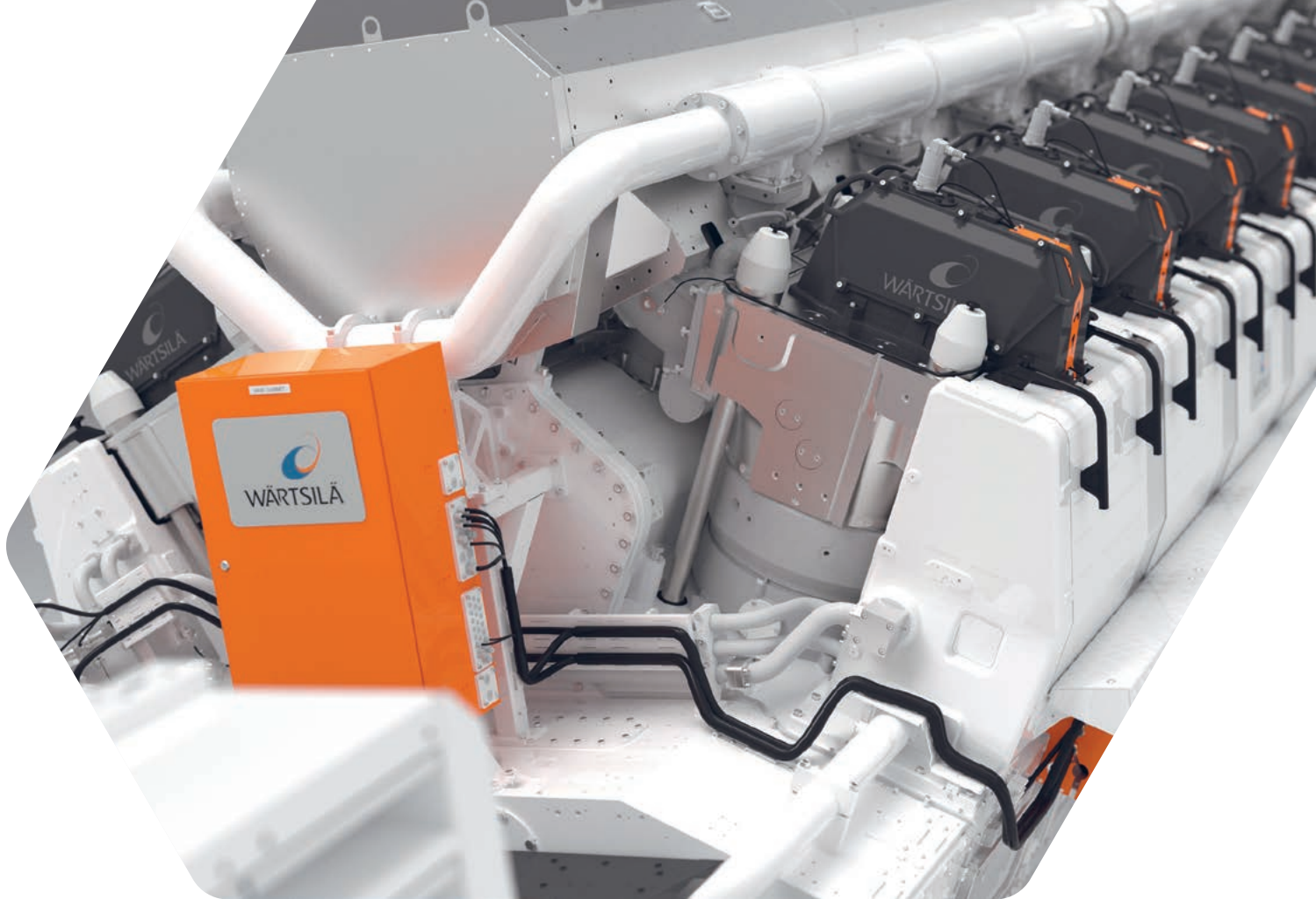




Wärtsilä 46TS

Power your present. Secure your future.



