



DEMONSTRATING ENERGY EFFICIENCY IN A RENOVATED SPACE

ENERGY TRUST OF OREGON'S SUSTAINABLY DESIGNED OFFICE

When businesses relocate, most move into pre-existing space built long before developers competed for green design honors. Even buildings with older infrastructure can upgrade with sustainability in mind. Portland's Lincoln Building, and Energy Trust of Oregon's third floor renovation, demonstrate how a 120-year-old space can meet stringent measures of contemporary sustainable design.

As an organization dedicated to delivering energy solutions that help utility customers shave costs, Energy Trust used the same strategies when it came to finding a hard-working, cost-efficient space. Our renovated office demonstrates energy efficiency with high-efficiency lighting, daylighting and an innovative server room design that lowers cooling needs. By working harder for us, the new space is a smart, sustainable investment—one that others can learn from, too.

Lighting design

Top priority for Energy Trust was to establish a lighting demonstration site. On average, lighting consumes 20 percent of energy used in a typical office building. Upgrading to energy-efficient lighting usually is the first, most cost-effective choice for improving energy efficiency in an existing building.

Energy Trust gathered a team of architecture, electrical engineering, lighting design and product specialists that achieved solutions that render lighting energy use in the office 35 percent more efficient than Leadership in Energy and Environmental Design, LEED®, baseline.

A tour of the space finds:

- Raised ceilings, lowered cubicle partitions, glass panels in walls and light-reflecting finishes that allow daylight from perimeter windows and the central atrium to reach interior spaces.
- Direct/indirect fixtures that send illumination down into work areas and up to reflect off ceiling features, providing comfortable, even lighting throughout the space.
- Task lamps that direct light where it's needed.
- Lamps that shine on the cool side of the color spectrum, closer to daylight—4,100 Kelvin, compared to 3,000 Kelvin in most offices—and 85 on the color-rendering index, so colors are brighter and more realistic.
- Occupancy sensors, dimmers and daylight-responsive controls that keep lighting levels balanced and turn fixtures off when occupants leave, while giving occupants control over light levels in each work area.
- Daylight harvesting solutions that keep sunlight glare off workstations and bounce light toward the interior.

Working together, these design strategies and innovative technologies meet lighting needs with only 30 footcandles of general illumination, compared to the traditional 50 to 100.



ENERGY TRUST LIGHTING DEMONSTRATION SITE

Lighting products

Open workspaces have long-lasting (30,000 hours/10 years) 2-lamp Philips T8 high-performance, low-mercury fluorescents with electronic ballasts placed in direct/indirect Ledalite pendant fixtures. By sending light upward as well as down into work areas, the fixtures provide even, comfortable illumination.

Corridors are illuminated by long-lasting (30,000 hours/10 years) single-lamp T5 fluorescents with electronic ballasts. Lamps and pendant fixtures are by LightEdge, an Oregon manufacturer.

Meeting rooms and workrooms with dropped ceilings use 2-lamp T8 Sylvania high-performance, low-mercury fluorescents in troffer fixtures by Lithonia Lighting and Philips Ledalite.

The T8 and T5 lamps are sized in 4-foot lengths for maximum performance and maintenance efficiency.

Humanscale LED desktop task lights with dimming controls use only 7 watts of power to provide the equivalent of a 90-watt incandescent task lamp.

Lighting fixtures

Other areas of the office showcase a variety of specialty fixtures—many of them demonstrating LED lighting. Products include:

- Stile T5 fluorescent wall wash fixtures
- Bruck LED decorative pendants
- Gotham LED recessed downlights and wall wash fixtures
- Shaper T5 fluorescent pendant fixtures
- Bartco LED wall wash fixtures
- MP Lighting LED accent spot lights
- Cooper Lighting LED exit signs

Lighting controls

Throughout open workspaces, WattStopper dimming controls allow users to adjust the brightness of overhead T8 fluorescent lamps.

WattStopper occupancy sensors, mounted on ceilings throughout open spaces, use infrared and ultrasonic technologies to turn off lights when no movement is detected.

Small workrooms and offices have corner-mounted infrared occupancy sensors, also by WattStopper.

The space employs one WattStopper daylight sensor for every bank of fixtures in open spaces and meeting rooms near windows. When daylight is bright, the sensors dim the fluorescent lamps to keep overall lighting levels even.

A SensorSwitch nLight programmable lighting control system serves the large conference rooms.

