Lighting = Cash + Code

The Case for Lighting Controls

BuildingEnergy NYC 15

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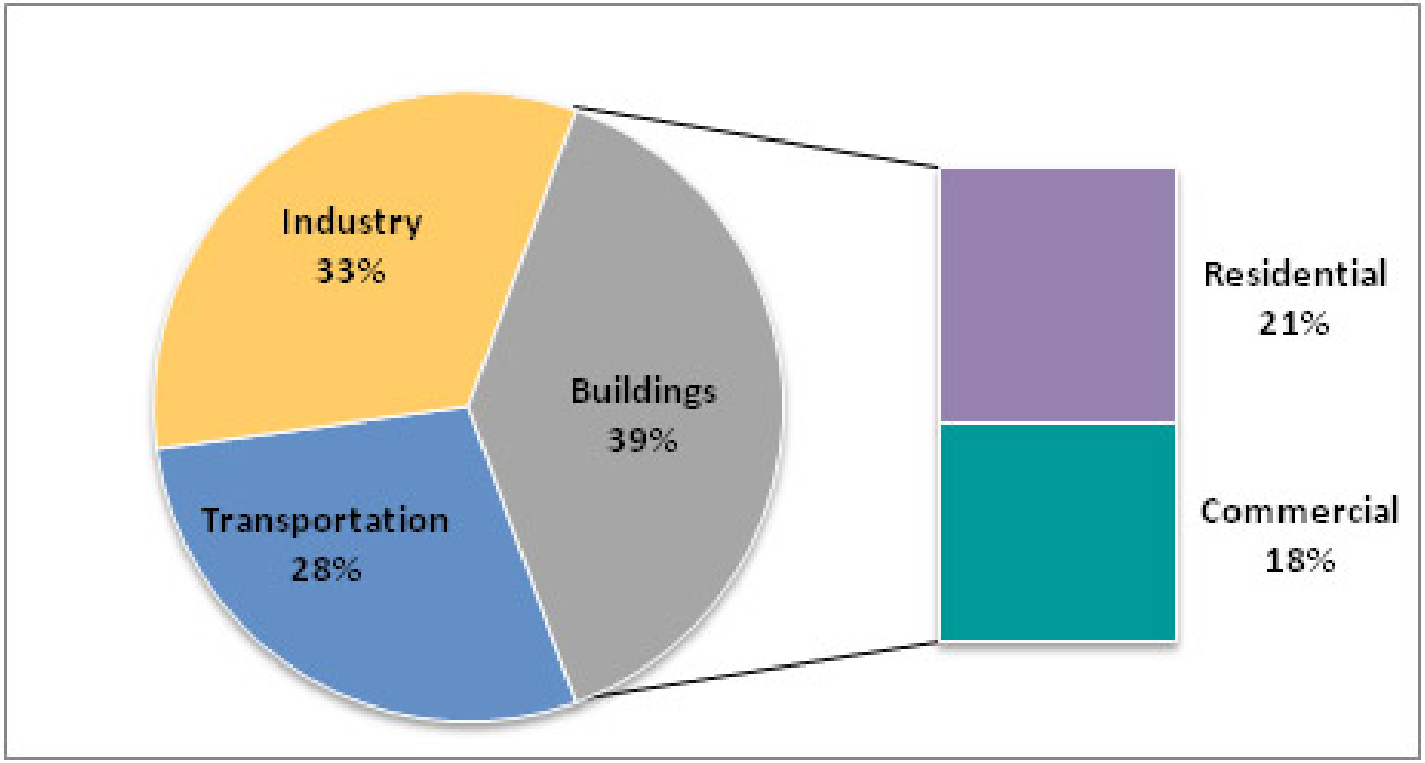
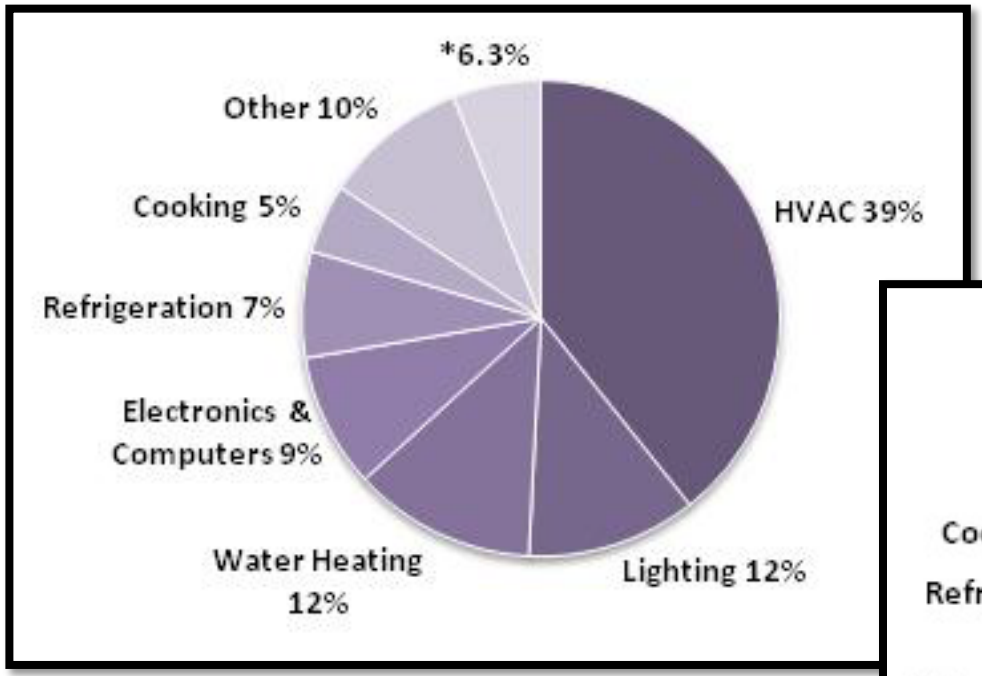
Buildings and Emissions: Making the Connection



