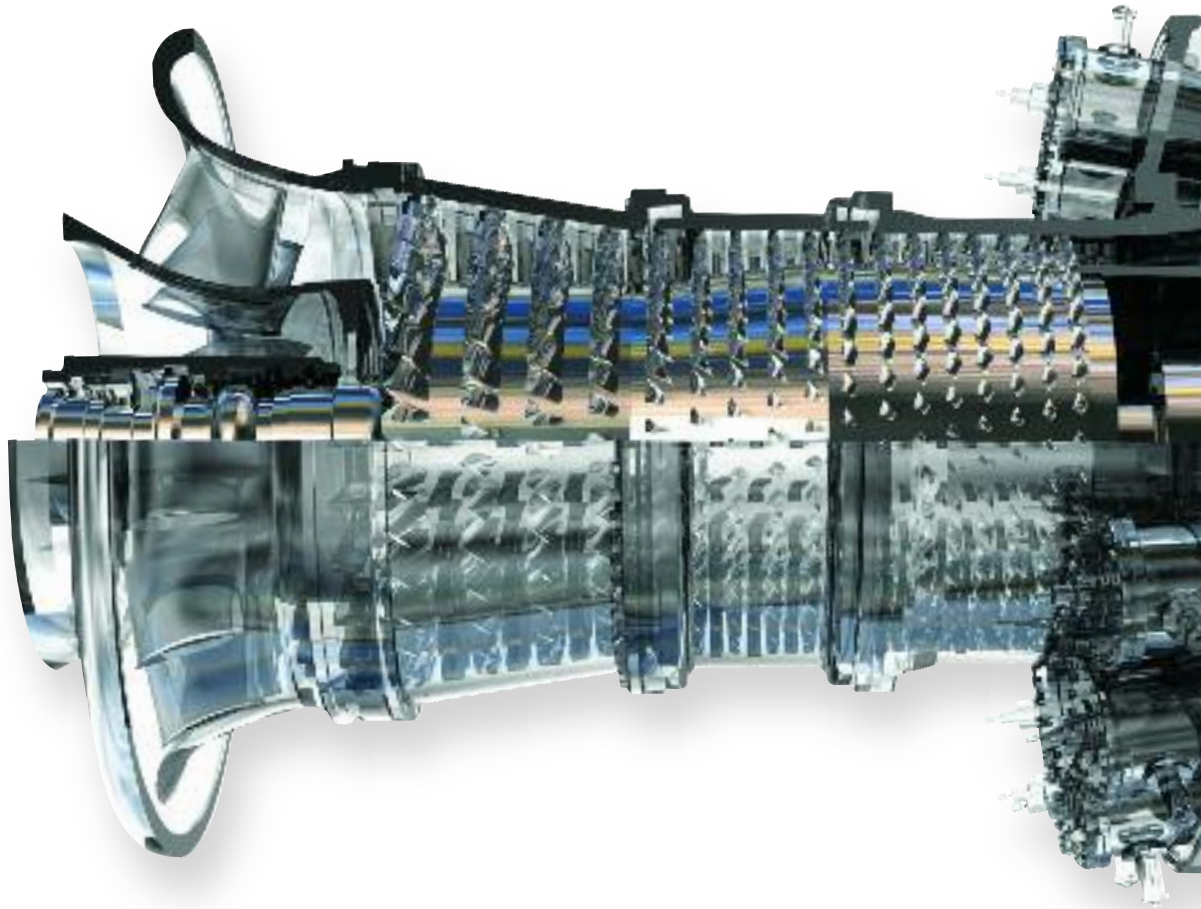


GE Energy



Heavy duty **gas turbine** products



imagination at work

The background of the slide features a blue-tinted, semi-transparent image of gas turbine components. In the upper right, there are circular compressor or turbine casings with internal blades visible. In the lower left, there are larger, more complex parts, possibly turbine casings or exhaust manifolds, showing intricate internal structures. The overall image is a technical representation of heavy-duty gas turbine machinery.

Heavy duty **gas turbine** products

Capitalizing on a rich history of innovation and technological leadership, GE Energy's heavy duty gas turbine product line is a global industry leader in enabling cleaner and efficient power generation in a wide range of applications. For over a century, GE has invested in the research and development of gas turbine technology—from aviation and ship propulsion to electric utility and industrial service—resulting in some of today's most efficient and versatile gas turbines. Today, with over 6,000 gas turbines sold and well over 200 million operating hours, our products demonstrate the kind of reliability and performance our customers depend on for their own success.



Since 1949, when a GE-designed turbine became the first gas turbine commissioned for electrical service (at Belle Isle Station in Oklahoma) we have continued to build on our proven technology to develop reliable power platforms that can evolve with customer needs.

By drawing on company-wide innovations and best practices, GE Global Research initiatives, and our rigorous gas turbine development and validation programs, GE Energy has created a wide range of industry-leading gas turbines. Designed to help power plant operators succeed in an increasingly competitive and highly regulated global market, GE gas turbines offer cost-effective features such as high efficiency, fuel and operational flexibility, advanced emissions controls, and high reliability and availability.

Our gas turbine product line includes:

