

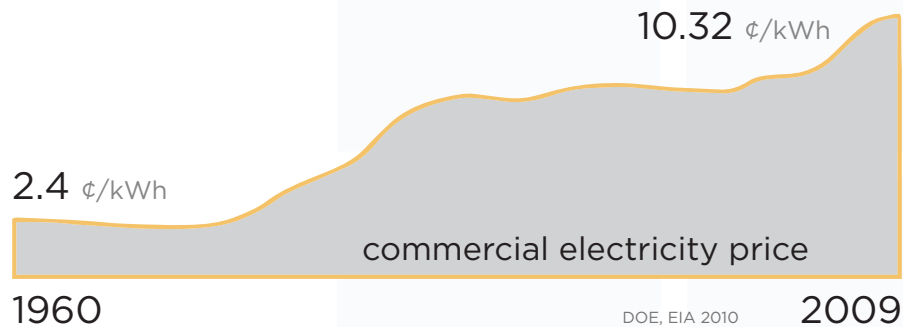


WHY CONTROLLABLE LIGHTING?

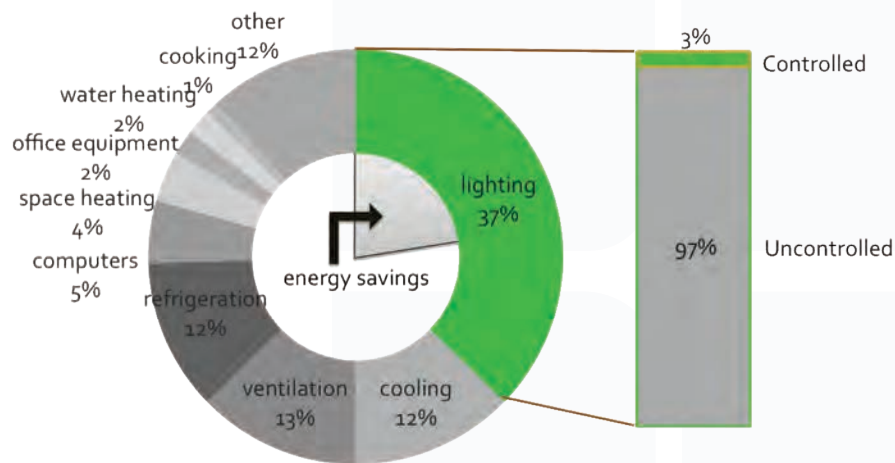


FULHAM
LIGHTINGCONTROLS™

Commercial Energy Cost Timeline



Lighting Cost in Commercial Buildings



Energy Information Administration, 2003 Commercial Buildings Energy Consumption Survey, released April 2009.
www.eia.doe.gov/emeu/recs/recs_cbecs0309/lighting.html
J. Sweeney, 2009

Title 24 2014 Code Requirements

- 4 light levels between on/off required (6 total)
- CENTRAL controls required in new construction or remodeling projects greater than 500sq ft. (Occupancy sensors are insufficient)



Why Controllable Lighting:



Generates up to 70% lighting energy savings

by intelligently adjusting lighting to your environment



Pays back quickly

Maximizes what you have and minimizes outlay.