DOE, *2008 Buildings Energy Data Book*, Section 1.1.1, 2008.

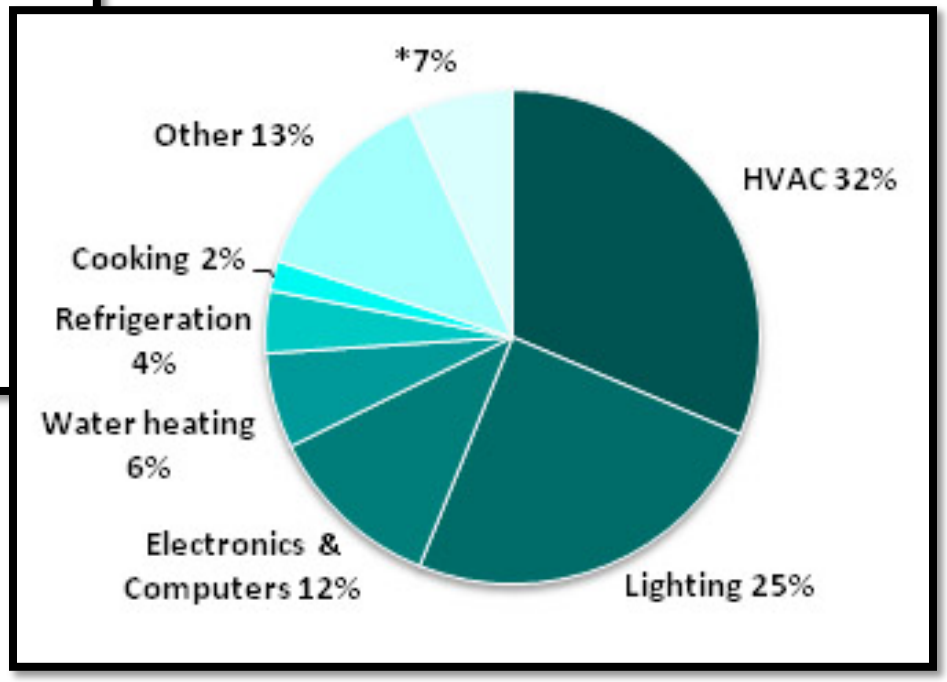
Building Energy End Use Breakdown

Residential



DOE, *2008 Buildings Energy Data Book*, Section 2.1.5, 2008.

Commercial



DOE, *2008 Buildings Energy Data Book*, Section 3.1.4, 2008.

Common Issues in Commercial Spaces

- Over illuminated
- No daylight control
- Lights left on in vacant spaces
- Lights left on after operating hours

Corrective Action: Lighting Controls

What is Lighting Control?

- The ability to regulate the level and quality of light in a given space for specific tasks or situations.

