ECOCARRETTE REPORT

UNIVERSITY OF OREGON

EAST CAMPUS RESIDENCE HALL

August 13, 2009

prepared by Zimmer Gunsul Frasca Partnership
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PURPOSE AND METHOD

The purpose of the East Campus Residence Hall EcoCharrette was to collaboratively explore the project’s vision and environmental performance goals. The ideas and opportunities explored at the eco-charrette are used to inform the user group in setting project priorities and direction in support of aggressive but achievable sustainable design for the residence hall. The established framework is then used to guide the building’s design and ensure success throughout the design process. The EcoCharrette is not an opportunity to evaluate the details of how to achieve the established goals, but rather to determine the lens through which important decisions will be made by the design team.

The eco-charrette was a participatory day, actively engaging the thoughts and ideas of all the attendees. After a short overview presentation (attached as Appendix A), the group engaged in a brainstorming exercise to identify the Opportunities and Challenges associated with the project. The attendees then described their Vision for the ECRH, in terms of qualities, function, perception, and relationship to the campus. Once the proposed Vision was summarized and organized, the UO representatives then provided input as to the relative priority of each of the desired outcomes discussed. Then the discussion turned to three areas, to further refine and clarify the goals established in the beginning of the charrette - Teaching Opportunities, Site/Water, and Building Systems.

This report summarizes the Eco-charrette held on August 13, 2009 from 8:30am to 3:00pm in the Gumwood Room of the Erb Memorial Union. The report also outlines potential next steps to continue the enthusiasm and momentum gained during the event.
The University of Oregon’s long-standing commitment to sustainable development and campus planning has created a significant body of policy in support of sustainable design principles, woven throughout the breadth of departments.

In addition, there are State mandated procedures that also influence project process and performance. Both of these sources of foundational aspirations - both institutional and regulatory - for this project have been outlined below.

**Broad Policies and Commitments**

- Comprehensive Environmental Policy Statement ('97)
- Campus Plan (2005)
- Sustainable Development Plan (2005)
- Sustainability Assessment Indicators
- ECRH Project Description
- American College and University Presidents Climate Commitment (ACUPCC)
- Eugene and Oregon Code, OR Governor’s Executive Order

**Focused Issue Policies:**

- Recycled Paper Policy
- Wood Products Purchasing Policy
- Bike Plan
- Campus Tree Plan
- Campus Transportation Plan
- Integrated Pest Management

The various policies related to sustainable development impact issues that fall within the following categories, further detailed in the following pages:

- Academics and Culture
- Development – Planning and Design
- Planning and Design Process
- Patterns
- Materials – Resource and Waste Management
- Greenhouse Gas Emissions
- Energy
- Land Use/Transportation
- Water
- Site/Landscape

**ACADEMICS AND CULTURE**

- Research focus on sustainability
- Sustainability-related curriculum
- ASUO-funded student sustainability programs
- Student publications dedicated to sustainability
- Sustainability service and outreach

**DEVELOPMENT – PLANNING AND DESIGN**

“The physical environment of the university - its landscape and buildings - must also support and enhance the excellence of our academic programs. Therefore: develop, redevelop, and remodel in ways that incorporate sustainable design principles.”

**PLANNING AND DESIGN PROCESS**

- Project Management and Integration
- Performance Standards – SEED and LEED
- Living Design – encourage sustainable behavior
- Connection to the Environment – connect occupants with university’s cultural and environmental features

**PATTERNS**

- Wings of Light
- South Facing Outdoors
- Pedestrian Pathways
- Sustainable Form
- Academic Linkages
- Accommodate Change
- One Room, Many Uses
- Participate in Sustainable Living
GREENHOUSE GAS EMISSIONS
Commitment to reduce emissions immediately
Commitment to action plan to achieve climate neutrality as soon as possible
3% minimum green power purchase
Measure, track, and report all greenhouse gas emissions

ENERGY
"Top Priority" to save energy
Maximize use of passive systems and synergistic strategies
Commitment to increase onsite production of renewable power
Design to meet occupancy patterns and provide for operability for indoor environmental quality

