

Energy-Efficient Schools

Oregon is aggressively pursuing energy efficiency in public schools by creating a funding infrastructure of financial incentives and technical support to help make the schools of the future a reality today.

The Jungers Culinary Center at Central Oregon Community College in Bend, Oregon, enrolled in Energy Trust's Small Commercial Efficiency pilot program, which was created for smaller commercial buildings.

WHEN EDUCATORS DISCUSS creating a high-quality learning environment, they can mean a range of things—from disciplinary practices to curriculum to the physical space. When energy efficiency experts talk about it, they refer to the interior spaces of classrooms—lighting, ventilation, heating, and cooling.

State governments are looking at opportunities to support both education and energy goals through a comprehensive effort to improve schools' energy efficiency. It is an idea that is gaining support among policy makers and community leaders. After all, lowering energy costs frees up more money for classroom instruction, and more comfortable, well-lit classrooms are shown to be a factor in better learning outcomes.

Slim state funds, however, mean that incorporating green building practices into new school construction and renovations can be seen as a frill in already tight budgets. Oregon's leaders have taken the position that the learning and financial benefits of energy efficiency and sustainability make them a top priority, and have created a funding infrastructure of financial incentives and technical support to help make the schools of the future a reality today.

Oregon wrote its commitment to energy efficiency into law in 1999 when Senate Bill 1149 created a public purpose charge dedicated to a clean energy future. The legislation mandated that the state's two largest investor-owned electric utilities collect a 3 percent public purpose charge from customers. Ten percent of those funds is directed to the Oregon Department of Energy for energy efficiency projects in the existing public schools within those utility service districts; 16.2 percent supports energy efficiency for low-income households; and 73.8 percent funds Energy Trust of Oregon, a nonprofit organization that delivers energy efficiency and renewable energy programs to commercial, industrial, and residential ratepayers. Subsequent legislation—and funding agreements with Oregon's large natural gas utilities—has allowed the nonprofit to help more public and private kindergarten through 12th-grade schools lower electricity and gas use.

Energy Trust is helping lead the building community to make green buildings the standard in Oregon. Program offerings are helping public schools—from K-12 to higher education—tap into resources to build

school facilities that sustainably meet education and financial goals for their students, faculty, and communities. The following are three of these Oregon school stories.

Hood River Middle School

When voters in Oregon's Hood River County approved a \$26 million construction bond measure in 2008, \$2.6 million was set aside for major renovations to historic Hood River Middle School. Visionary science teacher Michael Becker and his fellow teachers had already established a curriculum that incorporated sustainable concepts, so when the bond provided the funding for new science and music classrooms, officials knew what to do: create a school that would accommodate student needs and also serve as a teaching tool to illustrate sustainable ideas in practice.

Energy Trust's Path to Net Zero pilot program provided an opportunity to reach for the pinnacle of sustainability—a building that generates as much energy as it consumes. To be eligible, pilot projects had to be in the schematic design phase or earlier and commit to achieving energy efficiency savings of at least 50 percent beyond 2007 Oregon energy code, with combined energy efficiency and renewable energy savings of at least 60 percent beyond Oregon code. The district reached out to the community to make the case for pursuing net-zero energy and water and found it receptive to the idea. "We received a very favorable response from the school board, staff, and the community of Hood River for innovative energy measures," says Nick Hogan, finance director at the Hood River County School District.

Accepted as a pilot site, Hood River received cash incentives from Energy Trust for holding a comprehensive early design char-



RENDERING BY YOST GRUBE HALL ARCHITECTURE

Below: South Medford High School in Medford, Oregon, expects to save operating costs exceeding \$86,000 per year. Right: The Hood River Middle School in Hood River County, Oregon, serves as a teaching tool to illustrate sustainable ideas in practice.



MAHLUM

rette, conducting energy modeling, installing equipment and systems, and monitoring and reporting on post-occupancy energy use and consumption. Energy Trust also provided technical support and engineering expertise.