Protects your existing investment

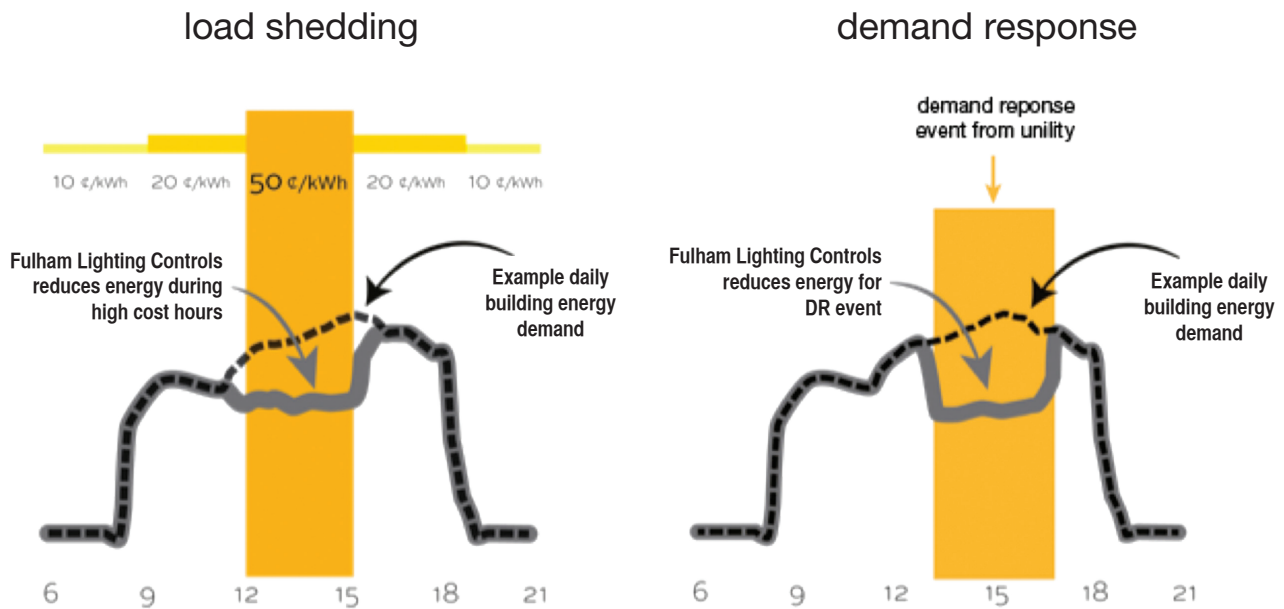
Works with your current fixtures and systems now and in the future

Savings per Lighting Control Strategy

Energy-saving strategy	Example	Potential savings
High-end trim / Tuning	Desired maximum light level (doesn't always need to be 100%)	20% Lighting
Occupancy / Vacancy sensing	Monitor vacant areas, turning lights off after optimal time	15% Lighting
Daylighting	Adjust electric lighting in a space to complement daylight	15% Lighting
Scheduling	Lighting settings adjust to building use depending on day & time	15% Lighting
Personal Light Control	Individual control of workspace lighting	15% Lighting
Lumen Maintenance	Adjust for decreasing efficiency over a lamp's life	5% Lighting
Load Shedding/ Demand Response	Reduction of lighting energy at peak times to avoid high costs	Variable

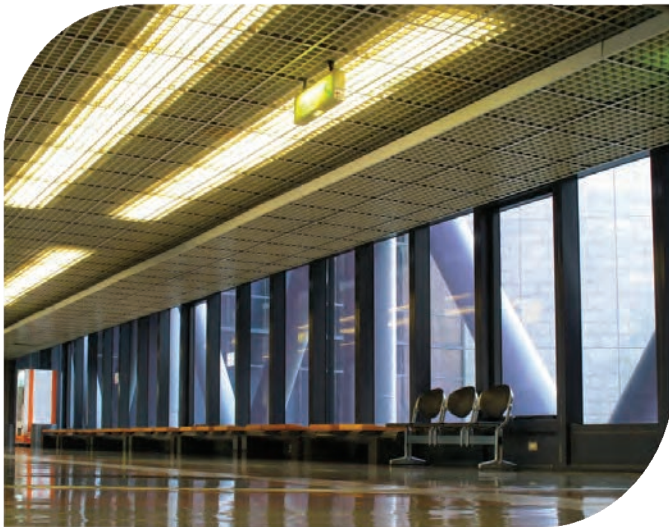
Advanced Smart Grid Capabilities

Capture added savings with smart grid functions



Lighting Controls Make Your Building Smarter

- A proven solution installed in millions of ft²
- Years of proven lighting technology
- Preserves your lighting infrastructure
- Easy installation – no fixture or lamp changes
- 2-way fixture-level communication
- Personal dimming and scene control



Good examples of Lighting Controls applications

Good Fit for Lighting Controls

- Where energy management is important
- Higher than minimum code compliance desired
- Property managers of tenant spaces – if they pay for utilities they are often interested

Good Fit for Lighting Controls (cont)

