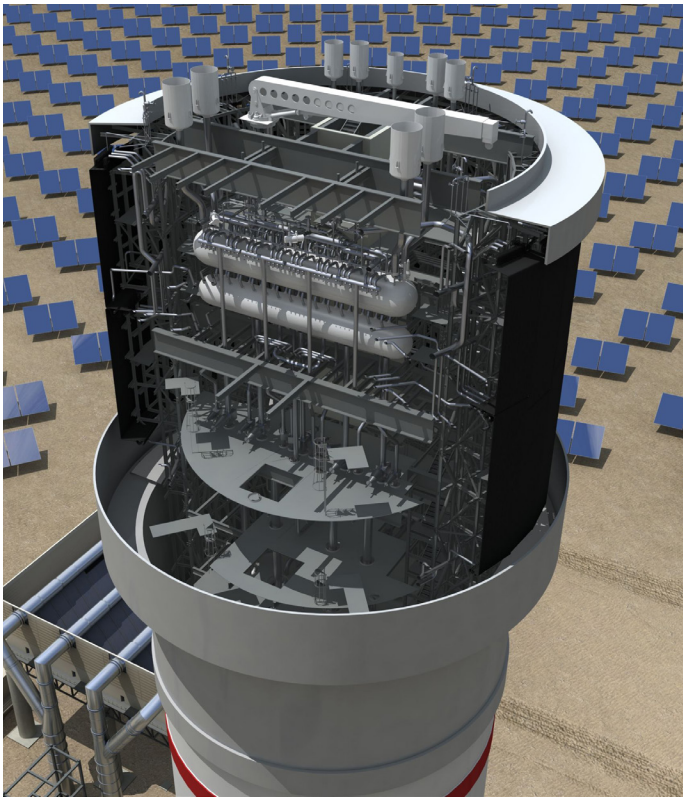
Solar Receiver Steam Generator (SRSG)

Bringing innovative technologies to concentrated power solutions

GE designs and delivers steam generators for a broad range of applications, including heat recovery, industrial-sized, and utility scale ultrasupercritical applications. Our extensive experience designing and sizing equipment for high temperatures and pressures has been successfully demonstrated for decades around the world.

GE's industry-leading boiler expertise shapes the future of next-generation CSP plants by delivering increasingly efficient solar receivers such as our Solar Receiver Steam Generator (SRSG). This advanced technology product – developed in collaboration with BrightSource Energy – is the complex result of engineering excellence and plant integration expertise, all based on a solid foundation of design experience.



How It Works

Thousands of mirrors, known as heliostats, track the sun on two axes and concentrate the solar energy onto the SRSG, located in the heliostat field on top of the tower. The concentrated energy reflected by the heliostats enables the heating of water, which is then transformed into steam to activate a steam turbine and produce electricity.

Design Features

Thermal Power Output Range	300 – 700 MWth, continuous rating
Multiple Plant Solutions	100 – 250 MWe, with or without thermal storage
Highest Solar Plant Temperature	585°C
Heliostat Interface	Cylindrical cross section for efficient interface with 360° heliostat field
Steam Generation	Super-heated, direct
Boiler Section	Forced-circulation
Non-reheat Cycle	Avoids losses and an expensive re-heat receiver section
Flexible Operation	Accommodates varying heat flux conditions
Erection Design	Final assembly is 20 m to 30 m in diameter and 30 m high

At the heart of the tower-based concentrated solar power plant, GE Renewable Energy's solar receiver technology defines the critical interface between the optics of the solar field and the traditional steam cycle.

The GE Advantage

Through our reliable, flexible and integrated solar technologies, we can help you harness the sun's energy for decades. GE's portfolio of solar receivers is steadily growing to include solutions across a broad range of power generation applications.

Our Solar Receiver Steam Generator is suitable for hybridization with gas, coal, and other types of steam plants, providing amongst the lowest cost of energy from a solar source.

We provide:

Flexibility

The SRSG circulation rate is designed to accommodate varying feedwater temperatures and heat fluxes as well as required steam-to-turbine conditions across the full operating range.

Fast startup

The SRSG unit's steam drum is maintained overnight in a hot condition while the evaporative heat transfer surface cools to ambient conditions. This allows for temperature matching of various sections of the SRSG system during startup.

Efficiency

An optimized, nearly cylindrical design decreases gaps between panels, resulting in reduced loss of transmitted solar flux. This design also improves the optical efficiency of the SRSG's heliostats.

Reliability

SRSG designed for exceptional reliability and availability, even in the most arduous of operation conditions.

Central Receiver (Tower) – How It Works

Thousands of flat mirrors, known as heliostats, track the sun on two axes and concentrate the sun's heat onto a boiler-mounted tower. This produces high temperature steam that is delivered to a conventional turbine to generate electricity. The intense energy concentration made possible by the large array of mirrors delivers exceptional operating efficiency and low capital costs per kilowatt-hour compared to other solar system solutions. The result is a system that delivers cleaner, reliable energy at costs that are becoming competitive with fossil fuels.

GE's innovative Solar Receiver Steam Generator is world-class direct steam technology for most efficient Solar Direct Steam or integrated Solar Combined Cycle solution.

For more information please contact a GE representative.

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