Daylight harvesting solutions

Energy Trust's office showcases three technologies for redirecting daylight deep into the space while blocking the sun from work surfaces:

- LightLouver horizontal light louvers
- Tubelight horizontal light shelves
- RetroSolar adjustable horizontal louvers



OTHER SUSTAINABLE FEATURES

Energy Trust and Unico incorporated a wide range of sustainable features on the third floor of the Lincoln Building. These include:

- **ENERGY STAR® equipment**—All computer equipment, copiers, refrigerators, dishwashers, microwaves and other kitchen equipment are ENERGY STAR-rated, representing more than 99 percent of ENERGY STAR-eligible equipment in the space.
- **Heating and cooling**—The building's HVAC system was top of the line when installed in 1994. Energy Trust added direct digital controls to support more accurate temperature readings and automatic settings. Energy Trust has committed to enhanced commissioning of the space's energy systems to ensure they operate with optimum efficiency.
- **Server room**—To reduce typical server room cooling requirements and related energy demand, Energy Trust designed server cabinets to perform like chimneys, conveying warm exhaust air away from the server room and into the building's air exhaust system.
- **Indoor air quality**—The building's outdoor air intake is well above the standard ASHRAE* requirement. **Previously titled American Society of Heating, Refrigerating and Air-Conditioning Engineers, the organization now does business under its acronym.*
- **Plumbing**—Thanks to low-flow urinals, toilets, faucets and showers, occupants use 40 percent less water compared to a space without these features.
- **Green cleaning**—More than 70 percent of cleaning products used at the Lincoln Building meet sustainability criteria that support high indoor air quality.
- **Transit and bicycle access**—Energy Trust staff and visitors enjoy access to bus, light rail and Amtrak transit, while 52 basement bike racks and seven shower facilities encourage bicycle commuting.

- **Green power purchase**—To encourage development of renewable energy technologies, Unico purchased 1.1 million kilowatt hours of wind-generated electricity, enough to offset 100 percent of electricity Energy Trust is projected to use over the next two years.

Environmentally friendly materials

To further demonstrate its commitment to sustainable resource use, Energy Trust designed user-friendly recycling centers and chose environmentally friendly materials for every element of the office renovation, including:

- Flooring is sustainably sourced
 - Cork floors have adhesives with low volatile organic compounds, VOC
 - Linoleum flooring has 47 percent recycled content and 23 percent rapidly renewable materials such as linseed oil and jute
 - Carpet has 44 percent recycled content and is 100 percent recyclable at end of life
- Vinyl wallcovering and paint on walls are low VOC
- Decorative wood in the reception area is 100 percent reclaimed wood—a recycled byproduct of fast-growing poplar used in furniture and pulp manufacturing
- Herman Miller workstations have 54 percent recycled content; at end of useful life, 69 percent of their materials can be recycled
- Break rooms include compost receptacles and built-in bins for separating recyclable materials—and no garbage disposals

ENERGY MAKEOVER OF A 120-YEAR-OLD BUILDING

The Lincoln Building originated as two separate structures built in the 1880s. In 1947, the north and south sections were connected, interiors gutted and a cast concrete skin constructed around the original brick and masonry exterior. The heating and cooling system was updated in 1994.

Current owner Unico and its investment partner, Broadreach Capital Projects, purchased the property in 2005. They began energy-efficiency upgrades culminating January 2012 in LEED-EB Gold certification for the building.



We pursued cutting-edge lighting system technologies and sustainable design treatments to showcase the wide range of choices available for office renovations. We're pleased the result is a space that works well for occupants and demonstrates solutions for visitors.

Steve Lacey
director of operations
Energy Trust



ENERGY EFFICIENCY IS A TEAM EFFORT

Even energy-efficiency experts benefit from technical and design advice. Energy Trust thanks the team responsible for its office lighting design:

Evergreen Consulting Group LLC—lighting efficiency services

Glumac—lighting design and electrical engineering

Group Mackenzie—architectural and interior design

Harry L. Stearns, Inc.—lighting manufacturers representative

Platt Electric Supply—lighting product distributor

Russell Construction—construction services

Solus—lighting manufacturers representative

Unico—building management

Willamette Electric Inc.—electrical contractor



When renovating or constructing new office space, you can incorporate similar energy-efficiency practices and products. Energy Trust cash incentives and technical assistance can make your project more affordable.

Start your green office renovation today, and take control of your energy costs. Call **1.866.368.7878** or visit **www.energytrust.org**.