MATERIALS - RESOURCE AND WASTE MANAGEMENT
Environmentally Preferable Purchasing
Life Cycle Impacts – maximize longevity, reduce material use, reuse, and recycle
Facilitate recycling by occupants through the design of convenient recycling facilities
Purchasing and waste guidelines to minimize of toxic and hazardous materials
Reuse or compost food waste

LAND USE/TRANSPORTATION
Use wisely what we have - maintain existing building stock and open space where feasible
Bike storage convenience and quantity
Provision of free bus passes for entire university population

WATER
Water to be protected - as one of OR's most precious resources
Augmentation of natural drainage and treatment of storm-water runoff onsite
City of Eugene requirement to connect to sewer if within 300 feet
Trend – UO summer water use significantly higher due to irrigation

SITE/LANDSCAPE
Stormwater management policy
Need to collect and pipe stormwater to public storm system
Must provide stormwater treatment for all new and replaced impervious surfaces
Site and orient new construction for synergy with environmental and campus context
Protect existing ecosystems
Native/adaptive vegetation
Integrated Pest Management program
Minimize noise and light pollution
Continue to enhance the campus forest
**WORKSHOP PROCESS**

**OPPORTUNITIES AND CHALLENGES**

This process enables the EcoCharrette participants to discuss and understand the factors that will shape the project’s success.

By understanding influences that contribute towards or complicate various sustainable strategies, we can focus our efforts strategically towards designing and constructing a building that lives up to the highest standards of sustainability at the University.

<table>
<thead>
<tr>
<th>OPPORTUNITIES</th>
<th>CHALLENGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong commitments/policies – regulatory context</td>
<td>Budget limitation</td>
</tr>
<tr>
<td>Opportunity to reach, shape values</td>
<td>ACUPCC performance bar is set high – challenge to reach</td>
</tr>
<tr>
<td>Good examples to review - +/-</td>
<td>Changing nature of leading edge</td>
</tr>
<tr>
<td>Residents &quot;own&quot; their space – responsibility</td>
<td>- How to stay relevant as a teaching tool – stay exciting?</td>
</tr>
<tr>
<td>Heating, cooling, lighting are lasting needs and building issues - always an opportunity</td>
<td>- Need for great flexibility and durability</td>
</tr>
<tr>
<td>Sustainable features may help neighbor perception – envelope, landscape, water</td>
<td>Complacency – pushing limits of our achievements, culture, and behavior</td>
</tr>
<tr>
<td>Make public through marketing the commitment and investment for this facility and campus</td>
<td>Balance of maintenance issues with sustainability measures</td>
</tr>
<tr>
<td>- transparent design process is educational</td>
<td>Need to be aware of occupancy pattern, and need to find synergies with other buildings</td>
</tr>
<tr>
<td>Student culture of green – haven’t studied cultural acceptance of active participation – this is potential pilot project</td>
<td>Lack of thermal comfort in summer drives away conference users</td>
</tr>
<tr>
<td>ECRH – opportunity to test systems as pilot for other buildings</td>
<td>Minimizing programmatic impacts to site: recreation, parking</td>
</tr>
<tr>
<td>Size of building will impact neighbors to east – represent campus visibly</td>
<td>Need to provide active, recreational spaces – lawn is predominant approach to that, which drives large water use</td>
</tr>
<tr>
<td>Lack of thermal comfort in summer drives away conference users</td>
<td>- Redefining recreational space or</td>
</tr>
<tr>
<td>Need to be aware of occupancy pattern, and need to find synergies with other buildings</td>
<td>- Meeting that need in a new/creative way</td>
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</table>
VISION

