



# SIEMENS

*Ingenuity for life*

## SST-700/900

Economical dual-casing steam turbine for reheat applications

[siemens.com/steamturbines](https://www.siemens.com/steamturbines)

Siemens' Model SST-700/900 steam turbine is a standard turbine solution featuring a short delivery time thanks to its fixed standard design. Pre-defined turbine modules enable short manufacturing periods, cost-efficient materials supply and fast ex-works delivery.

The straight-flow turbine design solution offering power outputs of up to 250 MW consists of one geared high-pressure (backpressure) steam turbine, and a combined intermediate/low-pressure (condensing) steam turbine, both of which drive an electrical generator arranged between them. The dual-casing reheat turbine configuration with inner casing is a competitive, optimized product for combined-cycle power plants and concentrated solar power plants.

# Successful SST-700/900 configuration

The SST-700/900 is configured in Siemens' global standard Enhanced Platform Design. The turbines are highly efficient thanks to the improved blade and seal designs. The steam path is equipped with specialized steam inlets which ensure high temperatures (up to 565 °C) with short heatup times, which likewise contributes to enhancing efficiency, as do additional competitive solutions for lower parameters. The turbines are all of simple modular construction for flexibility and ease of configuration and maintenance.

## Fast load changes, short startup times

The optimized homogenous geometry of the casing design guarantees reduced startup times by up to 50% over previous designs. Faster load changes and an unlimited number of load changes over the unit's service lifetime allow for virtually any load regime.

## Long service life

The consistent long-term material behavior of this turbine series ensures a long product service life of 200,000 operating hours. The use of proven designs for the high- and intermediate-pressure blades with tried-and-tested root clamping designs, for example, and of maintenance-free bolts good for up to 50,000 operating hours, serves to ensure a very high level of availability.

## Reheat improves efficiency

Integrating a steam reheat system is one of the best means of increasing overall plant performance. In Siemens' reheat turbine package, live steam is routed through a high-pressure (HP) turbine, returned to the steam generator to increase the steam temperature, then routed through a low-pressure (LP) turbine. Raising the temperature of steam that is moving from an HP turbine to an LP turbine generates higher output for same amount of fired fuel.

## Typical applications

- Combined cycle power plants
- Concentrated solarthermal power plants
- Biomass fired power plants

## Customer Benefits

- Fast load changes
- Short startup times
- Increased efficiency
- Longer service life
- Low-level arrangement



Configuration with center steam admission at backpressure (HP) and condensing (LP) steam turbine BH-40, BH-50, CN-80/8,7

# Technical overview



## Low-level arrangements

The SST-700/900 configuration is designed in a low-level arrangement. This keeps the foundation simple, reduces the size of the turbine building, and simplifies the piping systems and all other related arrangements. The design consequently also reduces initial costs significantly.

- Power output: up to 250 MW
- Speed: 3000 or 3600 rpm
- Live steam inlet pressure:  $\leq 180 \text{ bar(a)}$  /  $\leq 2611 \text{ psi}$
- Live steam inlet temperature:  $\leq 565^\circ\text{C}$  /  $\leq 1050^\circ\text{F}$
- Reheat: up to  $565^\circ\text{C}$  /  $1050^\circ\text{F}$  and up to 45 bar(a)
- Condensing exhaust casing: up to  $12.5 \text{ m}^2$
- Controlled and/or uncontrolled (up to 7) extraction possible

# Reference applications



## Parabolic trough technology in Morocco

On February 4, 2016, the King of Morocco, Mohammed VI, dedicated the Noor I unit of Ouarzazate Solar Power Station. This is the first of four phased Noor projects at Ouarzazate site which are expected to provide a total electrical generating capacity of 580 megawatts, making it the largest complex of its kind in the world. Siemens is supplying three turbine-generator sets for the power station. NOOR I and NOOR III will each operate an SST-700/900 configuration.

Steam turbine: SST-700/900

Power output: 160 MW

Inlet steam temperature: 380°C / 716 °F

Inlet steam pressure: 168 bar(a) / 2437 psi

Exhaust pressure: 0.06 bar(a) / 0.87 psi



## Solar tower technology in California

The company BrightSource Energy developed the Ivanpah Solar Energy Generating System in California's Mojave Desert. The facility consists of three separate plants based on solar tower technology delivering in total approximately 400 MW of electricity to the U.S. utilities PG&E and Southern California Edison. The whole complex will generate enough electricity to power more than 140,000 homes.

Steam turbine: SST-700/900

Power output: 123 MW(e)

Inlet pressure: 160 bar(a) / 2321 psi

Inlet temperature: 550° C / 1004° F



## La Caridad combined-cycle power plant in Mexico

Siemens supplied two turnkey combined cycle power plants to provide power for the Grupo Mexico mines. The two power plants of La Caridad I and II each have an installed capacity of 250 megawatts, producing 500 megawatts for the Sonora region. This resource-friendly combined cycle power plant enables Grupo Mexico to cut 40 percent from its electricity costs.

Steam turbine: SST-700/900

Power output per plant: 250 MW

Scope of supply: Turnkey incl:

SGT-6-5000 F, SST-700/900, SPPA-T3000

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