The next-generation large bore engine platform Wärtsilä 46TS has evolved from a long line of proven and reliable power plant engines that have clocked up millions of running hours in the field.

This future-proof engine can run on sustainable fuels and is designed for balancing renewables and providing cost-efficient baseload.

Optimal power generation today – future-proof technology for tomorrow

The biggest challenge faced by power plant owners and operators is securing a reliable and affordable energy supply while simultaneously decarbonising operations. Effective decarbonisation will require investments in future-proofed assets that can run on sustainable fuels. The Wärtsilä 46TS answers this challenge. As Wärtsilä's most flexible engine product, the Wärtsilä 46TS brings improvements to a variety of essential features, delivering both the security of supply you need now and the future-proof technology to help ensure the long-term success of your business.



Power and efficiency in one flexible package

The Wärtsilä 46TS provides an optimal combination of high power output and efficiency for your power plant. The engine's flexibility allows your plant to respond to fluctuations in renewable power sources without compromising reliability or efficiency. Flexible power generation also opens up new revenue streams, allowing you to capture value from market price volatility and profit from ancillary services.

In addition the engine's high electrical efficiency reduces emissions and helps to secure your investment by reducing fuel consumption. The technology benefits also include the capability to operate on low gas pipeline pressure and with minimal water usage.

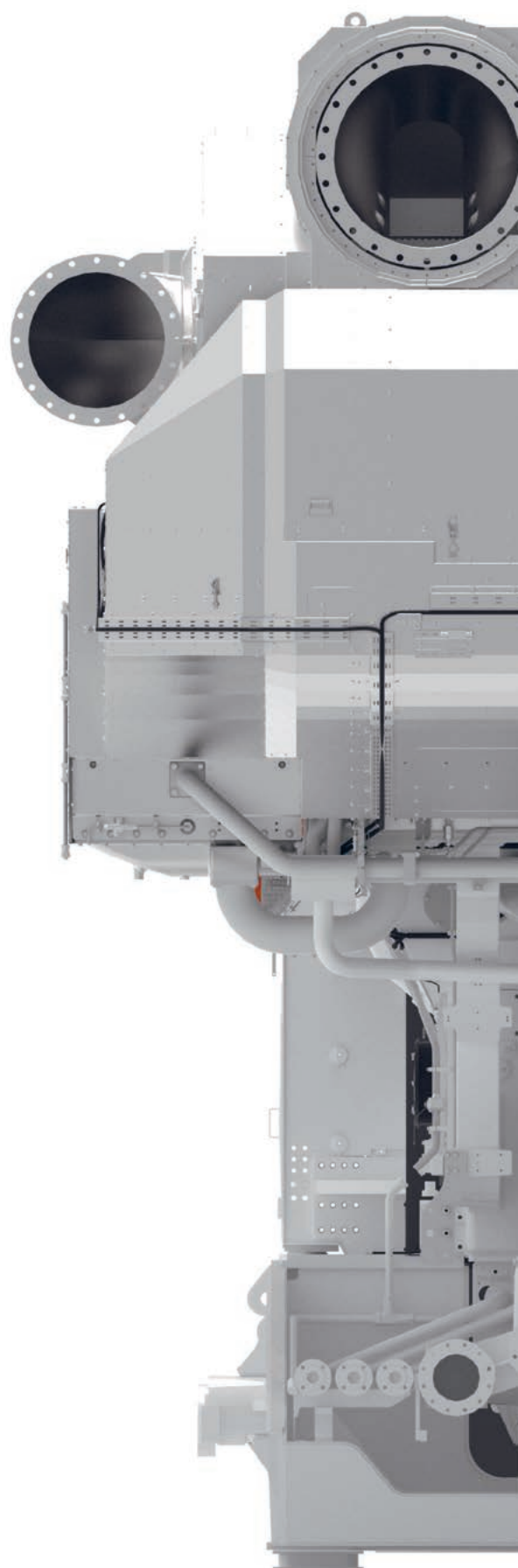
Fast-ramping balancing power

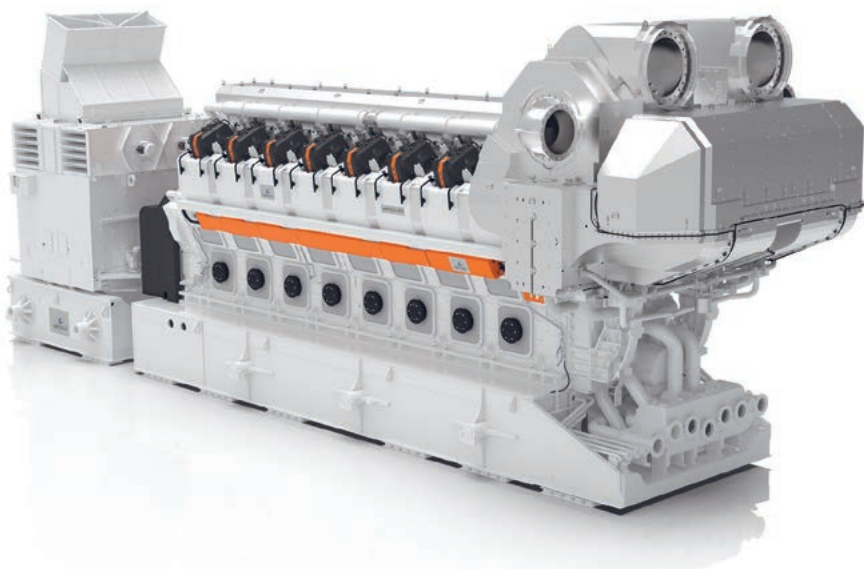
The flexible Wärtsilä 46TS provides fast-ramping balancing power to maintain grid stability and it can operate optimally even at minimal loads, with unlimited startups and shutdowns at no additional cost. The solution can be quickly and easily scaled up as the share of renewables in the power system increases.

Efficient baseload generation

