**Product design principles**

Wärtsilä strives to develop environmentally sound, safe, and reliable products and solutions for its customers. By providing lifecycle maintenance, reconditioning, and retrofitting services, we are able to support our customers' operations throughout the life of our products. The reconditioning of engines and components increases their reliable service life, while modernising improves the current operational performance of installations and enables customers to meet tightening future regulatory requirements.

In order to ensure our ability to respond to future regulation stipulations, we actively monitor legislative initiatives and changes in environmental legislation. As a result, we have focused our R&D activities on the development of new environmentally sound products and solutions in order to meet the evolving demands of a changing operating environment.

**Meeting regulatory requirements**

The majority of international environmental policies and requirements for Wärtsilä's products and solutions are set by the International Maritime Organization (IMO) and the International Finance Corporation (IFC) – a member of the World Bank (WB) group. On the regional or national level, organisations such as the United Nations Economic Commission for Europe (UNECE), the European Union (EU) and emission standards such as in the USA, Germany, Japan, and India, are also important policy and regulatory directors for Wärtsilä products.

The IMO is responsible for adopting its own standards for the safety and security of shipping, and the prevention and control of marine pollution and emissions from vessels. The IMO regulates nitrogen oxide emissions and fuel sulphur content, as well as ballast water treatment procedures and limitations. Wärtsilä’s engines are designed to meet the requirements of the EU Machinery Directive, the IMO Convention for the Safety of Life at Sea (SOLAS), and other relevant safety directives. Wärtsilä’s propulsion systems are designed to comply with the SOLAS and safety requirements of relevant classification bodies. Type approval is sought from classification societies before new products are launched. Wärtsilä’s ship designs follow class society and flag state rules to ensure safe and compliant designs for its clients. Class approval is required for drawings and calculations delivered to the client before construction of the vessel starts.

**Type Approvals in 2019**

In 2019, our Aquarius UV Ballast Water Management System (BWMS) was granted US Coastguard (USCG) Type Approval. Together with our other BWMS technology, the USCG Type Approved Wärtsilä Aquarius EC, we became the first manufacturer able to offer two USCG Type Approved BWMS technologies. In addition to the USCG approvals, both technologies have also been awarded Type Approval by the International Maritime Organization (IMO).

Additionally, our Exhaust Gas Cleaning (EGC) system was Type Approved in China by the China Classification Society (CCS). Full scale testing was carried out after its shipboard installation onboard a new Very Large Crude Carrier (VLCC) was completed, and the relevant data was reviewed and reported by Dalian Maritime University, as an independent third party. The CCS Type Approval now means that the product can be installed on any CCS class ship without the need for further emissions testing.

At the end of the year, Type Approval tests were performed for the Wärtsilä 14 high-speed engine, which was launched in 2018. The Wärtsilä 14 engine and engine automation Type Approval test was performed at Liebherr Machines’ Bulle factory in Switzerland. The test was witnessed by all seven standard classification societies for engines: ABS, BV, CCS, DNV-GL, LR, RINA, and RS.

The IFC provides general and industry specific examples of Good International Industry Practices (GIIP), such as the Environmental, Health, and Safety (EHS) Guidelines for Thermal Power Plants, which is today considered the minimum environmental standard in larger global power plant projects. When host country regulations differ from
the levels and measures presented in the EHS Guidelines, projects are expected to comply with whichever is the more stringent. The EHS guidelines together with the IFC's Environmental and Social Performance Standards are adhered to via the Equator Principles risk management framework in most projects in emerging markets financed by international financial institutions. In the EU, the Industrial Emissions Directive (IED) and the Medium Combustion Plant Directive (MCPD) set the main emission requirements for large and medium-sized combustion plants throughout the EU. EU Member States may set additional and/or stricter emission limits if needed, for example, to comply with ambient air quality standards.

Lifecycle approach

Wärtsilä’s products have a long operational life. Therefore, identifying the lifecycle impacts of our products is essential for understanding their total environmental impact. We manage the lifecycle of our products through their design, the careful selection of suppliers, production methods, and by optimising transportation, maintenance and repairs during the products’ operational life.

Our products are delivered with adequate user guides that include basic information about the products and full instructions for their use. Moreover, we provide specific training and advice for our customers to ensure environmentally sound and safe utilisation of Wärtsilä products, and that the products and systems are used in the most efficient way. We also offer service agreements and products that help customers to optimise their operations, and actively support them in selecting suitable solutions already in the early phase of projects.