Lutron Energy Savings Claims

LUTRON®

save energy with Lutron™ ®

Commercial Claims

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These are claims currently utilized by Lutron for commercial product marketing. The claims in this document may be amended from time to time as more information becomes available. The primary purpose of the document is to provide greater visibility to customers on the sources and assumptions of the claims.

Lutron controls can save up to 60% of lighting energy consumption.

Description:
Compared with manual (non-automated) controls, up to 60% lighting energy savings is possible on projects that utilize all of the lighting control strategies (occupancy sensing, high end trim, personal control and daylight harvesting). Actual energy savings may vary, depending on prior occupant usage, among other factors.
Sources:
The following paper: Williams A, et al. 2012. Lighting Controls in Commercial Buildings. Leukos. 8(3) pg 161-180 discusses savings from multiple strategies at a building level. However, many case studies of installed Lutron products have shown total combined savings to be in the 60% range.

Lighting accounts for 38% of commercial electricity consumption.

Description:
This information is taken from the Commercial Buildings Energy Consumption Survey (CBECS) 2003 [1], the most comprehensive collection of information for building energy use and other building related metrics. It is expected that newer data will be available in 2015 (tentative).
Sources:
[1] Energy Information Administration. 2003 Commercial Building Energy Consumption Survey, released September 2008.

Using Lutron solutions can reduce a commercial building's overall electricity use by up to 23%.

Description:
Lighting accounts for 38% of building electricity usage [1]. Compared with manual (non-automated) controls, up to 60% lighting energy savings is possible on projects that utilize all of the lighting control strategies (occupancy sensing, high-end trim, personal control and daylight harvesting).

A 60% reduction in 38% of building electricity results in 23% total electricity savings. Additional savings can be achieved by adding strategies beyond lighting controls such as shades and HVAC integration. Actual energy savings may vary, depending on strategies utilized, prior occupant usage and overall building energy performance, among other factors.

Sources:
[1] Energy Information Administration. 2003 Commercial Building Energy Consumption Survey, released September 2008.

Scheduling can save 10-20% of lighting energy.

Description:
Energy savings were estimated using data from VonNieda et al [1], based on 50% reduction of after-hours lighting energy waste [1]. The savings for scheduling were computed based on adding scheduling to a space with only manual lighting shutoff. Actual savings may vary depending on strategies utilized and prior occupant usage among other factors.

Sources:
[1] VonNieda B, Maniccia D, & Tweed A. 2000. An analysis of the energy and cost savings potential of occupancy sensors for commercial lighting systems. Proceedings of the Illuminating Engineering Society. Paper #43.

Occupancy/Vacancy sensing can save 20-60% of lighting energy.

Description:
Savings based on adding occupancy sensors to manual shutoff. The stated savings are based on average savings found for different room types by Von Nieda et al [1] at different timeout periods. Actual savings may vary depending on timeout periods utilized and prior occupant usage among other factors.

Sources:
[1] VonNieda B, Maniccia D, & Tweed A. 2000. An analysis of the energy and cost savings potential of occupancy sensors for commercial lighting systems. Proceedings of the Illuminating Engineering Society. Paper #43.

Partial-On can save an additional 50% of lighting energy in private offices.

Description:
Savings based on adding partial on control to occupancy sensors that turn on to 100% [1]. Actual savings may vary depending on timeout periods, partial on light level and prior occupant usage among other factors.

Strategy	Additional Savings Beyond Std. Occupancy Sensing[1]
Auto-On to 100%	Baseline
Manual On to 100%*	30%
Manual On to 50%	46%
Auto On to 50%	52%

Sources:
[1] Papamichael, K., et.al. February 2010. Bi-Level Switching in Office Spaces. California Lighting Technology Center.

*Manual On to 100% extrapolated from data presented in this paper.

High-end Trim can save 10-30% of lighting energy.

Description:
Savings based on adding high end trim to lights on at full output. Williams et al [1] showed that high end trim or “institutional tuning” saves up to 36% in office spaces and up to 60% in retail (non-mall) spaces. Savings for high end trim vary based on full output light level and the tasks performed in the space among other factors.

Sources:
[1] Williams A, et al. 2012. Lighting Controls in Commercial Buildings. Leukos. 8(3) pg 161-180.

Daylight Harvesting can save 25-60% of lighting energy.

Description:
Savings based on comparing a dimmed, automated daylight dimming lighting control system to a system controlled only by manual shutoff [1]. Maximum savings of 60% was seen in places with high window transmittance and for work areas adjacent to a window. Low end savings of 25% was for a second row of windows with lower Visible Transmittance. Actual savings may vary based on window transmittance, the room characteristics, and occupant usage among other factors.
Sources:
[1] Reinhart CF. 2002. Effects of interior design on the daylight availability in open plan offices. Study of the American Commission for an Energy Efficient Environment (ACE) Conference Proceedings. To achieve maximum lighting savings, automated shades are utilized.

