



Solar Awnings Save Energy Three Ways

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Solar awning an energy triple threat

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Ihab Elzeyadi has developed a prototype for a window awning that can save, generate and redirect energy for better lighting and energy efficiency in buildings. (Photo courtesy of Oregon BEST)
Professor Ihab Elzeyadi thinks building systems have it too easy.

That's why the University of Oregon professor and researcher has been testing a prototype solar photovoltaic window awning able to perform triple duty.

"We can use photovoltaics to some degree on roofs," Elzeyadi said. "But up there, they are generally doing one function: generating electricity. Generating energy is good, but saving it in the first place is better, and cheaper. We're trying to develop products that help us to save energy use in the buildings in the first place, as well as generate it."

The awning, Elzeyadi said, has three functions: it saves energy by reducing the amount of sunlight heating the building through shading, it generates energy through integrated solar photovoltaic cells, and it transmits energy by redirecting daylight using a light shelf. A light shelf is a reflective overhang used inside a building's window to reflect daylight onto the ceiling and deeper into a space.

A local manufacturer, Image King Signs of Eugene, built the initial prototypes for Elzeyadi's project. Those prototypes, installed at the University of Oregon's Onyx Building, allow Elzeyadi to track how the awning affects the building's energy use. Information on the building's energy use is available at a website.

"Some people had said the light-redirecting devices are not going to work," Elzeyadi said. "Now, it's easy to bring them in to the space and say, 'How do you like the lighting in here?' It has become a living, learning lab for the students, and also a good mock-up for building owners to see it in motion."

The solar awnings redirect light from the outside using a light bar that reflects sunlight onto the building's ceiling. (Photo courtesy of Oregon BEST)
The professor's next challenge is to shepherd the product to the marketplace. The Oregon Built Environment & Sustainable Technologies Center, a nonprofit focused on boosting Oregon's reputation as a place to do green business, is working to connect Elzeyadi with a business for commercialization of the awning.

"Compared to other products, like computers and cell phones, there is not a lot of research and development funding available for building sciences," Elzeyadi said. "That's a huge challenge for us. New ideas are always susceptible to failure and we don't have many vehicles for funding."

To get to the point he has with his prototype, Elzeyadi used capital construction funding from the Oregon University System, seed money from in-kind donations and a grant from Oregon BEST. Now, he is hoping that potential business partners will see the product's potential when they visit Onyx Hall.

"The economic climate is tough right now," said Greg Kleinner, spokesman for Oregon BEST. "But the good thing about Ihab's project is a company can see it in action. It's not sitting on a lab bench. It's a working prototype, and once you have that, it's easier to attract interest."

Elzeyadi is proud of his prototype, but he thinks it can do more. He is studying how to incorporate LED lights into his prototype to provide night-time lighting for the building.

"The same device that is harvesting daylight could emit electric light at night with LEDs," Elzeyadi said. "I'm trying to combine green products in buildings that benefit one another."

Sources :