Types of Lighting Controls:

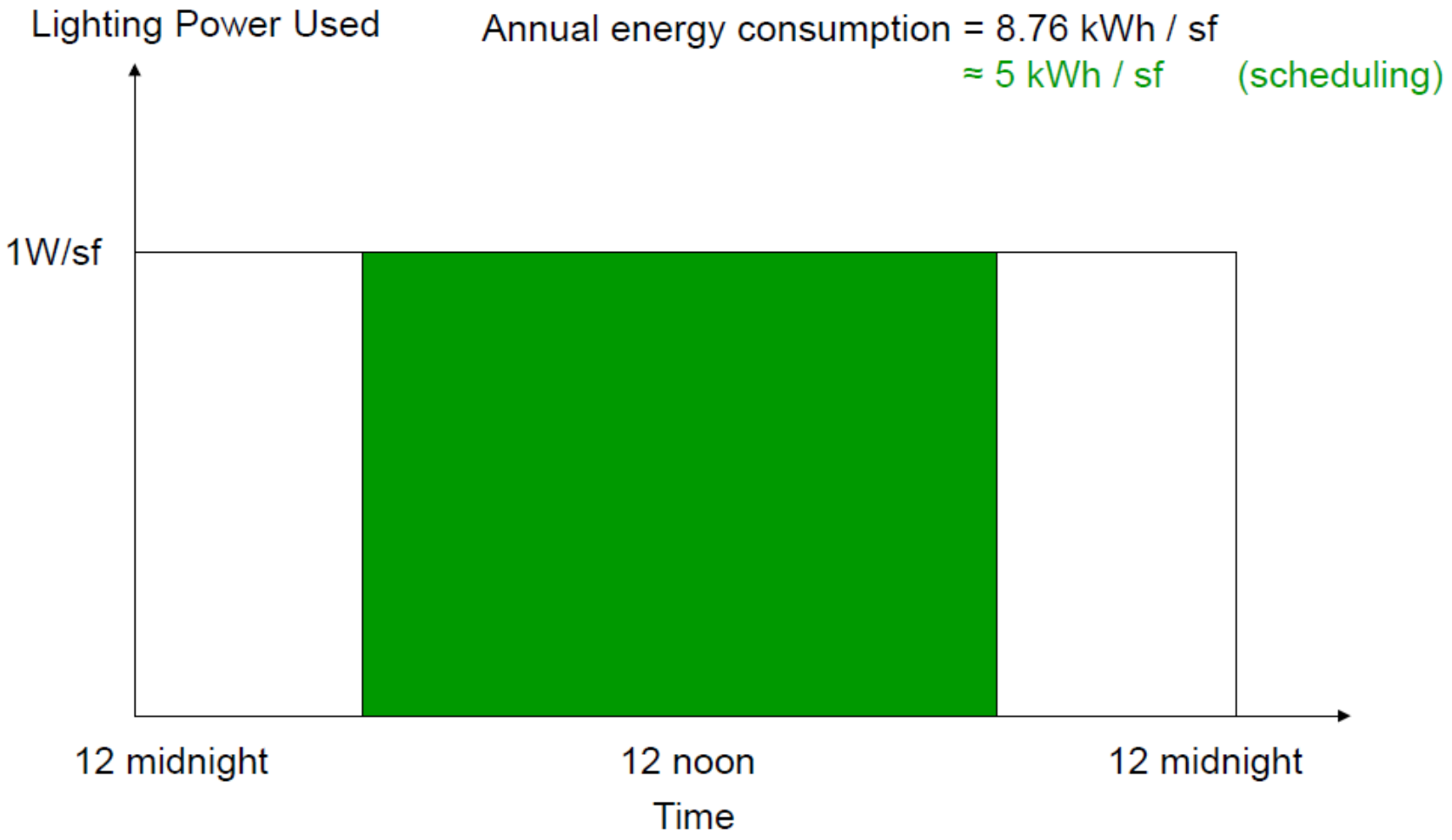
- Scheduling
- Occupancy / Vacancy Sensors
- Dimming
- High End Trimming / Tuning
- Daylight Harvesting

