California Edison) and the U.S. Department of Energy. The industry consortium is currently involved in discussions about using the experience gained from Solar Two to build a commercial 30-100 MW power tower in Nevada, a project that would create many new jobs.

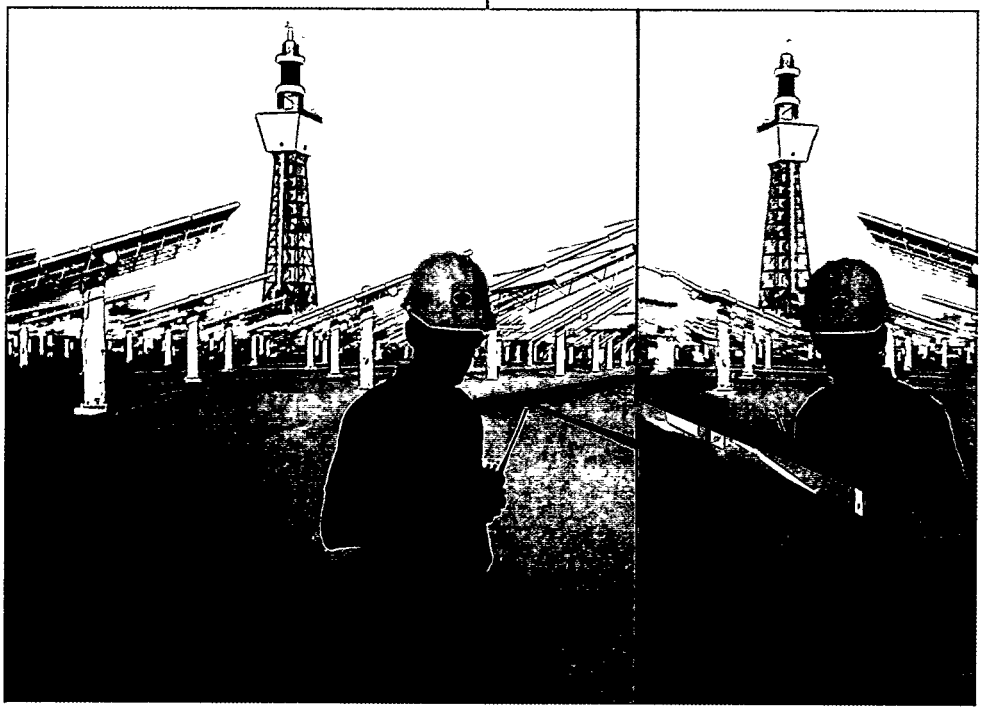
"Solar Two represents both a new source of clean power for California and neighboring states, and a new source of export technology for America and jobs for American workers."

— John Bryson, chairman of Southern California Edison, at the Solar Two dedication in June 1996

Solar Two gives an indication of the range of jobs that would be required to operate and maintain power towers once they are commercialized. The demonstration project employs nine full-time staff: three people to operate the plant's control systems plus a maintenance crew consisting of two full-time mirror washers and their truck driver, an instrument technician, an electrician, and a mechanic.

Dish/Engine Systems: Future Opportunity

Although dish/engine systems are still under development, the prospects for this technology look promising. The systems are transportable and are appropriate for both on-grid and remote applications. Science Applications International Corporation (SAIC), a solar dish developer, plans to produce five precommercial, 25-kW systems by 1999. SAIC also expects to be producing 1000 commercial dish/engine systems per year by 2002, creating 500 high-tech jobs at a manufacturing facility in the Southwest and an additional 1000 jobs at supplier facilities throughout the United States.



Warren Gretz, NREL/PIX02407

Solar Two technician Hugh Reilly inspecting one of the 1926 heliostats (mirrors) that track the sun during the day. Power towers provide a variety of jobs in systems operation and maintenance.

How It Works

Unlike photovoltaic systems, which generate electricity directly from *light*, solar thermal power systems use the *heat* from the sun's rays to generate power. Reflective surfaces concentrate the sun's rays to heat a receiver filled with oil or another heat-exchange fluid. The heated fluid is then used in some form of heat engine to generate electricity. Mechanical drives slowly turn the reflective surfaces during the day to keep the solar radiation focused on the receiver. There are three main types of solar concentrators used in solar thermal electric systems:

Parabolic trough systems concentrate solar rays onto a receiver pipe located along the focal line of a curved, trough-shaped reflector. The synthetic oil flowing through the pipe is heated to as much as 750°F. The hot oil is used to boil water to make steam, which runs a conventional steam turbine to generate electricity.

Power towers, also called central receivers, use a field of sun-tracking mirrors (heliostats) to reflect solar radiation onto a receiver that sits on top of a tall tower. The fluid in the receiver is heated to as much as 1050°F before being passed through a heat exchanger to produce the steam used to generate electricity.

Parabolic dish systems are similar to trough systems except that they use a dish-shaped reflector. The dish concentrates solar radiation onto a receiver mounted at the focal point of the dish, heating the receiver fluid to as much as 1500°F. Instead of boiling water to run a steam turbine, most dish systems today generate electricity by using the hot fluid to run a Stirling engine mounted at the dish's focal point.