- Heavy duty gas turbines
- Aeroderivative gas turbines

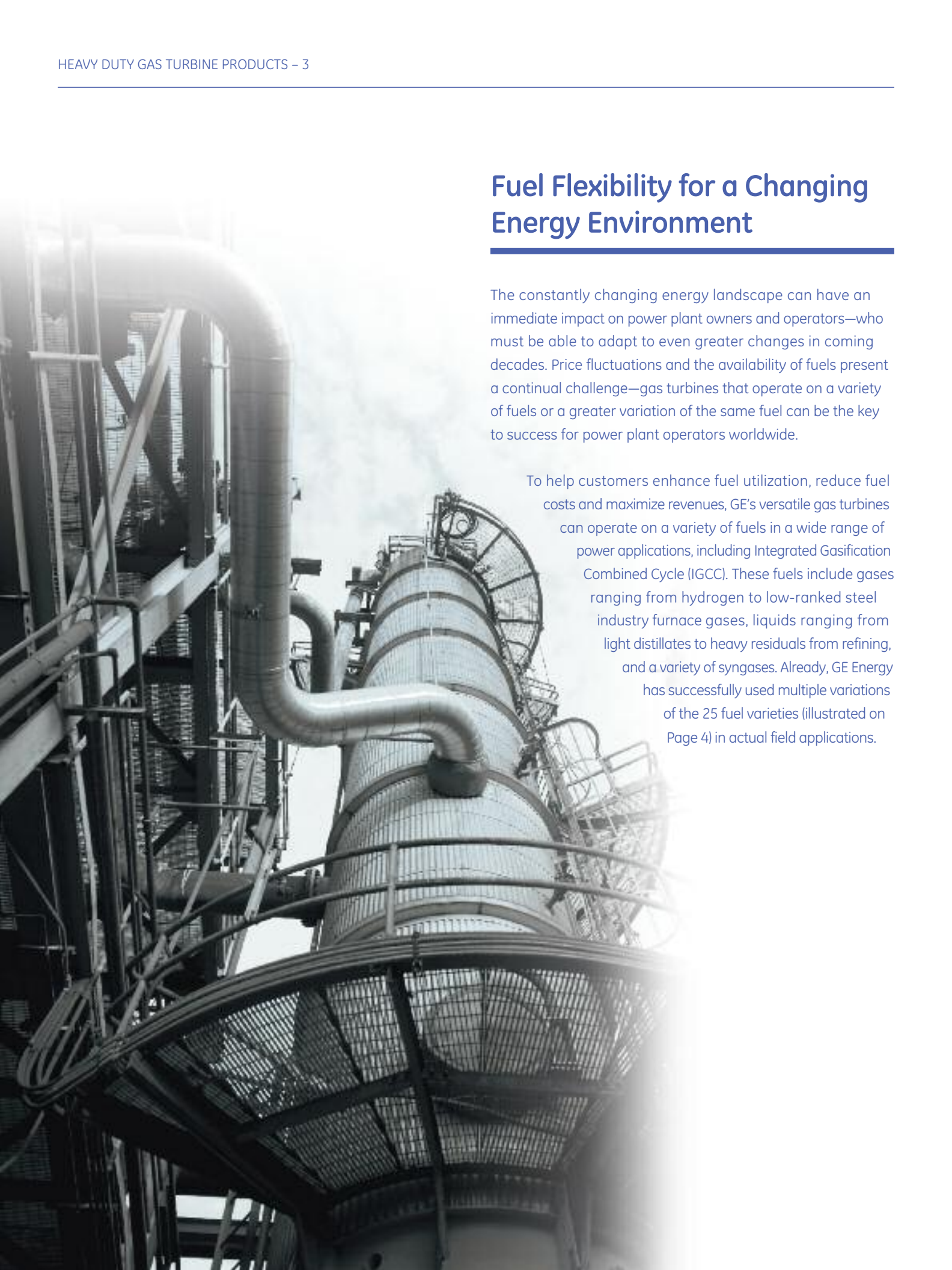
And to help maintain outstanding performance for your gas turbine, we offer customized OEM service solutions, including Contractual Service Agreements, outage support, upgrades, and complete parts and repair services.



Fuel Flexibility for a Changing Energy Environment

The constantly changing energy landscape can have an immediate impact on power plant owners and operators—who must be able to adapt to even greater changes in coming decades. Price fluctuations and the availability of fuels present a continual challenge—gas turbines that operate on a variety of fuels or a greater variation of the same fuel can be the key to success for power plant operators worldwide.

To help customers enhance fuel utilization, reduce fuel costs and maximize revenues, GE's versatile gas turbines can operate on a variety of fuels in a wide range of power applications, including Integrated Gasification Combined Cycle (IGCC). These fuels include gases ranging from hydrogen to low-ranked steel industry furnace gases, liquids ranging from light distillates to heavy residuals from refining, and a variety of syngases. Already, GE Energy has successfully used multiple variations of the 25 fuel varieties (illustrated on Page 4) in actual field applications.





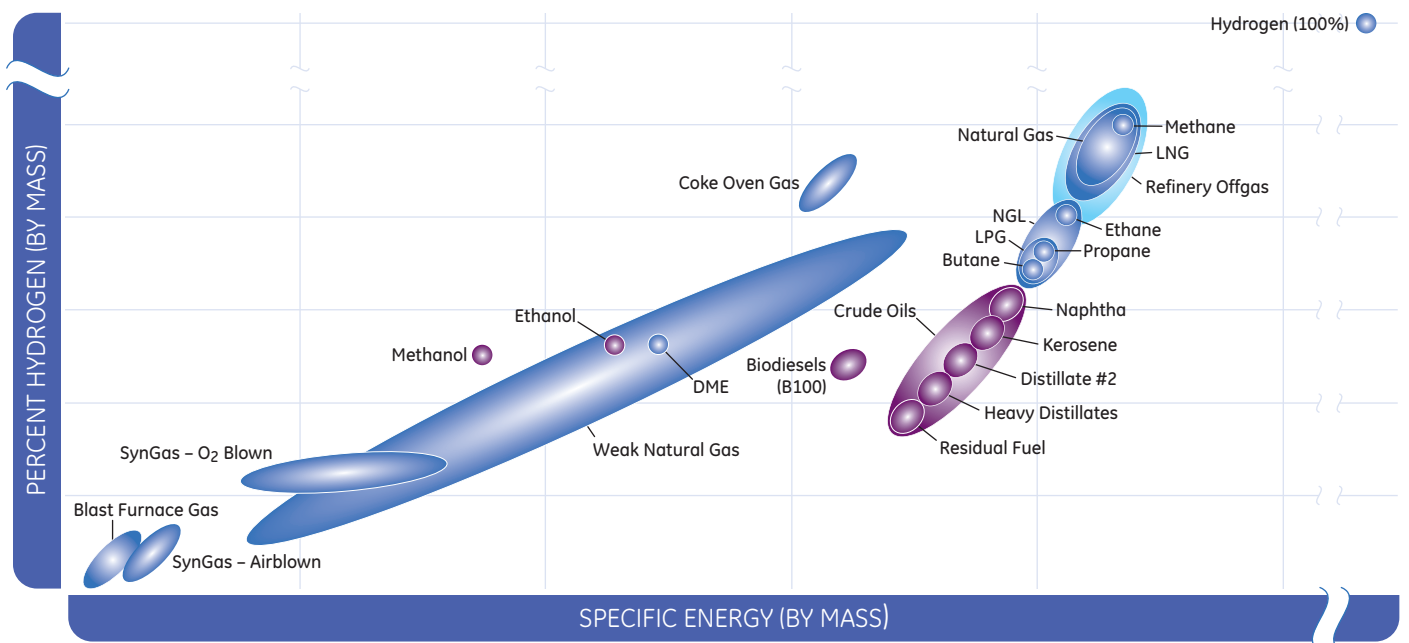
Meeting fuel challenges

GE is committed to providing efficient and reliable power from a variety of fuels—including renewable sources that can reduce carbon emissions—to help power plant operators satisfy Renewable Portfolio Standard requirements while increasing their potential to receive renewable energy credits.

