

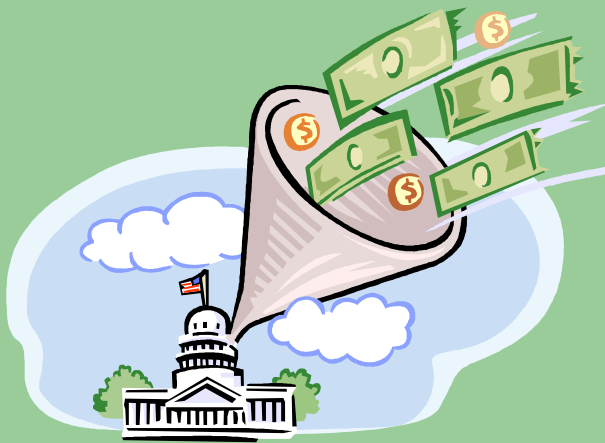
# Understanding the Commercial Building Tax Deduction

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# Outline

- History
- Applicability
- Methods
- Case Studies

# Brief Summary of the Tax Deduction

- Tax Deduction, not a Tax Credit
- Energy Policy Act of 2005
- Extended through December 31, 2013
- Deduction of up to \$1.80/sf
- Partial Deductions Allowed



# Who Can Earn the Deduction?

- ASRHAЕ Standard 90.1-2001
    - No Low-Rise Residential (3-stories of fewer)
  - Privately Owned Commercial Buildings
    - Building or efficient property owner earns tax deduction
  - Federal, State, or Local Government Owned Buildings
    - Primary Designer can claim deduction
    - Can be split between multiple designers
- Non-Profits are not included



# How Much is it Worth?

- Up to \$1.80/sf for buildings saving 50% regulated energy cost
- Partial Credit of \$0.60/sf for buildings savings 16-2/3% as a result of improvements to the HVAC and service hot water, building envelope, or lighting.
  - Option is available to shift percentages to 10% envelope and 20% for HVAC and lighting
- Interim Lighting Rule Available for buildings with Lighting 25% lower than ASHRAE 90.1-2001



# Who Can Perform Calculations?

- A “Qualified Individual”
  - Not related to the taxpayer claiming the credit
  - Professional Engineer or Contractor
  - Contractors will typically only be involved in interim lighting rule calculations



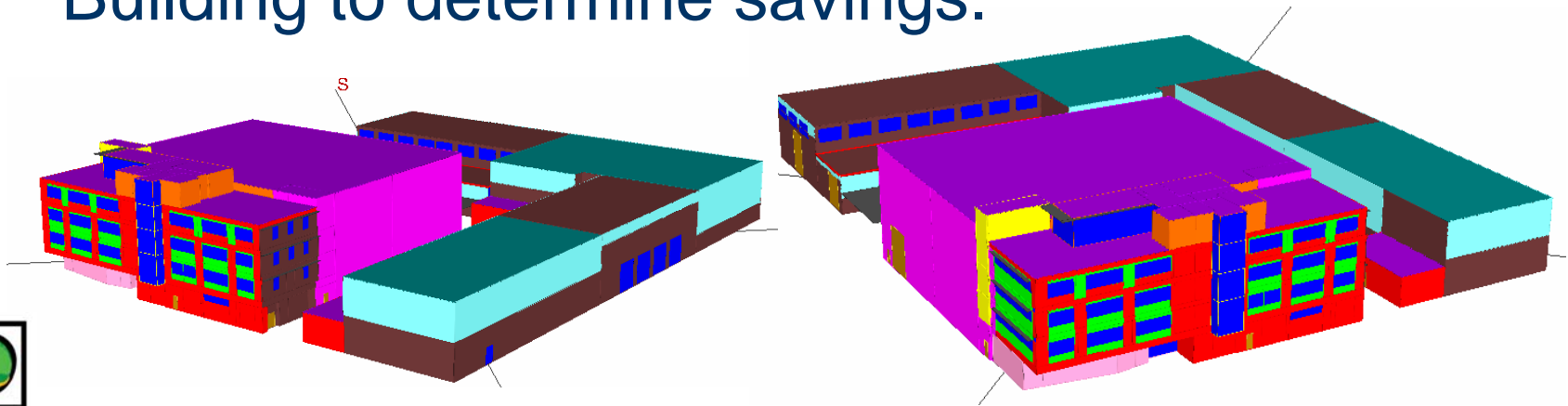
# Calculation Methods

- Whole Building Energy Model
  - Used for both fully and partially qualifying property
  - Maximum Deduction of \$1.80/sf
  - More Expensive
- Interim Lighting Rule
  - Used only for partially qualifying lighting
  - Maximum Deduction of \$0.60/sf
  - Less Expensive



# Whole Building Energy Model

- Methodology Developed by NREL
  - Combination of Appendix G of ASHRAE 90.1-2004, ASHRAE 90.1-2001, and the California 2005 Nonresidential ACM Manual
  - Only approved software may be used
- Improvements are “added” to the Baseline Building to determine savings.



