General Electric LM6000

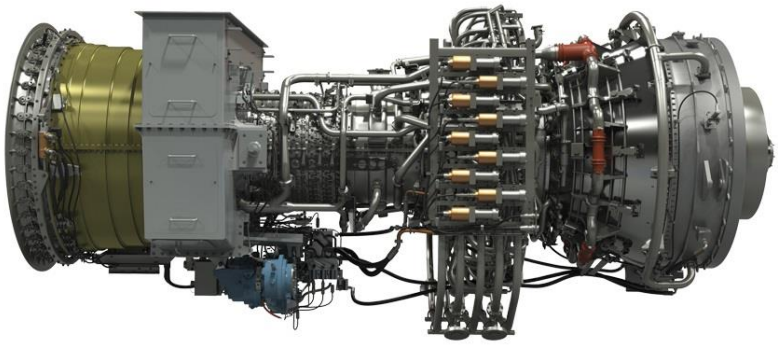
Medium Industrial Engines
January 2015

Program Briefing

Derived from the successful General Electric CF6-80C2 aero turbine in the 1980s. The various versions of the engine generate between 42.7 and 56.3 megawatts of power at high thermal efficiency rates of over 42%.

The LM6000 has been offered for marine applications since 1998, but no orders have been received up to this point. In 2011, the first mechanical drive applications were sold. The main use of the LM6000 remains to be power generation, however.

Teal Group projections for the LM6000 show 357 units to be built in the next 10 years, all for various power generation applications. The total value of the gas turbine component of the power systems is estimated at around $7.1 billion.



Quick Specs:

Power Class:	42.7 – 56.3 MW (59,914 hp – 64,698 hp)
Electrical Efficiency:	40.8% – 43.2%
Heat Rate:	8,170 Btu/kWh – 8,580 Btu/kWh

Manufacturers

General Electric Co.
GE Power & Water
Distributed Power
9050 Centre Pointe Drive, Suite 250
45069 West Chester, Ohio
www.ge-distributedpower.com
(power generation applications)

General Electric Co.
GE Oil & Gas
Turbomachinery Products & Services
via Felice Matteucci, 2
50127 Florence
Italy
tel: +39 055 4272500
fax: +39 055 4232800
(oil & gas industry applications)

General Electric Co.
GE Aviation
GE Marine
Cincinnati, OH
(marine applications)

The LM6000 gas generator is manufactured by GE Industrial AeroDerivative Gas Turbines at the company's Evendale, Ohio, facility. Packaging is accomplished by one of the organizations above, depending on application.

Technical Description

Components

Intake

Radial flow inlet with optional axial cone.

Summary Forecast

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
Units Produced	34	34	34	35	36	36	37	37	37	37	357
Value (2015 $ Millions)	680.0	680.0	680.0	700.0	720.0	720.0	740.0	740.0	740.0	740.0	7,140.0

LP Compressor

Based on the CF6-50, the five-stage compressor features variable inlet guide vanes.

HP Compressor

The 14-stage axial section is based on the CF6-80C2. The first six stages are variable. The compressor casing is a horizontal split model and produces up to 33.8:1 compression ratio.

Combustor

Triple annular combustor employing 30 pre-mixer assemblies with 75 gas fuel injection cups.

The turbine is available with a Dry Low Emission (DLE) combustor. Spray intercooling to reduce NOx emissions is also available.

HP Turbine

The HP turbine section comprises two stages and is based on the CF6-80C2 engine.

LP Turbine

Also based on the CF6-80C2, the turbine features five stages and also serves as the power turbine.

Additional Features

Accessory gearbox drives the lube oil and associated systems.

