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Giving back: Rose House takes energy efficiency to next level



GREEN INVESTMENT
FUND GRANTS

BY RICH RIEGEL

for the Daily Journal of Commerce

When Eldon Haines and Linda Rose leave their newly built Northeast Portland home for an early morning walk, the house will be just warming up to the job it will perform of generating the energy it needs.

The Rose House, one of the Oregon Department of Energy's demonstration homes, is being designed and built to generate annually more electricity than it consumes through a combination of energy conservation measures and a rooftop 3.3-kilowatt array of solar photovoltaic panels.

Christopher Dymond, energy analyst with ODOE, explained that the Rose House is a new class of home because it is a prototype demonstrating a new way of thinking about power generation. Dymond and his colleagues envision the house serving as one of many power sources within a distributed network designed to meet the community's peak energy needs.

In a distributed network, rather than using a limited number of



large central plants to generate energy and supply the power grid, electricity is generated through many small sources distributed around the grid closer to the places where the power will be used.

"The state of Oregon is emerging as a leader in developing a sustainable economy based on innovative practices," said Dymond. "If we want to achieve a local economy that generates what we need within our limited resources, we must start now.

Continued on next page



Dan Carter/DJC

Above, the Rose House, owned by Eldon Haines and Linda Rose, when finished will be an accessory dwelling unit which generates more electricity than it will use. The Rose House uses a structural insulated panel system at the roof, a staggered stud system, at left, at the walls and special foundation insulation details, minimizing temperature changes.



May 10, 2004

Continued on previous page

"The Rose House," Dymond continued, "is a demonstration of available technology for people ready to make lifestyle choices contributing to a healthier, livable, prosperous future."

When Haines and Rose decided three years ago to build a retirement home close to their children, an accessory dwelling unit in their children's backyard provided the solution. An accessory dwelling unit is a provision within Portland's zoning code.

As early pioneers of solar energy and sustainable living in the Northwest, Haines and Rose were committed to solar and green design principles.

The couple decided to design and build an 800-square-foot home that embraced sustainable design principles. They worked with John Echlin, principal in charge, and Clark Brockman, project manager, with Portland's SERA Architects, along with Dave Heslam of general contractor Coho Construction Services Inc. of Portland.

As a member of the Oregon Natural Step's construction group, Echlin had worked with ODOE's Charlie Stephens to answer the question, "What is a fully sustainable approach to energy for a building?" The group's answer was that a building should operate within its solar income, which the group defined as the energy contained in the sunlight that falls on a building. Dymond, Echlin and Brockman approached the clients of the Rose House with the concept of achieving a green-building design with zero net energy use – a concept which Haines and Rose enthusiastically embraced.

To meet the net energy goal, the Rose House employs several energy conservation strategies and technologies, including a space conditioning system that uses less than half the energy of a conventional system while providing abundant fresh air and eliminating the need for a furnace, resulting in a zero green-house gas emissions footprint.

The home's advanced shell design is super insulated.

It uses a structural insulated panel system at

the roof, a staggered stud system at the walls and special foundation insulation details, minimizing temperature changes.

SERA Architects and Coho Construction expect the home's high performance fiberglass windows to provide an airtight seal.

Because the Rose House is a prototype, the Oregon Institute of Technology in Klamath Falls will collect ongoing data to analyze the cost and flow of energy, allowing the design and construction industry to continually develop green building improvements on residential homes and on large-scale projects.

For SERA Architects, a firm well steeped in the intricacies and details of green building and sustainable design, this project presented special design challenges due to its smaller scale and limited budget.

The team committed to using easily replicable construction techniques that could be accomplished for not more than 115 percent of conventional comparable cost.

"The key difference with the Rose House," said Echlin, "is that in addition to demonstrating technical innovation, it is all about affordable and appealing design that is accessible to the general population.

"We are using a limited palette of materials," he added, along with "selective window placement, good daylighting and proportions to create an attractive small house.

"Linda and Eldon wanted as much sunlight brought into the living area as possible," said Echlin, though it meant punching a hole in the roof, which the energy guys weren't crazy about. But the clerestory not only provides generous daylight bouncing off the walls, it also allows for natural stack ventilation instead of air conditioning – and they did like that."

Because accessory dwelling units by code must have similarities to the homes to which they are attached, Echlin's roof form and the lap siding for the Rose House relate to the main house and surrounding neighborhood.

According to SERA's Brockman, "The Rose House goes beyond green building and starts to utilize ideas and methods that could lead toward truly sustainable architecture such as energy generation, zero greenhouse gas-relat-

ed energy impacts and low toxicity materials.

"In addition," Brockman continued, "we emphasized daylighting, increased living density and multigenerational living (as an accessory dwelling unit), and detailed with conventional construction materials and methods in mind."

ODOE's Stephens, who provided technical assistance for the project, said that this type of home is very affordable while containing all the typical amenities of a comfortable living environment.

"The home's integrated design actually creates a superior environment," he said, "with better indoor air quality, enhanced lighting, consistent temperature control and a quieter interior than a conventional residence."

Securing a \$15,000 grant from the city of Portland's Office of Sustainable Development to be used directly for construction costs was a key factor in the Rose House moving forward.

"The Green Investment Fund has helped us identify sustainable building practices and technologies that can be transferred to other projects throughout Portland and the region," said Dan Saltzman, commissioner-in-charge of the city's Office of Sustainable Development. "Portland continues to live up to its commitment to becoming a sustainable city and spurring innovation that connects our built environment to our natural environment."

Some of the home's appliances will also qualify for an Oregon Residential Energy Tax Credit.

The new home is scheduled for completion this month and is a key tour stop on the ReThink 2004 training series, sponsored by the Office of Sustainable Development for commercial and residential building design and construction professionals.

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EDITOR'S NOTE: This article is part of an ongoing series of Daily Journal of Commerce stories that provide an in-depth look at local projects recently selected to receive 2004 Green Investment Fund grants from Portland's Office of Sustainable Development. The projects were selected as grant recipients based on their use, or planned use, of innovative or unusual sustainable technology and approaches.

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