focusing on continuous process improvement throughout the organisation is a central pillar for reaching our financial targets.

Investing in technological leadership and providing shareholder returns
Our financial position enables investments in research and development activities and developing the business through acquisitions, thereby securing our future competitiveness. It also enables us to offer solid dividends to our shareholders.
Wärtsilä’s share price development in 2018

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Event</th>
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<tbody>
<tr>
<td>Q1</td>
<td>Order intake and net sales developed well in the equipment businesses.</td>
</tr>
<tr>
<td>Q2</td>
<td>Good development in orders received.</td>
</tr>
<tr>
<td>Q3</td>
<td>Good development in net sales.</td>
</tr>
<tr>
<td>Q4</td>
<td>Growth in order intake and net sales.</td>
</tr>
</tbody>
</table>

- 20.4. Wärtsilä establishes a world-class cyber academy in Singapore together with Tempar Executives.
- 20.5. Wärtsilä’s CMS, held in Helsinki, Finland, focuses on the Smart Marine and Smart Energy visions.
- 20.6. Wärtsilä introduces new hybrid solar PV and storage solution.
- 15.7. Wärtsilä announces a EUR 170 million scrubber deal.
- 20.8. Marco Ween appointed head of Energy Solutions and Arjen Berends CFO.
- 31.8. Wärtsilä announces its plans of building a Smart Technology Hub in Vaasa, Finland.
- 23.9. Wärtsilä delivers its first engine plus storage hybrid installation.
- 20.6.2. Wärtsilä and Hyundai Motor Group announce energy storage partnership maximising second-life electric vehicle batteries.
- 27.8. Second dividend installment paid. In accordance with the share split, the second installment was divided between one old and two new shares so that EUR 0.23 was paid on each share.
- 10.10. Wärtsilä announces decision to reorganise into two business areas, Wärtsilä Marine Business and Wärtsilä Energy Business, as of 1.1.2019. With this change, Wärtsilä aims to deliver increased value to its customers by better serving their needs across the full lifecycle.
- 4.10. Wärtsilä and Royal Caribbean strengthen their long-term cooperation by extending their service agreement to the year 2028.
- 19.10. Wärtsilä launches new Acceleration Centre and an International Maritime Cyber Centre of Excellence in Singapore.
- 31.10. Wärtsilä acquires Spanish (Daniel Navarro, S.L.) to support the growth of its underwater services and expand the company’s local presence in the European market.
- 31.10. Wärtsilä divests its pumps business to a Scandinavian investment company Sols Group. The divestment will enable Wärtsilä to devote greater focus to its Smart Marine vision.
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 Nordic Index & OMX GES Sustainability Finland Index
- RobecoSAM Sustainability Yearbook
- STOXX Global ESG Leaders index
- Member of Dow Jones Sustainability Indices