



**COMBINED HEAT AND POWER:
YOUR COMPETITIVE EDGE**

Solar[®] Turbines

A Caterpillar Company

SAVE BIG ON ENERGY AND TAKE CHARGE OF YOUR FUTURE

You pay a great deal for electricity and fuel. Combined heat and power (CHP) with gas turbines can deliver much more from your energy investment — and strengthen your business in other ways.

LET THE MARKETS WORK IN YOUR FAVOR

Why CHP now? Because advancing technology makes it more versatile and profitable than ever before and fluctuating natural gas and electricity markets create more sound business reasons to control your energy supply.

Solar Turbines can design a system to fit your financial and strategic goals — and take complete care of it while you focus on your business.

COMPARE FUEL EFFICIENCY

POWER GENERATION ONLY:

30% to 45%

COMBINED HEAT AND POWER:

80% to 90+%

FROM ONE FUEL, UP TO THREE FORMS OF ENERGY

The CHP concept is simple: A Solar® gas turbine turns clean-burning natural gas into cost-effective, reliable electricity, plus steam for heating — and even for cooling by way of absorption chillers. Energy savings alone can easily justify your investment. But in today's unpredictable energy markets, the benefits are even bigger. By controlling a major power source with turbine-based power generation, you can:

- Reduce production costs to gain a competitive advantage for your business.
- Insulate against spikes in market power prices.
- Make power more reliable and avoid critical process downtime.
- Create opportunities to sell surplus power at a profit.
- Meet environmental goals by cutting pollutant and greenhouse gas emissions.
- Advance corporate sustainability with improved use of a fuel source.





A SOUND ENERGY STRATEGY, PROVEN WORLDWIDE

Decades of experience prove it: CHP works. Solar Turbines CHP installations deliver results daily at thousands of commercial, industrial and institutional sites worldwide. Comprehensive service support from Solar Turbines and our fully integrated partner Turbomach ensures excellent performance and high uptime. If you need electricity and thermal energy at the same time, a CHP system can meet your needs at a highly favorable return on investment. Many owners report simple payback in four years or less.

POWER IT, HEAT IT, COOL IT

Gas turbine power generation yields high-quality exhaust heat for a host of applications. Our heat-recovery systems can help you:

- Capture exhaust heat directly for product curing and drying.
- Heat water or industrial process fluids.
- Produce steam for space heating, district heating or industrial processes.
- Use exhaust gas or steam to drive absorption chillers for space cooling or refrigeration.

There also is growing interest in trigeneration, a highly flexible concept that recovers exhaust energy for both heating and cooling.

Another CHP innovation inserts a duct burner between the gas turbine and heat recovery system. This adds great flexibility to serve variable heat and power loads, and decouple power production from heat generation at appropriate times, dramatically increasing overall efficiency.

MORE SUSTAINABLE USE OF ENERGY

Solar gas turbines generate electric power from natural gas — the least carbon-intensive fossil fuel — in packages designed to limit impact on the environment. Our turbines also can use alternate fuels like landfill and digester gas, coke oven gas, refinery off gases and gasified solid waste — turning “waste” gases into valuable fuel resources.

SoLoNO_x TECHNOLOGY

3,000+

GAS TURBINES EQUIPPED

200 million

OPERATING HOURS

Over 4 million

TONS OF NO_x EMISSIONS AVOIDED

Clean-burning fuels help displace emissions from more carbon-intensive sources. And each percentage point of efficiency gained in heat recovery cuts pollutant and greenhouse gas emissions proportionately.

Our SoLoNO_x™ lean-premixed combustion system significantly limits pollutant formation without costly post-combustion treatment and without sacrificing power or heat rate. Solar turbines power multiple LEED and ENERGY STAR certified facilities.



COMPLETE CHP SYSTEMS TO SUIT YOUR APPLICATION

Conditions are ripe for exploring CHP. The technology is more efficient and flexible than ever, delivering attractive returns even where heat and power demands fluctuate with the seasons or during the workday.

RIGHT AT HOME IN YOUR INDUSTRY

No one understands CHP better than Solar Turbines. We design, install, maintain and operate systems that drive down energy costs and improve business performance in multiple industries with unique energy requirements:

Agricultural products	Health care
Airports	Hotels
Breweries	Landfills
Casinos	Laundries
Ceramics	Manufacturing
Chemicals	Meat and poultry
Commercial real estate	Pharmaceuticals
Communications	Plastics
Convention centers	Printing
Dairying	Prisons
Data centers	Pulp and paper
District heating/cooling	Residential complexes
Electric utilities	Rubber
Food processing	Supermarkets
Forest products	Textiles
Glass	Universities
Government buildings	

EXPERTISE AT WORK

We deliver field-proven turbines with the highest-quality, time-tested designs and continuous product improvements, built with world-class manufacturing processes. Backed by long-term support, our machines ensure highly consistent and predictable performance.

How can our extensive CHP experience help you? Get ideas from the sampling of installations pictured here, and the case studies at solarturbines.com.

A WORLD LEADER IN CHP

5,000+
GLOBAL GAS TURBINE POWER
GENERATION INSTALLATIONS

60+%
OF UNITS IN CHP SERVICE

INDUSTRIES UTILIZING CHP SYSTEMS FROM SOLAR TURBINES



CERAMICS

Exhaust heat from two Centaur® 50 generator sets feeds spray dryers at an Indonesian ceramics factory.



WASTEWATER

This wastewater treatment plant in Ohio, USA, uses a Taurus™ 60 running on a blend of landfill and digester gas to provide 10 MW of power for use in their facilities and/or export to the grid.



PAPER

Two Titan™ 130 generator sets power a CHP system at this paper mill in Connecticut, USA.