Corrective Action: Lighting Controls

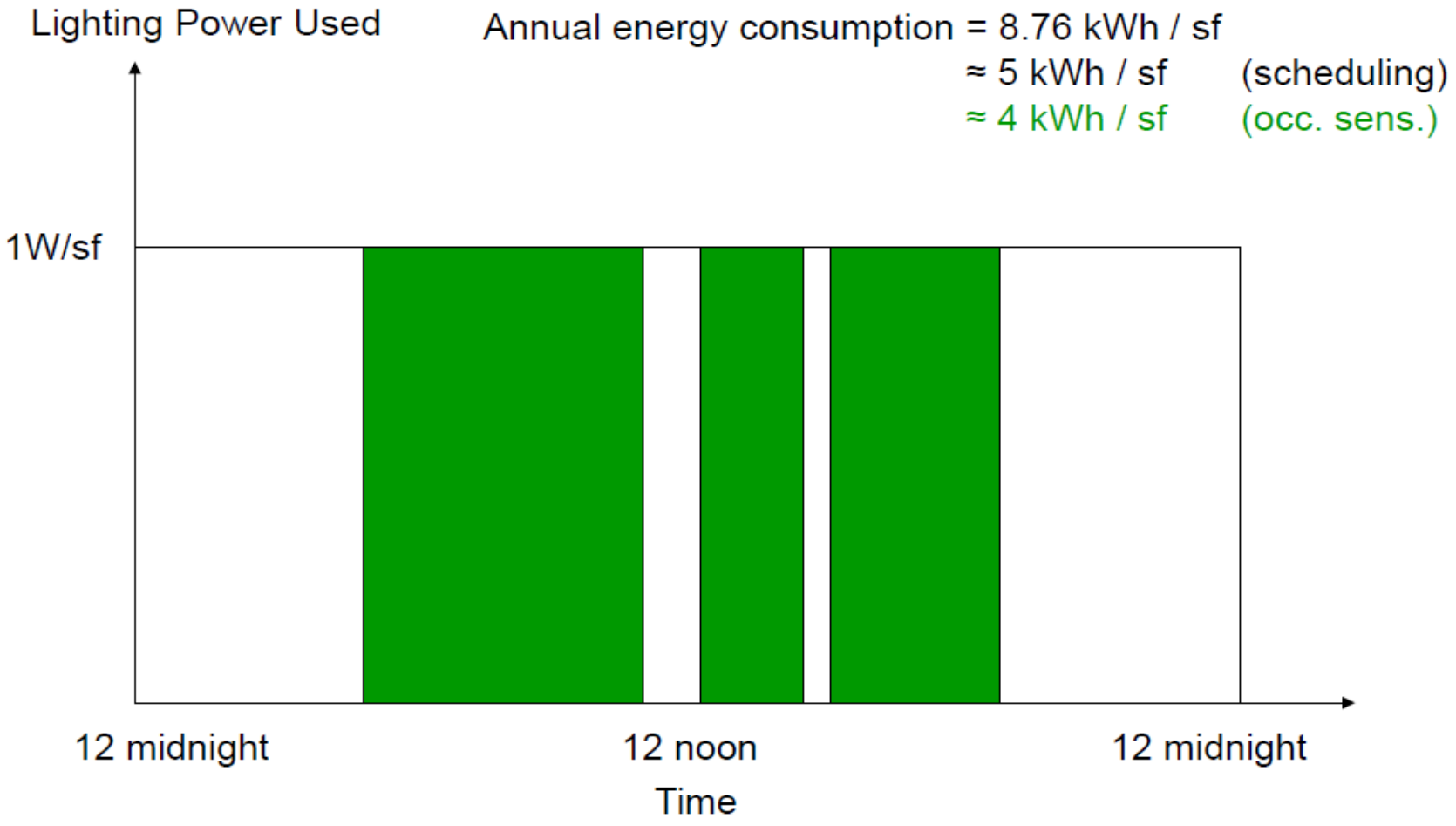
How can Lighting Control save energy?

- Reduces watts used when lights are on (dimming)
- Maximizes effective use of sunlight (daylight harvesting)
- Reduces operating hours (switching)
- Yields HVAC savings through reduced cooling load

