# THIS IS WARTSILA



www.annualreport2011.wartsila.com

Wärtsilä is a global leader in complete lifecycle power solutions for the marine and energy markets. By emphasising technological innovation and total efficiency, Wärtsilä maximises the environmental and economic performance of the vessels and power plants of its customers.

#### Wärtsilä in 2011:

Net sales EUR 4.2 billion

Approximately 18,000 employees

Operations in nearly 170 locations in 70 countries

Listed on the NASDAQ OMX Helsinki, Finland

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## WÄRTSILÄ IN BRIEF

# 32% POWER PLANTS

Wärtsilä is a leading supplier of modern, environmentally advanced, highly efficient, and dynamic power plants that allow the maximum integration of intermittent renewable power generation. We offer multi-fuel solutions for power generation markets, from baseload generation to peaking and load following, as well as dynamic system balancing and ultra-fast grid reserve for current and future capacity markets. Our fast track deliveries of complete power plants, together with long-term operation and maintenance agreements, offer our customers flexible capacity in both urban areas and the most demanding remote environments.

# 24% SHIP POWER

Wärtsilä enhances the business of its customers by providing solutions for the marine industry that are environmentally sustainable, efficient, flexible, and economically sound. Our solutions are based on our customers' needs and include products, systems and services. Being a technology leader in this field, and through the experience, know-how and dedication of our personnel, we are able to customise optimised solutions to the benefit of our clients around the world.

# 43% SERVICES

Wärtsilä supports its customers throughout the lifecycle of their installations by optimising efficiency and performance. We provide the most comprehensive portfolio of services, and the broadest service network in the industry, for both the energy and marine markets. We are committed to providing high quality, expert support, and the availability of services wherever our customers are – and in the most environmentally sound way possible.

#### **KEY FIGURES IN 2011**

NET SALES
EUR 1,365 MILLION

ORDER INTAKE
EUR 1,602 MILLION
ORDER BOOK
EUR 1,536 MILLION

#### **KEY FIGURES IN 2011**

NET SALES
EUR 1,022 MILLION
ORDER INTAKE
EUR 1,000 MILLION
ORDER BOOK
EUR 1,684 MILLION

#### **KEY FIGURES IN 2011**

NET SALES
EUR 1,816 MILLION
ORDER INTAKE
EUR 1,909 MILLION
ORDER BOOK
EUR 786 MILLION

#### **STRATEGY**

# LIFECYCLE POWER SOLUTIONS

Wärtsilä aims to be the leader in complete lifecycle power solutions for the global marine markets and selected energy markets worldwide. We see growth opportunities in gas power plants as part of our Smart Power Generation concept, as well as in gas-fuelled engines and related systems for the marine market. We also seek growth in environmental solutions, including scrubbers and ballast water treatment systems.

Our strengths are our technological leadership, an integrated product and service offering, our close and long-standing customer relationships, and our unparalleled global presence. Our production and supply chain management serves both our end markets, and we constantly seek ways to maintain cost efficiency and

high quality – often in co-operation with leading industrial partners in our key growth markets. Our R&D provides another source of synergies, allowing us to stay at the forefront of technology and innovation in our industry. We are determined to capture growth opportunities within our end markets, while maintaining a solid profitability.

#### **VALUES**

#### **ENERGY**

Capture opportunities and make things happen.

#### **EXCELLENCE**

Do things better than anyone else in our industry.

#### **EXCITEMENT**

Foster openness, respect and trust to create excitement.

#### **MISSION**

We provide lifecycle power solutions to enhance the business of our customers, whilst creating better technologies that benefit both the customer and the environment.

#### **VISION**

We will be the most valued business partner of all our customers.

#### **BUSINESS STRATEGIES**

#### **POWER PLANTS**

Our strategic aim is to be a globally recognised leader in liquid fuel and gas power plants. We will promote Smart Power Generation to the increasingly dynamic and environmentally conscious energy market to enable more sustainable, affordable, and reliable power systems globally.

Our target segments for power generation are flexible baseload power, grid stability & peaking, and industrial self-generation.
Our products are based on tried and tested concepts and deliver competitive costs, high efficiency, operational flexibility, low environmental impact, and fuel flexibility.

Our strategic goal is to grow in the large gas power plant market for utilities by influencing and actively developing selected target markets. We will demonstrate the superiority of our value proposition, which is based on the highest single-cycle efficiency, and on unbeatable operational flexibility. Our goal is to maintain our leading position in heavy fuel oil fired power plants. Our focus is on products and projects that provide unquestionable environmental benefits and that make economic sense.