In addition to its high efficiency, the Wärtsilä 46TS has a two-stage turbo-charger system that ensures, the engine can deliver full power at temperatures ranging from -55°C/-67°F to +55°C/131°F, making it suitable for power generation in a wide range of geographical locations.

Engine power plants can provide power for production processes along with spinning reserve to meet varying energy loads in production and allow you to integrate renewables seamlessly into your energy mix as they come on stream.





Wärtsilä 46TS-SG and 46TS-DF engines

The Wärtsilä 46TS is a powerful, highly efficient and flexible next-generation large-bore engine platform.

The platform includes 16V and 18V options for the 46TS-SG and 46TS-DF engine variants.

Key benefits



Power output

- High power output (23.4 MW/unit) means fewer engines are needed to meet demand



Efficiency & performance

- World-class efficiency (51.3%) saves fuel and reduces emissions
- Excellent performance in extreme ambient conditions and at high altitudes, no derating at temperatures between -55°C/-67°F to +55°C/131°F



Flexibility

- Rapid response to fluctuations with fast ramp-up time (2 min.)
- No minimum up or downtime requirements

Performance	Wärtsilä 46TS-SG 50Hz and 60Hz		Wärtsilä 46TS-DF (Gas) 50Hz and 60Hz		Wärtsilä 46TS-DF (LFO) 50Hz and 60Hz	
	16V	18V	16V	18V	16V	18V
Rated electrical power (MWe)	20.38 (16V)	22.93 (18V)	20.38 (16V)	22.93 (18V)	20.38 (16V)	22.93 (18V)
Electrical efficiency (%)	51.3 (16V)	51.3 (18V)	50.7 (16V)	50.7 (18V)	49.0 (16V)	49.0 (18V)
Heat rate (kJ/kWh)	7020 (16V)	7060 (18V)	7105 (16V)	7105 (18V)	7354 (16V)	7354 (18V)

Rated electrical power and electrical efficiencies are given at generator terminals at 100kPa ambient pressure, 25°C suction air temperature, and 30% relative humidity, and without engine-driven pumps. Power factor 1.0 (site). NOx emission level 90ppm @15% O2 dry. Electrical efficiency and heat rate with 5% tolerance according to ISO 3046-1. Gas LHV >28MJ/Nm3. Gas methane number >80. Site conditions, fuel and applicable emission limits may have an impact on performance figures. Please contact Wärtsilä for project-specific performance data.