GE gas turbines can efficiently use liquid and gaseous fuels to produce electricity while significantly reducing NO_x, CO, and PM₁₀ emissions—and we have also conducted successful biofuel testing across much of our gas turbine portfolio. By the end of 2008 our aero-derivative gas turbine fleet logged over 22,000 hours of successful commercial biodiesel operation.

Fueling a successful future

Through close collaborative relationships with owners, operators, and fuel suppliers, GE is actively pursuing additional combustion technologies that will further expand the available range of fuel sources for gas turbine operation.



Versatile GE gas turbines operate on a wide variety of fuels, with a representative sample above

Turbines for Syngas Applications

GE offers turbines for syngas applications in both 50 Hz and 60 Hz models. These turbines are designed and proven to meet the challenging requirements of syngas fuels, delivering high efficiency and reliability for our customers.

Our syngas turbine portfolio supports output requirements ranging from 45 MW to more than 305 MW (gas turbine output). GE-designed gas turbines operating in IGCC coal plants and refineries produce a total worldwide output of over 2.5 GW—with an additional 1 GW produced by GE gas turbines that operate on process fuels from steel mills. This fleet has accumulated over 1 million hours of operation on low-calorific syngas fuels, along with significant operation on alternative fuels.

Advanced technology delivers even greater performance

The GE 7F and 9F syngas turbines use advanced gas turbine technology to deliver greater performance levels than previous GE technologies for low heating value fuel and IGCC applications.

Our advanced technology benefits from our extensive experience in gasification, turbine technology and IGCC, including GE's low heating value Multi-Nozzle Quiet Combustion (MNQC) system; advanced Mark* Vle controls, and robust compressor and turbine systems that allow for increased torque and temperature operation.

Ready for carbon capture today

GE's IGCC plant technology is carbon capture ready today—it can be retrofitted for carbon capture without economic and performance penalty incurred by waiting for regulatory clarity and appropriate carbon value. Our 7F and 9F syngas turbines have been designed to offer flexible integration into a high-hydrogen fuel stream from plants equipped with a carbon capture system.

Universal gasification applicability

GE turbines have been designed for universal gasification applicability using various 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.

GE GAS TURBINES FOR IGCC SYNGAS APPLICATIONS¹

GAS TURBINES		COMBINED-CYCLE (CC)	
Model	Nominal Syngas Power Rating ²	Model	Nominal Syngas Output Power ³
6B	46 MW (50/60 Hz)	106B	70 MW (50/60 Hz)
7EA	80 MW (60 Hz)	107EA	120 MW (60 Hz)
9E	140 MW (50 Hz)	109E	210 MW (50 Hz)
6FA	92 MW (50/60 Hz)	106FA	140 MW (50/60 Hz)
7F Syngas	232 MW (60 Hz)	207F Syngas	710 MW (60 Hz)
9F Syngas	286 MW (50 Hz)	209F Syngas	880 MW (50 Hz)

Notes:

(1) Conventional gasification fuel, without CO₂ capture.

(2) Performance at ISO conditions.

(3) No integration with process. Steam turbine and generator product fit TBD. Assumes multishaft configuration.

Operational Flexibility

GE gas turbines provide a wide range of capabilities to match your operating needs, including flexibility in fuel selection, and site adaptation—with a variety of operating choices including base load, cyclic, and peaking duty. Applications for our gas turbines range from cogeneration and district heating to power generation in simple-cycle, combined-cycle, and IGCC—and to mechanical drive for oil and gas and industrial applications.

Meeting emerging operational needs

GE has pursued several initiatives that directly respond to customer needs, including a 10-minute startup capability⁽¹⁾ for 7FA gas turbines. This ability to dispatch power will enable operators to use the turbine in cyclic operation or realize additional revenue by providing power to the ancillary market. Unlike some competing 10-minute startup systems, the 7FA gas turbine will achieve stable combustion that is capable of 9 ppm NO_x and CO emissions within the startup time—which allows plant operators to extend turbine operation even when

emissions are capped. For the 6FA equipped with the DLN 2.6 system, GE has developed the optional capability to adjust the output to secure the local auxiliaries in case of grid failure.

Other operational flexibility initiatives include a series of enhancements for the 7FA gas turbine that can expand its operating profile. GE's OpFlex* enhancements include increased output, improved peak output, as well as reduced fuel consumption. For 9FA gas turbines, we have also developed an OpFlex enhancement that improves turndown capability (5 to 15%) for significant fuel savings and reduced cycling.

The Mark VIe control platform is an enabling technology for the OpFlex offerings. The use of advanced control platforms enables continuous operation across a wide range of natural gas-derived fuels and ambient conditions, while maintaining or improving emissions, performance, reliability and operating flexibility.

OpFlex OFFERINGS FOR F-CLASS GAS TURBINES

Offering	Key Benefits
OpFlex Peak	Improved peak output (up to 2.5%) ⁽²⁾⁽³⁾
OpFlex Turndown	Improved turndown capability (5 to 15%) for significant fuel savings/reduced cycling ⁽²⁾
OpFlex Start-up NO_x	Improved cyclic operation flexibility and community relations through reduced start-up/shutdown NO _x and opacity
OpFlex Start-up Fuel Heating	Reduced start-up fuel consumption, start-up time, and NO _x produced during start-up
OpFlex Autotune	Allows continuous operation across a range of natural gas-derived fuels while maintaining emissions performance, reliability and operating flexibility as well as eliminating the need for combustion retuning for variations in ambient condition
OpFlex Cold Day Performance	Increased output and improved heat rate at low compressor inlet temperatures ⁽⁴⁾

Notes:

(1) The 7FA gas turbine with the improved startup capability will be capable of dispatching in ten minutes after a start signal, and will achieve stable combustion with steady state NO_x and CO emissions of 9 ppm within this time period. In simple-cycle operation the 7FA will have the capability of dispatching more than 70% of baseload power output.

(2) Same or lower combustion dynamics due to advanced fuel scheduling controls logic.

(3) Results in slight increase in emissions.

(4) Output increased by up to 9 MW on each simple-cycle gas turbine. Provides 7FA combined-cycle users with up to an additional 16 MW and 0.7% improved heat rate on a 30°F day; even greater improvements may be realized on colder days.

Controlling Gas Turbine Emissions

Dry Low NO_x (DLN) gas turbine combustion systems

Enhanced combustion technology for lower emissions

GE's enhanced DLN combustion systems can be applied to a wide range of gas turbines—enabling customers to meet cost requirements and cleaner emissions standards. Since the 1970s and 1980s when GE introduced the DLN 1 and DLN 2 combustion systems, our DLN development program has focused on evolutionary combustion systems capable of meeting the extremely low NO_x levels required to meet current and future regulations.