#### SHIP POWER

Wärtsilä Ship Power's strategic goal is to be the leading solutions provider to the marine industry. As a solution provider, we are ready to deliver everything from a single product to entire lifecycle support, from initial building to operational use, of complex systems powering ships. Our wide range of products is supported by world class ship design and engineering capabilities, allowing us to find solutions that optimise lifecycle value for our customers.

We identify important midterm growth opportunities in solutions for gas fuelled vessels, environmental compliance, and efficiency optimisation.

Wärtsilä Ship Power seeks organic growth that will be supported by acquisitions and partnerships.

Maintaining our position as the shipbuilding industry's leading system integrator, and establishing a strong foothold as a system integrator in the offshore business, will also be key components for growth. Finally, further investments in strengthening our presence and maximising the competitiveness of our products and sales processes are of utmost importance in key shipbuilding areas.

#### **SERVICES**

For customers Wärtsilä is their competitive, trusted, and easy to deal with services partner. In Services, our objective is to maximise our market share in the marine and power plant service markets. Our offering includes an advanced portfolio of agreements, and we are able to deliver service projects that match the changing needs of our customers' businesses. Moreover, we also use acquisitions to extend our offering and strengthen our market share. We combine service solutions with new equipment sales into lifecycle solutions that meet the specific needs of our customers.

Being the only player on the market able to provide such a wide range of solutions from a single source, our competitive position is notably strengthened. Our target is to become the industry leader in environmental upgrade and retrofit solutions by building world-class delivery capabilities, and through developing a value-enhancing offering. The size and scope of the Services business creates stability in a changing market environment and provides a platform for growth.

#### **OPERATING ENVIRONMENT**

## **GLOBAL MARKETS**

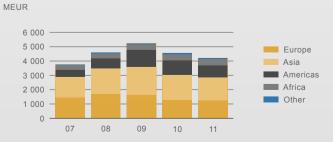
#### WÄRTSILÄ'S MARKET AREAS



#### Personnel by market area



#### Net sales by market area



#### **MARKET DRIVERS & STRENGTHS**

#### **POWER PLANTS**

In emerging markets demand is driven by growth in electricity consumption. In the developed countries, the aim for low carbon power systems is spurring investments in renewable energy which lead to unforeseen grid stability challenges. This drives the need for additional backup and balancing power capacity based on natural gas.

#### POWER PLANTS STRENGTHS

- + Unique operational and fuel flexibility
- Energy efficiency and emissions compliance
- + Competitive capital cost and EPC capability
- + Global service organisation

#### SHIP POWER

The demand in the shipbuilding and shipping industries is mainly driven by the development of the global economy and its impact on trade and transportation capacity required. Fuel prices also have an impact on both the shipping and offshore industries. Environmental regulation drives the demand for environmental solutions and gas as a marine fuel.

#### SHIP POWER STRENGTHS

- An unmatched track with our dual-fuel technology
- + The broadest portfolio of products and solutions, supported by the global services network
- Synergy between ship design and engineering capabilities to maximise efficiency
- + A strong presence in all major segments in the industry

#### **SERVICES**

The main drivers are the aim for lifecycle efficiency, the need to lower operating costs, and the need for enhanced safety. Outsourcing the operations and management of power plants is an important trend. The marine service business is strongly driven by the existing, as well as new, environmental regulations and ultimately by the activity levels of the vessel fleet.

#### SERVICES STRENGTHS

- Long-term relationships with customers and in-depth understanding of their needs
- + A lifecycle offering
- The broadest services offering in the industry
- + A global service network

#### SUSTAINABILITY

# WE REMAIN COMMITTED TO SUSTAINABLE DEVELOPMENT

As a global leader in complete lifecycle solutions for the marine and energy markets, Wärtsilä has a key role in providing sustainable solutions for its customers. We support our solutions globally during their entire lifecycle. This creates the basis for our sustainability work, which is supported by our commitment to responsible business conduct.

Our commitment to sustainability and responsible business is based on our mission, vision and strategy which, along with our sustainable development objectives, create the framework for developing the company's activities and products. Wärtsilä's management system and other sustainability tools provide us with the means to assess our performance and to improve our operations and products continuously.

Wärtsilä applies global guiding principles such as the Quality, Environmental, Health & Safety policy (QEHS policy) and the Code of Conduct, which together with the company's values ensure a harmonised way of working towards sustainable development.

Wärtsilä is well positioned to reduce emissions and the use of natural resources, thanks to its various technologies and specialised services. Wärtsilä's R&D efforts continue to focus on the development of advanced environmental technologies and solutions. The company is committed to supporting the UN Global Compact and its principles with respect to human rights, labour, the environment and anticorruption. Wärtsilä's share is included in several sustainability indices.