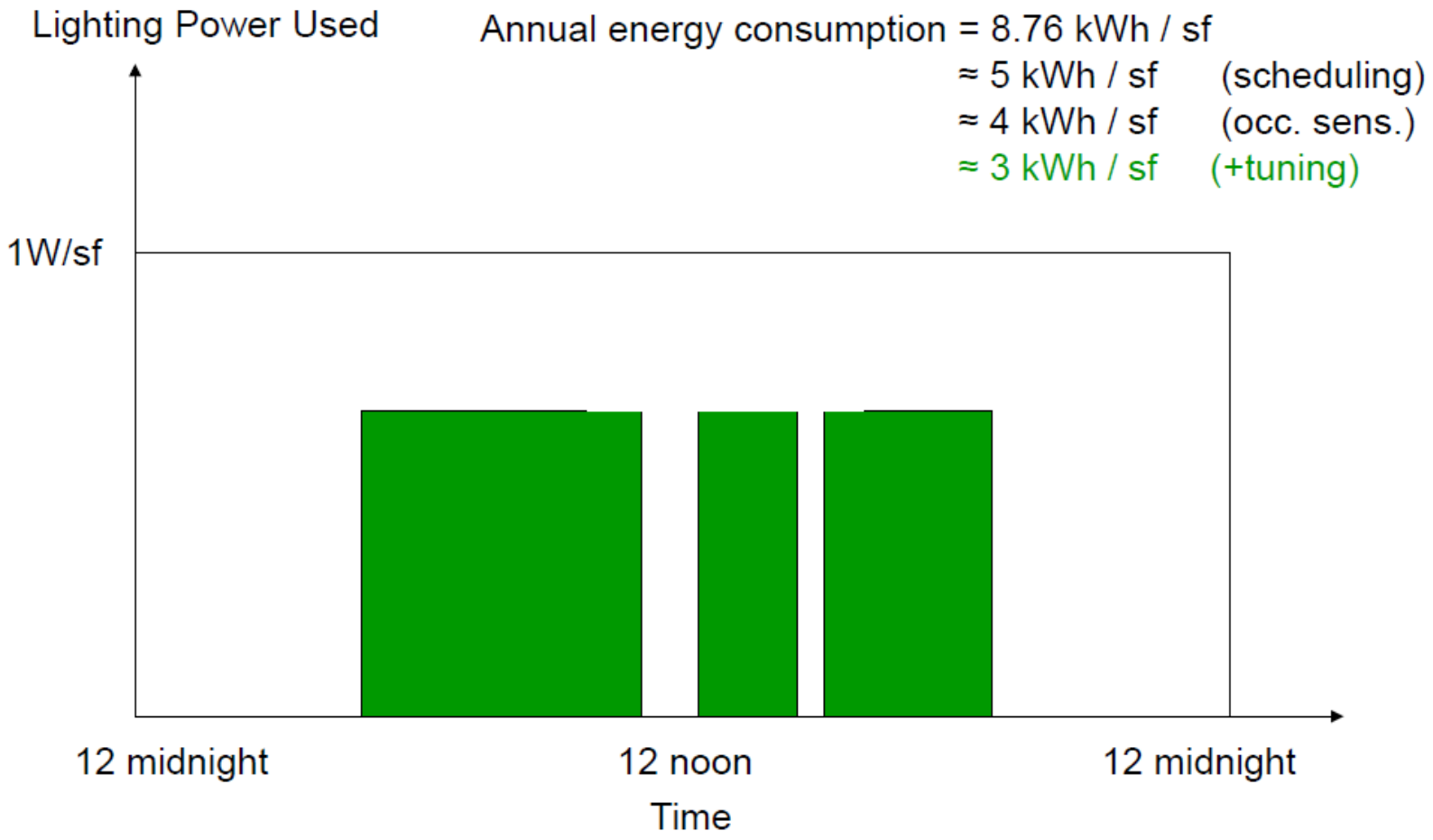
Lighting Controls: Scheduling



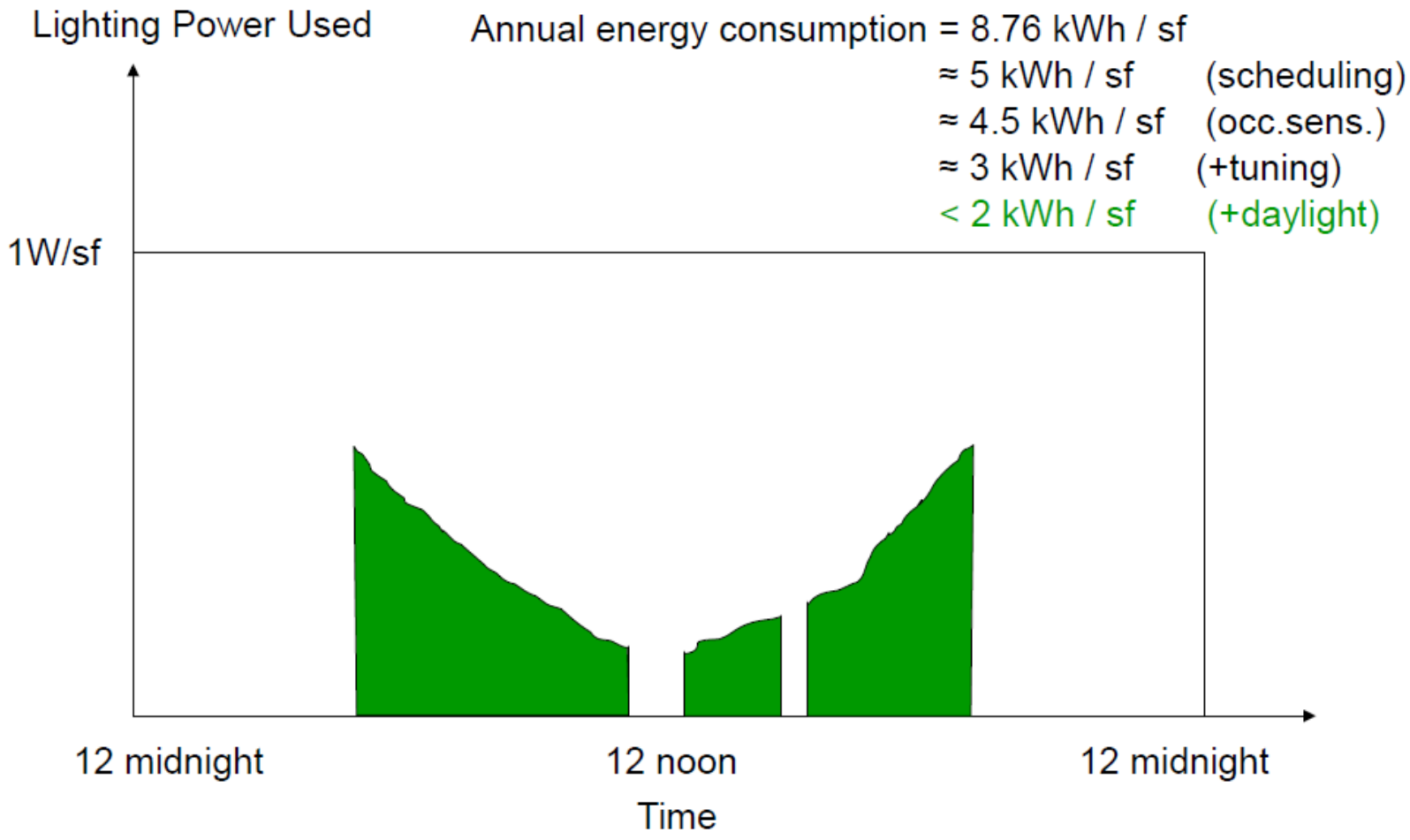
Lighting Control: Scheduling + Occupancy Sensors



