



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

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**Federal Energy Management Program**

# Overview of Federal High Performance Building Design Goals

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# Outline of Presentation

- Legislative Drivers
  - Federal Rulemaking
- Executive Orders
  - Memorandum of Understanding
  - Guiding Principles
- Coordination



# Legislative Drivers

- Energy Policy Act of 2005 (EPACT 2005)
- Energy Independence and Security Act of 2007 (EISA 2007)



# Energy Policy Act of 2005

- Section 102 – Energy Management Requirements
- Section 103 – Energy Use Measurement and Accountability
- Section 104 – Procurement of Energy Efficient Products
- Section 109 – Federal Building Performance Standards



## Section 102 – Energy Management Requirements

- Mandate – 2% reduction per year in energy consumption per gross square foot for all Federal buildings as compared with the reported 2003 values



## Section 103 – Energy Use Measurement and Accountability

- Mandate – all Federal buildings, for the purpose of efficient use of energy and reduction in the cost of electricity used in such buildings, shall be metered



## Section 104 – Procurement of Energy Efficient Products

- Mandate – to meet the requirements of an agency for an energy-consuming product, the head of the agency shall procure an Energy Star or a FEMP designated product



# Section 105 – Energy Saving Performance Contracting

- Reauthorizes use of Energy Saving Performance Contracting through 2016





# Section 109 – Federal Building Performance Standards

- Mandate –
  - New Federal buildings must achieve savings of at least 30% below ASHRAE Standard 90.1-2004 or the 2004 IECC if cost-effective.
  - Buildings must also use sustainable design principles for siting, design, and construction, if cost-effective.
  - If water is used to achieve energy efficiency, water conservation technologies shall be applied, if cost-effective.



# Bottom line for EPACT 2005

- Energy use reduction
- Better energy measurement and accountability
- More energy-efficient products
- More energy-efficient and sustainably designed buildings



# Energy Independence and Security Act of 2007

- Section 431 – Energy Reduction Goals for Federal Buildings
- Section 432 – Management of Energy and Water Efficiency in Federal Buildings
- Section 433 – Federal Building Energy Efficiency Performance Standards
- Section 434 – Management of Federal Building Efficiency



# Energy Independence and Security Act of 2007 (continued)

- Section 435 - Leasing
- Section 436 – High Performance Green Federal Buildings
- Section 437 – Federal Green Building Performance
- Section 441 – Public-Building Life Cycle Costs
- Section 523 – Standard Relating to Solar Hot Water



## Section 431 – Energy Reduction Goals for Federal Buildings

- Strengthens energy reduction goals for Federal agencies over requirements in EPACT 2005
- Not a design requirement – overall energy management requirement



## Section 432 – Management of Energy and Water Efficiency in Federal Buildings

- Requires energy managers
- Requires energy and water evaluations
- Requires consideration of re-commissioning and/or retro-commissioning



## Section 433 – Federal Building Energy Efficiency Performance Standards

- Requires steep reduction in fossil fuel energy relative to usage in DOE's Commercial Building Energy Consumption Survey (CBECS) or Residential Energy Consumption Survey (RECS)
- Applies only to public buildings, buildings with \$2.5 million in annual costs, or buildings for which GSA must file a prospectus to Congress
- New construction and major renovations



## Section 434 – Management of Federal Building Efficiency

- Requires that large capital energy investments that are not major renovations be life cycle cost effective
- Also requires installation of steam and natural gas meters in 2016





## Section 435 - Leasing

- Requires Federal government to lease Energy Star buildings or buildings that been renovated for all life-cycle cost-effective energy improvements



## Section 436 – High Performance Green Federal Buildings

- Sets up office of High Performance Green Federal buildings in GSA



## Section 437 – Federal Green Building Performance

- Provides for audits of Federal green building performance



## Section 441 – Public-Building Life Cycle Costs

- Changes life-cycle cost period from 25 to 40 years



## Section 523 – Standard Relating to Solar Hot Water

- if lifecycle cost-effective, as compared to other reasonably available technologies, not less than 30 percent of the hot water demand for each new Federal building or Federal building undergoing a major renovation be met through the installation and use of solar hot water heaters.



# Bottom Line for EISA 2007

- Greener buildings
- Fossil fuel usage reduction
- More renewable energy
- More buildings addressed (includes leases)
- More alterations covered (includes large capital investment)
- More tracking of “green” in Federal agencies
- New oversight of high performance and green building activities



# Federal Rulemakings

- Notice of Proposed Rulemaking on procurement of energy efficient products in Section 104 of EPACT 2005 – June 2007
- Final Rule on energy efficiency requirements of Federal buildings in Section 109 of EPACT 2005 – Dec 2007
- Notice of Proposed Rulemaking on sustainable design requirements and water conservation in Section 109 of EPACT 2005 – Summer/Fall 2008
- Notice of Proposed Rulemaking on fossil fuel reduction requirements in Section 433 of EISA 2007 – Fall/winter 2008



# Executive Order 13423

- Reduce green house gas emissions
- Increase renewable energy usage
- Reduce water consumption
- Procure sustainable and efficient products
- Ensure new construction follows Guiding Principles





# Guiding Principles History

- Developed originally as sustainable design principles
- Developed by Federal interagency working group and signed by all agencies as a memorandum of understanding
- Later made mandatory for Federal buildings in EO13423



# Guiding Principles Content

- Employ Integrated Design Principles
- Optimize Energy Performance
- Protect and Conserve Water
- Enhance Indoor Environmental Quality
- Reduce Environmental Impact of Materials



# Coordination

- Rulemakings must follow legislative mandates
- Executive orders (and Guiding Principles) originate in Executive branch and agencies
- FEMP is involved on both sides to minimize conflict
- FEMP is using Guiding Principles as template for Federal sustainable design rulemaking



# Fortunately, conflict is minimal

- All guidance is pointing in the same direction for Federal buildings
  - More energy efficiency, both in building design and in procured products
  - More water efficiency
  - Sustainable design



# Looking forward to 2030

- Federal agencies will use at least 30% less energy for buildings than they did in 2003
- New Federal buildings will use 100% less fossil fuel than similar buildings in 2003
- Every Federal building will have an active and knowledgeable energy manager
- Every Federal building will be metered for all energy uses
- Solar hot water systems will be widespread



## Looking forward to 2030 (continued)

- Federal buildings will not only be energy efficient, but also sustainable with all the indoor air quality, materials, and water conservation that implies
- Federal agencies will be audited and held to all these requirements.



# Looking forward to 2030?

- Net zero energy Federal buildings?
- Zero carbon Federal buildings?
- Extremely resource efficient Federal buildings?
  - Water, materials, site
- Yes, to all



# Thank-You

- Questions?