#### KEY FEATURES OF WÄRTSILÄ'S ENVIRONMEN-TALLY SOUND SOLUTIONS INCLUDE

- + Reliability, safety and long life-time
- + Solutions to reduce emissions
- + Alternatives to heavy fuel oil
- + Flexibility in fuel use
- + Solutions to maximise efficiency with lowest lifecycle cost
- + Solutions to minimise water consumption
- + Optimisation of vessel design and operations

#### POWER PLANTS AND SUSTAINABILITY

The development of a more sustainable energy infrastructure is driven by climate policies, energy security and economics. Carbon intensive energy sources are being replaced by low carbon fuels, such as natural gas and renewable solutions. Energy savings and efficiency improvements are being encouraged, and even legally enforced, at every level. This development is evident on a global scale, even though short-term actions can vary in different regions.

#### BIT VIKING'S GROUNDBREAKING CONVERSION TO LNG

In October 2011, Bit Viking became the first vessel in the world to be equipped with a fully mechanical propulsion system powered by Wärtsilä dual-fuel (DF) engines using gas as the primary fuel.

Back in August 2010, Wärtsilä announced that a turnkey project to convert the Bit Viking to LNG operation had been signed with Tarbit Shipping. The scope of the conversion package from Wärtsilä included deckmounted gas fuel systems, piping, two six-cylinder Wärtsilä 46 engines converted to Wärtsilä 50DF engines with related control systems and all adjustments to the ship's systems necessitated by the conversion. The Bit



Viking is the first LNG-fuelled vessel to be classified by Germanischer Lloyd, and the vessel's classification certificate was updated as a result of the conversion.

"The final result is a significant improvement in propulsion efficiency, reduced fuel consumption and corresponding reductions in emissions," says Giulio Tirelli, Marketing and Application Development Manager at Wärtsilä Ship Power.

Wärtsilä's energy solutions offer a unique combination of flexibility, high efficiency, and low emissions. Many different fuels, including bio fuels, can be used efficiently, which helps in reducing greenhouse gas emissions. Wärtsilä's Smart Power Generation technology enables the development of a reliable energy infrastructure, wherein most of the sustainable characteristics are already known.

#### SHIP POWER AND SUSTAINABILITY

The shipping industry is increasingly seeking ways to increase energy efficiency, lower operational costs, and comply with upcoming environmental legislation. The primary drivers for this are escalating fuel prices, the International Maritime Organisation's (IMO) Energy Efficiency Design Index (EEDI) for limiting the carbon dioxide emissions from new vessels, and emissions legislation specified by the IMO and the US Environmental Protection Agency for nitrogen oxides (NO<sub>x</sub>), sulphur oxides (SO<sub>x</sub>) and particulate matter (PM) emissions.

The development of new and existing technologies is the key to Wärtsilä's succeeding in offering its customers the best solutions to meet these needs. Wärtsilä's toolbox for reducing emissions includes, for example, switching

the fuel from heavy fuel oil to gas, using liquid fuels together with emission control methods, and improving vessel efficiency. Wärtsilä's development agenda focuses on all of these elements as part of its commitment to sustainability, and on retaining its leading position in this field.

#### SERVICES AND SUSTAINABILITY

Environmental legislation and the need for energy efficiency are currently the main drivers for our customers' actions towards developing their businesses in a more sustainable way. Wärtsilä Services strives to be a leader in supporting its customers' efforts to meet and exceed current and future business and sustainability demands. Through continuous innovation, we will continue providing shipping companies and energy providers with environmentally sound solutions well into the future.

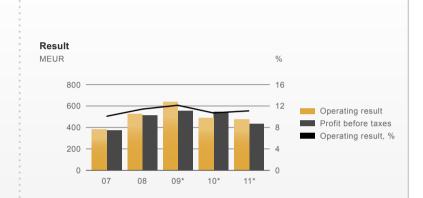
Wärtsilä Services conducts its business in a responsible way, and creates added value by providing services from locations in close proximity to its customers, and through offering employment opportunities in local communities.

#### **FINANCIALS**

# THE YEAR 2011 IN BRIEF

#### **HIGHLIGHTS**

- + Despite tough market conditions Wärtsilä performed well.
- + Wärtsilä's order intake for the financial period totalled EUR 4,516 million (4,005), an increase of 13%.
- + The book-to-bill ratio climbed over one for the first time since 2008, totalling 1.07 (0.88).
- + Order intake in the South Korean and Chinese joint venture companies grew significantly to EUR 394 million (77).
- + At the end of the financial period Wärtsilä's total order book stood at EUR 4,007 million (3,795), an increase of 6%.
- + Net sales decreased 7.6% and totalled EUR 4,209 million (4,553).
- + Profitability was 11.1% of net sales (10.7).
- + Operating result totalled EUR 469 million (487).
- + Earnings per share were 1.44 euro (1.96).
- + Second best year in Power Plants history: order intake up 13%.
- + Ship Power order intake grew 52%.
- + The activity in our Services business remained stable.
- + In order to strengthen its offering for marine markets, Wärtsilä acquired Cedervall and Hamworthy. The Hamworthy acquisition became effective on 31 January 2012.