DLN SYSTEMS/GAS TURBINES

Dry Low NO _x (DLN) Combustion System	Demonstrated Emission Levels	Maintenance Intervals	Gas Turbine Application
DLN 1+	3–5 ppm	Up to 24,000 hours	6B 7E 7EA
DLN 2.6+	9–25 ppm	Up to 24,000 hours	9FA 9FB

GE's ecomagination certified DLN 1+ and DLN 2.6+ combustion systems incorporate advanced technology to improve stability, reduce emissions, and extend outage intervals.

DLN 1+ for reduced emissions and extended inspection intervals

As one of GE's certified ecomagination products, our DLN 1+ gas turbine combustion system is designed to help power plant operators meet increasingly strict environmental standards—while also extending inspection intervals to 24,000 hours (based on natural gas operation). The DLN 1+ system guarantees NO_x emissions of 5 ppm or less for GE 6B, 7E and 7EA gas turbines.

Our DLN 1+ technology provides a cost-effective option for plant owners who have to meet revised government regulations that demand cleaner emissions. Instead of installing a costly Selective Catalytic Reduction (SCR) system on an existing unit, customers can replace an existing combustion system with the DLN 1+ system to reduce the amount of NO_x generated—and in some cases enable fewer CO emissions. Upgrading an existing DLN 1 system can further reduce NO_x emissions to 5 ppm.

DLN 2.6+ for lower emissions and operating flexibility

GE's DLN 2.6+ combustion system, also a certified ecomagination product, enables GE's 9FA gas turbine to reduce NO_x emissions to between 9 and 15 ppm—while extending outage intervals. The DLN 2.6+ system is proving to be a cost-effective alternative for power plants in Europe that otherwise faced the need to install costly post-combustion control solutions. With the DLN 2.6+ system, these plants can meet local emissions regulations and grid code requirements while running their gas turbines at lower loads during off-peak periods for significant fuel savings and emissions reduction.

ecomagination
a GE commitment



Services Portfolio



OEM Services for the Life of Your Equipment

As the original equipment manufacturer, GE has the in-depth fleet knowledge, expertise, and global resources to keep your equipment performing at peak levels. Supported by world-class manufacturing and repair facilities, our specialists can provide a complete range of services tailored to your specific needs.

Contractual Services Agreements (CSA)

Since maintenance and reliability are two of the larger factors affecting plant profitability, GE offers Contractual Service Agreements to reduce your maintenance cost risk while also providing contracted performance guarantees. For a fixed price we provide maintenance (including parts, services, and repairs) and upgrades over a specified amount of time. And to ensure that your plant performs at or above contracted levels, we apply best-practice expertise gained from the hundreds of turbines we routinely maintain.



Equipment Upgrades

Significant advances in gas turbine technology applied to new unit production can also be applied to your existing units—which can provide increased performance, longer useful life, and higher reliability—while yielding an attractive economic payback.

Parts and Repairs

GE's global network of repair centers can provide services for every component in your turbine, including auxiliary equipment. We service power generating gas turbines as well as mechanical drive gas turbines—and most of our in-shop services can also be performed on site. Since GE is continually improving turbine technology, we can also upgrade or uprate gas turbines by replacing existing components with the latest component technologies. GE also offers high quality replacement parts for all our equipment, including factory-new parts and refurbished parts.



Field Engineering

GE provides a comprehensive range of maintenance, overhaul, repair and modifications services to support your equipment. Our field engineering services team can identify conditions or components that can reduce unit performance or cause serious damage if not corrected. Through evaluations, audits, and tuning and modeling services, these specialists can help enhance performance, reduce forced outages, and increase the useful life of your equipment.

Lifecycle Services

To help keep your equipment operating reliably and efficiently, we offer a full range of services for your power generation equipment—from simple maintenance services, to monitoring and diagnostics, to plant assessments that can improve the life expectancy of your turbine. We also provide end-to-end outage services that can meet your critical schedule needs.



Global Experience

Worldwide expertise and innovation

With our global resources and unmatched experience base, GE has the expertise to provide a gas turbine system for our customers' site-specific needs—taking into consideration key factors such as regional environmental regulations, fuel availability and flexibility needs, size limitations, operational requirements, net plant output, and site designs that facilitate future additions or upgrades.

9FB launch site reaches milestone in Cadiz, Spain

Considered an industry milestone, GE's 9FB combined-cycle system surpassed 15,000 operating hours at the Arcos III power plant in January 2009. The launch site for GE's 50 Hz 9FB gas turbine has been in commercial operation since 2006 and is owned by Iberdrola Generacion S.A. Generating in excess of 810 MW of power for the Spanish electricity grid, the plant uses natural gas as its fuel and has exceeded operational expectations.

GE Low Calorific Value (LCV) technology used for steel industry applications

To help produce more electricity with lower fuel costs in today's competitive steel industry, GE developed technology that supports using our proven 9E gas turbine with various low calorific gas applications such as Corex* export gas, and blast furnace gas blended with coke oven gas. This 9E LCV technology, which has been in use for ten years in a plant in Italy, was also selected for the world's largest Corex gas turbine combined-cycle plant in Shanghai, China. Shipped in 2007, the LCV gas turbine will transform abundant Corex gas generated by the iron-making process into electricity through the 169 MW combined-cycle power plant.

GE's 9E LCV technology also was selected for an IGCC power plant in China's Fujian province—which will expand the crude oil processing capacity of an existing refinery from 4 million to 12 million tons per year.



Global Experience



| Baosteel, Shanghai



| PP9, Riyadh



| Duke Power, U.S.

Middle East's expanding power needs

With over 350 gas turbines currently installed in key locations throughout Saudi Arabia, and additional turbines throughout the region, GE continues to provide innovative technology to help meet the needs of the Middle East—where the demand for electricity is increasing at a rapid pace.

Some of our recently announced key projects in Saudi Arabia include Riyadh Power Plant 10 (where more than 30 GE 7EA gas turbines will add more than 2,000 MW of power to the region), Riyadh Power Plant 9 (where GE is providing 12 7EA gas turbines to expand the site's output by more than 660 MW) and the Marafiq power generation and water desalination project. At Marafiq, GE is providing 12 7FA gas turbines for a targeted net plant output of 2,500 MW with steam extraction for desalination. And on the west coast of Saudi Arabia, GE is providing 7EA gas turbines and 7A6 generators for a 960 MW expansion at the Rabigh Power Plant. Each site also has GE's Integrated Plant Control system, using a common Mark VIe control platform for turbine and plant control.