Dimensions

(Imperial)	Base Plate Length	Base Plate Width	Enclosure Height	Overall Length	Overall Width	Overall Height	Base Plate Foundation Load
SPRINT 60-Hz Gensets	56' 6"	13' 6"	14' 6"	56' 9"	49' 9"	36' 2"	476,000 lb
SPRINT 50-Hz Gensets	64' 7"	13' 6"	14' 6"	64' 10"	49' 3"	37' 11"	522,000 lb

(Metric)	Base Plate Length	Base Plate Width	Enclosure Height	Overall Length	Overall Width	Overall Height	Base Plate Foundation Load
SPRINT 60-Hz Gensets	17.22 m	4.11 m	4.42 m	17.30 m	15.16 m	11.02 m	214,200 kg
SPRINT 50-Hz Gensets	19.69 m	4.11 m	4.42 m	19.76 m	15.01 m	11.56 m	234,900 kg

Performance

Generator Drive (60 Hz)*

	LM6000-PC	*LM6000-PC SPRINT*
Fuel:	natural gas	natural gas
Output:	43.8 MW	50.3 MW
Efficiency:	41+%	41+%
Heat rate:	8,519 Btu/kW-hr	8,466 Btu/kWh
	8,988 kJ/kW-hr	8,932 kJ/kWh
Pressure ratio:	29:1	31:1
Shaft speed:	3,600 rpm	3,600 rpm
Exhaust flow**:	283 lb/s (129 kg/s)	296 lb/s (134 kg/s)
Exhaust temperature**:	809°F (432°C)	839°F (448°C)

	LM6000-PD	*LM6000-PD SPRINT*
Fuel:	natural gas	natural gas
Output:	43 MW	47.3 MW
Efficiency:	41+%	41+%
Heat rate:	8,180 Btu/kW-hr	8,170 Btu/kWh
	8,630 kJ/kW-hr	8,620 kJ/kWh
Pressure ratio:	29:1	30.8:1
Shaft speed:	3,600 rpm	3,600 rpm
Exhaust flow**:	275 lb/s (125 kg/s)	290 lb/s (132 kg/s)
Exhaust temperature**:	851°F (455°C)	838°F (448°C)

	LM6000-PF+	*LM6000-PF+ SPRINT*
Fuel:	natural gas	natural gas
Output:	52 MW	58 MW
Efficiency:	42%	42%
Heat rate:	8,656 kJ/kW-hr	8,803 kJ/kWh
Pressure ratio:	33.1:1	33.1:1

Shaft speed:	3,915 rpm	3,915 rpm
Exhaust flow**:	136 kg/s	146 kg/s
Exhaust temperature**:	500°C	486°C

	LM6000-PG	*LM6000-PG SPRINT*
Fuel:	natural gas	natural gas
Output:	54.1 MW	56.2 MW
Efficiency:	43.2%	40.8%
Heat rate:	8,546 Btu/kW-hr	8,580 Btu/kWh
	9,017 kJ/kW-hr	9,052 kJ/kWh
Pressure ratio:	33.1:1	33.8:1
Shaft speed:	3,905 rpm	3,905 rpm
Exhaust flow**:	318 lb/s (144 kg/s)	322 lb/s (146 kg/s)
Exhaust temperature**:	861°F (461°C)	868°F (464°C)

	LM6000-PH	*LM6000-PH SPRINT*
Fuel:	natural gas	natural gas
Output:	49.4 MW	51.7 MW
Efficiency:	42.6%	42.3%
Heat rate:	8,217 Btu/kW-hr	8,205 Btu/kWh
	8,669 kJ/kW-hr	8,657 kJ/kWh
Pressure ratio:	31.9:1	32.6:1
Shaft speed:	3,905 rpm	3,905 rpm
Exhaust flow**:	303 lb/s (138 kg/s)	306 lb/s (139 kg/s)
Exhaust temperature**:	885°F (474°C)	880°F (471°C)

Generator Drive (50 Hz)*

	LM6000-PC	*LM6000-PC SPRINT*
Fuel:	natural gas	natural gas
Output:	43.3 MW	50.6 MW
Efficiency:	41.3%	42.6%
Heat rate:	8,571 Btu/kW-hr	8,485 Btu/kW-hr
	9,043 kJ/kW-hr	8,952 kJ/kW-hr
Pressure ratio:	29.1:1	31.3:1
Shaft speed:	3,627 rpm	3,627 rpm
Exhaust flow**:	285 lb/s (129 kg/s)	299 lb/s (136 kg/s)
Exhaust temperature**:	803°F (428°C)	835°F (446°C)

