

# WHY ACT NOW?

## We will continue to lead the way.

While our efforts were on the leading edge in 2000 when the UO Sustainable Development Plan and LEED were adopted, portions were outdated in the fast-paced world of sustainable design. We needed to clarify our focus and strengthen best practices based upon current knowledge.

"Many of our green initiatives in academics and operations have been recognized over the years. Working towards climate neutrality is a significant undertaking for a large research institution and requires us to explore new territory, and **we will continue to lead the way**."

• President Lariviere's March 2010 introductory letter to the Climate Action Plan (CAP)

## We will respond to our 2010 Climate Action Plan commitment.

The University of Oregon must implement aggressive reduction strategies to meet its goal of **net zero emissions** as specified in the UO's 2010 Climate Action Plan:

- 2010: Stabilize and begin to reduce greenhouse gas emissions
- 2020: Achieve greenhouse gas levels 10% below 1990 levels

2050: Climate Neutrality

# We will focus on issues that matter most to the environment and to our campus: ENERGY, WATER, AND PEOPLE.

**Energy:** According to the Climate Action Plan, 60% of the university's emissions are from buildings and facility expansion is the single biggest driver of rising carbon emissions and energy use. Exploring more aggressive standards for new construction is one of the CAP's four highlighted action items:

"New Construction – Green design can dramatically reduce heating, cooling, and plug loads in our buildings. Currently, all new construction and large renovations must be LEED silver equivalent and exceed state energy code by 20%. However, we will explore adopting more aggressive design standards. A review will be completed within one year ...."

- President Lariviere's March 2010 introductory letter to the CAP

**Water**: Water is one of Oregon's most precious resources. Around the country, polluted and contaminated runoff accounts for 70% of water pollution in urban areas and is the leading cause of poor water quality and the degradation of aquatic habitat. Stormwater runoff from our parking lots and streets has the greatest negative impact on the region's water quality. Given the unique attributes of our campus — our large physical size with many open spaces and our direct connection to the Millrace and the Willamette River -- we have the ability to significantly improve the region's water quality and associated natural ecosystems.

**People:** Promoting energy awareness among people who occupy a building can provide energy savings for a negligible upfront cost (according to the EPA and the Center for the Built Environment at UC Berkeley). More importantly, as an educational institution, we have a particular opportunity and responsibility to educate campus users.

# HOW DID WE DEVELOP THIS PROPOSAL?

## We asked. We listened.

In the past year we posed the question to key campus constituents about how to move forward with a new model for sustainable development. During the initial stage:

- We held initial meetings with key campus staff, the Campus Planning Committee, and City staff.
- We reviewed current sustainable models and examples from other institutions.
- We held a round table conversations attended by faculty, engineers, architects, and UO staff.

These initial conversations helped define the areas of focus.

### We must focus on issues that matter most: ENERGY, LANDSCAPES, and PEOPLE.

Campus Planning and Real Estate (CPRE) led the project with the Campus Planning Committee serving as the primary review body. All requirements of the *Campus Plan* amendment process were addressed.

The first draft proposal incorporated suggestions from key staff administrative departments (primarily Facilities Services and the Sustainability Director), and initial input from AAA faculty at two round table sessions. We followed UO leadership's direction by soliciting broader input to develop a refined proposal.

Summary of Input Process:

- Round table advisors, key UO staff, and Campus Planning Committee input throughout process to develop and refine the model.
- Feedback from key UO faculty/staff/students including:
  - Facilities Services
  - Sustainability Office
  - Executive Leadership Team
  - Dean's Working Group
  - Auxiliaries (in particular Student Affairs and Athletics)
  - Vice Presidents and unit representatives
  - AAA
  - Environmental Issues Committee
  - ASUO
  - Student Sustainability Coalition
  - University Senate
  - OA Council
  - City of Eugene Planning and Public Works
  - other interested individuals/groups
- Open house
- Campus Planning Committee public hearing and action
- Adopted July 2011

We obtained professional assistance to clarify associated costs and to determine the appropriate Advanced Energy Efficiency Threshold goal. In addition, we worked with the City to determine how best to implement the proposed stormwater goal within the context of the current stormwater code.

The Campus Planning Committee recommended that the president approve the policy amendments at it May 26, 2011 meeting. Final adoption occurred July 2011.

For more information or a copy of this document visit our website (<u>http://uplan.uoregon.edu/</u>) or contact Christine Thompson, University of Oregon Campus Planning and Real Estate (<u>cthomps@uoregon.edu</u>, 541-346-5572).