Portland's Opsis Architecture designed the 5,600-square-foot (520-sq-m) building to Leadership in Energy and Environmental Design (LEED) Platinum standards with net-zero energy and water use. The school's energy solutions include a geo-exchange system of underground piping and a radiant slab, displacement ventilation, and a 35-kilowatt electric solar array.

Now that the building is occupied, Hood River students are gaining hands-on education in sustainability in Becker's classroom, where he has incorporated the building's design and energy-use monitoring into his lesson plans.

South Medford High School

The passing of a \$189 million school bond measure in 2006 gave southern Oregon's Medford School District the green light to start design of a much-needed new high school. Mahlum, with offices in Portland and Seattle, and ADW Architectural Design Works Inc. of Portland designed the 255,000-square-foot (2,400-sq-m) South Medford High School, which

welcomed students last fall. Project goals focused on accommodating up to 2,000 students while prioritizing building durability, ease of maintenance, and energy efficiency for long-term operational cost savings.

The school set aggressive energy-use reduction goals of 25 percent electricity savings and 40 percent natural gas savings over a building of similar type and size. The design includes energy-efficient lighting and lighting controls, as well as extensive north-south natural daylighting. A high-performance building envelope includes energy-efficient windows, ceiling and wall insulation, displacement ventilation, and a heat-recovery system to reduce heating and cooling costs and create a more comfortable indoor environment. The building is on track to meet energy goals, and administrators expect operating cost savings to exceed \$86,000 per year. "The design created high-quality learning environments with systems that maximize both return on investment and human comfort," says Mark Cork, a principal at Mahlum.

Jungers Culinary Center, Central Oregon Community College

The board of directors of Central Oregon Community College (COCC) in Bend is committed to a healthy, sustainable environment. So when members secured funding through



PHOTOGRAPH COURTESY OF HOOD RIVER MIDDLE SCHOOL

the COCC Foundation capital campaign for a new 14,700-square-foot (1,360-sq-m) facility for the college's culinary instructional program, they aspired to aggressive energy efficiency and green building standards. However, the cost of green building certification and energy modeling and analysis for such a small building was cost-prohibitive.

To achieve its goals at a cost it could afford, COCC enrolled in Energy Trust's Small Commercial Efficiency pilot program. The program seeks to maximize energy performance in buildings of up to 70,000 square feet (6,500 sq m) with guidance and incentives for off-the-shelf efficiency solutions for lighting, heating and cooling, controls, and equipment, based on the Advanced Buildings Core Performance Guide—Oregon Edition. Each energy solution is screened for cost-effectiveness and savings impact, creating a higher return on investment. Completing the Core Performance energy package also fulfills the energy requirements for Earth Advantage Commercial green building certification, an affordable, Oregon-specific green building certification specifically created for smaller commercial buildings.

The lighting, heating and cooling system, and kitchen equipment were pinpointed as the primary energy-saving opportunities by Yost Grube

Hall Architecture of Portland and Pinnacle Architecture of Bend. When completed in September 2011, the building will have energy-efficient lighting and automated lighting controls that exceed Oregon energy code by 25 percent, demand-control ventilation in the majority of occupied spaces, hot-water radiant flooring throughout, and a night flush ventilation system. Energy Star-qualified equipment, including refrigerators, freezers, and gas fryers, is specified for the kitchens.

"The energy efficiency elements we're incorporating will save us money year after year," says Gene Zinkgraf, director of construction at COCC. "Those funds can be used for instructional purposes. Whether that means we can serve more students or hire more faculty, it is a big win for the school and the community."

When public schools incorporate energy efficiency goals, everyone involved—from the students to the faculty, taxpayers, and ratepayers—benefits from significant educational and financial paybacks. In Oregon, the foresight of government leaders and the passion of local communities are creating a fertile environment for sustainable learning. **UL**

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