In late 2008, GE Energy announced an agreement with the government of Iraq to supply 9E gas turbines capable of supplying 7,000 MW of electricity as part of a significant power initiative.

U.S. launch of the H System* 60 Hz combined-cycle plant

The GE-owned and financed Inland Empire Energy Center in southern California is the site of the world's first installation of the 60 Hz version of GE's H System. Two GE 7H combined-cycle systems can produce a total of 775 MW—enough to supply nearly 600,000 households. For every unit of electricity produced, the H System uses less fuel and produces less greenhouse gases and other emissions when compared to other large gas turbine combined-cycle systems.

Platform Specifications

HEAVY DUTY GAS TURBINE PRODUCTS Combined-Cycle (CC) and Simple-Cycle (SC)

GAS TURBINES

Turbine Model	6B		6C		6FA		7EA	
Cycle	CC	SC	CC	SC	CC	SC	CC	SC
Output:								
MW	64	42	67	45	118	77	130	85
Hz	50/60	50/60	50/60	50/60	50/60	50/60	60	60
Heat Rate:								
Btu/kWh	6,960	10,642	6,281	9,315	6,199	9,760	6,800	10,430
kJ/kWh	7,341	11,226	6,627	9,825	6,540	10,295	7,173	11,002

NOTE: All ratings are net plant based on ISO conditions and natural gas fuel. All CC ratings shown above are based on a 1GT/1ST configuration.



6B



6C



6FA



9E



9E		7FA		9FA		9FB		7H	9H
CC	SC	CC	SC	CC	SC	CC	SC	CC	CC
193	126	269	183	391	256	413	279	400	520
50	50	60	60	50	50	50	50	60	50
6,570	10,100	6,090	9,360	6,020	9,250	5,880	9,016	5,690	5,690
6,930	10,653	6,424	9,873	6,350	9,757	6,202	9,510	6,000	6,000



7FA



9FA



9FB



9H

Advanced Technology Combined-Cycle Platforms

F-Class Combined-Cycle Platforms

High efficiency F-class gas turbines for operational and fuel flexibility

Since introducing F-class technology to the industry over 20 years ago, GE has continued its evolution of this advanced technology to meet our customers' far-ranging needs. Along the way we achieved several industry firsts—which make F-class gas turbines the best-in-class choice for power generators and industrial cogenerators requiring large blocks of reliable power. These industry firsts include the first F-class gas turbine to reach 55% thermal efficiency in commercial combined-cycle operation...the first to record 100% availability and reliability over 254 days of continuous operation...the first to achieve single-digit NO_x emissions...and the first to ship over 1000 units and reach over 20 million fired hours in worldwide service.

6FA (50/60 Hz) – for advanced technology mid-sized combined-cycle

With over 2,000,000 operating hours and more than 100 units installed or on order, the 6FA gas turbine has a proven record of reliability—while also providing the operating flexibility needed for harsh environments. A direct down-scaling of the proven 7FA, the high-efficiency 6FA gas turbine offers an output of 77 MW in simple-cycle applications with net plant efficiency of 35.5%, maintaining high exhaust energy for very efficient and flexible combined-cycle or industrial cogeneration.

Ideally sized for IPP combined-cycle applications, the 106FA configuration provides an output of 118 MW with 55.0% efficiency—while the 206FA configuration provides output of 239 MW with 55.6% efficiency. The output and efficiency of the 6FA make it well suited for combined heat and power, cogeneration, and for industrial or island operation in base load mode or cyclic duty. This robust advanced design—which includes the DLN 2.6 combustion system for reduced emissions—also provides flexibility in fuel selection and site adaptation.

7FA – the industry standard for 60 Hz power in all duty cycles

With consistent reliability over 99%—which provides operators more days of operation—the 7FA gas turbine is suited for a wide range of applications, including combined-cycle, cogeneration, simple-cycle, and IGCC. The 7FA gas turbine has an output of 183 MW in simple-cycle operation, and in a 207FA combined-cycle configuration it can achieve net plant output up to 542 MW with net plant efficiency of 57.6%. An industry leader in reducing emissions, the 7FA's DLN 2.6 combustion system produces less than 9 ppm NO_x and CO, while minimizing the need for exhaust cleanup systems.

To meet the needs of our fleet of over 670 7FA gas turbines, GE is continually developing incremental enhancements that can improve the output and efficiency for both new and existing units. In summer peak demand periods where quick startup is needed, we also offer power augmentation equipment for inlet cooling, steam injection, and peak firing.

In late 2007, we announced the upcoming availability of a faster start-up option for the 7FA turbine. This machine will be able to dispatch in 10 minutes after a start signal, and will achieve stable combustion capable of NO_x and CO emissions of 9 ppm within this time period.

**F-Class
Platforms**

When integrated into GE's next-generation Rapid Response combined-cycle power plant design, this turbine has the ability to reduce startup emissions for a 207FA system by as much as 20% and increase starting efficiency by up to 30%.

9FA – proven combined-cycle technology for large blocks of reliable 50 Hz power

Representing the world's most experienced fleet of highly efficient 50 Hz large units, the 9FA gas turbine offers the key advantages of higher output and a fuel flexible combustion system. The 9FA gas turbine is configured with the DLN 2.6+ combustion system—a certified GE ecomagination product that can achieve less than 15 ppm NO_x while also providing extended turndown capacity for superior part load performance.

A popular choice for combined-cycle or cogeneration plants where flexible operation and maximum performance are the prime considerations, the 9FA gas turbine can be arranged in a multi-shaft configuration that combines one or two gas turbines with a single steam turbine to produce power blocks with an output of 391 MW or 787 MW. For re-powering applications with space limitations, the 9FA can be configured in a single-shaft combined-cycle arrangement with the generator and steam turbine. And in simple-cycle configuration, the 9FA can provide

256 MW of output. Applications include power generation in base load, and mid- or peaking-duty. The 9FA can also be used in applications such as aluminum smelters or Integrated Water and Power Plants (IWPP).

9FB – GE's most advanced 50 Hz combined-cycle air-cooled gas turbine

An ideal choice for 50 Hz base load and cycling applications where fuel costs are critical, the 9FB gas turbine provides high performance in simple-cycle and combined-cycle applications and reduces the net cost of electricity generation.

The 9FB gas turbine incorporates advanced technology validated in GE's H System gas turbine. In simple-cycle configuration the 9FB gas turbine can provide output of 279 MW—while achieving output of 413 MW for the 109FB and 825 MW for the 209FB combined-cycle configurations. Focusing on low emissions, it is equipped with a DLN 2.6+ combustion system. The 9FB gas turbine has successfully demonstrated dual fuel capability and meets Safety Integrity Level (SIL) compliance.



