Solar® Turbines

A Caterpillar Company

POWERING THE GLOBAL ENERGY DEMAND

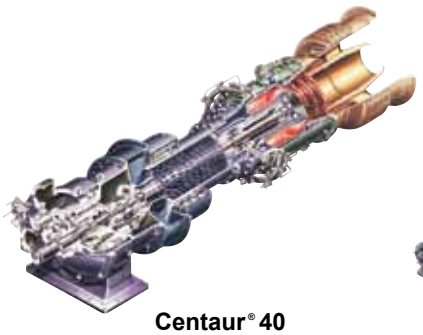
Renewable Energy Solutions

Advantages for Gas Turbines

- Extensive experience has shown that gas turbines enjoy a significant availability advantage over competing technologies. And when you need maintenance, Solar offers an engine exchange program, which can limit overhaul downtime to as little as 48 hours.
- Independent studies have shown that maintenance costs are lower for our gas turbines compared with alternative technologies.
- Gas turbines are smaller and lighter for comparable power output compared to other power generation technology.
- Noise from gas turbines, being confined primarily to higher frequency ranges, is easily attenuated, making them good neighbors.
- Gas turbines normally produce lower emissions, in terms of NOx and CO, as compared to internal combustion power generation alternatives.
- Gas turbines offer the advantage of a high quality exhaust heat stream that can be used in steam production, drying and other applications.

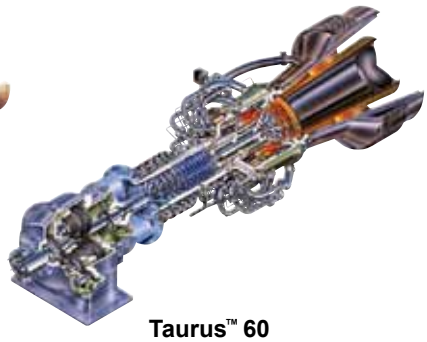
Tailored to Renewable Fuel Applications

Solar® gas turbines can operate on renewable fuels in either simple cycle, combined cycle, or combined heat and power (CHP) modes.



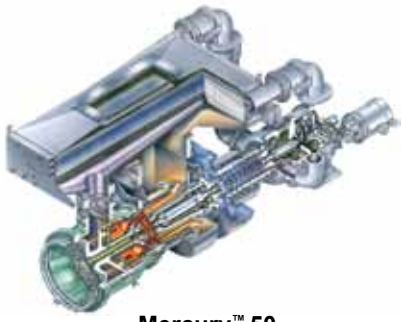
Centaur® 40
3515 kWe
19,600 lbs/hr steam