HEALTH CARE

This medical center in California, USA, employs two Taurus 60 CHP units.



CASINO

Two Taurus 70 CHP systems cool this resort and casino in Connecticut, USA.



MANUFACTURING

Two Taurus 60 generator sets run on landfill gas and provide 50 percent of the energy demands for this manufacturing facility in South Carolina, USA.



PHARMACEUTICAL

A Taurus 60 unit provides steam and reliable power for a pharmaceutical plant in Massachusetts, USA.



TEXTILE

A textile manufacturing plant in Pakistan employs a Centaur 40 CHP system.



FOOD PROCESSING

A Canadian food processor gets power and steam from a Taurus 60 genset.

MAKING ECONOMICS WORK FOR YOU

Solar Turbines can help build your CHP system at an attractive return while preserving capital to invest in your core business.

We provide a complete, realistic analysis of your project's financial outlook, using your preferred criteria — simple payback, net present value, life-cycle cost or internal rate of return. Then we can assemble an attractive financing package:

- Flexible leasing
- Project financing
- Tax-exempt government leasing
- Traditional loans
- And others

We often can structure financing to provide positive cash flow, right from start-up. We may alert you to government programs that offer tax benefits for CHP plant owners. It's all for one purpose: To help you deploy CHP for the best business advantage.



OPTIMIZING EQUIPMENT VALUE, ANYWHERE AND ANYTIME

Solar Turbines provides products and services that exceed your expectations for performance, reliability and availability — and deliver the uptime and output on which your success depends. Our thoroughly proven standard designs and consistent, high-quality manufacturing and testing ensure our machines deliver the maximum efficiency and return on investment.

QUALITY AND EFFICIENCY BUILT RIGHT IN

Solar Turbines provides repeatable quality that minimizes risk: You can expect every machine to perform to the same standard of excellence as more than 5,000 others in power generation and CHP duty worldwide. We have attained 100 percent on-time delivery performance for new machines.

Customers recognize Solar turbines for low life-cycle cost and optimum long-term return on investment. Extremely competitive efficiency ratings help Solar turbines deliver attractive life-cycle cost. We can support CHP packages with power, heat rate and emissions guarantees.

Our Quality, Health, Safety and Environmental (QHSE) management system helps you protect the environment and the people who operate the equipment — and respect people who live nearby.

VAST EXPERIENCE

75+
YEARS IN BUSINESS

15,000
TURBINE PACKAGES

100+
COUNTRIES

2.3 billion
HOURS OF OPERATION

EXPERIENCE OUR CULTURE OF CUSTOMER CARE

Solar Turbines has been a pioneer in the design, manufacture and packaging of gas turbine systems for more than 75 years and is the world leader in the midrange industrial gas turbine industry. Our worldwide sales and service organization, including Turbomach, is dedicated to your success. We are committed to the highest-quality experience, from your initial inquiry throughout your equipment's life.

READY TO SERVE YOU EVERYWHERE

When you need support, Solar Turbines is available around the clock and only a phone call or click away. Our nearly 3,000 field personnel constitute the world's largest, best-trained and most experienced turbomachinery service team. We offer support from 50 strategic locations:

- Overhaul centers
- Parts depots
- Field service offices
- Training facilities

You can expect responsive service and unrivalled technical assistance no matter where you are. Service personnel speak the language and understand the culture, customs and business practices where they work. Solar Turbines engineers and technicians are nearby to swiftly respond and resolve issues promptly and definitively.

Field team members have access to hundreds of design and support engineers at Solar Turbines research, development, design, manufacturing and overhaul facilities. Strategically located parts warehouses and sophisticated logistics enable the most timely delivery of Solar certified service parts and tools to minimize downtime.

MORE THAN MAINTENANCE

Customer support extends beyond maintenance and repairs to include:

- Overhauls
- Upgrades and uprates
- Refurbishment
- Low-emission conversions
- Technical training courses

All of this helps enhance equipment performance and safety, extend life and prevent obsolescence.

MAINTAINING YOUR EQUIPMENT'S HEALTH

Like all products from Solar Turbines, your cogeneration system comes with renowned worldwide customer support to ensure optimum performance throughout the life of your equipment. It's delivered through the industry's largest, most highly skilled turbomachinery services team found globally. We're there with you from product selection to commissioning, operations and maintenance.

InSight System™, a comprehensive online approach to equipment health management, includes the industry's most advanced remote monitoring and predictive diagnostics system. Maintenance based on equipment condition rather than traditional time intervals saves time and money on maintenance and repair, boosting uptime, productivity and service life.



LET US HELP POWER YOUR FUTURE

The worldwide sales and service organization at Solar Turbines is dedicated to your success. Our culture of customer care is the foundation for our commitment to the highest quality customer experience – from your initial inquiry throughout the life of your equipment.

A gas turbine from Solar will deliver reliable and efficient equipment that precisely fits your project requirements. Contact us directly or access our CHP Energy Profile and Cogeneration Calculator at www.solarturbines.com/chp for an analysis of your energy outlook and estimate for getting the most payback from your investment.

For more information and the office nearest you, visit www.solarturbines.com/chp or call +1 619 544-5352.



Solar[®] Turbines

A Caterpillar Company

THE AMERICAS

Solar Turbines Incorporated
Administrative Headquarters
San Diego, California USA
Tel: +1 619 544-5352
Email: infocorp@solarturbines.com
Web: www.solarturbines.com

EUROPE, AFRICA AND THE MIDDLE EAST

Turbomach S.A.
Riazzino, Switzerland
Tel: +41 91 851 1511

THE PACIFIC AND FAR EAST

Solar Turbines International Company
Republic of Singapore
Tel: +65 6828 7000