	LM6000-PD/PF	*LM6000-PD/PF SPRINT*
Fuel:	natural gas	natural gas
Output:	42.7 MW	47.5 MW
Efficiency:	41.3%	42.6%
Heat rate:	8,227 Btu/kW-hr	8,198 Btu/kW-hr
	8,675 kJ/kW-hr	8,649 kJ/kW-hr
Pressure ratio:	29.3:1	31.1:1
Shaft speed:	3,627 rpm	3,627 rpm
Exhaust flow**:	277 lb/s (126 kg/s)	277 lb/s (126 kg/s)
Exhaust temperature**:	843°F (451°C)	843°F (451°C)

	LM6000-PG	*LM6000-PG SPRINT*
Fuel:	natural gas	natural gas
Output:	54.1 MW	56.3 MW
Efficiency:	41.3%	42.6%
Heat rate:	8,543 Btu/kW-hr	8,577 Btu/kW-hr
	9,013 kJ/kW-hr	9,049 kJ/kW-hr
Pressure ratio:	33.2:1	33.8:1
Shaft speed:	3,911 rpm	3,911 rpm

Exhaust flow**:	318 lb/s (144 kg/s)	322 lb/s (146 kg/s)
Exhaust temperature**:	860°F (460°C)	867°F (464°C)

	LM6000-PH	*LM6000-PH SPRINT*
Fuel:	natural gas	natural gas
Output:	48.8 MW	51.2 MW
Efficiency:	42.6%	42.3%
Heat rate:	8,321 Btu/kW-hr	8,306 Btu/kW-hr
	8,779 kJ/kW-hr	8,763 kJ/kW-hr
Pressure ratio:	32:1	32.7:1
Shaft speed:	3,911 rpm	3,911 rpm
Exhaust flow**:	304 lb/s (138 kg/s)	307 lb/s (139 kg/s)
Exhaust temperature**:	885°F (474°C)	879°F (471°C)

Mechanical Drive

	LM6000PC	*LM6000PF*	*LM6000PH*
Fuel:	natural gas	natural gas	natural gas
Output:	59,914 hp	58,969 hp	64,698 hp
Heat rate:	5,944 Btu/hp-hr	5,981 Btu/hp-hr	6,057 Btu/hp-hr
	8,409 kJ/kW-hr	8,469 kJ/kW-hr	8,381 kJ/kW-hr
Pressure ratio:	28.8:1	29.1:1	30.3:1
Shaft speed:	3,600 rpm	3,600 rpm	3,743 rpm
Exhaust flow**:	278 lb/s (126 kg/s)	275 lb/s (125 kg/s)	282 lb/s (128 kg/s)
Exhaust temperature**:	848°F (453°C)	851°F (455°C)	917°F (492°C)

**Performance based on 59°F ambient temperature, 60% RH, sea level, no inlet/exhaust losses on natural gas fuel with no NOx media.*
***@ISO*

Marketing Data

Costs

Our estimated value for a simple-cycle LM6000 generator package is $20 million.

Recent Orders

June 2001—Lincoln Electric System ordered three LM6000PC SPRINT gensets—two combined cycle, one simple cycle—for installation at its Salt Valley Generating Station in Lincoln, NE.

October 2001—Arizona Electric Power Cooperative contracted for n LM6000PC SPRINT genset to be located at Apache Station in Cochise, AZ.

January 2002—Woodside LNG ordered two LM6000 genset packages to provide additional power at an LNG plant located in Karratha, Western Australia.

March 2002—GE Energy won an order from ATCO Power for two LM6000PC SPRINT generator sets. The machines are to be located at the Valleyview and Rainbow Lake powerplants, respectively, in Albert, Canada.

March 2002—Pan Canadian Energy Corp. contracted for four LM6000PC gensets for installation (two each) at its Cavalier and Balzac Power Stations in Alberta, Canada.

March 2002—GE Energy scored a four-engine order (all LM6000PCs) from TransAlta of Centralia, WA. The units are to be installed at an existing powerplant.

March 2002—SP Newsprint bought two LM6000PC SPRINT generator sets as part of a paper mill plant upgrade.

