



U.S. Department of Energy
Energy Efficiency and Renewable Energy

Lighting Controls & Daylighting

Presented by:

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Illumination Concepts & Sales, Inc.

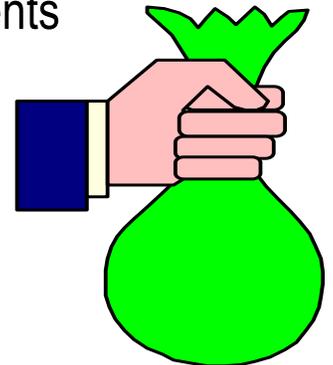


Why Use Lighting Controls?

Practicing environmental responsibility in designs

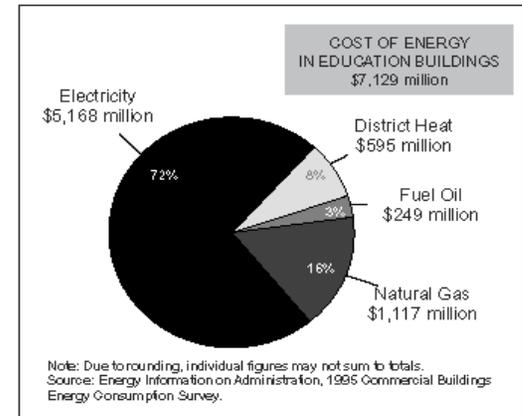


- Lowers pollutants in atmosphere
- By-product is energy savings
 - Lowers operational costs of facility
 - Funds can be used in other areas or departments





Expected Energy Savings



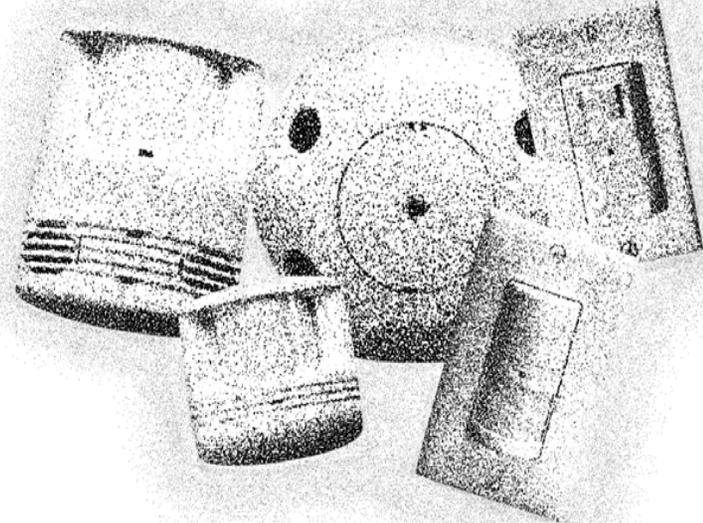
*Energy Usage Characteristics
of Educational Facilities*

- **Electricity Expenditures account for 72% of energy costs**
- **At least 50% is consumed by lighting**
- **Expected savings in classrooms is 10-50%**
- **Daylighting savings can be up to 40%**



Types of Controls

- **Occupancy Sensors**
 - Automatic On/Off
 - Integration with HVAC





Occupancy Sensors

Technologies:

- **Passive Infrared**
- **Ultrasonic**
- **Dual Technology**



Ceiling Mounted vs. Wall Mounted

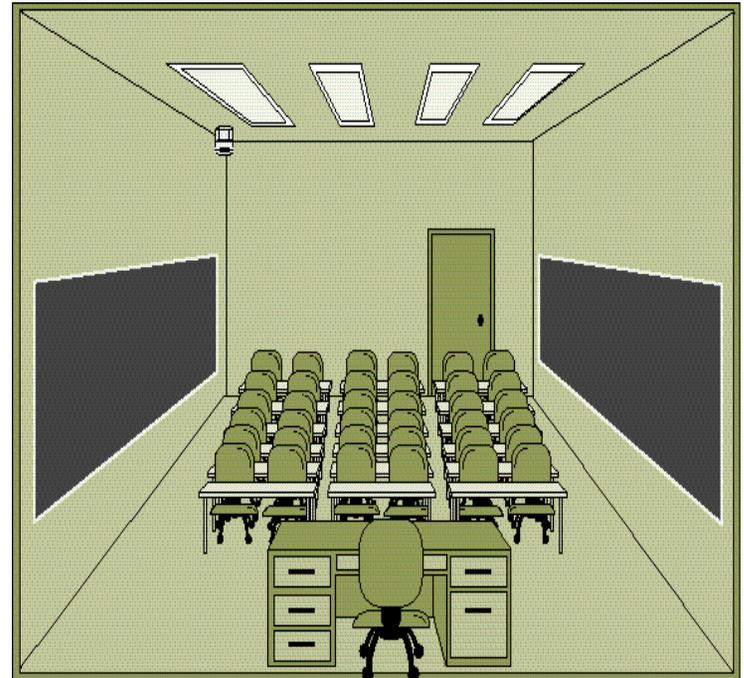
Common Applications:

Ceiling Mounted:

- Classrooms
- Teachers' Lounges
- Administrative Areas
- Restrooms

Wall Mounted:

- Janitorial Storage
- Non-Student Occupied Areas





Types Cont'd.