\* Operating result before non-recurring items.

#### Net sales by business area

Services 43% (40)
Power Plants 32% (34)
Ship Power 24% (26)

#### Personnel by business

Services 65% (65)
Wärtsilä Industrial Operations 24% (25)
Ship Power 6% (6)

Power Plants 5% (5)

#### **FINANCIAL TARGETS**

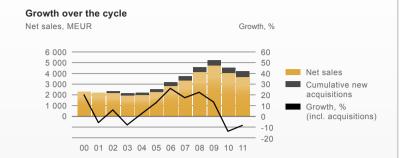
#### **NET SALES**

#### **Target**

Our target is to grow faster than global GDP.

#### **Development in 2011**

In 2011, Wärtsilä's net sales decreased 7.6% to EUR 4,209 million. Wärtsilä's CAGR 2000-2011 was 5.7%. In the WEO January 2012 report, economic growth is estimated to be 3.3% in 2012. Wärstilä estimates that its net sales will grow 5-10% in 2012.



Note: World nominal GDP growth 2000-2011 averages 7.3% USD denominated (source: IMF).

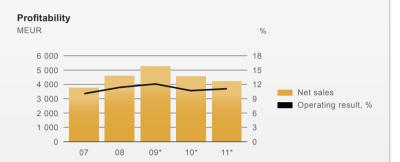
#### **PROFITABILITY**

#### Target

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

#### **Development in 2011**

In 2011, our operating profit was EUR 469 million, 11.1% of net sales.



<sup>\*</sup> Operating result before non-recurring items.

#### **CAPITAL STRUCTURE**

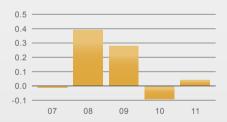
#### Target

Our target is to maintain gearing below 0.50.

#### **Development 2011**

In 2011, our gearing was 0.04.

#### Gearing



#### DIVIDEND

#### **Target**

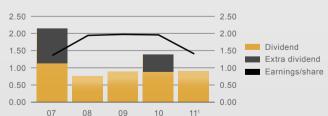
Our target is to pay a dividend equivalent to 50% of earnings.

#### Development in 2011

The Board of Directors proposes that a dividend of 0.90 euro per share be paid for the financial year 2011.

#### Earnings/share, dividend/share

EUR



<sup>&</sup>lt;sup>1</sup> Proposal by the Board 2011.

#### **KEY RATIOS**

MEUR	2011	Q4 / 2011	Q3 / 2011	Q2 / 2011	Q1 / 2011	2010	2009
Net sales	4 209	1 238	851	1 036	1 083	4 553	5 260
Power Plants	1 365	413	243	360	349	1 525	1 645
Ship Power	1 022	309	197	223	294	1 201	1 767
Services	1 816	513	412	452	439	1 823	1 830
Depreciation and amortisations	-113	-29	-27	-28	-29	-116	-165
Operating result <sup>1</sup>	469	145	94	117	113	487	638
Operating result <sup>1</sup> , %	11.1	11.7	11.0	11.3	10.4	10.7	12.1
Profit before taxes	429	131	83	108	107	548	558
Earnings per share <sup>1</sup> , EUR	1.52	0.48	0.28	0.39	0.38	1.68	2.15
Balance sheet total	4 600	4 600	4 439	4 396	4 533	4 696	4 655
Interest-bearing liabilities, gross	652	652	604	607	618	628	664
Cash and cash equivalents	592	592	658	541	619	776	244
ROI, %	20.4	-	-	-	-	26.0	29.9
Gearing	0.04	0.04	-0.03	0.04	0.00	-0.09	0.28
Order book, end of period	4 007	4 007	4 042	3 779	3 669	3 795	4 491
Order intake	4 516	1 250	1 118	1 170	979	4 005	3 291
Personnel, end of period	17 913	17 913	17 875	17 654	17 526	17 528	18 541
Year-end market capitalisation	4 402	-	-	-	-	5 631	2 768

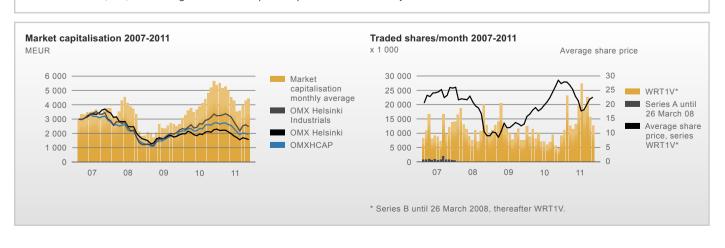
<sup>&</sup>lt;sup>1</sup> Figures exclude non-recurring restructuring items and selling profits.