FOR THE EAST CAMPUS RESIDENCE HALL

Energy Star labels
Recycling and composting fully integrated
Dining not separate from rest of ground floor
24/7 life cycle encompassed here and blurred/integrated spaces breakdown compartmentalization
Welcoming - Magnet to East Campus – Active
Serves more than just the students
Waste cooking oil = $ for equipment and chemistry faculty lined up to manage converting to fuel
Allow variety of options of engagement (prospect and refuge) – variable commitment spaces
Doors serve new role of entry into spaces
No longer the edge of campus – has it’s own center
Outdoors would integrate water demonstrably – story of water
Cool, polished concrete surfaces
Open, light, airy
Flow from inside to outside
Solar energy captured
Technology – interactive displays very prominent
Immediate impact of energy performance
  - Intuitive, tangible display and actions
  - Make the abstract understandable
Building as new example of energy efficiency – model for others beyond the UO
Needs retrofit in five years, but designed so we know how
Web interface for each room to monitor performance and guide behavior
  - Dashboard
  - Residence Hall
  - Floor/hearth
  - Room
  - Website as part of University Dashboard
Select a few actions to guide to operate spaces – without requiring seeking it out: light–indicators, thermostats, small LCDs
Farmer’s Market – bring in neighbors
Eliminate disposables
Noise from occupants, not building systems

TARGETS

FOR ENVISIONED PERFORMANCE

ENERGY

Minimum 30% better than OR code (BTUs/SF, OCC/SF, BTUs/OCC)
Target space heating for efficiency energy and GHG problem
Capture waste heat – exhaust air – 50-75%; refrigeration later on – 50-75%
Thermal storage – net positive/peak zone; 29% opening
Balance heat loss/gain
2000 W Society living as experiment

EDUCATION

Central - to educate visitors and guest with broader, general information about the building that can remain static
Dispersed - to inform residents as to how to be comfortable, and how to contribute
Immediate and personal impact
Real-time data
Interpretive – Styrofoam cup example “never decomposes”
Staff fully informed and educated, capable of guiding residents

WATER

Express stormwater management

SUSTAINABLE LIVING + WASTE MANAGEMENT

Farmers Market
Bike storage, recycling/compost, education
Recycling and composting easy and integrated
Make disposables compostable – reusable plates (baskets)
Biofuel creation – waste cooking oil
Recycling is easy and incorporated

INDOOR ENVIRONMENT

Fresh air
Cool, light, airy, open to outdoors
NOTES FROM THREE FOCUSED DISCUSSIONS
DEFINING DESIGN PARAMETERS

I - BUILDING SYSTEMS

Public Spaces will require some degree of automation to make work (controls and relays to ensure efficient)

Need to define ownership of systems that require operation

Student rooms are a great space to rely on occupant action

Competition between dorms led to 15% savings through behavior

Students want their doors open when they’re home. Need to design for that.

Certain rooms/room types could be passive, others active – students select

Shoulder seasons when heating is needed at north and cooling at south zone by exposure

Partial summer occupancy?

Utilize north side only?

Occupancy patterns – need detail

Intensive use through August 1st

August has lowest occupancy

Maintenance prior to the year

Lull in academic activity at end of summer: August 1 through Labor Day

When groups come through – large group up to 300 people for two weeks; larger groups only 4-5 days; varying down to as small as 30 people

Usually no longer than 15 days

IntroDucktion – 1 or 2 day stays – not likely to learn complex operations during that short stay

August 1-15 worst weather - 5, 6, 7 especially

Energy Use (from highest to lowest proportion of annual energy use)

1. Heat
2. Light
3. Hot water
4. Fans, pumps
5. Plug loads
6. Cooling

Conductivity of glazing systems

Aluminum conductivity
Wood windows insulative

Air quality and noise pollution from kitchen and loading dock

Relocating exhaust fans from kitchens
Covering loading dock and ensuring exhaust vented well

Grease exhaust duct – expense of moving air to tower roof?
Alternate is ducted air to residence rooms or venting exhaust out side wall

Allergens – some with severe allergies require window units

NEXT STEPS

1. Commence Energy Analysis to establish baseline for SEED and LEED models.
2. Hold a meeting to determine Energy Conservation Measures (ECMs) for modeling.
3. Complete preliminary model of ECMs and initial life cycle costing for SEED.
4. Define zones for automation versus interactivity, level of responsibility.
5. Outline metering and relay systems necessary to meet needs.
2 - TEACHING OPPORTUNITIES

The teaching opportunities discussed tended to fall into three categories: teaching about the building, teaching sustainable living, and connecting to the sustainability efforts of the University at large.

