Energy Trust New Buildings
Higher Ed Sustainability Conf
Chemeketa Community College’s Path to Net Zero
February 5, 2016
Project Overview
Chemeketa Community College’s Health Science Complex
Salem, OR
72,000 sf new construction
$285/sf
Path to Net Zero
Saves $47,000/yr
The Team

SRG

PAE

Energy Trust of Oregon, Inc.

Chemeketa Community College

LEASE CRUTCHER LEWIS

... and ESLB, RACI & InSpec
Health Science Complex
Salem, OR
Health Science Complex

1st Floor

Slide courtesy of SRG & PAE
Health Science Complex

2nd Floor
Native American Garden
Lobby/Student Gathering
Faculty Office Suite
Reduce Loads
It All Adds Up
Integrated Design
Top Lighting
Side Lighting & Shaft
Design Process
Ensuring It Will Work
Photovoltaics
Photovoltaics
Lessons Learned
Verify Performance

Metering - System

Modeled

- HEATING WATER: 45%
- PLUG LOADS: 28%
- LIGHTING: 15%
- OTHER HVAC: 7%
- DOMESTIC HOT WATER: 3%
- CHILLER: 2%

Actual

- HEATING WATER: 45%
- PLUG LOADS: 20%
- LIGHTING: 12%
- ELEVATOR: 0.4%
- CHILLER: 2%
- OTHER HVAC: 15%
- DOMESTIC HOT WATER: 6%
- OTHER: 2%

Slide courtesy of SRG & PAE
Deep Metering
Submetering at the Room Level

- Room Heating Load
- Room Occupancy
- Slab Temp
- Plug Loads
- Lighting
- Room Space Temp
- HVAC – Heat Recovery Unit
- Ventilation Air Temp
- Air Flow
- Outlet Damper
- Ceiling Fans
Lessons Learned in Construction

Coordination of New Design Components

Jurisdiction Approval

Commissioning
Lessons Learned

It Takes LOTS of Studies

Figure 6, Temperatures of classroom on ninety hottest interior temperature days
Lessons Learned

Buildings are for Teaching

• Electrochromic glass
• Noisy actuators
• KISS
  (keep it simple/separate)
Lessons Learned
Engage and Train Users

How it works: First Floor Classroom

- Vertical daylight shaft and night flush ventilation shaft. Shaft to be kept clear for night flush ventilation.
- Ceiling projectors controlled by AMX.
- Blackout shade for projection at headwall. Automatically controlled from AMX.
- Light reflective ceiling with daylight sensors automatically control electric lighting use. Occupancy sensors control lighting, ceiling fans and window shades once the occupants have vacated the room.
- Headwall projection screens automatically controlled by AMX with projection setting.
- Ceiling fans manually controlled by wall switch. Use if room feels warm.
- AMX control hub for standard room settings.
- Window shades for blackout. Automatically controlled by AMX with projection room settings.
- Windows are automated and will open for night flush if outside air temperature is cooler than inside during summer months.
- The floor provides thermal mass for cooling and heating. Do not cover with insulating materials like carpet.
Resources/Credits

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Path to Net Zero
It all adds up to zero

- Increased incentives for early design, technical assistance, installation and post-occupancy
- Technical resources and assistance from kick-off through occupancy
- Incentives for net-zero certification
Incentives & resources for early design

• Facilitated kick-off meeting to adopt an EUI target that aligns with the Architecture 2030 Challenge

• Up to $10,000 to offset a design charrette to refine approach and goals using:
  • EUI targeting tool
  • Shoebox modeling

• Construction Document review (required)
Technical assistance & incentives

- 75 percent of the cost of energy studies, up to $50,000, including:
  - Early design shoebox modeling
  - CFD analysis
  - Daylighting studies
  - Energy modeling
  - Commissioning design review
Installation incentives

- Modeled savings: $0.40/kWh, $1.20/therm

- OR -

- Market solutions “very best” level

- Standard and/or special measure incentives
Performance & post-occupancy incentives

- $0.15/sq ft for functional testing, up to $40,000
- Up to $40,000, or 50 percent of cost of energy metering
Incentives for net-zero certification

• 50 percent of the cost of net-zero certification from the International Living Future Institute, ILFI (including application fee)
Thank You

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