6FA



7FA



9FA



9FB

H System* Combined-Cycle Platforms

9H (50 Hz) and 7H (60 Hz) gas turbine systems for enhanced performance and operability

As one of the most advanced turbines in the world, GE's H System power island (H System) incorporates advanced single-crystal materials, thermal barrier coatings, and closed-loop steam cooling to achieve the higher firing temperatures required for increased efficiency—while still meeting maintenance intervals. The H System also uses the proven DLN 2.5 combustion system to achieve low NO_x levels.

The 50 Hz and 60 Hz versions of the H System enhance performance by integrating each component into a seamless platform that includes a gas turbine, steam turbine, generator, and heat recovery steam generator—which provides a small footprint with high power density. The 9H System can achieve net plant output of 520 MW and the 7H System can achieve 400 MW net plant output—with both versions using less fuel and producing fewer greenhouse gases in comparison to other large sized gas turbine combined-cycle systems.

ADVANCED COMBINED-CYCLE PERFORMANCE

	Turbine Model	Net Plant Output (MW)	Heat Rate		Net Plant Efficiency (%)
			Btu/kWh	kJ/kWh	
6FA (50/60 Hz)	S106FA	118	6,199	6,539	55.0
	S206FA	239	6,132	6,470	55.6
7FA (60 Hz)	S107FA	269	5,955	6,280	57.3
	S207FA	542	5,920	6,245	57.6
9FA (50 Hz)	S109FA	391	6,020	6,350	56.7
	S209FA	787	5,980	6,308	57.1
9FB (50 Hz)	S109FB	413	5,880	6,202	58.0
	S209FB	825	5,884	6,206	58.0
9H (50 Hz)	S109H	520	5,690	6,000	60.0
7H (60 Hz)	S107H	400	5,690	6,000	60.0

H System Platforms



Baglan Bay Energy Park, Wales



TEPCO, Tokyo



7H Gas Turbine, Greenville

ADVANCED SIMPLE-CYCLE PERFORMANCE

6FA Simple-Cycle Performance Ratings

	50/60 Hz
Output	77 MW
Heat Rate	9,760 Btu/kWh 10,295 kJ/kWh
Pressure Ratio	15.6:1
Mass Flow	466 lb/sec 212 kg/sec
Turbine Speed	5,231 rpm
Exhaust Temperature	1,107°F 597°C

7FA Simple-Cycle Performance Ratings

	60 Hz
Output	183 MW
Heat Rate	9,360 Btu/kWh 9,873 kJ/kWh
Pressure Ratio	16.2:1
Mass Flow	961 lb/sec 436 kg/sec
Turbine Speed	3,600 rpm
Exhaust Temperature	1,120°F 604°C

9FA Simple-Cycle Performance Ratings

	50 Hz
Output	256 MW
Heat Rate	9,250 Btu/kWh 9,757 kJ/kWh
Pressure Ratio	17.0:1
Mass Flow	1,413 lb/sec 641 kg/sec
Turbine Speed	3,000 rpm
Exhaust Temperature	1,116°F 602°C

Mid-Range Power Platforms

7EA – proven performance for 60 Hz applications

The medium size of the versatile 7EA gas turbine enables flexibility in plant layout and fast, low-cost additions of incremental power. With high reliability and availability, this 85 MW unit provides strong efficiency performance in simple-cycle and combined-cycle applications—and is ideally suited for power generation, industrial, mechanical drive, and cogeneration applications. With a multiple-fuel combustion system and dual fuel operation, the 7EA can switch from one fuel to another while running under load or during shutdown. 7E/EA units have accumulated millions of hours of operation using crude and residual oils. Well suited for peak, cyclic, or base load operations, the low capital cost 7EA has a Fast-Start-Fast-Load capability that can deliver 85% load in under 10 minutes. Its DLN combustion system achieves less than 9 ppm NO_x—and a DLN 1+ upgrade is available to enable the 7EA to produce less than 5 ppm NO_x—making it an industry leader in reducing emissions. For customers needing additional performance, GE's optional performance improvement pack can provide up to 5.1+% incremental output and up to 2.7% reduction in heat rate in simple-cycle applications.

9E – flexible and adaptable performance for 50 Hz applications

Since its introduction in 1978, GE's 9E gas turbine has accumulated over 22 million hours of utility and industrial service—often in arduous climates ranging from desert heat and tropical humidity to arctic cold. With a fleet of over 430 units, the 9E has incorporated numerous improvements and now boasts an output of 126 MW. In a 209E combined-cycle configuration it can achieve output of 391 MW at 52.7% efficiency, and the 109E configuration can produce 193 MW output at 52.0% efficiency. For customers needing additional performance, GE's optional performance improvement pack can provide up to 2.1+% incremental output and up to 1.7% reduction in heat rate in simple-cycle applications.

GE's DLN combustion system is also available on the 9E, which allows it to achieve NO_x and CO emissions below 15 ppm and 25 ppm respectively. Its flexible fuel handling capabilities include

natural gas, light and heavy distillate oil, naphtha, crude oil and residual oil—and it can switch from one fuel to another while running under load. It also burns a variety of medium or low Btu syngases, including syngas produced from oil and steel mill gasses. The 9E is a quick power solution also well suited for IGCC or mechanical drive applications. This reliable, low first-cost machine has a compact design that provides flexibility in plant layout—as well as easy addition of incremental power when phased capacity expansion is required.

6B – reliable and rugged 50/60 Hz power

This rugged and reliable 42 MW gas turbine, a popular choice for mid-range power generation service, has a well-documented availability of 94.6% and 99% reliability. With over 1100 units worldwide, the dependable 6B features low capital investment and low maintenance costs. It has accumulated over 60 million operating hours in a wide range of applications—including simple-cycle, heat recovery, combined-cycle, and mechanical drive. Introduced in 1978, many upgrades are available to improve the performance of earlier versions, including rotor life extension and combustion system retrofits that can deliver 5 ppm NO_x when operating on natural gas.

An industry leader in gas and liquid fuel flexibility, the 6B can handle the multiple start-ups required for peak load, effectively drive a compressor, and be installed quickly for near-term capacity. In combined-cycle operation the 6B is a solid performer with nearly 50% efficiency—and in cogeneration applications it can produce a thermal output from 20 to 40 million Btu/hr with steam pressure up to 110 bar, well appreciated in oil and gas and various industries. With its lengthy industrial experience and high reliability, the 6B is an excellent fit for industrial and oil and gas applications, providing horsepower and high exhaust energy.