Teaching about the building:
Sustainability Center – place to educate guests/visitors
3-Dimensional model (or physical) showing sustainability elements plus signage throughout
Distributed signage throughout the building – calling out features
Let the building speak for itself
“Green Features” element of Campus Dashboard

Teaching Sustainable Living:
Educational programs will need ongoing staff or organizational support. Put out call to campus community – who wants to dedicate to this?
Programs supporting student and intention
Training with incentives
Growth in Environmental responsibility in rooms and private zones – at fingertips
Provide real-time feedback - “my actions cause this reaction”
Demonstrate how to live communally in a way that contributes globally and is meaningful individually

Connecting to Campus Sustainability - Scholarship and Action
Displaying scholarship – Learning Commons could show student work relating to sustainability
Place to communicate research results relative to sustainability
Dynamic education – requires dedicated ownership
Changing displays
Programs to influence residents’ behavior
Staff
Student organizations
Academic department

Home for sustainable efforts across all residence halls
Gateway for residents to access sustainable programs on campus – introduce existing opportunities such as Survival Center, ESBL, CASL, campus green buildings

NEXT STEPS

1. University Dashboard integration meeting: Identify points of input, data format and streams, review possible website configuration for ECRH.
2. Meet with Student representatives to brainstorm best means of interfacing with residents. What format and where signs, indicators, screens should be located.
3. Seek partners within the campus community interested in dedicating staff and programs to the teaching effort around sustainable living.
3 - SITE AND WATER CYCLE

Factors to be considered: Maintenance requirements, water demands, energy impacts

Maintenance preferences
- Less finicky landscapes – natives better
- Stormwater planters relatively low-maintenance – removing silts and sediments is about all that is required

Treat parking/street runoff separately

Celebrating stormwater as an artistic display
- Storage – one large, one small to show/demonstrate – or view to the larger
- Sculptural element that moves with runoff
- Exposing runoff in open channels
- Run on chains, runnels, walls

Approximate end uses:
- 1.8 mil gallon flushing; 500k -750K gal irrigation

Green roofs – some failures on campus
- Some resulting skepticism
- Irrigation required – provides cooling
- Need a diversity of plants – climate responsive – 4 zone
- If columns there supporting concrete roof structure, could put larger planters to support trees* (code restrictions)
- Ensure occupants can’t get out to roof through operable windows

Kitchen roof will need some area dedicated for equipment – may require screening

Green walls
- Trays or trellises
- Great loading dock screening
- PK Park will have them

Language immersion – label plants in various languages

Approximately 1800 SF of infiltration planter would be needed for runoff - this needs to be studied in further detail for filtration versus infiltration, as well as planting types.

NEXT STEPS

1. Quantify stormwater rate and flow reduction and filtration requirements.
2. Size vegetated flow-through planters and swales to meet LEED and Eugene requirements.
3. Identify direction of flow from all site and roof areas to filtration, storage, and storm drains.
4. Identify best location, size, and type of water storage cisterns and pump equipment
5. Discuss fixture selection with maintenance to identify solutions meet conservation and functional performance expectations.
APPENDICES

ECOCHARRETTE AGENDA
ECOCHARRETTE ATTENDEES
PRELIMINARY LEED SCORECARDS
INTRODUCTORY PRESENTATION
ENERGY BENCHMARKS
SEED PROCESS FLOW CHART
University of Oregon East Campus Residence Hall

EcoCharrette Agenda

8:30am-3:00pm, August 13th, 2009

Location – Erb Memorial Union, Gumwood Room

In this EcoCharrette we will collaboratively explore the vision and environmental performance goals for the new East Campus Residence Hall. The following three areas of discussion will be pursued to further refine and clarify the goals established in the beginning of the charrette - Teaching Opportunities, Site/Water, and Building Systems. These goals will be used to guide the building’s design and will be tracked throughout the design process.