Lighting Controls: Scheduling + Occupancy Sensors + Tuning



Lighting Controls: Scheduling + Occupancy Sensors + Tuning + Daylight



Evolution of Lighting Controls

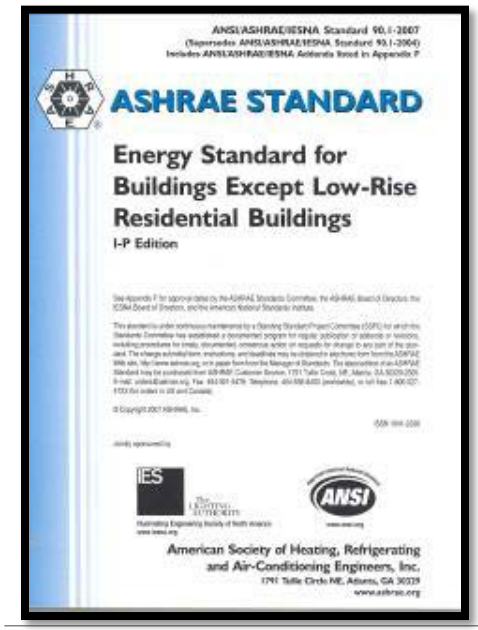
- Building Sweep Controls
  - Facility Level Shut-off after hours
  - No user Feedback and No Sensing Capability
- Occupancy and Daylight Detection
  - Room Level Sensing
  - Extensive pre-design phase and wiring
  - Limited to private offices and conference rooms
- Zone Level Lighting and Centralized Control
  - Centralized Server based control
  - Network dependency
  - No individual optimization of light
- Intelligent Fixture Management
  - Luminaire Level Sensing and Control
  - Maximizes occupant comfort and energy savings
  - Intelligent data network and analytics

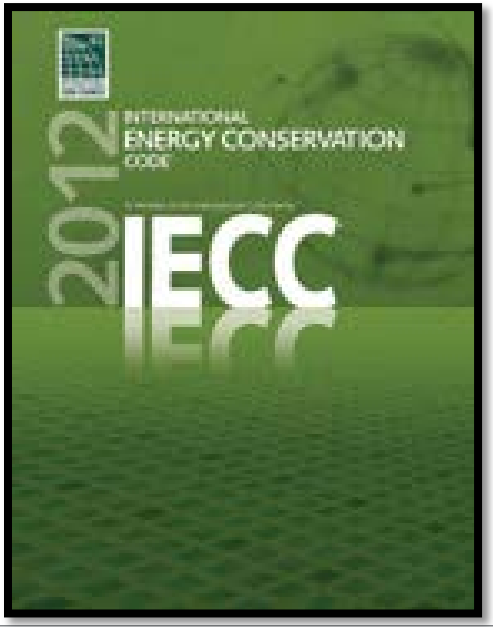
Other Benefits of Advanced Lighting Control