# Whole Building Energy Model

- Baseline systems are determined based on building size, height, use, and fuel type
- Baseline systems can have a significant impact on what technologies will be successful in various buildings
- Inspection of equipment is required

**TABLE G3.1.1A** *Baseline HVAC System Types*

Building Type	Fossil Fuel, Fossil/Electric Hybrid, & Purchased Heat	Electric and Other
Residential	System 1 – PTAC	System 2 - PTHP
Nonresidential & 3 Floors or Less & <75,000 ft <sup>2</sup>	System 3 – PSZ-AC	System 4 – PSZ-HP
Nonresidential & 4 or 5 Floors & <75,000 ft <sup>2</sup> or 5 Floors or Less & 75,000 ft <sup>2</sup> to 150,000 ft <sup>2</sup>	System 5 - Packaged VAV w/ Reheat	System 6 - Packaged VAV w/PFP Boxes
Nonresidential & More than 5 Floors or 150,000 ft <sup>2</sup>	System 7 - VAV w/Reheat	System 8 - VAV w/PFP Boxes

# Interim Lighting Rule

- Achieve a reduction of at least 25% over maximum levels in ASHRAE 90.1-2001
- Controls that comply with Mandatory Provisions of ASHRAE 90.1-2001
- Bi-Level Switching
- On-site inspection to verify installation and perform light level measurements



# Case Studies – Holiday Inn Gaithersburg

- Renovation project that includes window retrofit in 218 guest rooms and several common areas.
- Total 61,500 sf
- Pursuing tax deduction for building envelope improvements



# Case Studies – Holiday Inn Gaithersburg

- All windows replaced with new units with assembly U-0.29
  - Installed vinyl curtainwall system with PPG Solarban 60 glass
- Baseline in ASHRAE 90.1-2001 is assembly U-0.57
- Results in 12.4% energy cost savings.
- **Earns \$0.60/sf for Envelope Improvements (\$37,000)**



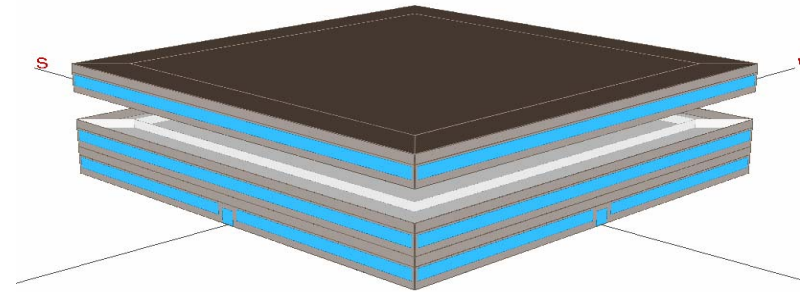
# Case Studies – Holiday Inn Gaithersburg

- Other Important Issues
  - Shell improvement credits ideal for hotel/motel building types.
  - Will be very difficult to obtain for office, school, or other building types with large internal loads that drive energy use

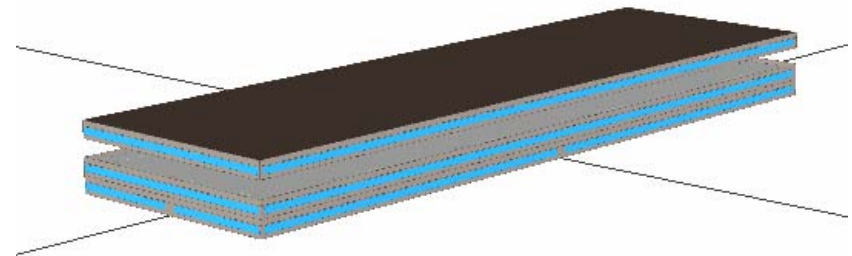


# Effect of Building Shape

- Same Size, Different Shapes
- Building 1 cannot earn a shell deduction.
- Building 2 can earn a shell deduction with an assembly U-0.37 window system



