

CASE STUDY - Office Building

Liberty Property Trust Malvern, PA

LIBERTY
PROPERTY TRUST



PROJECT OVERVIEW

Liberty Property Trust (NYSE:LRV) is a \$6.5 billion real estate investment trust which owns 77 million square feet of office and industrial space in over 20 markets throughout the United States and the United Kingdom. Their corporate headquarters, located in Malvern Pennsylvania, is a beautiful, single story office building situated in suburban Philadelphia's pre-eminent Great Valley Corporate Center.

Liberty was looking for a way to optimize the economic, energy and environmental performance of their building during a 2005 renovation. Princeton Energy Systems, an energy and sustainability, consulting and planning firm, recommended that Liberty install the Encelium Energy Control System (ECS) to reduce energy consumption, save money and provide individual user control in their 31,000 square foot corporate headquarters.

"We wanted to use our own office space as a pilot demonstration site to evaluate the system, determine actual savings and whether advanced network lighting controls made sense for all of our other properties. We were also interested in a technology solution that would allow us to provide individual control of light fixtures. With Encelium's Polaris software, we were able to collect data on each energy management strategy validating the savings and allowing us to further optimize performance and dollar savings. We are very serious about reducing our carbon footprint, increasing energy performance and looking to potentially include this type of lighting control system on other LEED certification development activities," says Fred Dougherty, Liberty's Vice President Portfolio Technology.

PROJECT OBJECTIVES

- Reduce lighting energy consumption by 50% and deliver a payback from energy savings in less than 5 years
- Maintain illumination levels consistent with IES standards and eliminate over-lighting where possible
- Provide office staff with individual flexibility and control of lighting from their desktop PC
- Improve workplace comfort, ergonomics and productivity by optimizing lighting control



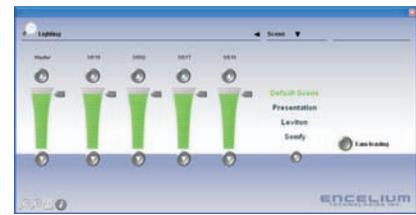
STRATEGIES

ECS delivers energy savings exceeding customer expectations through the deployment of the following energy management strategies:

-  Personal Control - Control of personal lighting space from the desktop PC
-  Task Tuning - Tuning light levels to suit the particular task or use in a workspace
-  Daylight Harvesting - Adjusting artificial light based on ambient natural light contribution
-  Smart Time Scheduling - Time scheduled switching based on zones as small as an individual workspace
-  Occupancy Sensing - Switching or dimming lighting based on occupancy
-  Load Shedding - Intelligent management of peak/non peak lighting energy demand

Improved Workspace Comfort and Reduced Lighting Costs

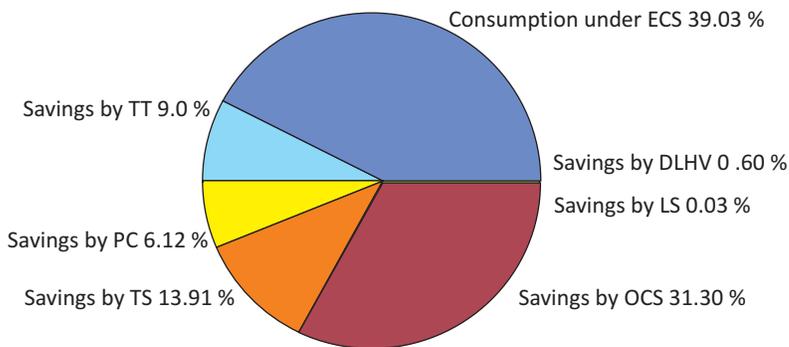
“Our employees feel empowered knowing they can adjust their light levels to suit their individual needs. It makes for a happier and more comfortable environment for everyone. The PCS users have made great use of the software tool adding to the overall savings.” says Fred Dougherty



RESULTS DELIVERED

- Lighting energy consumption reduction of 60%
- Annual energy cost reduction of \$10,383
- Simple payback from energy savings of 3.9 years
- CO2 Reduction of 57.6 metric tons per year

Consumption Savings by strategy



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|  Consumption Savings |  Savings by Time Scheduling |
|  Consumption under Energy Control System |  Savings by Occupancy Sensing |
|  Savings by Task Tuning |  Savings by Load Shedding |
|  Savings by Personal Control |  Savings by Daylight Harvesting |

“I would highly recommend the advanced network based Encelium lighting control system to any company looking to save energy and improve workplace productivity. We are seeing savings of over 60% in our lighting energy use and fully expect that number to increase with the implementation of Encelium’s two way Demand Response load shedding technology.

After reviewing the reports from Encelium’s Polaris energy management software, the source of the energy savings are clear and easy to identify. Gone are the days of reviewing our electrical bills on a month to month basis. Now we can review the lighting component of our energy savings in an easy format to help us analyze the system and the different strategies.

We have made the strategic decision to have all new development properties LEED certified and this advanced lighting control system will definitely help us achieve points towards higher levels of certification. Down the road, I fully expect us to go even further and to integrate this type of control system with energy and HVAC system controls.

The ECS system is easy to install, saves energy, saves money and helps the environment. We plan to evaluate the use of this system in our other properties as we move forward because it’s makes good business sense,” says Dougherty.