June 2002—GE Power announced the sale of two LM6000PD generator sets to a combined-cycle cogeneration plant in Seraing, Belgium. The

DLE equipped turbines will be installed to power an associated steel mill.

October 2002—Norwegian firm, Snohvit, contracted for four LM6000PD turbogenerators to power compressor sets at an LNG plant on Melkoya Island, Hammerfest, Norway.,

January 2003—GE Power Systems announced a contract to supply two LM6000 units and an associated SAC4 steam turbine to provide 150 megawatts of electricity and steam to Madison Gas and Electric.

March 2003—GE Power announced a contract with Brownsville Public Utilities Board for one LM6000 turbine to produce 45 megawatts to power the city of Brownsville, Texas. The gas-powered unit will be configured as a generation package.

April 2003—GE signed a deal to supply two LM6000 to the Modesto Irrigation District in Modesto, CA. The units will be used in simple-cycle power generation capacity. The two units are equipped with SPRINT technology.

April 2004—Wood Group Power Solutions ordered an LM6000PC generator set, valued at $20 million, to provide power at a coal mine in Cesar Coal Basin, Colombia.

April 2004—Turkish firm Habas Sinai ve Tibbi Istihsal Endustrisi AS contracted for four LM6000PC combined-cycle powerplants. The machines are to be located in Aliaga/Izmir, Turkey.

October 2004—A $61 million order from Dangote Industries for three LM6000PC SPRINT generator sets represents the first LM6000 project for GE in Nigeria.

November 2004—TransCanada Energy signed a deal for two LM6000PD cogeneration sets for the Grandview Cogeneration Project at an Irving Oil facility in Saint John, New Brunswick, Canada.

November 2004—HERON SA, a subsidiary of TERNA SA, bought three LM6000PC SPRINT generator sets, running in open-cycle mode. The powerplants are to be sited in Thebes, Greece, and are to be used for peak shaving in summer and grid stabilization in winter.

February 2005—The Industrial Company of Steamboat Springs, CO, contracted for four LM6000PC SPRINT generator sets, all simple cycle, for intermediate power generation duties at two Louisiana powerplants.

March 2005—Cerkezkoy Enerji Elektrik Uretim AS ordered an LM6000PD SPRINT cogen set for the OSB (organized industrial zone) of Cerkezkoy, Turkey. The plant will provide power and process steam for nearby industries.

June 2005—Bis Enerji Elektrik Uretimi Otoprodüktöör of Turkey signed a deal for an LM6000PC combined-cycle powerplant for its Bursa power station.

December 2005—Pinelawn Power LLC bought an LM6000PC combined-cycle plant for installation at the Pinelawn Power Project, Babylon, NY.

December 2005—GE Energy was awarded a contract from the Reedy Creek Improvement District for an LM6000PC SPRINT generator set to replace an older LM5000 machine at the Buena Vista Cogeneration Facility in Florida.

February 2008—Geometric Power Ltd. purchased three LM6000s, balance of plant equipment, auxiliaries, control systems and coils for inlet air chilling, for a power plant in Aba, Nigeria. Operation in 4Q2008.

April 2008—ZAO Energokaskad bought two LM2500 PD SPRINT packages for use at OAO TGK-4 plant in Voronezj, Russia.

April 2008—ZAO Energokaskad bought two LM2500 PF SPRINT packages for use at OAO SGK TGK-8 plant in Astrakhan, Russia.

April 2008—E4 Group bought two LM2500 PD SPRINT packages for use at TGK-4's Kursk North-West Boiler House plant.

June 2008—The Burgo Group SpA ordered two LM6000PD SPRINT packages for use at a combined-cycle paper mill in Duino, Italy.

June 2008—Sadelmi SpA ordered one LM6000PD SPRINT package to be operated by Cartiere de Garda SpA, Riva del Garda, Italy.

June 2008—Dufenergy Italia SpA ordered two LM6000PD 15ppm SPRINT packages for use at SILVACHIMICA's chemical factory near Mondovi, Italy.

June 2008—CPS Energy contracted for four dual-fuel LM6000PC SPRINT packages for the VH Braunig Power Plant in San Antonio, TX.