Fast, cost-efficient plant construction

High-quality prefabricated power plant modules mean your Wärtsilä 46TS engine power plant can be up and running more quickly, giving you a faster return on your investment.

The simplified design of the Wärtsilä 46TS engine power plant offers:

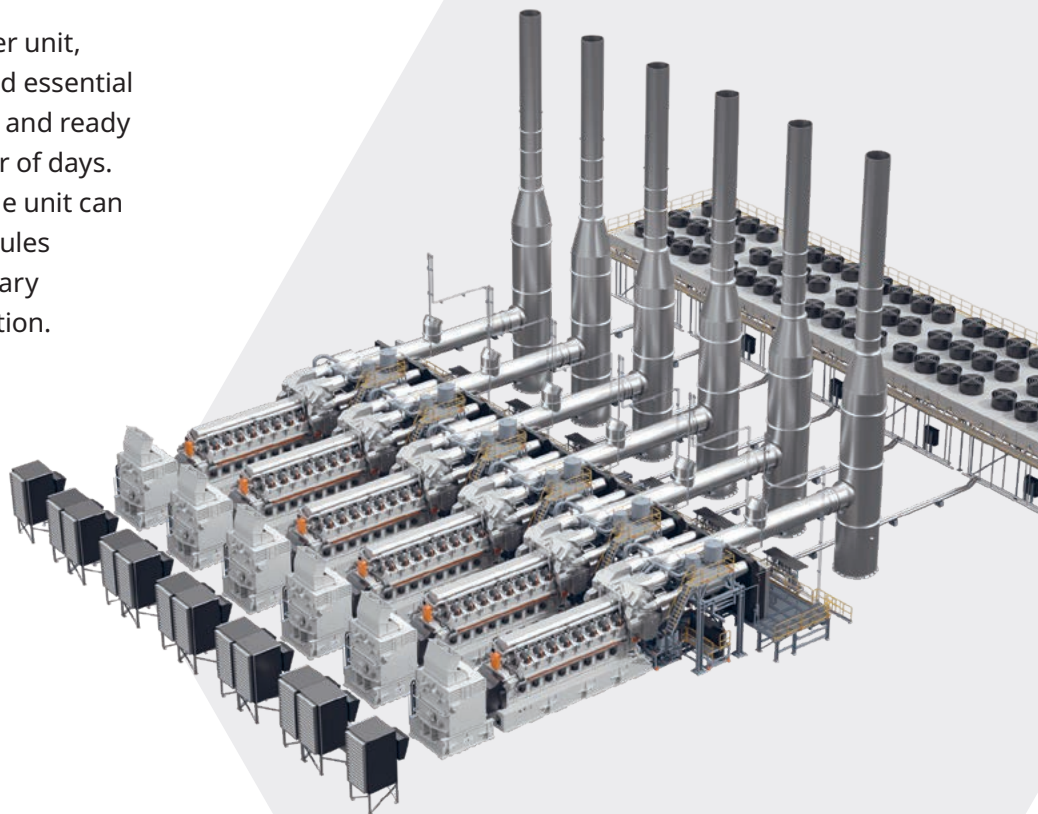
- Free-standing equipment that are not connected to the engine hall structure
- Equipment setups that support typical local engine hall utilisation
- Reduced number of modules compared to previous-generation engine platforms
- Faster and easier module connection with a highly accurate engine interface
- Plug-and-play type installation that eliminates the need for pipe welding on site

At the heart of your plant is the power unit, comprising the engine and associated essential equipment. The unit can be installed and ready to start generating power in a matter of days. Depending on your project needs, the unit can be complemented with process modules that enable easy integration of auxiliary equipment, process media and filtration. You can also add electrical modules to enable easy integration of low and medium-voltage systems.