6C – 50/60 Hz advanced technology 45 MW gas turbine

Designed for low-cost electricity production in heat recovery applications, GE's 6C is well suited for industrial cogeneration, process industries, district heating, combined heat and power, and mid-sized combined-cycle operation with natural gas. Incorporating advanced technologies validated worldwide, this unit builds on the experience and performance of our successful 6B.

MID-RANGE COMBINED-CYCLE PERFORMANCE

	Turbine Model	Net Plant Output (MW)	Heat Rate		Net Plant Efficiency (%)
			Btu/kWh	kJ/kWh	
7EA (60 Hz)	S107EA S207EA	130	6,800	7,173	50.2
		264	6,700	7,067	50.9
9E (50 Hz)	S109E S209E	193	6,570	6,930	52.0
		391	6,480	6,835	52.7
6B (50/60 Hz)	S106B S206B S406B	64	6,960	7,341	49.0
		131	6,850	7,225	49.8
		261	6,850	7,225	49.8
6C (50/60 Hz)	S106C S206C	67	6,281	6,627	54.3
		136	6,203	6,544	55.0

MID-RANGE SIMPLE-CYCLE PERFORMANCE

7EA Simple-Cycle
Performance Ratings

	60 Hz	Industrial
Output	85 MW	116,230 hp
Heat Rate	10,430 Btu/kWh 11,002 kJ/kWh	7,720 Btu/shp
Pressure Ratio	12.7:1	12.6:1
Mass Flow	660 lb/sec 299 kg/sec	666 lb/sec 301 kg/sec
Turbine Speed	3,600 rpm	3,600 rpm
Exhaust Temperature	999°F 537°C	995°F 535°C

9E Simple-Cycle
Performance Ratings

	50 Hz	Industrial
Output	126 MW	174,520 hp
Heat Rate	10,100 Btu/kWh 10,653 kJ/kWh	7,350 Btu/shp
Pressure Ratio	12.6:1	12.6:1
Mass Flow	922 lb/sec 418 kg/sec	929 lb/sec 422 kg/sec
Turbine Speed	3,000 rpm	3,000 rpm
Exhaust Temperature	1,009°F 543°C	1,004°F 540°C

6B Simple-Cycle
Performance Ratings

	50 Hz/60 Hz	Industrial
Output	42 MW	58,380 hp
Heat Rate	10,642 Btu/kWh 11,225 kJ/kWh	7,650 Btu/shp
Pressure Ratio	12.2:1	12.2:1
Mass Flow	311 lb/sec 141 kg/sec	309 lb/sec 140 kg/sec
Turbine Speed	5,163 rpm	5,111 rpm
Exhaust Temperature	1,018°F 548°C	1,019°F 549°C

6C Simple-Cycle
Performance Ratings

	50/60 Hz
Output	45.4 MW
Heat Rate	9,315 Btu/kWh 9,825 kJ/kWh
Pressure Ratio	19.6:1
Mass Flow	269 lb/sec 122 kg/sec
Turbine Speed	7,100 rpm
Exhaust Temperature	1,078°F 581°C

Aeroderivative Gas Turbines

Aeroderivative gas turbines – fuel flexible power generation with low emissions

GE's aeroderivative gas turbines provide flexible power generation solutions that range from 18 to 100 MW for utility, petroleum, marine, and industrial applications—along with comprehensive support from one of the largest and most experienced service networks in the world. Designed to provide efficient and reliable power from a variety of fuel sources, our aeroderivative gas turbines can produce electricity while significantly reducing emissions and improving plant economics.

GE's LMS100* gas turbine, a product of ecomagination, can reduce CO₂ emissions by more than 30,000 tons over the course of a typical peaking season when compared to similar gas turbines of its size. The unparalleled efficiency of this 100 MW gas turbine—along with its 10-minute start times, unmatched hot day performance, load following and cycling capabilities—make it an ideal solution for power generation planners and developers. It is well suited for a variety of applications, including peaking, wind firming, and desalination.

The LM6000 gas turbine—the most efficient LM unit in its class for combined-cycle and cogeneration applications—can provide output from 53 MW to 62 MW with efficiencies up to 52%. Our LM2500 gas turbine provides the most reliable and experienced power generation platform with output from 23 MW up to 36 MW, with efficiency up to 39%. And with over 2.6 million operating hours, the LM2500 gas turbine has achieved reliability exceeding 99%.