# WHAT WOULD IT COST?

## ENERGY GOAL: Net Zero Increase in Campus Energy Use from New Development

We estimate that, over the next ten years, this proposal will cost:

- 1% to 6% of each individual total project cost, or
- a total of 10 million dollars in first costs.

Costs are based upon based upon recent and projected construction projects. It is estimated that nine projects totaling 1.3 million sq ft will be constructed in the next ten years. Costs do not account for annual savings resulting from a decrease in energy use. Also, all funds will not be needed up front. Rather, they will be needed incrementally as development projects occur.

**Funding sources:** Up-front costs will be shared by new development project funds and central funds in order to:

- reduce the financial burden of a single project and account for the underlying differences in energy use for different building types (e.g., a typical classroom versus a lab);
- provide a financial incentive for development projects to strive for energy efficiency;
- provide an opportunity to solicit donor funds; and
- repay central funds over time with annual savings resulting from decreased energy use.



# FREQUENTLY ASKED QUESTIONS

## 1. Why is this important to the University of Oregon?

Our current era may well be remembered as a critical moment in defining how to live productively in an environment that not only satisfies our own needs but also is sustainable for future generations. Since the 1970s the university and the State of Oregon have been national leaders in establishing sustainable practices. At the state level these include water quality, land-use planning, and the "bottle bill," and at the campus level, transportation and recycling initiatives.

Ten years ago the university became one of the first universities in the nation to develop and adopt a plan for sustainable development of its campus. The university is a signatory of the American College and University Presidents' Climate Commitment and has put in place its own Climate Action Plan. When signing the Climate Action Plan in 2010, President Lariviere called for the campus to "continue to lead the way" in green initiatives. The university's faculty also is well known for its international contributions toward creating and disseminating knowledge about sustainable structures and processes. The university recognizes its special position within a milieu that values the environment. It benefits from a concentration of intellectual resources and values its mission to teach and to conduct cutting-edge research on the challenging issues before us. As such it is uniquely positioned to lead the way in creating a sustainable environment both for the people of Oregon and beyond.

### 3. This sounds expensive. Who pays and what are the trade offs?

The Model proposes that associated development costs be shared between individual building projects and central funding sources. The costs of implementing the proposed actions in each building vary between 1% and 6% of the project cost depending on the kind of building. The total cost over the ten-year cycle of the Model are anticipated to be about \$10 million (assuming 1.3 million square feet of development with a value of about \$475 million). The contribution from central funds would be approximately \$2 million and the remaining \$8 million would be split among the individual projects. Clearly, these additional costs will come at the expense of other initiatives. In the case of each individual buildings will have to be smaller or of a lesser quality construction. For the central funds, centrally funded initiatives such as this will have to become a priority. However, maintaining our position as the nation's leader in sustainability is precisely consistent with our academic plan and is a direct reflection of who we are.

## 4. Are there tangible benefits to implementing this Model?

Research has shown that occupants are healthier and happier in sustainably designed buildings through increased access to outside air and natural day light. Another long-term benefit is the reduction of energy costs due to lessening the amount of energy required to support and sustain building activities.

## 5. The goal of the Model sounds overly aggressive. Is it actually feasible?

The Model was developed by university staff who manage the design and development of the campus in consultation with university research faculty and a variety of private sustainability consultants, architects, engineers, and other experts in the field. Once the idea of the Model was in place, a review process, which extended over several months, included an in-depth analysis of the feasibility and costs of the Model's energy component. The Model, as proposed, is both feasible and effective without being overly expensive to implement or wildly optimistic in its objectives.

# 6. What about limiting the airplane travel of our community because this accounts for a huge part of our carbon footprint?

The Oregon Model for Sustainable Development is limited to new and renovated buildings only. The university also is making great strides in reducing carbon footprint in areas other than buildings. Please visit the Office of Sustainability web site for other initiatives.

# CASE STUDY

# East Campus Residence Hall

### Background

The University of Oregon is in the process of adopting a new model for sustainable design. This model anticipates requiring projects to meet a high standard of energy efficiency, a new approach towards stormwater treatment, and the continued education of building and campus users about their new buildings. The model also anticipates retrofitting existing buildings to make them more energy efficient and to offset the new energy needed by each new project. Accomplishing each of these initiatives requires the expenditure of funds, and there is a corresponding effect on individual projects and campus expenditures relating to the resulting trade-offs.

