



**Oregon State University**  
Corvallis, Oregon  
Energy-Energy Center

**SCHOOL**

Oregon State University (OSU) is a four-year public university located in Corvallis, Oregon. The university has a student population of 23,761.

**ABSTRACT**

OSU is well-recognized for its efforts in sustainability. These efforts span across multiple areas, including efficient and renewable energy production and promotion of alternative transportation. The OSU Energy Center, the nation's first LEED Platinum-rated power facility, became fully operational in June 2010. The cost and effort required to maintain the old Heat Plant, as well as a need to meet OSU's increasing steam load, were main drivers of the project. It was also an opportunity to increase the



efficiency of generation of energy (both steam and electricity). The Energy Center provides for the University's energy needs through a co-generation process, allowing OSU to capture the waste heat from electricity producing turbines and convert it into steam heat. This allows OSU to generate nearly half of its electricity needs on site. With a maximum generation capacity of 6.5 megawatts the highly-efficient system saves OSU an estimated \$650,000 a year in energy costs. The Energy Center is expected to reduce OSU's carbon emissions resulting from electricity production by 38 percent. In addition to its heating and energy producing roles the center will also serve as learning lab for OSU students by allowing them to mine energy data and test alternative bio-energy sources. Total project cost was approximately \$52 million, and was funded through a combination of bonds, deferred maintenance funds, and energy and carbon emissions reduction incentives.

**Goals and Outcomes**

Project coordinators had projected the center would cut OSU's electricity by \$650,000 annually. But the goals of center go far beyond energy efficiency and reducing carbon emissions. Features showcasing sustainable building design are dispersed throughout the 27,000 square-foot LEED Platinum building. The plant currently runs on natural gas with a diesel backup, but it can also run on biodiesel and methane. It is anticipated that the plant will be fully powered by alternative energy sources once they are made available and affordable in years to come.

Specific outlined goals for the project include:

- Reduce by at least 30% the fossil fuel needed to produce OSU's electricity.
- Reduce air emissions, including an estimated 38% reduction in greenhouse gases.
- Reduce water consumption through rainwater harvesting and upgraded equipment.

- Provide onsite facilities for sustainable/renewable energy research and demonstration.
- Provide onsite facilities for teaching energy and environmental professionals.
- Ensure greater control over operating costs in an escalating energy market.
- Minimize transmission losses by generating about 50% of campus electrical needs onsite.

### **Accomplishments and Outcomes**

The energy production and cost-savings goals of the center are expected to be met; through the first 8 months of FY11, utility costs were \$350,000 less than the same time period in FY10. This savings calculation has not been normalized for weather or other factors. OSU is in the process of performing its FY11 Greenhouse Gas Inventory, which will provide data on emissions reductions.

The project earned a total of 52 LEED points to obtain its LEED Platinum recognition. The most notable areas of the project's sustainable design include: Alternative transportation; Available bike storage and changing rooms, small parking capacity, and public transportation access. Natural cooling; reflective impervious surfaces are on the roof the center. Stormwater management; Best Management Practices remove 88% of Total Dissolved Solids. Water efficient landscape; drought resistant plantings, Evapotranspiration-based irrigation controls, and low-flow irrigation. Water use reduction; dual flush toilets and ultra low-flow sinks & showers. Building energy use that is 52% below code; A well-insulated thermal envelope is installed in the occupied portion of the center, high performance glazing are on all windows, lighting levels are set low, occupancy and day lighting controls are installed along with demand control ventilation and natural ventilation. Waste heat from electricity & steam production is used to heat occupied spaces and the blowdown from boilers is used to heat occupied space. Wise use of Materials and Resources; 95.4% of waste was diverted from the landfill, 29% of building materials were made from recycled materials, materials were regionally sourced, and all wood is certified as sustainably harvested.

In 2009, just before the Energy Center went fully operational in 2010, the OSU Climate Plan was developed by staff members at the OSU Sustainability Office. This plan outlines methods and strategies towards OSU's goal of becoming Climate Neutral (defined by the ACUPCC as "having no net greenhouse gas emissions") by 2025. Direct reductions in emissions through conservation and efficiency projects is the most effective way to achieve OSU's goal, and the Energy Center exemplifies the institution's commitment to progress.

### **Challenges and Responses**

Recurring maintenance costs may be more than initially expected and will reduce cost savings associated with the project. It is essential to know and consider these costs when evaluating a project of this type.

### **Campus Climate Action: Your School's Carbon Footprint**

Through its substantial contributions to greenhouse gas emissions reductions (namely CO<sub>2</sub>) the Energy Center directly contributes to climate change mitigation. Climate mitigation is big priority for OSU, which is a signatory of the American College and University President's Climate Commitment.

### **Commentary and Reflection**

The Energy Center illustrates human ingenuity in sustainable building design and construction. While much of the credit is attributed to the engineers on the project, appreciation also goes out to the

administration, our funding sources, and the Sustainability Office for a high level of support for the center. Collaboration around such a project is crucial to its success.

## **ENGAGEMENT AND SUPPORT**

### **Leaders and Supporters**

Major leaders of the project include: Larrie Easterly, University Engineering Manager and Project Manager, Steve McKinney, Energy Center Manager, Les Walton, Supervisor of Energy Operations, and Brandon Trelstad, Sustainability Coordinator. Design and Oh Planning + Design and Jacobs Engineering, both of Portland, collaborated on the Center. W&H Pacific worked on civil engineering and landscape architecture. PAE Consulting Engineers worked on the mechanical, electrical and plumbing aspects and Green Building Services was hired for LEED documentation and certification. Rider, Levett & Bucknall was hired for cost estimating and Andersen Construction was the construction manager/general contractor.

### **Funding and Resources**

The \$52 million dollar project was funded by a combination of state bonds, The Climate Trust, OSU deferred maintenance funds, gifts, and energy tax credits. Some of the bond money will be repaid through energy savings. This project was not supported through a NWF Campus Ecology Fellowship.

### **Education and Community Outreach**

The Energy Center provides an onsite facility for sustainable/renewable energy research and demonstration. It also offers a learning lab for OSU students by allowing them to mine energy data and test alternative bio-energy sources. More recently, tours of the center are being offered to interested members of the OSU and greater community. These tours will grow in time as more people discover the Energy Center's tremendous contribution to sustainability at OSU.

### **National Wildlife Federation's Campus Ecology Program**

The Campus Ecology program did not directly contribute to the success of this project. However, the program is a source of inspiration for those working on sustainability-related projects and policies at OSU. It is the hope of staff at the OSU Sustainability Office that as a result of this report and others, strong connections are made between our office and the Campus Ecology Program.

## **CONTACT INFORMATION**

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## **MORE ABOUT YOUR SCHOOL**

### **Campus Sustainability History**

Just before the Energy Center went fully operational in 2010, the OSU Climate Plan was developed by staff members at the Sustainability Office. This plan outlines methods and strategies towards OSU's goal of becoming Climate Neutral by 2025. The OSU Sustainability Office (created in 2007) is the primary support organization for sustainability efforts at OSU. The office works in areas of networking and communications, infrastructure and administration, student engagement and academic support. We also collaborate with the Student Sustainability Initiative and Campus Recycling on campus events, projects, and initiatives.

**Image credit:** OSU Sustainability Office