June 2008—Two additional LM6000PC SPRINT packages ordered for the City of Austin's Sand Hill Energy Center in Texas.

June 2008—One LM6000PC SPRINT package contracted for Bryan Texas Utilities for the Dansby expansion.

June 2008—Thermal Energy Corp. bought one LM6000PD SPRINT package to support operations in the Texas Medical Center in Houston.

March 2010—MTU Onsite Energy, a business unit of Tognam, is to install an LM6000PF SPRINT-powered cogeneration plant in Halle, Germany, for Heizkraftwerk Halle-Trotha GmbH. Delivery in May 2011; operation in April 2012.

January 2012—GE announced it would supply a 48-MW LM6000-PC Sprint and related services to independent power producer Bis Enerji Elektrik Uretim AS for the expansion of one of Turkey's largest merchant power plants.

December 2012—GE was selected to supply two LM6000-PC Sprint gas turbine-generators and technical advisory services for a plant located in Alhone Township, Yangon City, Myanmar. Independent power producer TOYO Thai Power Corp. in Singapore (TTPSG) is the owner/operator of the plant and is selling the power to Myanmar's Ministry of Electric Power.

May 2013—GE Oil & Gas and Norway-based Statoil Petroleum AS signed two new, five-year frame agreements that called for GE to supply turbomachinery equipment as well as services to support Statoil's installed fleet of GE turbomachinery. GE's first equipment order under the new frame agreement was to supply key equipment for the Aasta Hansteen field in the North Sea, which included the LM6000. This was to be the first installation of an LM6000 mechanical drive aeroderivative gas turbine specifically for offshore applications in the industry.

September 2013—GE was selected to provide nine LM6000s to Çalık Enerji, the Turkish engineering, procurement and construction (EPC) firm handling multiple projects in Turkmenistan. The Akhal site, located near Ashgabat, featured two LM6000-PF units and one LM6000-PC unit; the Mary site, located in the city of Mary, featured three LM6000-PC units; and the Lehab site, located in Turkmenabat, featured three LM6000-PF gas turbines.

June 2014—Tanzania ordered four LM6000-PF dual-fuel gas turbines, which would increase the county's overall power output by 15%..

September 2014—First Generation Corporation's (First Gen) Avion selected LM6000-PC Sprint units for its new Manila, Philippines, 97-MW power plant.

February 2015—GE announced it was supplying European energy developer STC SpA with an LM6000-PF SPRINT gas turbine generator as part of the modernization of the city of Oradea's district heating plant in northwestern Romania. This marked GE's first aeroderivative gas turbine order in Romania.

Milestones

Date	***Milestone***
1988	LM6000 program launched
1991	Initial engine delivered
1992	First production models shipped
1993	LM6000 with DLE combustor offered
1994	Turbines ordered for installation in China
1998	Higher output SPRINT models announced
1998	LM6000 offered for marine applications
2000	GE acquired Kvaerner Thermal Power
2003	LM6000 gensets offered for marine use
2003	Upgraded LM6000 SPRINT offered
May 25, 2004	GE introduces LM6000PD with DLE combustor
June 4, 2008	LM6000PG and LM6000PH DLE introduced
Sept. 8, 2009	LM6000 Enhanced Package announced
July 26, 2011	Bechtel places first order for LM6000 mechanical drives
Feb. 25, 2014	GE announces formation of GE Distributed Power organization

Program Overview

Background

History

The LM6000 is based on the mature -80C2 variant (fifth generation) of the General Electric CF6 aero turbine, itself derived from the GE TF39. The pedigree of the turbine has resulted in a level of efficiency and reliability that characterizes the aeroderivative.

Initial work on the engine started in the late 1980s, very soon after the launch of the CF6-80C2 and while the smaller LM2500 was in the midst of a strong run of orders from marine and industrial customers.

Incremental improvements to the turbine have helped it maintain its edge in efficiency while reducing emissions. GE started offering its Dry Low NOx (DLN) combustion system on the LM6000 in 1994.

