Steam Turbine Assisted Cogeneration Systems

Gas Turbine Power Plants, 1-50 MW

• Efficient
• Flexible
• Reliable
The gas turbine-based combined heat and power system (CHP), or cogeneration, is a proven concept which has gained wide acceptance with industrial, commercial, and utility users throughout the world who need a high level of thermal energy in addition to electrical energy. CHP users enjoy efficiencies of 70 to 90% at hundreds of sites ranging from industrial process plants to large district heating and cooling complexes.

**Challenge: Efficiency and Flexibility**

A CHP system is cost effective to install and can be matched to varying thermal and electric loads. However, the system’s overall efficiency decreases during operating periods when little or no thermal energy is used. Technical solutions intended to maintain high efficiency during these periods usually increase system complexity and cost while they decrease plant reliability and availability. Those solutions traditionally have incorporated combined-cycle designs that use high pressure, super-heated steam or systems where super-heated steam is injected directly into the gas turbine to increase its power output.
**STAC: The High Efficiency, Reliable Solution**

Solar has solved the requirement for a flexible, yet highly efficient and cost-effective, CHP plant design by developing the Steam Turbine Assisted Cogeneration (STAC) system. This high efficiency system, designed and pre-engineered around Solar’s successful family of industrial gas turbines, uses other proven CHP components to produce durable and reliable power plants.

Solar’s STAC systems are available in three size ranges:

| STAC 60 | 5.0-6.3 MW |
| STAC 70 | 6.5-8.0 MW |
| STAC 100 | 10.7-13.8 MW |

These systems can be combined for power plants up to 50 MW.

**System Description**

The STAC system consists of a gas turbine-driven generator package, a heat recovery steam generator (HRSG) closely matched to the process steam conditions, and a steam turbine matched to the HRSG’s output and connected to the generator shaft’s free end through an overriding clutch. Overall system reliability and availability are increased while potential compromises in component performance and life are greatly reduced. This is due to the relatively simple design which allows each component to be optimized to its intended use and design conditions.

**Advantages**

- High Thermal Efficiency
- Operating Flexibility
- Dry Low Emissions Available
- Low Maintenance Costs
- High Availability and Reliability
- Low Installation Cost

**Optional Features**

- Double-End Drive Generator with Self-Actuating (Overriding) Clutch
- Heat Recovery Steam Generator (HRSG)
- Steam Bypass Valve
- Control System
- Commissioning

**Standard Features**

- Gas Turbine Generator Package
- Steam Turbine Package

**Expected Performance (without supplemental firing)**

![Expected Performance Graph](image-url)
Experience

Solar's experience in gas turbine power generation systems is unrivaled throughout the world. Solar's first STAC installation has been in operation since 1989 providing a durable, reliable, and cost-effective system. Solar has built and installed over 10,000 industrial gas turbines with 600 million operating hours serving customers in 85 countries. More than 1000 of those gas turbines are at work in CHP or STAC applications. No gas turbine manufacturer of any size has more units or operating hours in industrial service. Solar has made a strong commitment to build durable, reliable, and efficient turbine systems well into the 21st century.

For More Information

For more information on Solar's STAC system, write to:
Solar Turbines Incorporated
IPG Marketing
P.O. Box 85376
San Diego, CA 92186-5376, U.S.A.
Telephone: 619-544-5352
Telefax: 619-544-2633
Telex: 695045

Solar Turbines Europe S.A.:
Brussels (Gosselies); London (Slough); and Dubai

Solar Turbines Asia:
Singapore and Tokyo

Solar Turbines Australia:
Melbourne (Rowville)

Solar Turbines Canada Ltd.:
Calgary

Turbinas Solar, S.A. de C.V.:
Mexico City

Delcom Services SDN BHD:
Kuala Lumpur, Malaysia

P.T. Indoturbine:
Jakarta, Indonesia

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