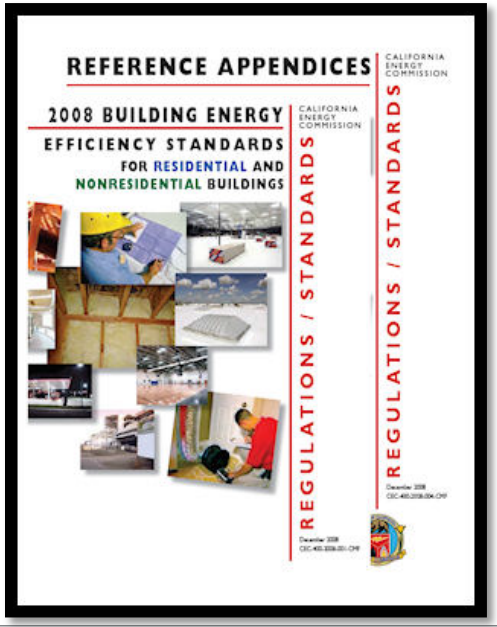
- Demand Response
- Space Utilization / Workplace Strategy
- Automated Window Treatments

Building Energy Codes

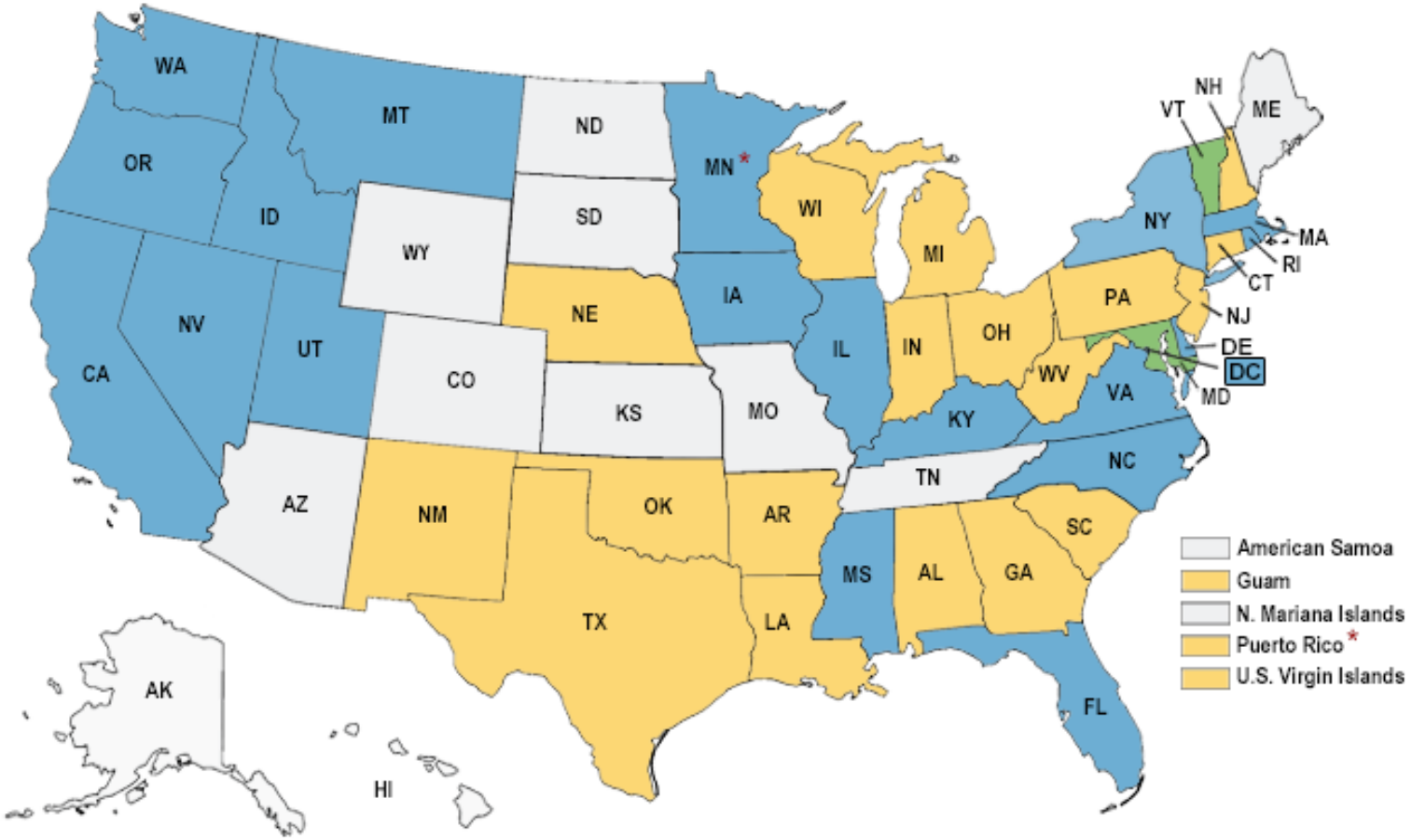
- ASHRAE 90.1
- IECC
- Title 24 (California)