SPRINT System Introduced

The company introduced its SPRINT (SPRay INTercooling) system in 1998 which increased power output by nine to 20 percent based on ambient conditions. Existing turbine installations can be upgraded to the

DLN and SPRINT standards upon request.

Combined Cycle

The efficiency of LM6000 turbines can further be increased by using them in a combined cycle setup. Thermal efficiencies more than 50% have been achieved.

Packagers

LM6000 turbines have been packaged and sold by companies such as Avio, Thomassen and Ishikawajima-Harima Heavy Industries (IHI) as well as now-GE owned Kvaerner and Nuovo Pignone. In 2014, the first LM6000 packaged by Huadian GE Aero Gas Turbine Equipment Co., Ltd., a joint venture founded by Huadian Group and GE, which invested 51 percent and 49 percent respectively.

Marine Propulsion

In April 2003, General Electric announced the availability of the LM6000 as generator set packages for a variety of marine uses. The new configuration allowed for installation of the LM6000 aboard vessels utilizing electric drive arrangements. Marine engine sales and manufacturing are handled via the GE Aviation business unit.

Engine Upgrades Offered

In May 2003, GE announced an upgrade to LM6000PC SPRINT units that improved output by up to four percent under ISO conditions. The Enhanced Flow and Speed (EFS) upgrade includes variable inlet guide vanes, higher core speed and software enhancements.

In May 2004, GE Energy introduced the LM6000PD model installed with a dry low emissions (DLE) combustor producing less than 15ppm NOx when running on natural gas. The turbine is the first with efficiency of greater than 40% and NOx emissions of lower than 15ppm.

Oil & Gas Applications

In 2005, GE reported that 15 LM6000s had accumulated 340,000 operating hours in diverse marine environments over the last 10 years. Applications included gensets aboard floating, production, storage and offloading (FPSO) vessels; aboard commercial power barges; and offshore platforms. The high-time machine had logged more than 41,000 hours.

GE Reorganization

In January 2004, General Electric merged its aircraft engine and transportation (marine) businesses. Marine customers for the LM series as well as diesel powerplants now purchase their needs from the newly formed GE Transportation/Marine division.

LM6000 Mechanical Drive Tests

In July 2006, it was reported that GE was in the process of testing and validating the LM6000 for mechanical drive applications for both the marine and oil & gas industries.

MRO

Canadian LM6000 Upgraded

In June 2003, GE Power Systems announced that it had installed a synchronous condenser clutch on an LM6000 operated by ATCO Power of Alberta, Canada. The new clutch enables the engine to be disconnected from the generator and be shut down when not needed foe power. When disconnected, the generator can provide voltage support for the grid.

PA to PD Upgrades

GE Energy reported on Sept. 9, 2003, that it had been awarded a contract by Northland Power in Iroquois Falls, Ontario, Canada, to upgrade two of the company's LM6000PA engines to PD standard. The turbines were replaced by LM6000PD units equipped with SPRINT technology to provide as much as 18% increase in output while lowering the plant's NOx emissions. The represented the first instance of a PA-PD modification.

On Nov. 30, 2004, GE announced that it had performed a PA-PD upgrade on an LM6000 at JFK Airport in Jamaica, NY. This was the second such mod at JFK and the ninth overall since the mod was implemented in 2001.

Upgrade for Electrabel

On May 2, 2005, it was reported by GE that it had upgraded an LM6000PB gas turbine to PD standard for Electrabel SA of Brussels, Belgium. This allowed the engine to be functionally interchangeable with the company's existing LM6000PD fleet.

Delta Power Service Contract

GE Energy announced on May 11, 2006, that it had won a six-year contract to perform overhaul and repair services for a variety of gas turbines at 14 Delta Power Co. projects in California and Michigan. Included are LM2500, LM5000, and LM6000PC gas turbines. The work will be performed at GE Energy facilities in Houston, TX, and Bakersfield, CA.

Spanish Services Contract

On May 30, 2006, GE announced that it had signed a six-year contractual services agreement with Zabalgarbi SA, of Bilbao, Spain. Terms call for GE to provide overhaul and repair services for the Spanish company's LM6000PD genset at its municipal solid waste plant.