8:30-8:45  Introductions
8:45-9:15  Introductory presentations
  Project Overview – Project Description, Program, Phasing, and Site Data
  Campus Policy and Precedent Overview – lessons-learned at UO
9:15-9:45  Unique opportunities and challenges at the ECRH
  Outline the factors that will shape this project’s success
9:45-10:30 Vision for ECRH – define the sustainable residence hall
10:30-11:00 Priorities for performance – which aspects of the described vision should be given the greatest focus
11:00-11:45 Teaching Opportunities – how to communicate building performance and sustainable living to the campus and residents
11:45-12:15 Lunch
12:15-12:45 Site visit – discuss views, adjacent buildings and open spaces
12:45-1:00 Break
1:00-1:45 Site and Water Cycle, Form and Function of Outdoor Spaces
1:45-2:30 Experience with and expectations for systems at UO and within the team
  Passive / Active: discuss expectations for occupant interactivity
  Envelope as a system, HVAC, Light, Solar Energy
2:30-2:45 Relationship between ECRH and future residence hall projects – setting the stage
2:45-3:00 Next Steps
ECOCHARRETTE ATTENDEES

Tom Driscoll    UO Housing
Sandy Schoonover UO Housing
Fred Tepfer     UO Campus Planning
George Bleekman UO
Jeff Madsen     UO Capital Construction
Terrie Scharfer UO Housing
Martina Bill   CPRE
Cathy Soutar   CPRE
Brad Black     UO Housing
Teri Jones     UO Facilities
Gregg Lobisser EMU/User Group
Susan Lesyk    Teaching and Learning Center
G.Z. Brown     UO Architecture
Mitch Dec      Glumac
Jennifer Riehl Glumac
David "Chris" Stewart Glumac
Ann Hushagen   OR Dept of Energy
Mark Foster    ZGF Architects
Trent Thelen   ZGF Architects
Lee Kerns      ZGF Architects
Johanna Brickman ZGF Architects (facilitator)
Larry Gilbert  CMGS Landscape Architects
Lisa Cline     Hoffman Construction
Greg Hansen    Balzhiser & Hubbard
Tina Guard     Balzhiser & Hubbard – Civil
Dale Stadler   Balzhiser & Hubbard – Electrical
C. Mark Penrod Balzhiser & Hubbard – Mechanical
The Leadership in Energy and Environmental Design (LEED) green building rating system is authored by the U.S. Green Building Council (USGBC), a consensus driven coalition consisting of 6,000 member organizations from all areas of the building industry (e.g. building owners, architects, engineers, governmental agencies, product manufacturers, etc.). In short, the LEED rating system is a system for designing, constructing and certifying green buildings.

The USGBC offers third-party certification of building performance. LEED for New Construction (LEED-NC), was launched in March 2000 following review by the entire USGBC membership and a national pilot testing program. LEED-NC is designed for rating new buildings, and is intended to be regularly updated with new versions. The current version is LEED version 3, though the Oregon State requirement for capital projects is based on LEED version 2.2.

LEED provides a framework for assessing building performance and meeting sustainability goals. LEED emphasizes sustainable design and construction practices in five primary areas:

1. Sustainable site development
2. Water efficiency
3. Energy and atmosphere
4. Materials and resources and
5. Indoor environmental quality

An initial scorecard/checklist is included on the following pages. This is an educated, but very preliminary assessment of the project. It indicates that LEED is worth pursuing, but actual certification depends on a number of factors, most importantly being the definition of project area. LEED allows teams great flexibility in defining the project area, but once defined, the project area can not be changed.
**LEED-NC VERSION 2.2 PROJECT CHECKLIST**

University of Oregon East Campus Residence Hall

Preliminary LEED Assessment

### Sustainable Sites

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<td>Construction Activity Pollution Prevention</td>
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<td>Site Selection</td>
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<td>Credit 2</td>
<td>Development Density &amp; Community Connectivity</td>
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<td>Site Development, Protect of Restore Habitat</td>
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### Water Efficiency