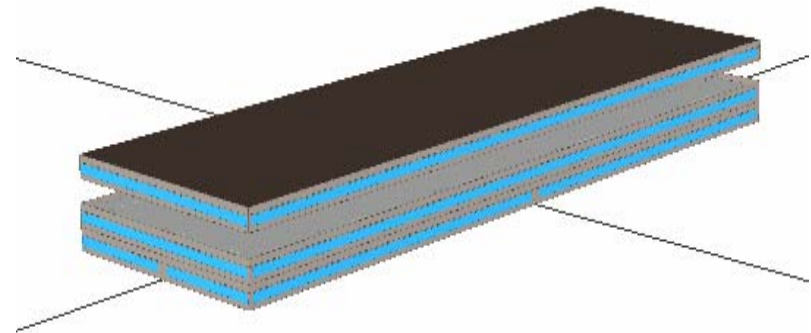
Building 1



Building 2

# Effect of Building Fuel

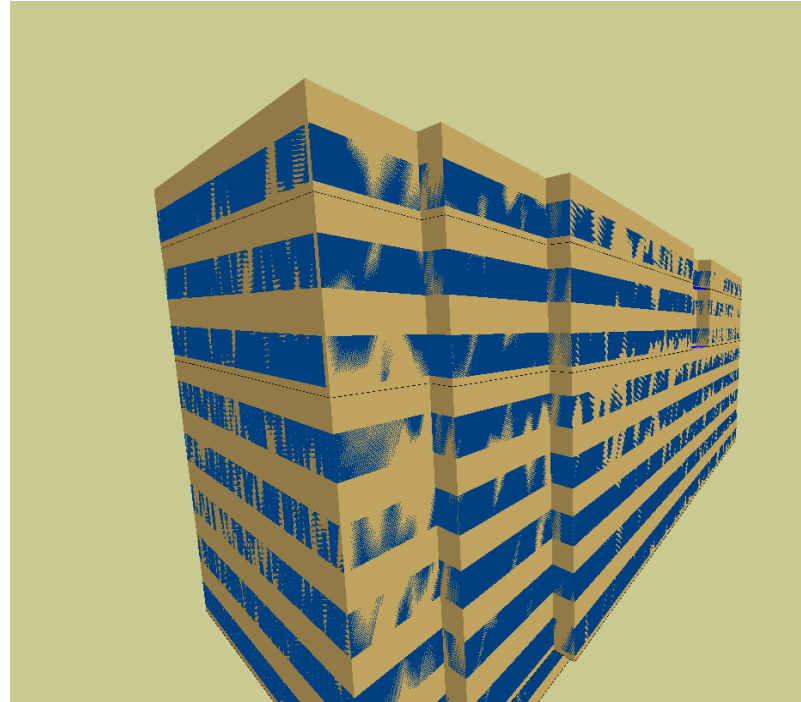
- Building 2 – Identical to previous
- Gas Heat
- In order to earn deduction
  - U-0.37 windows
  - Add 2” rigid insulation to walls
  - Add 1” polyisocyanurate to roof



Building 2

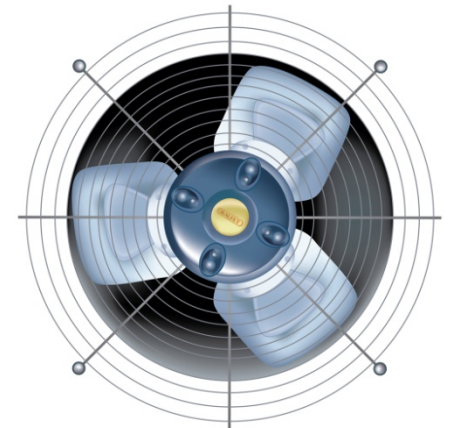
# Case Study – Rockville Office Building

- New Construction Core & Shell Office Building pursuing LEED Platinum Rating
- 191,679 sf
- Pursuing tax deduction for HVAC and hot water systems



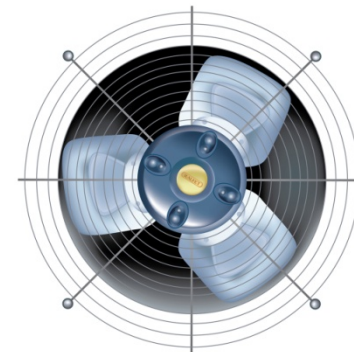
# Case Study – Rockville Office Building

- Floor-by-Floor air handlers utilizing series PIU boxes with electric heat and Electrically Commutated Motors
- Low-temperature chilled water system served by high efficiency series chillers and primary only variable flow pumping scheme
- Dedicated ventilation unit with heat recovery and variable flow with floor-by-floor boxes
- **Earns \$0.60/sf for HVAC Improvements (\$115,008)**



# Case Study – Rockville Office Building

- Other important issues
  - Core & Shell offices will rarely be able to obtain the lighting credit since there is rarely a design for most of the building.
  - Most office buildings will not be able to earn the shell deduction due to high internal loads.



# Take-Home Points

- Tax Deduction is NOT easy to obtain
- Technologies that obtain the deduction vary by building type, use, and size
- In retrofit projects new equipment will be compared to baseline equipment for new buildings, not existing equipment being replaced!



## Questions / Additional Resources

### Contact

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### Additional Resources

Commercial Building Tax  
Deduction Coalition  
[www.efficientbuildings.org](http://www.efficientbuildings.org)

NEMA Lighting Deduction Website  
[www.lightingtaxdeduction.org](http://www.lightingtaxdeduction.org)

NREL Modeling and Inspection  
Guidelines  
[www.nrel.gov/docs/fy07osti/40467.  
pdf](http://www.nrel.gov/docs/fy07osti/40467.pdf)