

Mining the Savings From Lighting Controls in Existing Commercial Buildings

ACEEE Market Transformation

Washington, DC

March 25th, 2002

The Watt Stopper

- Founded in 1980
- 30% average growth rate
- Purchased by Pass and Seymour in 1996
- Largest manufacturer of commercial lighting control occupancy sensors
- Full line...occupancy sensors, scheduling panels, daylighting control

“Putting a stop to energy waste”



Preview

- Potential...a function of need, quality of our solutions, ability to deliver solutions
 - ◆ Classroom upgrade example
- Mining strategies that work
 - ◆ Application focused solutions
 - ◆ What our most experienced sales people do to grow retrofit sales

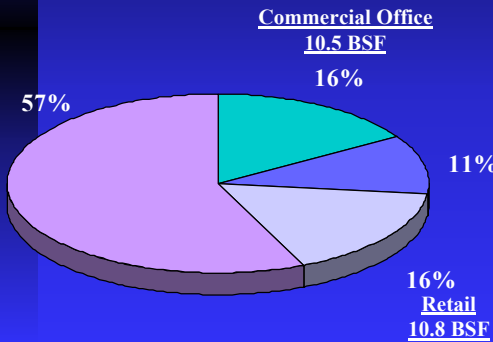
Potential

- ◆ Commercial Installed base
- ◆ Lighting as a percent of total energy
- ◆ Savings potential
 - ◆ Improve efficiency (reduce watts/sq.ft.)
 - ◆ Reduce runtime (turn off when not occupied)
 - ◆ Reduce levels (day lighting and tuning)

Commercial Installed Base vs. New Construction

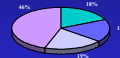
Existing Inventory

65.6 Billion SF



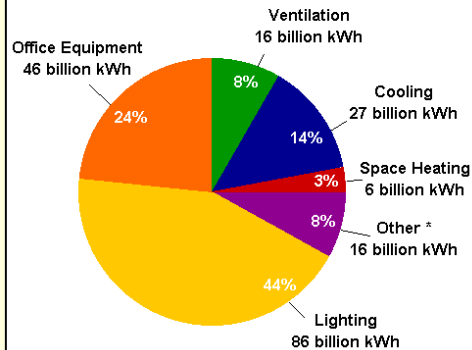
New/Retro Activity

2.06 BSF



Lighting Electrical Usage (Mine)

**SITE ELECTRICITY USE
IN OFFICE BUILDINGS**
198 billion kWh

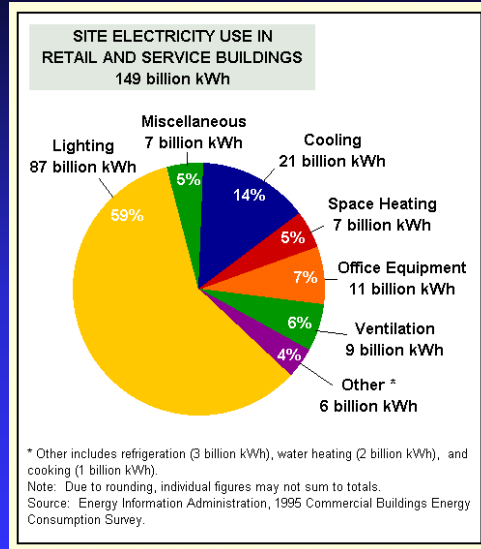


* Other includes miscellaneous uses (13 billion kWh), water heating (2 billion kWh), refrigeration (1 billion kWh), and cooking (<1 billion kWh).

Note: Due to rounding, individual figures may not sum to totals.

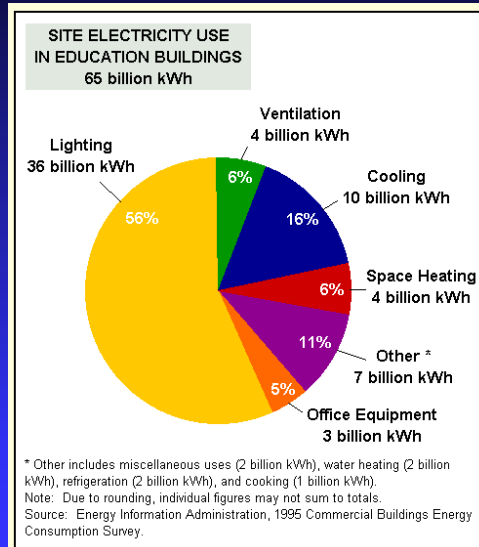
Source: Energy Information Administration, 1995 Commercial Buildings Energy Consumption Survey.

Lighting...the Retail Shaft



Lighting in Education

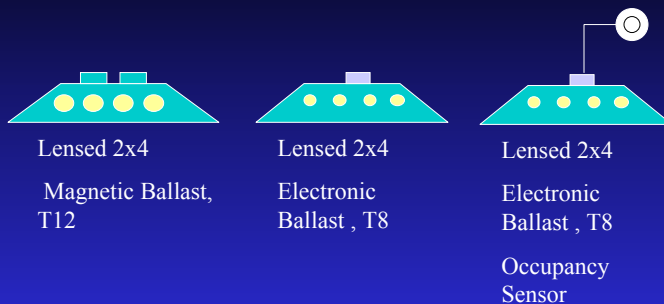
Cost per Sq Ft per year
\$0.92 total energy
\$0.67 electricity
\$0.38 lighting