#### KEY FIGURES FOR WÄRTSILÄ SHARE

		2011	2010	2009	2008	2007
Earnings per share (EPS) <sup>3</sup>	EUR	1.44	1.96	1.97	1.94	1.37
Book value of equity per share <sup>3</sup>	EUR	8.30	8.30	7.59	16.01	6.85
Dividend per share <sup>3</sup>	EUR	0.90 <sup>1</sup>	1.38	0.88	0.75	2.13
Dividend per earnings	%	62.7	70.3	44.4	38.7	155.1
Dividend yield	%					
Series A		-	-	-	_	8.01
WRT1V <sup>2</sup>		4.03	4.82	6.23	7.14	8.16
Price per earnings (P/E)						
Series A		-	-	-	-	19.4
WRT1V <sup>2</sup>		15.5	14.6	7.1	5.4	19.0
Price to book- value (P/BV)						
Series A		-	-	-	-	3.9
WRT1V <sup>2</sup>		2.7	3.4	1.9	1.7	3.8
Adjusted number of shares	x 1 000					
end of financial year		197 241	98 621	98 621	98 621	95 970
on average		197 241	98 621	98 621	97 944	95 751

<sup>&</sup>lt;sup>1</sup> Proposal of the Board of Directors.

<sup>&</sup>lt;sup>3</sup>The share issue approved by Wärtsilä Corporation's Annual General Meeting on 3 March 2011 increased the total number of Wärtsilä shares to 197,241,130. The figures in the comparison periods have been adjusted to reflect the increased number of shares.



<sup>&</sup>lt;sup>2</sup> Series B until 26 March 2008, thereafter WRT1V.

#### **CONSOLIDATED STATEMENT OF INCOME**

MEUR	2011	%	2010	%
Net sales	4 209	100.0	4 553	100.0
Change in inventories of finished goods & work in progress	39		-164	
Work performed by the Group and capitalised	1		2	
Other operating income	47		52	
Material and services	-2 285		-2 372	
Employee benefit expenses	-956		-948	
Depreciation amortisation and impairment	-113		-116	
Other operating expenses	-506		-601	
Share of result of associates and joint ventures	-500		5	
orace of result of associates and joint ventures	J		3	
Operating result	445	10.6	412	9.1
Dividend income	3		7	
Interest income	13		6	
Other financial income	10		12	
Interest expenses	-18		-18	
Other financial expenses	-23		-20	
Net income from financial assets available-for-sale			149	
Profit before taxes	429		548	
Income taxes	-136		-151	
Profit for the financial period	293	7.0	397	8.7
Attributable to:				
Equity holders of the parent company	283		386	
Non-controlling interests	10		11	
	293		397	
Earnings per share attributable to equity holders of the parent company:				
Earnings per share (basic and diluted), EUR*	1.44		1.96	
Statement of Comprehensive Income				
Profit for the financial period	293		397	
Other comprehensive income after tax:				
Exchange rate differences on translating foreign operations	-4		17	
Financial assets available for sale				
Fair valuation	16		30	
Transferred to statement of income			-110	
Cash flow hedges	-23		-9	
Other income/expenses			1	
Other comprehensive income	-12		-71	
	281		326	
Total comprehensive income for the period	201			
· ·	201			
Total comprehensive income attributable to:			212	
·	270 11		313 13	

<sup>\*</sup> Free share issue approved by Wärtsilä Corporation's Annual General Meeting on 3 March 2011 increased the total number of Wärtsilä shares to 197,241,130. The figures in the comparison periods have been adjusted to reflect the increased number of shares.

#### **CONSOLIDATED STATEMENT OF FINANCIAL POSITION, ASSETS**

MEUR	31.12.2011	%	31.12.2010	%
Non-current assets				
Goodwill	616		574	
Intangible assets	209		205	
Property, plant and equipment	463		455	
Investment properties	9		11	
Investments in associates and joint ventures	87		65	
Financial assets available-for-sale	39		18	
Interest-bearing investments	1		16	
Deferred tax receivables	119		122	
Other receivables	33		16	
	1 577	34.3	1 483	31.6
Current assets				
Inventories	1 222		1 244	
Interest-bearing receivables	1		1	
Trade receivables	877		860	
Income tax receivables	38		26	
Other receivables	294		305	
Cash and cash equivalents	592		776	
	3 023	65.7	3 213	68.4
Total assets	4 600	100.0	4 696	100.0

