

Ivanpah Solar Electric Generating Facility



Each of the three units at Ivanpah includes more than 50,000 heliostats.

Bechtel is performing project management, engineering, procurement, construction, and startup services for the Ivanpah Solar Electric Generating Facility in San Bernardino County, California. The 392 MW concentrated thermal solar power facility consists of three separate plants scheduled to come on line in 2013.

PLANT CONFIGURATION

Facility Configuration. The facility consists of a single 126 MW plant and two 133 MW plants.

Heliostats and Control System. Thousands of heliostats—each consisting of two glass mirrors, a support structure, a pylon, and a computerized dual-axis motorized tracking system—individually track the sun to focus light onto a high-efficiency boiler atop a tower. The solar field layout and its aiming and control system are designed to send sunlight to the boilers in a manner that maximizes the steam output.

Tower and Boiler. Steel towers support each boiler at a height of more than 450 feet (137 meters), enabling it to receive light from more than 50,000 heliostats. The boilers convert water into superheated steam at 1,000 °F (538 °C) and reheat steam at 900 °F (482 °C).

Power Block. A steam-powered turbine at the base of each tower generates electricity that is transmitted to the power grid. The Ivanpah installation will use the same reheat, condensing-style turbine, with a regenerative feedwater heating cycle, that is used in traditional power generating facilities.



Location:

San Bernardino County, California, USA

Customer:

NRG, Goggle, BrightSource Energy Inc.

Scope of Services:

Engineering
Procurement
Construction
Startup

Project Completion:

2013

Units and Megawatts:

3 separate power plants totaling 392 MW

Significant Features/ Accomplishments:

- Facility estimated to displace more than 450,000 tons (408,000 metric tons) per year of CO₂
- System preserves scarce water by air-cooling steam from its turbine before returning it as water to the boiler, which uses 90 percent less water than traditional wet-cooled power plants
- Plants designed to recycle all process wastewater for zero liquid discharge
- Detailed design started in August 2009, and field mobilization occurred in October 2010

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BECHTEL
Frederick, Maryland USA
301-228-8609
bechtel.com

San Francisco Houston London Brisbane