Personal Dimming Control can save 10-20% of lighting energy.

Description:
Galasiu [1] showed that savings based on comparing a manual on/off control to a dimming control. When occupants are given individual dimming control in their immediate work area, energy savings of 10-20% is achievable. The study was done in an open office environment. Actual savings may vary based on occupant usage among other factors.
Sources:
[1] Galasiu AD, et al. 2007. Energy saving lighting control systems for open-plan offices: A field study. Leukos. 4(1) pg 7-29.

Controllable window shading can save 10-20% of cooling energy.

Description:
Savings is based on adding automated shades to a window without shades. The savings is taken from a Lutron commissioned study through Purdue University [1]. A number of fabric and glass combinations as well as facade orientations were tested for different US cities. Actual savings may vary based on window transmittance, room characteristics, and occupant usage among other factors.
Sources:
[1] Lutron commissioned study by Herrick Laboratories. Purdue University. 2011.

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Eliminating glare from windows can increase productivity by up to 25%.

Description:
Glare from windows was found to reduce productivity by up to 25% in a study conducted by the Heschong Mahone Group [1]. The actual reduction in productivity may vary based on many factors including occupant sensitivity to sunlight.
Sources:
[1] Heschong Mahone Group, Inc., 2003. Windows and offices: A study of office workers performance and the indoor environment. Prepared for the California Energy Commission

Automated shades can increase lighting energy savings from daylight harvesting by 1.6 kWh/sq.ft./yr.

Description:
Lutron Electronics worked with Purdue University to analyze the benefits and savings potential of Lutron's Hyperion automated shading systems [1]. Savings are based on energy simulation of a perimeter private office with a lighting power density of 0.9 W/ft^2, a standard clear double pane glass, and a shade fabric with 5% transmittance and 76% reflectance. Values shown are the average of three window to wall ratios: 20%, 40%, and 60%. The base case was modeled with manual shades in the closed position. Daylight harvesting system required. Actual savings may vary based on window transmittance, room characteristics, how far the shades are closed and occupant usage among other factors.
Sources:
[1] Lutron commissioned study by Herrick Laboratories. Purdue University. 2013.

Demand Responsive Lighting can save 30-50% of lighting power during peak periods.

Description:
The savings are based on a study [1] of an office building and a college campus. The study showed that dimming by 20% can be done in less than a minute and dimming down to 50% could be done over a 30 minute period. When combined with daylighting, fixtures could be dimmed down by 80% output without impacting a majority of the occupants.
Sources:
[1] Newsham GR & Birt B. 2010. Demand-responsive lighting: a field study. Leukos. 6(3) pg 203-225.

Plug Load Control can save 15-50% of energy use on controllable loads

Description:
The savings are based on comparing energy use of devices with automatic shutoff by occupancy sensing to the same loads being controlled manually with an on/off switch [1]. The study considered a wide variety of plug loads including printers, monitors and desk lamps. Actual energy savings may vary, depending on devices controlled, standby power settings, and prior occupant usage, among other factors.
Sources:
Ecos. 2011. Commercial office plug load savings assessment. California Energy Commission PIER Program.

HVAC integration can save 5-15% of HVAC energy.

Description:
The savings are based on detailed simulations described in a paper published by Sothern California Edison [1] and another by the Pacific Northwest National Lab [2]. The savings range varied widely based on the assumptions for the studies. The simulation considered office/school buildings and the energy savings potential in different regions by utilizing an occupancy sensor to setback temperature during periods of space vacancy.
Sources:
[1] Southern California Edison Company, 2011. "Classroom HVAC Occupancy Sensor".
[2] Zhang, J., et. al, 2013. "Energy Savings for Occupancy Based Control (OBC) of Variable-Air-Volume (VAV) systems. Prepared for the U.S. Department of Energy.

Monitoring/Feedback can save 5-15% of energy for monitored loads.

Description:
Darby [1] showed that direct energy feedback provided savings of 5-15%. Actual savings may vary depending upon prior occupant usage and awareness about environmental issues among other factors.
Sources:
[1] Darby S. 2006. The effectiveness of feedback on energy consumption. Environmental Change Institute, University of Oxford.

Save up to 80% of lighting energy in stairwells with Lutron's stairwell solution.

Description:
Savings up to 80% based on replacing a 4ft T12 fixture (2-40W lamps at 100% output) with a 4ft LED Lutron stairwell solution (44W at 80% high-end output, 20% low-end output). Existing system is at full output 24 hours a day, while replacement system is at full output for 6 hours and low-end output for 18 hours a day. Actual savings may vary based on existing fixture wattage and stairwell occupancy. Always verify replacement system meets light level requirements.