This paper uses a recent project, the East Campus Residence Hall, to illustrate the possible effects of various trade-offs. It also relies on data in a 2011 study by SOLARC, an engineering firm hired to examine the higher energy standard, its costs, its operating savings, and the feasibility of retrofitting existing buildings to reduce their energy use. Finally the paper uses input from staff within both University Housing and Campus Planning and Real Estate.

This paper does not analyze the trade offs needed to pay for retrofitting existing buildings because, in the case of auxiliaries, those costs are set at a level that results in a simple payback of less than ten years and, in the case of the centrally provided funds, the costs are paid back within twenty years.

# • The East Campus Residence Hall (ECRH) and the Oregon Model for Sustainable Design (OMSD)

The ECRH project currently is under construction and is generally described as a \$68 million, 175,000 GSF building that will house 450 beds, dining facilities, meeting facilities, classrooms, and other spaces typically found in a residence hall.

The idea behind this case study is to examine the project budget and explore possible ways to realign it to accommodate the additional costs.

To implement the higher standard of energy-efficient design an expenditure of \$680,000 would have been required. The requirement to certify the building as LEED gold would have cost \$150,000, and the requirement to implement training for the use of the building would have cost \$35,000. Together these additional costs equal \$865,000.

The building's annual operating costs would be reduced by \$37,000 as a result of lower energy use if the building were built to the higher energy-efficiency standard.

CPRE staff has reviewed this additional cost with leadership from University. A further followup communication with the Housing's capital project manager identified several specific strategies for how the project budget might have been adjusted. One strategy was to simply increase the budget and—since the project will be supported by the income it brings in—increase the rates charged to the occupants. Other strategies included changes to the design of the building, shifting costs to other parts of the campus, and finding efficiencies in the techniques used to construct the building.

# • Strategies for accommodating the cost of the Oregon Model for Sustainable Design in the East Campus Residence Hall

### 1. Charge a higher room-and-board rate to students.

While simplistic in its genesis, this idea could negatively affect students' decisions to attend the UO if room and board costs were to rise significantly. It is beyond the scope of this paper to understand the actual effect of the rate increase needed. Cursory analysis estimates that to meet the OMSD's energy-efficiency standard, the residence hall's construction cost would increase by 1.3%; however, knowing how this translates into increased annual rates is not feasible to do here. It is important to note—and this is true for every strategy noted—that if the building were designed to the higher standard, its annual operational savings in terms of energy costs is \$37,000. Again, it is not possible to know how this might affect the annual rate charges, but this annual savings would apply throughout the life of the redesigned building.

### 2. Build a smaller building

At the current project cost, about 3,150 square feet would have to be removed to remain within its \$68 million budget. Removing income-producing spaces (defined as those directly related to housing the student, i.e., rooms, common spaces, dining facilities, resident life program spaces, bathrooms, etc.) should not be considered. Reducing the size of individual income-producing spaces (such as room size) negatively affects the marketability of the project and as such was not seen as a viable idea either.

What is left are spaces that do not relate directly to producing income, such as classrooms or other academic support areas. Roughly 3,100 square feet is equal to four classrooms and about 190 classroom seats. To reduce these spaces, other adjustments would need to be made, which may likely decrease the functionality of the ground floor spaces or reduce the size of the enclosed courtyards.

#### 3. Reduce the quality of materials and the design.

Reducing the quality of finish materials in the public areas of the building would produce upfront savings but also would increase maintenance over time. Redesigning and simplifying the building's exterior could negatively affect its character or uniqueness and possibly reduce it attractiveness to students. Exact costs of such reductions are beyond the scope of this paper.

4. Shift costs to other entities on campus.

Other funding sources could be found for the classrooms, the replacement of the pre-existing on-site parking, or other aspects of this project not directly related to housing activities. As noted above, the classrooms are one possible source of cost-shifting strategy.

5. Find efficiencies in the project's administration, its design and building techniques, or its financing.

It is reasonable to assume that the project as it is being managed currently contains some opportunities for cost savings. Cost-saving trade offs often result in a loss of control of certain aspects of the project and could result in inefficiencies due to a loss of coordination.

#### Conclusion

These are some of the ways that the costs associated with applying the Oregon Model for Sustainable Development to the East Campus Residence Hall project could be accommodated. Most likely, accommodation would come as a result of a combination of the ideas listed above. As was noted, it is important to keep in mind that the annual cost of operations will be reduced as a result of implementing the higher standard of energy efficiency.