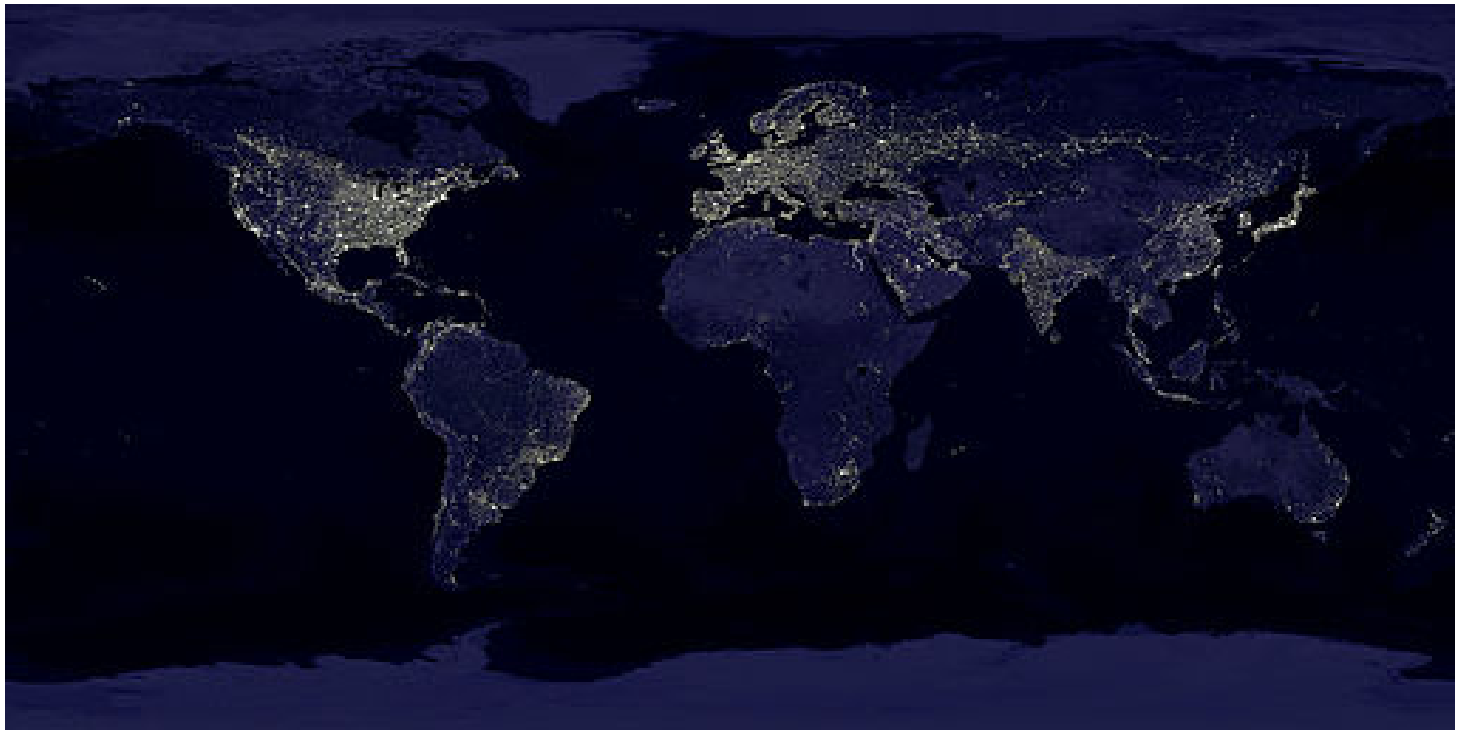
State Energy Code Adoption



www.energycodes.gov

Case Study: Global Financial Headquarters

- Reduced annual lighting consumption by 3 million kWh
- Reduced HVAC consumption by 400,000 kWh
- Annual utility savings of $561,000
- Payback of 5.5 years after incentives
- 19% ROI



By Data courtesy Marc Imhoff of NASA GSFC and Christopher Elvidge of NOAA NGDC. Image by Craig Mayhew and Robert Simmon, NASA GSFC.

Thank you

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