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<td>Water Efficient Landscaping, Reduce by 50%</td>
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<td>Water Efficient Landscaping, No Potable Use or No Irrigation</td>
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### Energy & Atmosphere

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<td>Fundamental Commissioning of the Building Energy Systems</td>
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<td>Minimum Energy Performance</td>
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### Materials & Resources

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<td>Storage &amp; Collection of Recyclables</td>
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<td>Building Reuse, Maintain 75% of Existing Walls, Floors &amp; Roof</td>
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continued...
## 1 Credit 1.2 Building Reuse, Maintain 100% of Existing Walls, Floors & Roof

## 1 Credit 1.3 Building Reuse, Maintain 50% of Interior Non-Structural Elements

## 1 Credit 2.1 Construction Waste Management, Divert 50% from Disposal

## 1 Credit 2.2 Construction Waste Management, Divert 75% from Disposal

## 1 Credit 3.1 Materials Reuse, 5%

## 1 Credit 3.2 Materials Reuse, 10%

## 1 Credit 4.1 Recycled Content, 10% (post-consumer + ½ pre-consumer)

## 1 Credit 4.2 Recycled Content, 20% (post-consumer + ½ pre-consumer)

## 1 Credit 5.1 Regional Materials, 10% Extracted, Processed & Manufactured Regionally

## 1 Credit 5.2 Regional Materials, 20% Extracted, Processed & Manufactured Regionally

## 1 Credit 6 Rapidly Renewable Materials

## 1 Credit 7 Certified Wood

### Indoor Environmental Quality 15 Points

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<th>Credit</th>
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<tbody>
<tr>
<td>1</td>
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<td>Construction IAQ Management Plan, During Construction</td>
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<td>Low-Emitting Materials, Adhesives &amp; Sealants</td>
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### Innovation & Design Process 5 Points

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### Project Totals (pre-certification estimates) 69 Points

Certified 26-32 points Silver 33-38 points Gold 39-51 points Platinum 52-69 points
## LEED 2009 BD+C PROJECT CHECKLIST

### University of Oregon East Campus Residence Hall

Preliminary LEED Assessment

### SUSTAINABLE SITES

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<td>CREDIT 7.1 Heat Island Effect: Non-Roof 1</td>
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<td>CREDIT 8 Light Pollution Reduction 1</td>
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### WATER EFFICIENCY

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<tr>
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<td>PREREQ 1 Water Use Reduction, 20% Reduction Required</td>
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<td>CREDIT 1.1 Water Efficient Landscaping: Reduce by 50% 2</td>
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<td>CREDIT 1.2 Water Efficient Landscaping: No Potable Water Use or No Irrigation 2</td>
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### ENERGY & ATMOSPHERE

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Certified 40-49 points, Silver 50-59 points, Gold 60-79 points, Platinum +80 points
### MATERIALS & RESOURCES

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<td>Building Reuse: Maintain 50% of Interior Non-Structural Elements</td>
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<td>Construction Waste Management: Divert 50% from Disposal</td>
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### INDOOR ENVIRONMENTAL QUALITY

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### INNOVATION IN DESIGN

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### REGIONAL PRIORITY CREDITS

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</table>
TODAY’S AGENDA

SET THE STAGE:
- Understand the Project
- Understand the Context
  - Environment
  - Policy
  - Benchmarks

EXPLORE THE VISION:
- Aspirations and Priorities

PLOT THE COURSE:
- Teaching Opportunities
- Site and Water
- Building Systems

NEXT STEPS
• Concept 1a
Scheme A - Summer - Total Solar Radiation
OBJECT ATTRIBUTES

Total Radiation
Value Range: 0 - 175000 W/m²
60 EC97/SEC VIII

Scheme D - Summer - Total Solar Radiation
45% increase in solar load over 3-bar form
GUIDING POLICY FROM CAMPUS AND GOVERNMENT