Centaur® 50
4600 kWe
25,300 lbs/hr steam

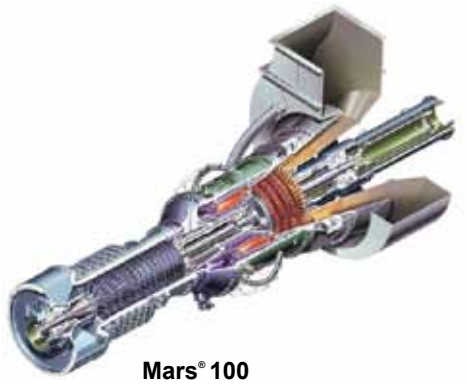


Taurus™ 60
5670 kWe
29,800 lbs/hr steam

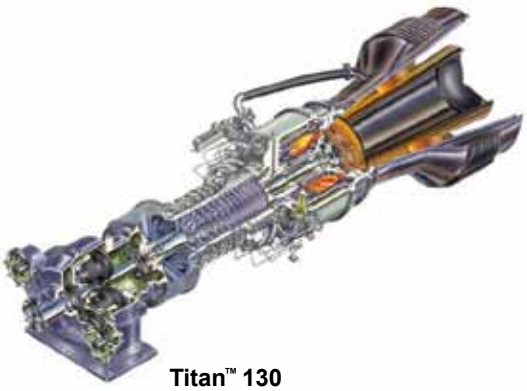
Taurus™ 70
7965 kWe
34,400 lbs/hr steam



Mercury™ 50
4600 kWe
13,800 lbs/hr steam



Mars® 100
11 350 kWe
51,800 lbs/hr steam



Titan™ 130
15 000 kWe
64,500 lbs/hr steam

Titan™ 250
21 745 kWe
78,000 lbs/hr steam

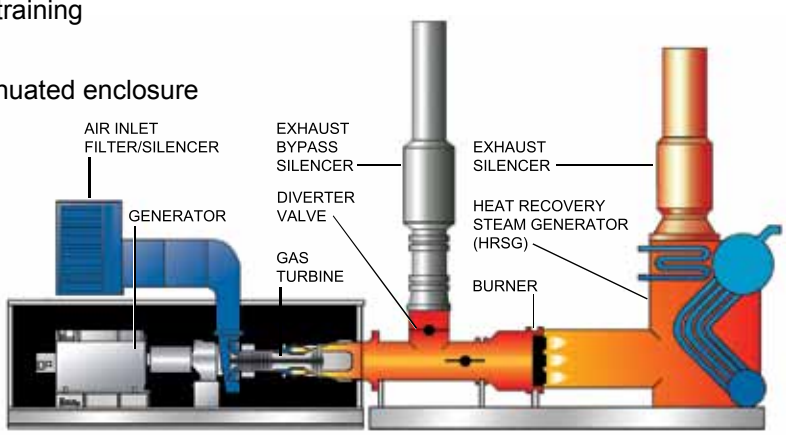
Capabilities

Solar gas turbine power generation packages are skid mounted and come with the following standard features:

- Industrial grade three-phase induction generator, both 50 Hz and 60 Hz
- Epicyclic gearbox between turbine and generator
- PLC-based *Turbotronic*™ control system to monitor both turbine and generator operations
- Lube oil system for turbine and generator, including lube oil cooler
- Turbine air filtration system
- Electric start system
- Operator and maintenance personnel training

Optional Features:

- Outdoor weather-resistant, sound attenuated enclosure with fire detection/suppression system
- Black start capability
- Remote control operation
- Fuel gas compression equipment
- Switchgear and motor control center equipment
- Stacks and silencers
- Heat recovery steam/hot water generators



Comprehensive Services

Solar offers a complete range of services to help you achieve the lowest life-cycle costs for your equipment at the highest availability.

Services include:

Construction Services

- Engineering
- Project Management
- Procurement
- Construction
- Installation

Customer Services

- Extended Service Agreements
- Operations and Maintenance Training
- Plant Management

Financing

Whatever your needs, Solar can work with you to structure a financing solution. Along with Caterpillar Financial Services Corporation and other financing resources, we provide a complete offering of tax-exempt and conventional financing products including project financing.

Our programs allow you to finance not only our equipment, but also in some cases the rest of your plant requirements, such as necessary infrastructure improvements. Financing can be done at competitive interest rates and at transaction costs commensurate with the market. Whether your financing needs are large or small, we have the ability to customize the term, structure and repayment options to meet your budget and timing.

Sustainable Power

Long before the introduction of worldwide agreements regarding climate change or the appearance of utility portfolio standards specifying the use of renewable fuels, a small and diverse industrial sector began to put biogas fuels such as landfill, digester gas and synthetic gases to use producing heat and electric power. Starting as far back as 1981, Solar Turbines initiated our support of these pioneers, committing research and development resources and modifying our turbines to burn these low-energy fuels cleanly and efficiently. That commitment has continued through the years with a progression of improvements culminating in our most efficient turbine, the *Mercury*™ 50, with modifications that allow it to burn these fuels.

In addition to providing the industry with increasingly advanced turbine designs, Solar actively participated in the industry's successful efforts to develop a cost-effective and reliable siloxane removal technology.

Our long-term focus and support of this industry has not gone unnoticed. Over the years, customers have overwhelmingly chosen Solar when it comes to using gas turbines in biogas applications. Experience has shown their trust in us to be well placed, as together we have recorded millions of hours of reliable, low-cost operation with a fleet of more than 100 gas turbines firing a variety of biogases and high hydrogen fuels.

Solar's long-term support of the renewable energy community helped one of our customers in China to become the first foreign business to win the U. S. Environmental Protection Agency's (EPA) International Combined Heat and Power Award. Shandong Jinneng Coal Gasification Co., Ltd. won the award for using a *Solar* gas turbine to create electricity from burning hazardous coke oven gas. Using *Solar* gas turbines in coke oven gas applications not only makes commercial sense but, as the award acknowledges, also benefits the environment. The EPA estimates that the Solar based CHP system at the Jinneng site reduces CO_2 emissions by 40,000 tons per year, the equivalent of removing annual emissions from approximately 6,600 automobiles.

Corporate Overview

Headquartered in San Diego, California, Solar Turbines Incorporated is a subsidiary of Caterpillar Inc., a Fortune 100 company and a leading supplier of power generation systems worldwide. Solar Turbines is committed to producing reliable, efficient turbines with low emissions of NOx, CO, unburned hydrocarbons and particulate matter. We are a leader in pollution-prevention combustion technology and continue to develop new low-emission turbines.

Solar has been a pioneer in the design, manufacture and packaging of industrial gas turbine systems for more than 50 years and is a world leader in the industrial gas turbine power solution business for needs in the 1-22 MW size range. Customers with more than 13,900 gas turbines operating in 98 nations spanning the globe, know they can rely on Solar Turbines to provide rugged, reliable gas turbine systems, responsive service, and 24/7 product support - translating into low life cycle costs and excellent availability.

For More Information

For more information about how Solar Turbines can provide you with an effective solution to meet your renewable energy application needs, contact:

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