

Wärtsilä Power plant gas conversion



As gas grids expand and emission levels continue to tighten, conversion to natural gas is an increasingly viable alternative for power plants. Wärtsilä engines are flexible and easily adapted to using gas and, in the future, synthetic renewable fuels as a primary fuel. This helps cut operational costs and exhaust gas emissions while increasing fuel flexibility. A gas conversion can also promote the addition of more renewables into the system.

WHY CONSIDER A GAS CONVERSION?

As natural gas is both attractively priced and efficient, converting an existing engine to operate on gas offers significant economic and environmental benefits. Gas also offers you increased operational flexibility as other fuels can still be used if needed. A gas conversion helps to future-proof your plant by allowing you to transition to synthetic fuels at a later date and enables integration of renewable energy sources by providing reliable balancing.

CONVERSION OPTIONS

Spark ignited (SG) gas engines are mono fuel and use natural gas, LNG, or LPG. They are a strong option where there is a secure supply of natural gas. Pure gas engines enable the highest efficiency and asset output with the lowest emissions.

Dual fuel (DF) engines can use multiple fuels: HFO, LFO, natural gas, and LNG. This is the best option when you want to achieve high efficiency while still being able to use liquid fuels as backup.

KEY BENEFITS

- Optimise OPEX by reducing fuel and lube oil use and cutting maintenance costs
- Reduce exhaust gas emissions
- Increase operational flexibility
- Extend lifetime of the installation

SCOPE OF SUPPLY

All conversion options involve modifications to engines, electrical and automation systems and mechanical auxiliary systems. A Wärtsilä gas conversion of an existing power plant is not just about the engine conversion – it follows the same principles as any new-build plant constructed by Wärtsilä, meaning all aspects, from safety to operational reliability, are taken into account:

Engine conversion covers elements like the turbo chargers and charge air coolers, piping and valves, cylinder heads, pistons, connecting rods and camshafts.

Mechanical auxiliary system upgrades include installation of gas regulating unit(s), safety vents and exhaust gas ventilation unit(s). As part of the project the cooling and compressed air systems may also require modification.

Electrical and automation system upgrades include changes to the engine control system, HMI system, and LV switchgear.

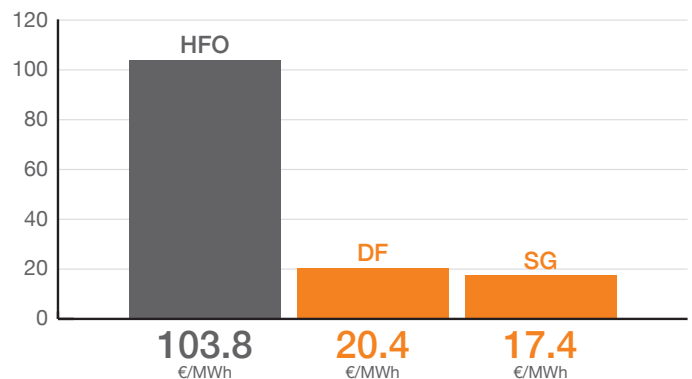
We manage all phases of a gas conversion project as a full EPC solution, from feasibility studies, financing support (if required) and solution proposals to execution planning and implementation. The most convenient time to carry out a gas conversion is when a major engine overhaul is planned. We also offer tailored service agreements that can help secure a smooth restart and maximise the return on the gas conversion investment. Our engineering, procurement and construction (EPC) solution includes:

- Project management
- Engineering
- Parts delivery
- Installation
- Performance testing

CASE EXAMPLE: THE IMPACT OF FUEL TYPE AND TECHNOLOGY ON LEVELISED COST OF ENERGY

	HFO engine	DF engine (DF conversion)	SG engine (SG conversion)
Fuel cost	€0.4/litre	€0.6/litre (LFO) €0.05/m ³ (Gas)	€0.05/m ³
Lube oil cost	€2.6/litre	€3.7/litre	€3.7/litre
LCOE	€103.8/MWh	€20.4/MWh	€17.4/MWh

Plant size: 6 x W18V46 / 100 MW



LCOE, average over the economic period (10 years)

WHY CHOOSE WÄRTSILÄ?

Wärtsilä has extensive experience with gas engines and gas power plants with more than 30 gas conversion projects completed globally by converting over 100 engines totalling in excess of 1.2 GW. Our world-class project management organisation delivers an average of 80 lifecycle upgrades per year. We also offer performance guarantees, a warranty on parts and service and extensive lifecycle support.