

9F Syngas Turbine High Efficiency Syngas-Based Power Generation

GE Energy offers the 9F Syngas Turbine, which uses advanced gas turbine technology to deliver greater performance levels than previous GE Energy technologies for low-BTU fuel and Integrated Gasification Combined Cycle (IGCC) 50 Hz applications.

Efficient and Reliable Performance

The 9F Syngas Turbine gives customers a gas turbine with a wide range of fuel and process integration flexibility. Based on significant gas turbine and syngas experience, GE Energy is pleased to offer a product that delivers high efficiency and reliability for advanced IGCC plants.

Operating on syngas, the 9F Syngas Turbine is capable of generating 290 MW in simple-cycle operation with a heat rate of 9170 kJ/kWh (LHV). Operating on a high-hydrogen fuel delivers increased performance. Using diluent fluid injection, the 9F Syngas Turbine can achieve 25 ppm NO_x emissions with either fuel type.

The 9F Syngas Turbine will be offered in both single- and multi-shaft combined-cycle power plant configurations.

9F Syngas Turbine Simple Cycle Performance Ratings*

		Syngas**	High H ₂ Syngas***
Output	(MW)	290	305
GT efficiency	(% LHV)	39.3	41.1
NO _x	(PPM @ 15% O ₂)	25	25

* Output and heat rate improvements can be realized for both syngas and high-H₂ applications with implementation of fuel or diluent moisturization.

** Dry syngas (LHV = 214 BTU/scf)

*** Dry syngas (LHV = 176 BTU/scf)

Product Features and Flexibility

GE Energy's 9F Syngas Turbine is built on GE Energy's F-class product experience and incorporates a number of its technology advancements, including GE Energy's low-BTU fuel Multi-Nozzle Quiet Combustion (MNQC) system; advanced Mark* Vle controls; and robust compressor and turbine systems. The MNQC combustion system was designed for operating on low-BTU fuels and is a proven technology that has been operating since the 1990s.

The 9F Syngas Turbine has been designed with flexibility for compressor air extraction, allowing for integration in a variety of power plant cycles. The 9F Syngas Turbine can also be integrated into a high-hydrogen fuel stream from plants equipped with a carbon capture system.

High-hydrogen content in the fuel can vary from 25-100%. Levels above 65%, however, require nitrogen dilution.

Built on Strong Product and Fuel Flexibility Knowledge and Experience

The 9F Syngas Turbine is based on the successful 9FA. This configuration employs the experience of GE Energy's F-class turbine products, which have accumulated more than 28 million hours of operation, establishing GE Energy as an industry leader for advanced technology gas turbines. As of July 2009, 179 9FA turbines are operating with more than seven million fired hours and 75,000 fired starts.

In addition, GE Energy has extensive low-BTU fuel experience with 3 GW in operation today—consisting of 27 gas turbines at 15 locations around the world, with more than one million total hours of operation. This experience includes operation employing GE Energy and non-GE gasification technologies, including numerous leading oxygen and air-blown gasifier suppliers, and a variety of fuels including high- and low-sulfur coals, and petroleum coke.

This unique knowledge gives GE Energy an unparalleled edge in providing customers with the best advanced combined-cycle technology for IGCC and syngas applications.