### CONSOLIDATED STATEMENT OF FINANCIAL POSITION, EQUITY AND LIABILITIES

336 61		000	
		000	
61		336	
		61	
2		8	
5		12	
1 233		1 221	
1 636	35.6	1 638	34.9
30	0.7	26	0.6
1 666	36.2	1 664	35.4
485		572	
69		70	
39		40	
		45	
120			
765	16.6	831	17.7
167		56	
215		233	
443		511	
348		366	
55		105	
941		929	
2 169	47.1	2 201	46.9
2 934	63.8	3 032	64.6
4 600	100.0	4 696	100.0
	5 1 233 1 636 30 1 666 485 69 39 52 120 765 167 215 443 348 55 941 2 169 2 934	5 1 233 1 636 35.6 30 0.7 1 666 36.2 485 69 39 52 120 765 16.6 167 215 443 348 55 941 2 169 47.1 2 934 63.8	5     12       1 233     1 221       1 636     35.6     1 638       30     0.7     26       1 666     36.2     1 664       485     572       69     70       39     40       52     45       120     104       765     16.6     831       167     56       215     233       443     511       348     366       55     105       941     929       2 169     47.1     2 201       2 934     63.8     3 032

#### **CONSOLIDATED STATEMENT OF CASH FLOWS**

293	397
113	116
16	13
-6	-147
-8	-5
136	151
544	526
3	132
	379
	-141
-88	370
456	896
430	090
	11
	-72
	-173
-224	-233
232	663
01	6
	-6
	-92
	9
3	173
_	-13
	8
-166	79
66	742
	37
-50	-78
2	2
79	-2
	-175
-247	-216
-181	525
776	244
	7
-0	
592	776
	113 16 -6 -8 136 544  3 33 -125 -88 456  25 -49 -199 -224 232  -91 -90 9 3 3 -166 66  -50 2 79 -279 -247

# WARTSILA INSIDE STORIES







# WELCOME TO INSIDE STORIES

"WÄRTSILÄ INSIDE STORIES CONTAINS STORIES, VIDEOS, INTERVIEWS AND CASES, WHICH DEMONSTRATE OUR COMMITMENT TO SUSTAINABILITY WITH LANDMARK LNG AND ENVIRONMENTAL SOLUTIONS AS WELL AS THE CONTINUING SUCCESS OF OUR SMART POWER GENERATION CONCEPT."

- BJÖRN ROSENGREN, PRESIDENT AND CEO

## SUSTAINABILITY HIGHLIGHTS IN 2011

Q1

Wärtsilä received an order for gas engines and equipment for Viking Line's new environmentally sound passenger ferry.



GLOCAL.

Wärtsilä's Sustainability Report 2010 published as a part of the Annual Report.

**Q2** 

Wärtsilä Power Plants launched the Smart Power Generation concept.



CMI CLLEBRATES 10 YEARS!

Wärtsilä entered into co-operation with Crisis Management Initiative, an independent Finnish non-profit organisation working to resolve conflicts and to build sustainable peace.

Q3

Wärtsilä's first full-size commercial installation of a marine SO<sub>x</sub> scrubber completed.



1 6 3

The 4th global Suppliers' Day gathered Wärtsilä's key suppliers to Helsinki, Finland.

**Q**4

Wärtsilä contracted to supply two gas-fired Flexicycle™ power plants totalling 430 MW to be installed in the Dominican Republic.





The unique fuel conversion of the product tanker Bit Viking from heavy fuel oil to gas operation successfully completed.





WÄRTSILÄ IS A LEADING SUPPLIER OF MODERN, ENVIRONMENTALLY ADVANCED, HIGHLY EFFICIENT, AND DYNAMIC POWER PLANTS THAT ALLOW THE MAXIMUM INTEGRATION OF INTERMITTENT RENEWABLE POWER GENERATION.





⟨ Wärtsilä's first land-based Flexicycle™ power plant will begin electricity production in the Dominican Republic in 2013.

Wärtsilä provides Sasol New Energy (SNE)
Holdings with Africa's largest gas engine plant.

Read full stories at insidestories.wartsila.com

# Inside story: Smart Power Generation supports the Estonian national grid

Estonia is a small country but one in which an efficient and well-maintained grid system is of paramount importance. When Elering, the state-owned independent transmission network operator responsible for this system's functioning, required a reserve power plant to guarantee high-quality electricity supply to the country's consumers, they selected Wärtsilä's Smart Power Generation as the ideal solution.

The project, with its total contract value of EUR 129 million, is part of the Estonian electricity sector's development plan to have new dynamic power stations available for operation by 2014. The requirement for these plants is that they must be able to compensate for lost generating capacity in no more than 15 minutes in the event of a plant shut down. The 10-minute start-up capability of the Wärtsilä power plants is therefore vital. Built to meet sudden drops in the electricity supply, the reserve plant actually takes the form of two completely independent units, ensuring that if a problem were to occur with one, the other can continue and consumers will not be affected.

