Estimates of Energy Savings Potential from Lighting Controls

Researchers have been quantifying energy savings from lighting controls in commercial buildings for more than 30 years. However, each study differs in its goals, methods, and coverage, so results vary widely and have been difficult to compare. To leverage the value of the entire literature collection and better assess the energy savings potential of different lighting controls strategies, Lawrence Berkeley National Laboratory conducted a meta-analysis of lighting energy savings identified in the literature. Published in the IESNA journal Leukos (January 2012), the paper synthesizes the results from 240 savings estimates included in 88 papers and case studies, categorized into daylighting strategies, occupancy strategies, personal tuning, and institutional tuning.

Beginning with an overall average of savings estimates by control strategy, the authors added successive analytical filters to identify potential biases introduced to the estimates by different analytical approaches. These filters screened out savings from non-controls lighting technology and savings reported in something not equivalent to lighting energy. In addition, because simulations were found to significantly overestimate the average savings obtainable from daylighting in actual buildings, the final filter removed any savings data that were not from actual installations – either lab or field. Table 1 shows the final estimates of average lighting energy savings potential by control strategy.

TABLE 1.
Best Estimates of Average Lighting Energy Savings Potential From Lighting Controls

CONTROL STRATEGY	EXAMPLES	AVERAGE SAVINGS
Institutional Tuning	High-end trim dimming (ballast tuning), task tuning, lumen maintenance, provision of controls for areas/groups of occupants	36%
Personal Tuning	Dimmers, wireless switches, bi-level switches, computer based controls (for personal offices, workstation-specific lighting, classrooms)	31%
Daylighting	Photosensors	28%
Occupancy	Occupancy sensors, time clocks, EMS	24%
Multiple Strategies	Any combination of the above	38%

For more information:

Williams, A., B. Atkinson, K. Garbesi, E. Page, and F. Rubinstein (2012). Lighting controls in commercial buildings. Leukos 8(3): 161-180. http://www.ies.org/leukos/samples/1_Jan12.pdf

ABOUT ALG Connections

Through a series of abstracts and synopses, ALG Connections informs readers on timely topics such as research, conference reviews, industry trends and technology updates.

ALG Online is one of the design guides offered by New Buildings Institute (NBI) through its Advanced Buildings® suite of tools and resources.

Visit us for more information about New Buildings Institute at newbuildings.org, ALG Online at algonline.org and Advanced Buildings at advancedbuildings.net.