Broad Policies and Commitments:
Comprehensive Environmental Policy Statement (’97)
Campus Plan (2005)
Sustainable Development Plan (2005)
Sustainability Assessment Indicators
ECRH Project Description
American College and University
   Presidents Climate Commitment (ACUPCC)
Eugene and Oregon Code, and OR Executive Order

Focused Issue Policies:
Recycled Paper Policy
Wood Products Purchasing Policy
Bike Plan
Campus Tree Plan
Campus Transportation Plan
Integrated Pest Management
GUIDING POLICY FROM CAMPUS AND GOVERNMENT

**Academics and Culture**
Research focus on sustainability
Sustainability-related curriculum
ASUO-funded student sustainability programs
Student publications dedicated to sustainability
Sustainability service and outreach
GUIDING POLICY FROM CAMPUS AND GOVERNMENT

Development – Planning and Design
“The physical environment of the university - its landscape and buildings - must also support and enhance the excellence of our academic programs. Therefore: develop, redevelop, and remodel in ways that incorporate sustainable design principles.”
GUIDING POLICY FROM CAMPUS AND GOVERNMENT

Planning and Design Process
Project Management and Integration
Performance Standards – SEED and LEED
Living Design – encourage sustainable behavior
Connection to the Environment – connect occupants with university’s cultural and environmental features
GUIDING POLICY FROM CAMPUS AND GOVERNMENT

Patterns
Wings of Light
South Facing Outdoors
Pedestrian Pathways
Sustainable Form
Academic Linkages
Accommodate Change
One Room, Many Uses
Participate in Sustainable Living
GUIDING POLICY FROM CAMPUS AND GOVERNMENT

Materials – Resource and Waste Management
Environmentally Preferable Purchasing
Life Cycle Impacts – maximize longevity, reduce material use, reuse, and recycle
Facilitate recycling by occupants through the design of convenient recycling facilities
Purchasing and waste guidelines to minimize of toxic and hazardous materials
Reuse or compost food waste
GUIDING POLICY FROM CAMPUS AND GOVERNMENT

Greenhouse Gas Emissions
Commitment to reduce emissions immediately
Commitment to action plan to achieve climate neutrality as soon as possible
3% minimum green power purchase
Measure, track, and report all greenhouse gas emissions

Summary Statistics
Making fair comparisons between higher education institutions is always challenging due to the rich diversity of higher education. The unverified nature of the information in this database and unavaliability of unbiased normalization metrics mean such comparisons are even more difficult. Users should therefore approach direct institution to institution comparisons with caution and recognize that all comparisons between institutions are inherently biased.

<table>
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<tr>
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<th>Per Full-Time Enrollment</th>
<th>Per 1000 Square Feet</th>
<th>% Offset</th>
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<td>41,289 metric tons of CO2e</td>
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<td>6.6 metric tons of CO2e</td>
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<tr>
<td>Gross emissions (Scopes 1 + 2 + 3)</td>
<td>48,072 metric tons of CO2e</td>
<td>2.5 metric tons of CO2e</td>
<td>7.7 metric tons of CO2e</td>
<td>0%</td>
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<tr>
<td>Net emissions</td>
<td>48,072 metric tons of CO2e</td>
<td>2.5 metric tons of CO2e</td>
<td>7.7 metric tons of CO2e</td>
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</table>

Emissions Inventory Methodology and Boundaries
Start date of the 12-month period covered in this report: July 1, 2007
Consolidation methodology used to determine emissions:
GUIDING POLICY FROM CAMPUS AND GOVERNMENT

Energy
“Top Priority” to save energy
Maximize use of passive systems and synergistic strategies
Commitment to increase onsite production of renewable power
Design to meet occupancy patterns and provide for operability for indoor environmental quality
GUIDING POLICY FROM CAMPUS AND GOVERNMENT

Land Use/Transportation
Use wisely what we have - maintain existing building stock and open space where feasible
Bike storage convenience and quantity
Provision of free bus passes for entire university population
GUIDING POLICY FROM CAMPUS AND GOVERNMENT