Wärtsilä's scope for delivery includes engineering, procurement of equipment and materials, construction and commissioning of the plants with a capacity of 110 and 140 MWe respectively. Construction will take place on an EPC "turnkey" basis, with 27 Wärtsilä 20V34DF engines to be built in our factory in Vaasa, Finland. The project also offers significant opportunities for construction firms in Estonia, as Wärtsilä employs local partners for the on-site work, directed by our own project management team.

As is often the case when working with companies responsible for grids covering relatively large areas, location is a key issue. In this case, the ideal site for the reserve power plant is at the intersection of most of the country's main voltage lines in the



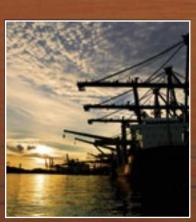
small borough of Kiisa. This location's substation, about 25 km from Tallinn, is at the very heart of Estonia's electricity system, and has the advantage of strong connections through high-voltage lines to the other substations in Estonia.

Timo Mahlanen, Business Development Manager at Wärtsilä, identifies the chief benefits this case offers the customer, "Although in ideal circumstances this reserve power station should not see a great deal of use, its high efficiency and low lifecycle cost are still of vital importance when taking escalating fuel costs into account. Wärtsilä's broad service organisation is another key benefit, encompassing support in the local language. These factors, combined with our track record as an EPC project implementer, decided the case for us over the course of a demanding public procurement process."

Mr Taavi Veskimägi, Elering's Chairman, emphasises the necessity of this plant, "This is an important project for the Estonian energy sector, and one that will ensure the supply of electricity to consumers should any existing power station unexpectedly lose production. The capacity of the new plants is equal to one-sixth of Estonia's peak demand, so in an emergency they will be able to cover a large part of Tallinn's, the capital, winter electricity consumption."

# SHIP POWER

WÄRTSILÄ ENHANCES THE BUSINESS OF ITS CUSTOMERS BY PROVIDING SOLUTIONS FOR THE MARINE INDUSTRY THAT ARE ENVIRONMENTALLY SUSTAINABLE, EFFICIENT, FLEXIBLE, AND ECONOMICALLY SOUND.





- Co-operation between Ship Power and Services allows us to offer lifecycle solutions for ship owners and operators.
- Wärtsilä delivers products and services with sound environmental and economic performance.
- Read full stories at insidestories.wartsila.com



## Inside story: Dual-fuel technology puts Viking Line in control of emissions

In a climate of tight regulation and media focus on the threat emissions pose to the environment, maritime operators are under increasing pressure to look carefully at the way they do business and introduce solutions that will be effective both now and for the foreseeable future.

In March 2011, Wärtsilä helped Viking Line address this challenge when it was contracted to supply the propulsion machinery of a new passenger ferry for the Finnish ship owner. The ship in question, to be built by STX Finland Oy, will be the largest passenger ferry yet to operate on liquefied natural gas (LNG), making it the industry's most environmentally sound and energy-efficient large passenger vessel to date.

The vessel will sail between Turku and Stockholm on the Baltic Sea and is scheduled to enter service in 2013. It will be capable of transporting cars, trucks and road trailers, and it has been designed to carry 2,800 passengers and a crew of 200.

The selection of LNG as an energy source enables a reduction in particulate emissions of more than 90% compared to conventional diesel engines, while carbon dioxide emissions are 20-30% lower. Additionally, the use of Wärtsilä's dualfuel engine technology, running on gas in this instance, will enable the ferry to sail without restrictions in Sulphur Emission Control Areas (SECAs) and Nitrogen Emission Control Areas (NECAs).

Environmental regulation limits the levels of  $SO_x$  that vessels are permitted to release in SECAs, to which the Baltic Sea belongs. These  $SO_x$  limits will become more stringent in 2015. Jukka Paananen, Business Manager, Special Vessels, at Wärtsilä, highlights, "The vessel's four Wärtsilä 8L50DF dual-fuel gas engines will surpass these requirements and stand Viking Line in good stead for the vessel's lifecycle."

Paananen also outlines the unique benefits LNG offers in the passenger ferry industry, "The reductions in emissions through the use of LNG enables ship owners like Viking Line to navigate increasingly tight environmental regulation, helping them to stay one step ahead of society's expectations, while preserving their



operating environments in a sustainable fashion."

