

Public POWER

September-October 2005

DEED

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TVA, Sunlight Direct Team Up On Hybrid Solar Lighting Project



Latest version of solar collector. Unit is installed on the rooftop of the American Museum of Science and Energy in Oak Ridge, Tenn. Photo courtesy TVA.

Commercial buildings represent the largest energy end-use sector in the United States. Lighting is the largest end-use energy consumption in commercial buildings. Imagine a technology with the potential to reduce lighting costs by as much as 50 percent. It could save businesses thousands of dollars per year.

Tennessee Valley Authority and Sunlight Direct, LLC have teamed up to install that technology, dubbed hybrid solar lighting, into several commercial sites over the next year for testing. Sunlight Direct will monitor the sites for one year. TVA has funded one demonstration site already. DEED is contributing to a second.

Hybrid solar lighting technology uses rooftop collectors to track the sun and focus sunlight onto bundled optical fibers. The fibers are connected to hybrid solar lighting fixtures that illuminate the site. If there is little sunlight available, standard electric lights are used to compensate.

Hybrid solar lighting is superior to other forms of lighting, TVA said in its DEED project proposal. Since most commercial offices operate during the day, harnessing natural light could significantly reduce peak energy demand. The hybrid solar lighting user lowers costs while maintaining a consistent degree of lighting and reducing electricity demand.

Fluorescent lighting is at best a fair copy of natural light. Hybrid solar lighting uses direct sunlight and resembles it closely. In the mornings and evenings, light delivered via hybrid solar lighting will have a red tint just as the rising and setting sun has, but the shift can be rectified by the system if so desired. Hybrid solar lighting does not contain infrared or ultra-violet wavelengths. Unlike other natural lighting options, such as skylights and oversized windows, Hybrid solar lighting allows for directionally controlled illumination, thus reducing architectural intrusion from lighting.

The hybrid solar lighting system is easily shut off via a switch. Additionally, hybrid solar lighting fixtures generate less heat than traditional bulbs, potentially reducing cooling costs as well.

TVA hopes to satisfy four goals with the hybrid solar lighting demonstration:

- determine the feasibility and actual energy-savings potential of hybrid solar lighting systems;
- expose hybrid solar lighting technology to potential users and its stakeholders;
- acquire field data on the best way to install and operate the technology; and
- help bridge the gap between the research and development efforts that have gone into hybrid solar lighting and its actual commercialization.

If successful, hybrid solar lighting could be made available to the commercial sectors of other municipally owned utilities as early as 2006. The technology is patented by Oak Ridge National Laboratories and licensed exclusively to Sunlight Direct.



Internal view of a fluorescent hybrid luminaire. Two fluorescent lamps can be seen with a sunlight-diffusing rod between them. Photo courtesy TVA.