LMS100



LM6000



LM2500



LM2500+G4

AERODERIVATIVE GAS TURBINES

	Turbine Model	Output	Heat Rate		Pressure Ratio	Turbine Speed (rpm)	Exhaust Flow		Exhaust Temp.	
			Btu/kWh	kJ/kWh			lb/sec	kg/sec	°F	°C
50 Hz Power Gen	LM2000PS	18,363 kW	10,094	10,647	16.0:1	3,000	146	66	866	463
	LM2000PJ	17,855 kW	9,888	10,430	16.0:1	3,000	140	64	925	496
	LM2500PE	22,346 kW	9,630	10,158	18.0:1	3,000	154	70	1001	538
	LM2500PE	23,060 kW	10,041	10,591	18.0:1	3,000	158	72	963	517
	LM2500PJ	21,818 kW	9,655	10,184	18.0:1	3,000	152	69	995	535
	LM2500PH	26,510 kW	8,769	9,155	19.4:1	3,000	168	76	929	498
	LM2500+RC	36,024 kW	9,263	9,771	23.0:1	3,600	213	97	945	507
	LM2500+RD	32,881 kW	8,949	9,439	23.0:1	3,600	201	91	977	525
	LM6000PC	43,339 kW	8,478	9,041	30.0:1	3,600	285	129	803	428
	LM6000PC Sprint ^{1*}	50,836 kW	8,222	8,943	32.3:1	3,600	300	136	835	446
	LM6000PD	42,732 kW	8,374	8,673	30.0:1	3,600	277	126	844	451
	LM6000PD Liquid Fuel	40,999 kW	8,345	8,802	29.5:1	3,600	272	123	852	456
	LM6000PD Sprint	47,505 kW	8,198	8,647	32.0:1	3,600	293	133	835	446
	LM6000PF	42,732 kW	8,222	8,673	30.0:1	3,600	277	126	844	451
	LM6000PF Sprint	48,040 kW	8,188	8,637	32.1:1	3,600	294	133	840	449
60 Hz Power Gen	LMS100PA	102,995 kW	7,894	8,327	41.0:1	3,000	470	213	765	407
	LMS100PB	99,044 kW	7,665	8,085	40.0:1	3,000	456	207	782	417
	LM2000PS	18,412 kW	9,874	10,415	15.6:1	3,600	143	65	886	460
	LM2000PJ	17,657 kW	9,707	10,239	15.6:1	3,600	136	62	918	492
	LM2500PE	24,049 kW	9,717	10,249	19.1:1	3,600	157	71	995	513
	LM2500PE	23,292 kW	9,315	9,825	19.1:1	3,600	153	69	992	533
	LM2500PJ	22,719 kW	9,345	9,857	19.1:1	3,600	151	68	987	531
	LM2500PH	27,765 kW	8,391	8,850	19.4:1	3,600	167	76	922	494
	LM2500+RC	36,333 kW	9,184	9,687	23.1:1	3,600	213	97	945	507
	LM2500+RD	33,165 kW	8,774	9,255	23.1:1	3,600	201	91	977	525
	LM6000PC	43,843 kW	8,519	8,986	29.8:1	3,600	283	128	810	432
	LM6000PC Sprint ¹	50,526 kW	8,458	8,922	31.9:1	3,600	297	135	838	449
	LM6000PD	43,068 kW	8,173	8,621	29.8:1	3,600	275	125	851	455
	LM6000PD Liquid Fuel	40,712 kW	8,315	8,771	29.8:1	3,600	268	122	856	458
	LM6000PD Sprint	47,383 kW	8,162	8,609	31.7:1	3,600	290	132	838	448
Mechanical Drive	LM6000PF	43,068 kW	8,173	8,621	29.8:1	3,600	275	125	851	455
	LM6000PF Sprint	48,092 kW	8,151	8,598	31.9:1	3,600	291	132	846	452
	LMS100PA	103,045 kW	7,890	8,322	41.0:1	3,600	470	213	763	406
	LMS100PB	99,012 kW	7,668	8,088	41.0:1	3,600	456	207	780	416
	LM6000PC	59,762 hp	5,963	—	29.8:1	3,627	281	127.5	841	449
	LM6000PC	59,530 hp	6,240	—	29.8:1	3,627	285	129.3	803	428
	LM2500PE	58,809 hp	5,985	—	29.8:1	3,600	274.8	124.7	851	455
	LM6000PF	58,810 hp	5,985	—	29.8:1	3,600	274.8	124.7	851	455
	LM2500RC	49,754 hp	7,119	—	23.0:1	3,600	216.1	98.0	902	483
	LM2500RD	45,439 hp	6,404	—	23.0:1	3,600	201.0	91.1	977	525
	LM2500PE	32,013 hp	6,777	—	19.1:1	3,600	153.0	69.4	992	533
	LM2500PE	33,044 hp	7,072	—	19.1:1	3,600	157.4	71.4	955	513
	LM2000PS	25,236 hp	7,205	—	15.6:1	3,600	142.7	64.7	860	460

¹ Sprint 2002 deck is used with water injection to 25 ppmvd for power enhancement.NOTE: Performance based on 59°F (15°C) ambient temperature, 60% RH, sea level, no inlet/exhaust losses on gas fuel with no NO_x media, unless otherwise specified.

Oil & Gas Turbines

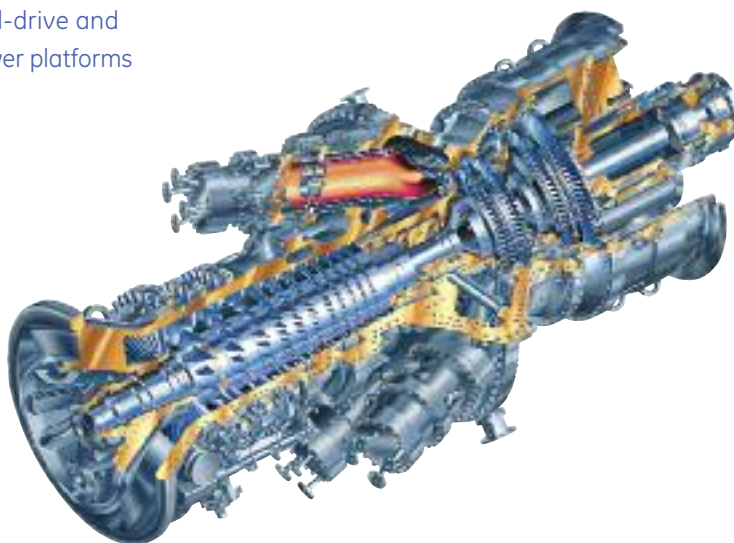
Reliable power for the petroleum and petrochemical industries

As part of GE's global network of businesses, GE Oil & Gas has access to boundary-breaking technology that enables us to provide our customers with technological breakthroughs geared to their specific needs. We offer a full line of small heavy duty gas turbines for all major oil and gas applications—including natural gas plants, gas compression stations, oil booster stations, petrochemical plants, power generation and cogeneration.

Since 1961 we've been manufacturing gas turbines to complement GE's portfolio of products for the petroleum and petrochemical industries. Today this proven line of mechanical-drive and generator-drive gas turbines provides reliable power platforms

that range from 11,250 kW for the GE10 gas turbine to 126,000 kW for the 9E gas turbine. We offer full turnkey systems and aftermarket services for production, LNG, transportation, storage, refineries, petrochemical and distribution systems.

We also have a portfolio of solutions to provide customers with improved production, efficiency, reliability, availability and lower emissions—such as our Power Crystal upgrade kit that significantly extends mean time between maintenance and can improve output for the MS5000 gas turbine product line.



OIL & GAS TURBINES

	Turbine Model	Output	Heat Rate		Pressure Ratio	Turbine Speed (rpm)	Exhaust Flow		Exhaust Temp.	
			Btu/kWh	kJ/kWh			lb/sec	kg/sec	°F	°C
Generator Drive¹	GE10-1	11,250 kW	10,892	11,489	15.5:1	11,000	104.7	47.5	900	482
	MS5001	27,232 kW	11,813	12,460	10.6:1	5,094	276.1	125.2	900	482
	MS5002E	30,881 kW	9,799	10,336	17.0:1	5,714	225.0	102.1	946	508
Mechanical Drive²	MS5002C	38,650 hp	8,633	—	8.9:1	4,670	274.1	124.3	963	517
	MS5002D	43,207 hp	8,602	—	10.9:1	4,670	311.5	141.3	945	507
	MS5002E	42,914 hp	7,052	—	17.0:1	5,714	225.5	102.3	947	508

¹ ISO conditions @ base load | natural gas | no inlet/exhaust losses included | terminals output

² ISO conditions @ base load | natural gas | no inlet/exhaust losses included | shaft output



* Mark, OpFlex, H System, LMS100, Sprint and ecomagination are trademarks of General Electric Company.
Corex is a trademark of Siemens AG, which is not affiliated with the General Electric Company.

©2009, General Electric Company. All rights reserved.

GEA-12985H (06/09)