

Concentrating Solar Power

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Concentrating Solar Power (CSP) is electricity generated from mirrors to focus sunlight onto a receiver that captures the sun's energy and converts it into heat that can run a standard turbine generator or engine. CSP systems range from remote power systems as small as a few kilowatts up to grid-connected power plants of 100's of megawatts (MW). CSP systems work best in bright, sunny locations like the Southwest. Because of the economies of scale and cost of operation and maintenance, CSP technology works best in large power plants.

Why CSP?

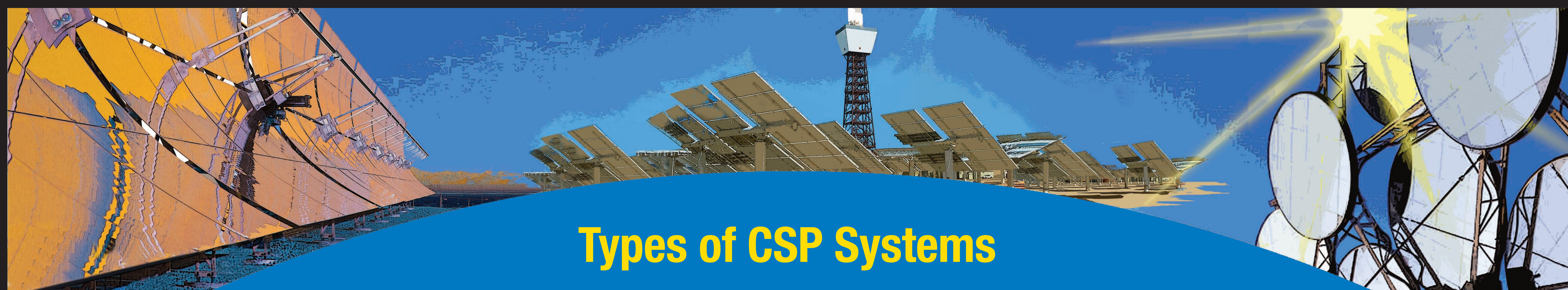
- Clean, reliable power from domestic renewable energy
- Operate at high annual efficiencies – Firm power delivery when integrated with thermal storage
- Easily integrated into the power grid
- Boosts national economy by creating many new solar companies and jobs.

CSP Power Plants

More than 350 MW of CSP systems were installed in California in the 1980s. More recently, CSP has experienced a rebirth. Two plants were completed in 2006 and 2007: the 64-MW Nevada Solar One in the U.S. and the 11-MW PS10 power plant in Spain. Three 50-MW plants were under construction in Spain at the end of 2007 with 10 additional 50-MW plants planned. In the U.S., utilities have announced plans for at least eight new projects totaling more than 2,000 MW. Numerous integrated CSP/combined-cycle gas turbine power plants are under development in North Africa and California.

EERE Information Center
 1-877-EERE-INF (1-877-337-3463)
www.eere.energy.gov

Solar Energy Technologies Program
www.eere.energy.gov/solar



Types of CSP Systems

Parabolic Trough



A section of the parabolic troughs from the Nevada One project tracking the sun.

Power Tower



This 10-MW power tower facility known as Solar Two near Barstow, California, demonstrated molten salt storage.

Dish Engine



These new record-performing dish engine systems are being commercialized.

Key Environmental Topics

Energy Payback (Input vs. Output) – The energy payback time of CSP systems is about 5 months. CSP power plants also pay back in jobs, tax revenue, and increase gross state product.

Greenhouse Gas Mitigation – Compared to fossil-fueled power plants, CSP power plants generate significantly lower levels of greenhouse gases and other emissions.

Toxic Emissions – CSP is clean, non-polluting, and has no carbon emissions that contribute to climate change.

Land Use – CSP plants use approximately 5 acres of land per MW of installed capacity. Enough suitable land is available in the Southwest to generate six times the current U.S. demand for electricity.

Health & Safety – The health and safety risks associated with CSP power plants are the same for any power plant. Employee health and safety measures are in place to protect workers from injury.

Produced by
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