All module interfaces are streamlined and simplified for quick installation and easy integration into your systems and facilities. The modular design means your plant can be scaled up as needed, allowing you to integrate more renewables in the future.

Key benefits

- Simplified design enables cost-efficient plant construction
- Engine equipment can be installed in a matter of days
- 30% less site work means shorter time-to-electricity
- Scalable and intelligent modules with plug-and-play interfaces allow you to integrate more renewables and expand your plant as needed





Future-proof technology for long-term peace of mind

The rapid growth of clean, affordable renewable power sources like wind and solar has brought uncertainty as well as opportunities for power producers. How do you choose the right technology to reach decarbonisation targets while also securing grid reliability? With fuel-flexible engines, power producers can minimise the risk of investing in assets that may become unprofitable or even obsolete.

The Wärtsilä 46TS has been designed to operate on various gaseous and liquid fuels, including natural gas, biogas and hydrogen blends up to 25%.

The groundbreaking modular design makes it easier than ever before to convert the engine to run on sustainable fuels as they become available. This means that whatever fuels become dominant in the future, the Wärtsilä 46TS will be able to run on them.

Key benefits

- Capable of running today on natural gas, biogas or hydrogen blends up to 25%
- Easily convertible to run on sustainable fuels when they become available

Ensure safe, reliable performance with Wärtsilä Lifecycle services

Wärtsilä Lifecycle services can support you throughout the life of your power plant, helping to derisk your investment with customised operations and maintenance plans. Our comprehensive Lifecycle service solutions – which bring together our vast knowledge and expertise in power generation with the latest digital technologies like advanced analytics, artificial intelligence and machine learning – ensure safe, reliable and efficient operations throughout your equipment's lifetime.

Our remote support solutions can help you reduce operating costs through data and infrastructure optimisation, preventing problems before they occur. Our solutions include real-time monitoring and remote support provided by Wärtsilä Expertise Centres around the world.

Key benefits

- Guaranteed performance of Wärtsilä-operated power plants, with over 99% annual engine reliability
- Ensure the reliability and predictability of your operations
- Maximised availability – Wärtsilä-operated power plants have over 97% average annual availability



Choose the right level of support for your power plant



Wärtsilä Optimised maintenance

Ensure safe and reliable operations:

- Power plant maintenance by Wärtsilä with predictable maintenance costs
- Services and support from Wärtsilä Expertise Centres



Wärtsilä Guaranteed asset performance

Ensure power plant performance:

- Power plant maintenance by Wärtsilä with performance guarantees.
- Services and support from Wärtsilä Expertise Centres



Wärtsilä Operation and maintenance

Protect your investment:

- Power plant operation & maintenance by Wärtsilä with performance guarantees.

Wärtsilä leads the transition towards
a 100% renewable energy future.
We help our customers to decarbonise by
developing market-leading technologies.

Wärtsilä Energy is at the forefront of the transition towards a 100% renewable energy future. We help our customers and the power sector to accelerate their decarbonisation journeys through our market-leading technologies and power system expertise. Our solutions include flexible engine power plants, energy storage and optimisation technology, and services for the whole lifecycle of our installations. Our engines are future-proof and can run on sustainable fuels. Our track record comprises 79 GW of power plant capacity and over 130 energy storage systems in 180 countries around the world. Over 30% of our operating installed base is under service agreements.

www.wartsila.com/energy



Wärtsilä is a global leader in innovative technologies and lifecycle solutions for the marine and energy markets. We emphasise innovation in sustainable technology and services to help our customers continuously improve their environmental and economic performance.

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