Thai Services Contract

GE and Bangkok-based power plant developer Bangpa-In Cogeneration Ltd., a subsidiary of CK Power Plc., announced the signing of a $33 million service agreement. Under the agreement, GE was to provide inspection and planned maintenance services for 12 years for two LM6000-PD gas turbines at a 110-MW gas-fired cogeneration plant in Bangpa-In, in Thailand's Ayutthaya Province.

Another Thai Services Contract

In October 2014, GE announced that it had signed a 12-year multi-year agreement with Ratchaburi World Cogeneration Company, Limited (RWC) of Thailand. The services agreement provided planned maintenance for LM6000-PD packages.

Recent Activity

G and H Models Added

In June 2008, GE announced two upgraded models, the LM6000-PG with single annular combustor (SAC) and its dry low emissions (DLE) equivalent, the LM6000-PH.

New Enhanced Package

A new model, the LM6000 Enhanced Package, was introduced by GE in September 2009. It is optimized for both offshore and onshore applications. Capable of producing more than 40 MW, the integrated package features an LM6000 coupled with a centrifugal compressor for mechanical drive duty. Targeted uses are for floating LNG facilities, onshore liquefaction, natural gas and pipeline compression applications.

Ethanol Tested in LM6000

In January 2010, GE announced that, with the help of Petrobas, it had successfully tested the use of sugarcane-based ethanol fuel in a simple-cycle LM6000-powered generation plant in Juiz de Fora, Brazil. One of the plant's two gas turbines was fitted with a modified combustor for the tests.

First Mechanical Drives

In July 2011, GE Oil & Gas entered into an agreement with Bechtel International, Inc. for the supply of compression technology for two customized LNG refrigeration trains for the Chevron-operated Wheatstone Project in Western Australia.

This was GE Oil & Gas's first installation of an LM6000 mechanical drive aeroderivative gas turbine. Chevron committed for a total of 16 LM6000-PFs, 12 for mechanical drive and four to drive generators. The mechanical drives were to be used in the main refrigeration compression trains of the LNG facility.

GE Distributed Power Formed

In February 2014, GE announced the formation of a new business unit under the GE Power & Water organization called GE Distributed Power. The new unit combined three product lines—Aeroderivative Gas Turbines, Jenbacher Gas Engines and Waukesha Gas Engines. GE Power & Water had been formed when, in July 2012, GE Energy was split into three pieces—GE Energy Management, GE Oil & Gas, and GE Water & Power. Thus, the fortunes of the LM6000 are now advanced by three GE units: GE Distributed Power (power generation installations), GE Oil & Gas (petroleum industry applications), and GE Aviation (marine applications).

Teal Group Evaluation

The LM6000 is able to deliver up to 56 MW of power in a highly efficient manner. The turbine's 43% thermal efficiency and relatively small/light form-factor indicative of its aeroderivative roots are all positive selling points, for buyers willing to pay the price. The cheaper Siemens SGT-800 (previously known as the GTX100) is currently available at 37% efficiency and for penny-pinching customers who don't care much about the European turbine's immobility.

GE has managed to dominate the power band with the LM6000. Our projections for the engine show 311 units built in the next 10 years. The total value of the gas turbine component of the power systems is estimated at around $7 billion.

Production Forecast

Units	Through 2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
Power Generation												
LM6000	1,100	30	30	30	31	31	31	32	32	32	32	1,411
Mechanical Drive												
LM6000	24	4	4	4	4	5	5	5	5	5	5	70
Total	**1,124**	**34**	**34**	**34**	**35**	**36**	**36**	**37**	**37**	**37**	**37**	**1,481**

Value (2015 $Millions)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
Power Generation											
LM6000	600.0	600.0	600.0	620.0	620.0	620.0	640.0	640.0	640.0	640.0	6,220.0
Mechanical Drive											
LM6000	80.0	80.0	80.0	80.0	100.0	100.0	100.0	100.0	100.0	100.0	920.0
Total	**680.0**	**680.0**	**680.0**	**700.0**	**720.0**	**720.0**	**740.0**	**740.0**	**740.0**	**740.0**	**7,140.0**

