

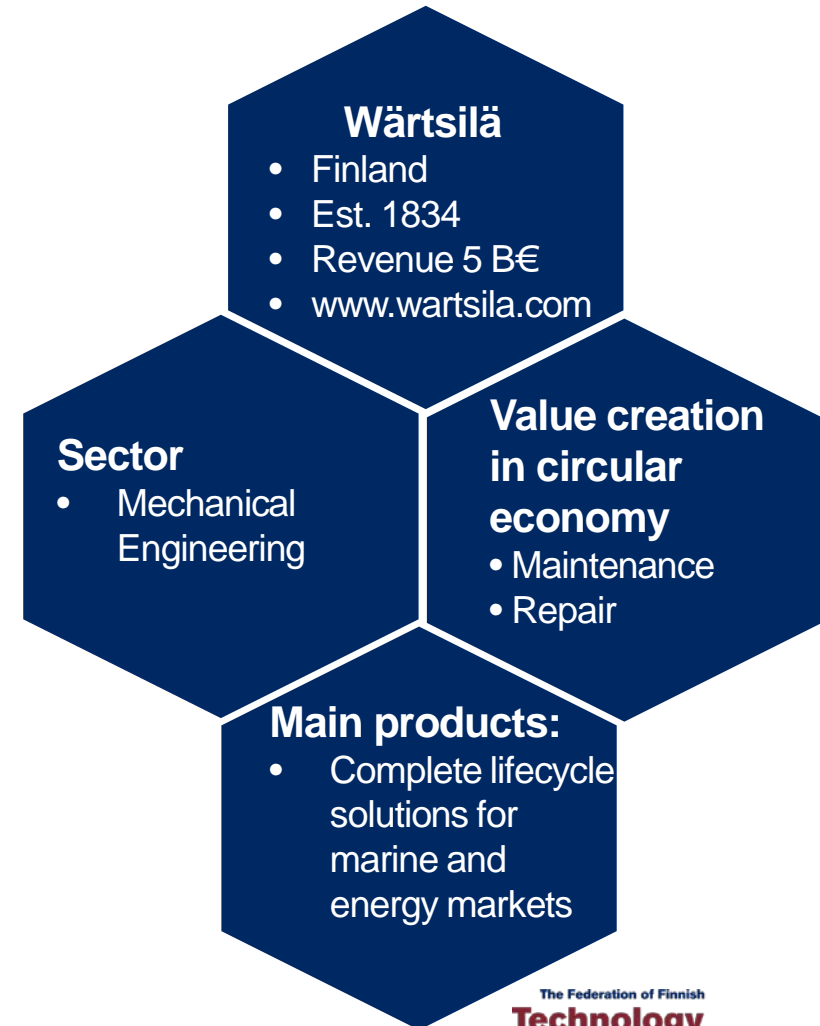
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The Company



- **Wärtsilä** is a global leader in advanced technologies and complete lifecycle solutions for the **marine and energy markets**.
- By emphasizing sustainable innovation and total efficiency, Wärtsilä maximizes the **environmental and economic performance** of the vessels and power plants of its customers.
- In 2015, Wärtsilä's net sales totalled **EUR 5.0 billion** with approximately **18,900 employees**.
- The company has operations in more than 200 locations in nearly **70 countries** around the world.
- Wärtsilä is listed on the Nasdaq Helsinki.
- Wärtsilä was established in 1834.



The Challenge / Opportunity: Condition Based Maintenance (CBM)



- Increasingly, Energy and Marine Solution customers focus their attention on equipment performance and **predictive maintenance** solutions as a way to **optimize the availability and productivity** of installations.
- With Wärtsilä's **Condition Monitoring / Condition Based Maintenance (CM/CBM) services** customers can fine-tune equipment operations parameters.
- CM/CBM also makes it possible to identify trends and changes in operating parameters well before they might compromise the operational availability of the installation – thus **maintenance is performed only when needed** and this **optimizes the productivity**.
- The **analytics** behind Wärtsilä's Condition Monitoring / Condition Based Maintenance services generates also valuable input to the product development process.



The Challenge / Opportunity: Retrofitted engines

- As another way to prolong the lifecycle of their products and solutions, Wärtsilä provides also **refrofitted engines**. Sustainability can also be interpreted as the ability of equipment to reliably deliver performances required by design or regulations.
- As **regulations change** with time, fuel flexibility and engine upgrades will always be necessary to keep equipment up to date with legislation. There retrofits are made to improve both **economic and environmental performance**, as well as the safety and reliability of systems, throughout their life cycle.
- **Modernization of engines** can improve the performance of existing power plants, and help the customers to meet the new, more strict regulatory and performance requirements. Due to subsidies, customers often keep the power plants in production as long as technically possible.



The Challenge / Opportunity: Managing the life cycle of products



- As Wärtsilä is also a leading supplier of **flexible power plants** for the decentralised power generation market.
- One of the strengths of Wärtsilä is the ability offer a **modular approach** where **capacity can be added in smaller steps** as the demand for capacity increases.
- This way a power plant can operate all the time close to the **optimal level**. Furthermore, also maintenance is easier to do unit by unit.
- Since Wärtsilä's products have such a **long operational life**, identifying the life cycle impacts of the products is essential to understand their total environmental impact.
- Based on the results of **life cycle assessments**, the majority of the environmental impacts of a diesel engine arise during the operation of the engine: from **exhaust emissions** during engine operation, and from the **fuel supply chain** relating to its operations.
- Wärtsilä manages the life cycle of its products, among other things, through product desing, **optimising maintenance and repair** during the products' operational lifetime, and by training and advising customers.