Water
Water to be protected - as one of OR's most precious resources
Augmentation of natural drainage and treatment of storm-water runoff onsite
City of Eugene requirement to connect to sewer if within 300 feet
Trend – UO summer water use significantly higher due to irrigation
GUIDING POLICY FROM CAMPUS AND GOVERNMENT

Site/Landscape
Stormwater management policy
Need to collect and pipe stormwater to public storm system
Must provide stormwater treatment for all new and replaced impervious surfaces
Site and orient new construction for synergy with environmental and campus context
Protect existing ecosystems
Native/adaptive vegetation
Integrated Pest Management program
Minimize noise and light pollution
Continue to enhance the campus forest
EDUCATIONAL DISPLAYS

PORTLAND STATE UNIVERSITY

DICKINSON COLLEGE
EDUCATIONAL DISPLAYS
STORMWATER MANAGEMENT

Green Roofs
Bioswales
Green Streets
Storage and Reuse

Expected quantity of stormwater from ECRH
4,000,000 GALLONS
BUILDING SYSTEMS

TO CONSERVE WATER, THIS BUILDING USES RECLAIMED WATER TO Flush TOILETS AND URINALS
TODAY’S AGENDA

SET THE STAGE:
- Understand the Project
- Understand the Context
  - Environment
  - Policy
  - Benchmarks

EXPLORE THE VISION:
- Aspirations and Priorities

PLOT THE COURSE:
- Teaching Opportunities
- Site and Water
- Building Systems

NEXT STEPS
University of Oregon – East Campus Residence Hall
Ecocharette Supporting Documentation
Energy Use Summary

Residential Housing Energy Consumption
Typical Breakdown in Pacific Northwest

Key points:
- Low flow fixtures should reduce Hot Water consumption. LLC’s use is much less due to low flow fixtures and solar hot water heating.
- Space Cooling is likely less due to reduced summary occupancy. 6% is based on an annual occupancy through the summer. For most UO residences the space cooling energy does not exist in residential spaces.
- Building geometry and façade will be critical to revealing the energy savings potential.
ENERGY EFFICIENCY (or CONSERVATION) MEASURES TO CONSIDER:

- Envelope, Envelope, Envelope –
  - 29.9% (maximum) window-to-wall ratio.
  - No aluminum framing or direct connections for thermal bridging
  - Thermal mass and use common area AHUs for night flushing?
  - If steel framed wall, no batt insulation, only continuous, rigid insulation.
  - Living (vegetated) wall or south facing winter garden?

- Low flow plumbing fixtures – LLC uses 5.6% of its energy for natural gas to heat DHW.

- Lighting power reductions – not just efficient lamps, but also efficient arrangement. Target no incandescent as a goal.

- Heat recovery –
  - Tunnel heat
  - Kitchen exhaust
  - Toilet/Bathroom exhaust

- Passive solar thermal for space heating – critical to achieve large savings. LLC uses 40% of its energy every year just for the steam space heating. How can we obtain passive heating w/out negative overheating conditions in the summer?

- Solar DHW heating (drainback system like 12W).

- Photovoltaics.
## ENERGY EFFICIENCY BENCHMARKS

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<th>Carson Kitchen</th>
<th>Walton</th>
<th>Hamilton</th>
<th>Bean</th>
<th>LLC</th>
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<td>282 beds</td>
<td>613 beds</td>
<td>780 beds</td>
<td>576 beds</td>
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<td>96,174 GSF</td>
<td>161,454 GSF</td>
<td>216,849 GSF</td>
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<td>25.5 mbtu/bed</td>
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1. Is your project subject to SEED?

Yes

2. Class 1 or Class 2 building?

Class 1

3. Notify ODOE

4. Pre-design

5. Design

6. Construction

9. Occupancy

No

Proposed Building

Select and analyze ECMs

SEED Building

Is SEED Building 20% better than code?

Yes

Final SEED Building

No

Code Building

Compare

Finished

Class 2

3. Notify ODOE

4. Implement ECMs

5. Report ECMs

Finished

Iterative SEED Analytical Process, for further explanation see SEED Guidelines