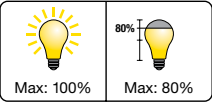
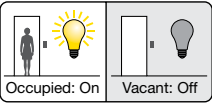
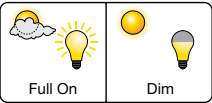
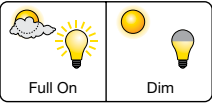
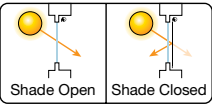
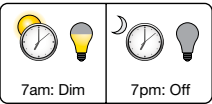
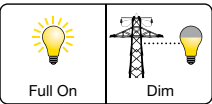


# Lutron Light Control Strategies

How Lutron energy-saving strategies meet current energy codes and LEED

Strategy	Codes	Requirements	LEED 2009 Requirements	Potential Lighting Energy Savings	Potential HVAC Energy Savings <sup>9</sup>
 <b>High-end trim/tuning</b>	N/A	N/A	EA: Minimum Energy Performance; EA: Optimize Energy Performance	10-30% <sup>3</sup>	0-5%
 <b>Occupancy/vacancy sensing</b>	ASHRAE 90.1-2010; IECC 2012; Title 24 2013	Automatic lighting shutoff; occupancy sensor control	SS: Light Pollution Reduction; EA: Minimum Energy Performance; EA: Optimize Energy Performance	20-60% <sup>4</sup>	0-10%
 <b>Daylight harvesting</b>	ASHRAE 90.1-2010; IECC 2012; Title 24 2013	Daylight control	EA: Minimum Energy Performance; EA: Optimize Energy Performance; IEQ: Daylight and Views-Daylight	25-60% <sup>5</sup>	0-10%
 <b>Personal dimming control</b>	ASHRAE 90.1-2010; IECC 2012; Title 24 2013	Multi-level lighting/light reduction	EA: Minimum Energy Performance; EA: Optimize Energy Performance; IEQ: Controllability of Systems-Lighting	10-20% <sup>6</sup>	0-3%
 <b>Controllable window shade</b>	ASHRAE 189.1-2011	Permanent projections: office space shading	SS: Light Pollution Reduction; EA: Minimum Energy Performance; EA: Optimize Energy Performance; MR: Recycled Content; IEQ: Low-emitting Materials <sup>1</sup> IEQ: Daylight and Views-Daylight; IEQ: Daylight and Views-Views	N/A	10-20% <sup>10</sup>
 <b>Scheduling</b>	ASHRAE 90.1-2010; IECC 2012; Title 24 2013	Automatic lighting shutoff	SS: Light Pollution Reduction; EA: Minimum Energy Performance; EA: Optimize Energy Performance	10-20% <sup>7</sup>	0-3%
 <b>Demand response</b>	Title 24 2013; ASHRAE 189.11-2011; IgCC 2012	Demand responsive lighting	EA: Demand Response <sup>2</sup>	30-50% <sup>8</sup> during peak demand period	Variable

Source located on page 2

Learn how to apply these strategies to your next project: [email sales@lutron.com](mailto:sales@lutron.com)

## Sources

- 1 LEED 2009 for schools and LEED CI (commercial interiors)
- 2 Coming in LEED v.4, expected November 2014
- 3 Williams A, et al. 2012. Lighting Controls in Commercial Buildings. Leukos. 8(3) pg 161-180
- 4 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
- 5 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.
- 6 Galasiu AD, et al. 2007. Energy saving lighting control systems for open-plan offices: A field study. Leukos. 4(1) pg 7-29
- 7 Energy savings estimated based on 50% reduction of after-hours lighting energy waste. Source: 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
- 8 Newsham GR & Birt B. 2010. Demand-responsive lighting: a field study. Leukos. 6(3) pg 203-225
- 9 The Advanced Lighting Guidelines indicate that the combined HVAC effect of reducing lighting energy on average is approximately 15%. Internal Lutron EnergyPlus simulation showed similar HVAC savings. Source: New Buildings Institute. 2003. Advanced Lighting Guidelines
- 10 Lutron commissioned study by Herrick Laboratories. University of Purdue. 2011

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