- Lighting Control Panels





Lighting Control Panels:

Operation:

- Time clocks
- Indoor/outdoor lighting loads
- Local overrides



Control Panel Applications:

- Classrooms
- Corridors
- Lobbies
- Auditoriums
- Security and parking lot lighting
- Entire building control
- Maximum flexibility and energy savings
- Commonly combined with occupancy sensors



Types Cont'd.

- Daylighting Controls



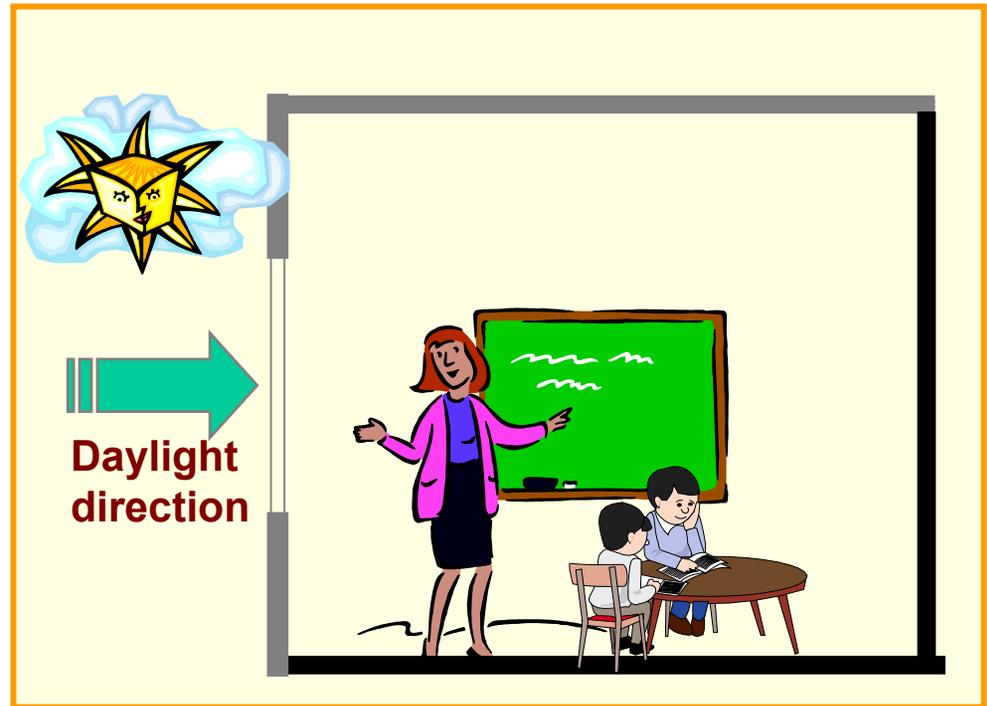


Daylighting Controls:

- Continuous dimming

versus

- Stepped dimming





Daylighting: Common Applications

Classrooms

Cafeterias

Corridors

Gymnasiums



Wrap-up Notes:

- Lighting controls much improved
- Local energy codes/national energy codes
- Environmentally responsible design



Additional Resources:

- **Government Programs**
 - **Rebuild America**
 - www.rebuild.org/index.asp
 - **Energy Smart Schools, a Rebuild America Campaign**
 - www.eren.doe.gov/energysmartschools/
 - **Alliance to Save Energy Green Schools Program**
 - <http://www.ase.org/greenschools>
- **Building Energy Rating Programs**
 - **EPA Energy Star Schools**
 - <http://www.energystar.gov/default.shtml>
 - **LEED Green Building Rating System**
 - www.usgbc.org/programs/leed.htm



Additional Resources Cont'd.

- Codes and Standards
 - ASHRAE
 - www.ashrae.org
 - IESNA
 - www.iesna.org
 - U.S. DOE State Code Status
 - <http://www.energycodes.gov/>
- State Programs
 - Collaborative for High Performance Schools
 - www.eley.com/chps/
 - The Daylighting Collaborative
 - www.ecw.org/