- Tenants are most interested during lease changes to reduce their costs (if they pay utilities) or for better light control (as part of a new lease)
- Spaces with varied work hours – very easy to turn on lights only as needed
- Schools (classrooms, corridors, hallways, offices)
- Where a small number of lighting presets (scenes) can be used consistently (not constantly adjusted)
- High efficiency sources
- Where lighting quality affects productivity
- Linear T5/T8 fluorescent fixtures with 3 or fewer lamps
- Green buildings, customers with sustainability goals
- Where the desire is to match the light to the task
- Where spaces are flexible and also need flexible lighting
- Where safety is important – hazardous processes
- Where TCO is important

Challenges for Lighting Controls

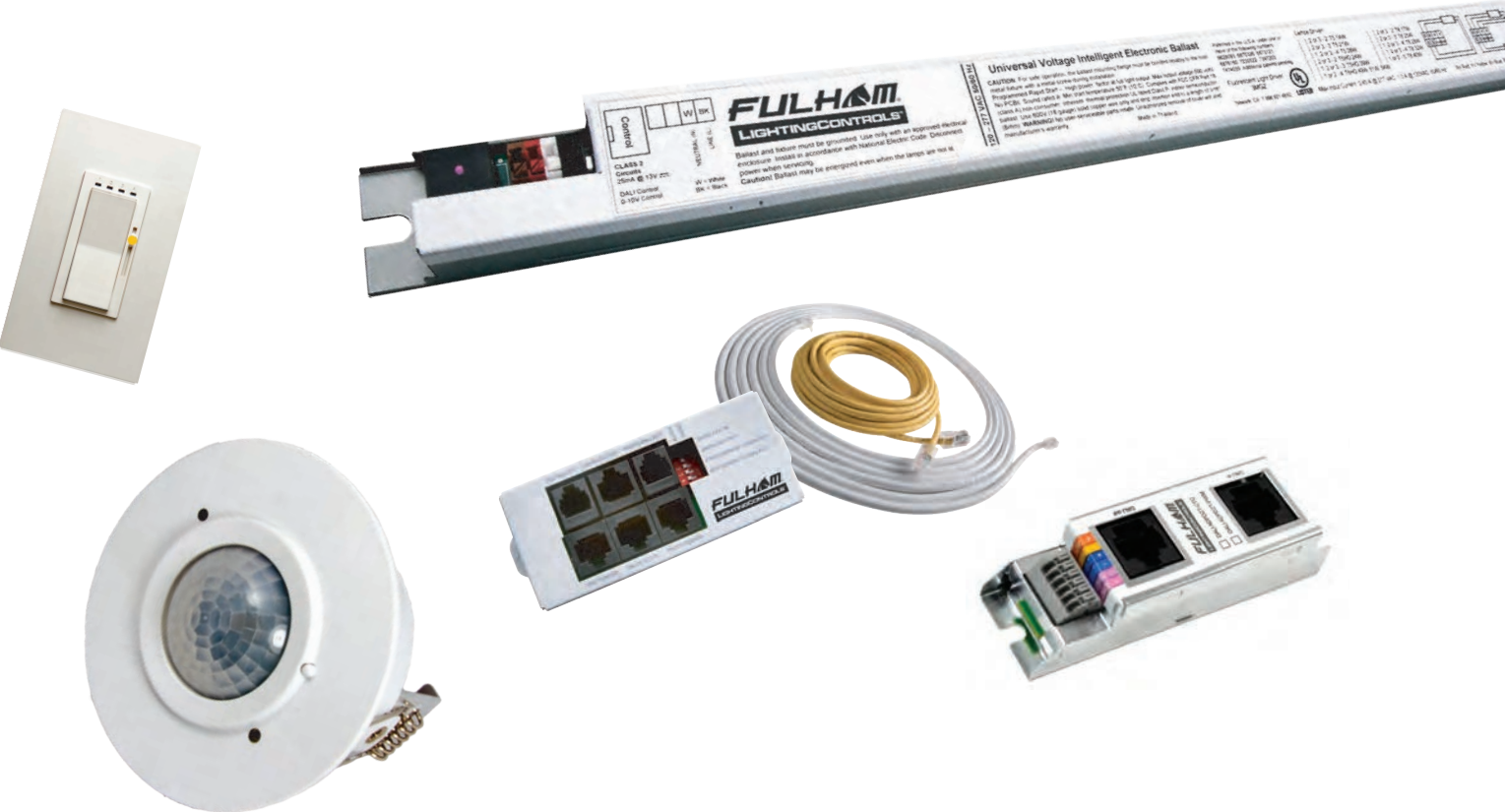
- Highly architectural spaces – where there is a huge range of small, different fixtures.
- Very high levels of room integration (using touchpads, crestron, AV integration, etc.)
- Code compliance only at lowest cost
- Multipurpose school rooms – typically theatrical in nature
- Where they want to be able to create a large number of scenes from within the space
- Mostly low efficiency sources, such as incandescent used for general lighting
- Where initial cost is the most important factor



