Sandia National Laboratories

News Release

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Dish-Stirling Solar Technology Showcased Near Olympics

ALBUQUERQUE, N.M. – Viewers of the Summer Olympic Games in Atlanta may catch a glimpse of a prototype solar dish system that engineers at Sandia National Laboratories helped to develop.

The dish-Stirling solar system, which consists of a large dish of solar concentrators and a Stirling heat engine, is installed on the Georgia Institute of Technology campus, next to the Natatorium, site of the Olympic swimming events. The system is capable of producing 7 kilowatts of electricity and is connected into the campus' electrical grid. It will be in operation from the beginning of June through August.

"This project will demonstrate to domestic and international audiences one of DOE's premier renewable energy technologies and the capabilities of U.S. industry," said Allan Hoffman, Acting Deputy Assistant Secretary of the Department of Energy's Office of Utility Technologies.

Sandia has provided technical support to the development of the dish-Stirling system since the late 1980s. The system is a joint venture of the DOE's solar program at Sandia and Cummins Engine Company, a leading manufacturer of diesel engines and generators. The National Renewable Energy Laboratory in Golden, Colo., a DOE national laboratory, also has provided technical expertise to the system, primarily in the area of optical materials. Current work on the system focuses on increasing its efficiency while bringing down its price.

"Sandia has helped in all aspects of the project, including its engine, mirrors, receiver and controls," said Craig Tyner, manager of Sandia's Solar Thermal Technology Dept.

The dish-Stirling system is named for its two major components: a dish-shaped solar concentrator and a Stirling heat engine. The concentrator focuses the sun's heat onto a receiver, which collects and transfers it to the engine. The engine is a sealed system filled with gas, and as the gas heats and cools, its pressure rises and falls. The change in pressure is controlled to make the pistons inside the engine move, producing mechanical power. The mechanical power in turn drives a generator and makes electricity.

The system is designed for remote sites. "It typically will be used in third-world countries for applications such as pumping water, operating a mill, or providing power to a remote village," Tyner said.

An added advantage of the system is its versatility: When the sun doesn't shine, the engine can be heated with an auxiliary fuel such as natural gas, propane, or heating oil.

The dish-Stirling system on the Georgia Tech campus is one of only four full systems. The others are located in Dallas and Abilene, Texas, and Fort Huachuca in southern Arizona.

The system in Atlanta sits on the site of Georgia Tech's former Advanced Component Test Facility, which conducted pioneer work in solar thermal technology during the 1970s and 1980s.

Sandia National Laboratories is a multiprogram national laboratory operated by a subsidiary of Lockheed Martin Corporation for the U.S. Department of Energy. With main facilities in Albuquerque, N.M., and Livermore, Calif. Sandia has broad-based research and development programs contributing to national defense, energy and environmental technologies, and economic competitiveness.

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