The Commercial Lighting Mine

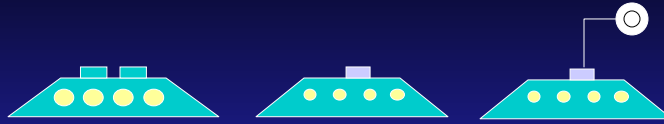
- Lighting is the single largest electrical user
- Different usage by application
- Solutions vary by building type, occupancy
- Many approaches...not optimized

Example...College Classroom



Watts per Sq Ft	2.9	2.28	2.28
Runtime	2028	2028	1014
900 Sq Ft classroom	\$529	\$415	\$207
Savings	base	\$114	\$114 + \$207 = \$321
Cost	base	\$342	\$118 + \$342 = \$460

Example...College Classroom



Lensed 2x4

Magnetic Ballast,
T12

Lensed 2x4

Electronic
Ballast, T8

Lensed 2x4

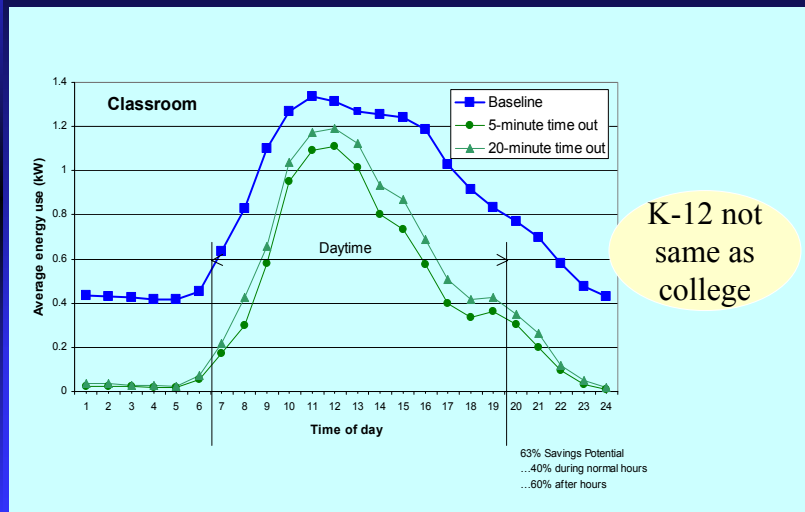
Electronic
Ballast, T8

Occupancy
Sensor

Issue:
Savings
predictability and
persistence

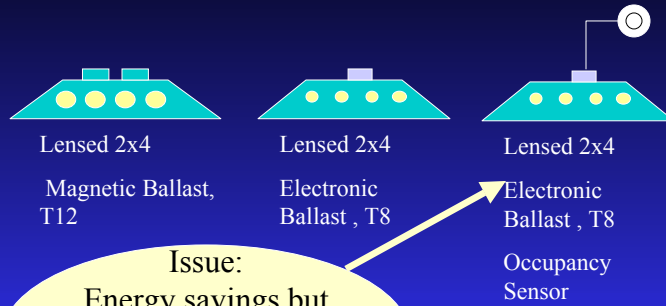
Watts per Sq Ft			2.28
Runtime			1014
900 Sq Ft classroom	\$529	\$415	\$207
Savings	base	\$114	\$114 + \$207 = \$321
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Occupancy Sensor Potential



K-12 not
same as
college

Example...College Classroom



Issue:
Energy savings but
little improvement in
lighting quality

Watts per Sq Ft			2.28
Runtime			1014
900 Sq Ft classroom	\$529	\$415	\$207
Savings	base	\$114	\$114 + \$207= \$321
Cost	base	\$342	\$118+\$342 = \$460

Maximize energy savings and improve quality



Watts per Sq Ft	2.9	1.16
Runtime	2028	1014
900 Sq Ft classroom	\$529	\$106
Savings	base	\$423
Cost	base	\$1531

Mining strategies that work for controls

- Focus the controls on the application
 - ◆ Warehouse relighting using T-5 vs. metal halide
 - ◆ Desktop loads
 - ◆ Individual fixture controls in open offices
 - ◆ Stairwell emergency lighting with bi-level occupancy sensing based control
- Expertise in the field
 - ◆ Solutions engineering
 - ◆ Pre-installation training
 - ◆ Facility manager support

Warehouse relighting using T-5 vs. metal halide

Control Need

Ability to control each fixture for added savings of 50%

Labor associated with individually wiring each fixture

Solution

Sensor built into each T-5 fixture

Integrate with fixture manufacturer



Desktop loads

Control Need

Loads moving from ceiling to workplace

Individual desktop control and surge protection

Solution

Isole

California energy crisis

Free demo units to top 100 and PG&E rebate



Mining strategies that work ...what our field experts say

- Promote ASHRAE 90.1 as a baseline for new construction and renovation.
- Demonstrate occupancy sensor performance in common areas...restrooms, conference rooms, break rooms, storage
- Share best rebate programs
- Utilities should act as customer advocate and promote test installations
- Education for specifiers and contractors combining lighting and controls
- Create a national database sharing what works and what doesn't
- Don't sweat the payback on sensors...let the owner estimate his own savings
- Use the right product for the application...not the cheapest

My Takeaways

- Focus on specific winning applications
 - ◆ Total product solution
 - ◆ Channel capability and measurements
- Do it once
- Promote based on performance
 - ◆ Voice of the customer
 - ◆ Energy and occupant satisfaction