Sources:

Lamp Type	Wattage	Number per landing	% of Hours on per year	Number of Hours of Usage	Power Consumption - Occupied Periods	Power Consumption - Unoccupied Periods	Energy Consumption in kWh/yr.
T12	80	1	100%	8760	100%	100%	700.8
LED w/ controls	44	1	25%	2190	74%	23%	137.8

Save 50-80% of lighting energy in gymnasium or warehouse with Lutron's High bay solutions.

Description:
80% savings assumes replacement of a 1000 W Metal Halide High Bay Fixture with a 192 W Fluorescent High Bay Fixture, with an expected reduction in light level. A typical replacement with minimal or no light reduction achieves savings closer to 50%. Actual savings may vary based on existing fixture wattage and occupancy among other factors. Always verify replacement system meets light level requirements.

Lamp Type	Wattage	Number of Hours of Usage	Energy Consumption in kWh/yr.
Metal Halide	1000	4000	4000
T8 (32 W)	192	2500 Hours at 100%, 1000 Hours at 50%	576

Every year, installed Lutron controls save nearly 10 Billion kWh of lighting energy.

Description:
Estimated savings based on Lutron sales; 296kWh annual energy use for residential circuits (a); 2,492kWh annual energy use for commercial circuits (b); 20% savings from dimming (c); a U.S. average electricity rate of $0.11 per kWh (d); estimated greenhouse gas equivalency (e); and the average generating capacity of a coal power plant (d).

a. Computed from energy usage by room type from the report published by Navigant. [1] and surveys of installed room types [2].
b. Computed from 712W per circuit (Lutron project data.) and 3500 annual hours.
c. Information on dimming savings from the California study [3].
d. Energy Information Administration (EIA)
e. Information on CO2e emissions were computed using this source [4].

This claim is made by looking at multiple data points, including historical sales, energy savings from installed products in both residential and commercial buildings and bases quantification of savings from data collected from US DOE and EPA.

Sources:
[1] Navigant. 2002. U.S. Lighting Market Characterization
[2] Lutron commissioned Ipsos surveys
[3] Lighting Efficiency Technology Report: Volume I. 1999. California Energy Commission.
[4] U.S. annual non-base load CO2 output emission rate, year 2007 data U.S. Environmental Protection Agency, Washington, DC.
To learn more, download whitepaper at:
www.lutron.com/10billionkwh

Reducing light output by 75% is associated with only a 50% reduction in perceived light level.

Description:
This statement is based on perception curves from the IES Handbook [1] published by the Illumination Engineering Society, which helps establish standards for lighting and daylighting design.

Sources:
[1] Rea M. 2000. IESNA Lighting Handbook: Ninth Edition. Illuminating Engineering Society of North America. New York.

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Reduce labor time by up to 70% with wireless Lutron products.

Description:
Savings based on a comparison of installing a typical wired solution (including (1) wall switch, (1) wired sensor, and (1) power pack) at an estimated installation of 50 minutes, to a Lutron wireless solution (including (1) Maestro wireless switch and (1) Radio Powr Savr occupancy sensor) at an estimated 15 minutes. Labor time may vary based on room size and conditions.

Sources:
To learn more, go to
www.lutron.com/wirelessinstall

Residential Claims

Residential Claims

These or any other claims will be supported by a reference to the source or a disclaimer in packaging or point of purchase displays. The primary purpose of the document is to provide greater visibility to customers on the sources and assumptions of the claims.

Lighting energy savings of 20% can be achieved with residential dimming.

Description:
Savings based on replacing a standard switch with a dimmer in a residence [1]. Actual savings may vary based on occupant use among other factors.
Sources:
[1] Heschong Mahone Group. 1999. Lighting Efficiency Technology Report. Prepared for the California Energy Commission.

Lighting energy savings of 50% can be achieved with residential occupancy sensing.

Description:
Savings based on replacing a standard switch with an occupancy sensor in a residence [1]. Actual savings may vary based on occupant use among other factors.
Sources:
[1] Heschong Mahone Group. 1999. Lighting Efficiency Technology Report. Prepared for the California Energy Commission.

Lighting energy savings of 60% can be achieved by combining dimming and occupancy sensing in a residence.

Description:
Estimated lighting savings based on a power reduction of 20% (dimmer) and a 50% reduction in hours of use (sensor) [1]. Actual savings may vary based on occupant use among other factors.
Sources:
[1] Heschong Mahone Group. 1999. Lighting Efficiency Technology Report. Prepared for the California Energy Commission.

www.lutron.com

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