Wärtsilä has consistently been at the forefront in the development of dual-fuel technology, and during recent years has launched a series of gas engines. These 4-stroke engines, namely the Wärtsilä 50DF, Wärtsilä 34DF and Wärtsilä 20DF, represent the best technology available in terms of efficiency and low emissions. The Wärtsilä 50DF engine is becoming one of Wärtsilä's most successful products and has been used in marine applications since the introduction of dual-fuel propulsion in 2003.

Viking Line's management has high expectations regarding the new ferry. Tony Öhman, Senior Vice President, Marine Operations & NB, points out, "As one of the cruise ferry companies operating in this environmentally sensitive archipelago, we believe that LNG will be the most cost-effective fuel in the future and that its usage also confers a boost to our environmental profile." He goes on to state, "More capacity, lower operating costs, lower emissions and a new treat for our passengers will provide increased profitability for this route between Turku and Stockholm."

This timely project will be a demonstration of the fact that LNG as an energy source offers the most economical and environmentally sound solution on the market. Customers of Viking Line's popular cruise services are particularly interested in the ecological effects of vessel traffic in the Baltic Sea, and the company's environmental profile is, of course, also of signal importance to its consumer-oriented business.

# SERVICES

WE PROVIDE THE MOST COMPREHENSIVE PORTFOLIO OF SERVICES AND THE BROADEST SERVICE NETWORK IN THE INDUSTRY, FOR BOTH THE ENERGY AND MARINE MARKETS.



# Inside story: Our most expansive support agreement yet

Wärtsilä's long-term agreement with Royal Caribbean Cruises Ltd. (RCL) is the most extensive maintenance and technical support partnership we have formed with a marine customer yet. "Although we have been working with RCL and its predecessors for more than 40 years, the new agreement covers more vessels and involves much more detailed operational planning than our previous partnerships," explains Leif Rönnskog, Wärtsilä's Vice President for Strategic Account Management.

The maintenance support agreement covers 29 cruise ships owned by RCL, operating the cruise brands Royal Caribbean International, Celebrity Cruises, and Azamara Club Cruises. "The main idea behind the new deal is that Wärtsilä will organise the work that needs to be done on the ship engines, leaving RCL to concentrate on its core business – looking after cruise guests." Wärtsilä can provide maintenance services for marine installations all around the world, from its operations in 160 ports in 70 countries.

The ships covered by the agreement have 118 Wärtsilä engines in all, with an output of approximately 1400 MW. "Most of these are Wärtsilä 46 engines," Rönnskog tells us, "which we see as the workhorse of the global cruise business." Wärtsilä's Condition Based Maintenance (CBM) engine monitoring systems also enable the performance of individual engines to be monitored online anywhere in the world. Rönnskog points out that the new collaboration with RCL will take related monitoring and reporting procedures to the next level.

Regular engine condition reports can be sent automatically to Wärtsilä and to customers' operational offices using an easily understood "traffic light system". Green lights mean that everything is running smoothly, amber shows where maintenance measures should soon be taken, and red means that corrective action is needed urgently.

After overall reliability in terms of keeping ships sailing, energy efficiency is the most important consideration in dealings between cruise firms and technical service providers. "Fuel costs are a huge part of the running costs of a cruise operator like RCL, amounting to several hundred million dollars a year," says Rönnskog. "Closer collaboration on maintenance, including the recording of annual reference measurements for the fuel economy of each engine, can certainly help us find innovative new ways to reduce and optimise fuel consumption."

Working more closely together with the customer can greatly speed up the identification and reali-



sation of investments that will generate significant improvements in fuel economy – often with very rapid payback-on-investment times.

Investments are also needed to meet ever-tighter environmental controls. Emissions of sulphur and nitrogen oxides are central to the planning of engine maintenance. Rönnskog explains that Wärtsilä and RCL are already collaborating closely to find ways to reduce emissions and meet the challenges posed by demands for cruise lines to use more environmentally sound fuels.

Through the new agreement, Wärtsilä's own personnel will also provide on-board supervision and training for RCL's own crews. The new deal includes harmonising and aligning procedures within both companies to facilitate streamlined scheduling and accurate budgeting by eliminating uncertainties.

Wärtsilä and RCL are both convinced that by combining their knowledge and experience, this new kind of cooperation will bring concrete benefits in terms of the optimised availability of ships and improvements in fuel economy.

"This type of long-term maintenance support agreement has previously been more common on the energy side of our business at Wärtsilä, but we're very pleased to be asked to make such a commitment on the marine side too," Rönnskog enthuses.

The whole process of shaping this groundbreaking agreement has taken a full year and involved dozens of people from both companies. "We ran a series of detailed workshops focusing on issues like fuel economy, engine component lifetime, logistics and overhauls. This enabled everyone from both sides to learn about each other's needs. Everyone involved at Wärtsilä and RCL is excited about this new page in our common history."