Lighting Controls Overview

Fulham’s Lighting Controls System (LCS) delivers maximum energy and cost savings for large and medium-scale office and industrial buildings, for both retrofits and new construction.

The LCS product line includes advanced ballasts and a sophisticated control system that work together to enable dynamic lighting control schemes that result in appropriately lit areas with the minimum energy expenditure, reducing energy costs from lighting by up to 70%.



General Lighting Controls Benefits

Unique Fulham Technologies and Expertise:

- Superior functionality at a lower cost—affordable dimming on every ballast

Best-in-class Lighting Management Solutions:

- Tangible and measurable savings from integrated control strategies: daylighting, scheduling, task-tuning, demand response
- Improved worker productivity and security
- Ongoing cost savings

Universal Interoperability:

- Easy upgrade
- Rapid integration and deployment into existing spaces
- Immediate integration with fluorescent technology today
- Expandable to control other energy-sensitive systems
- Enables control of legacy 0-10V fixtures within intelligent system

Ideal for both retrofit and new construction in the following markets:

- Commercial
- Institutional
- Retail
- Education
- Hospitality
- Government
- Manufacturing & Distribution
- Freight Terminals
- Airports
- and much more...



Benefits for Lighting Specifiers, Distributors, Consultants & Utility Companies

Architects & Engineers:

- Gain LEED points by minimizing lighting power density
- Implement scheduling and other advanced controls
- Improve comfort and aesthetics
- Enable sustainable and low-carbon designs



Distributors and OEMs:

- Breakthrough ballast technology lowers number of SKUs required in inventory
- Highly interoperable ballasts and control system ensures fit for multiple projects

ESCOs:

- Demand response provides additional energy savings

Energy Service Providers:

- Advanced demand response allows multi-stage priority-based loadshedding
- Monitoring and reporting provides for demand response verification

Facility Managers:

- Lower replacement cost
- Universally interoperable
- Virtually maintenance-free
- Long expected service life of controllers

As architects and engineers take the time for high-quality design, the supporting construction documentation will create a more valuable building. Therefore, the specifier has a critical role in significantly improving a project's financial bottom line.

When a building's overall value is increased, and its occupants are more productive and happier, the higher initial cost of using more efficient products and investing more in the design is easily justified.



In networked lighting control, the goal is distributed points of intelligence, which includes smart dimming ballasts connected to smart switches.



For the owner of a commercial office building, choosing the right technology can help mitigate economic uncertainty. A facility that adjusts to fluctuating electricity rates will be less expensive to operate and maintain.

FULHAM[®]
Lighting... Global. Intelligent. Sustainable.

Fulham Co., Inc. is a leading global supplier of electronic ballasts, lamps, electronic transformers, LED modules & drivers, emergency lighting systems, induction systems, wiring harnesses, custom assemblies and more. Fulham has facilities dedicated to sales and service excellence in North America, Latin America, Europe, Asia, Africa, India, and the Middle East. Fulham's product diversity and excellence is due in part to its international staff of world-class engineers and production experts, as well as its commitment to product innovation. Fulham's product quality ranks among the highest in the industry. Fulham is dedicated to being the leader in cost-effective and energy-efficient lighting solutions. For more information about Fulham Co., Inc., please visit www.fulham.com, or contact our U.S. Customer Service team at (323) 599-5000.



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