Buildings Working Group Meeting

AEO2016 Model Updates

Office of Energy Consumption and Efficiency Analysis
December 8, 2015 | Washington, DC

By
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Overview

• AEO release: this year versus last
• Federal standards and ENERGY STAR specifications
• Energy efficiency and distributed generation
• End-use technology characterizations
• Commercial floorspace and CBECs
• Annual updates
• Discussion
AEO2016 release will include more than AEO2015, but still somewhat limited compared with previous releases

• Multiple side cases

• More features and analysis
  – Issues In Focus, Legislation & Regulations

• Updated model documentation

• No early release of Reference case
Policy assumptions – equipment

- Federal equipment standards
  - DOE rulemakings from this year to be incorporated
    - general service fluorescent lamps
    - commercial ice makers
    - commercial oil-fired water heaters
    - commercial packaged air conditioners and heat pumps
    - commercial clothes washers

- ENERGY STAR specifications
  - televisions/ displays, set-top boxes, computer monitors, and dehumidifiers.
Policy assumptions – building codes

• States assumed to meet goals defined in ARRA, then continue trends in code adoption

  • Residential: IECC 2009 or better by 2017
  • Commercial: ASHRAE 90.1-2007 or better by 2016; ASHRAE 90.1-2013 or better by 2024
Policy assumptions – Clean Power Plan (CPP)

• Changes first incorporated for EIA’s Analysis of the Impacts of the Clean Power Plan, focusing on the preliminary EPA rule for existing power plants

• Modeling of major end-use equipment and residential shell rebates by Census division to represent utility programs
  – Equipment rebates and estimated utility program administrative costs sent to Electricity Market Module of National Energy Modeling System (NEMS)

• AEO2016 will include additional rebate modeling capability for distributed generation and combined heat and power (CHP) technologies to align with final CPP rulemaking
Policy assumptions – tax credits

• Tax credits
  – Includes American Taxpayer Relief Act of 2012 enacted January 2013
    • extends residential equipment and envelope credits for 2013
    • only manufacturer credits included for 2012 – credits had expired at the end of 2011
  – 2016 expiration of investment tax credit for solar PV, small wind, fuel cells, geothermal heat pumps, solar water heaters
    • EPACT 2005, EIEA: 30% of cost with no upper limit (except fuel cells)
    • commercial solar tax credit reverts to 10% after 2016
  – 2016 expiration of investment tax credit for microturbines, CHP
    • EPACT 2005 (microturbines only), EIEA: 10% of installed cost
End-use technology characterizations and other contractor data

• Major end-use technology menu updates
  – Residential and commercial lighting
  – Commercial ventilation and refrigeration

• Residential fuel/ technology switching costs
  – Costs associated with switching fuels and/or equipment types for space heating, cooling, water heating, cooking, and clothes dryers
  – Includes costs in addition to the equipment itself, such as ductwork, piping, exhaust, other installation and removal costs associated with fuel switching

• Residential efficiency of equipment stock
  – Historical shipment data for residential equipment, segmented by efficiency range (i.e., shares of ENERGY STAR and non-ENERGY STAR equipment)
Commercial buildings

• New floorspace modeling
  – Macroeconomic Activity Module (MAM) no longer outputs proprietary McGraw-Hill new commercial floorspace for use by Commercial Demand Module (CDM) and Natural Gas Transmission and Distribution Module (NGTDM)
  – CDM now uses annual floorspace growth rates from MAM, and NGTDM uses CDM floorspace
  – MAM now produces growth rate projections based 1970 through 2019, which yields different mix of commercial floorspace from previous AEOs

• 2012 Commercial Building Energy Consumption Survey (CBECS)
  – The 2012 CBECS will NOT be included in the AEO2016 because consumption and expenditure public use microdata will not be available until February 2016 at the earliest
Distributed generation technology characterization, alternative modeling options, and interconnection limitations

• Cost/performance updates
  – PV costs align with *Tracking the Sun VIII* for 2015 installations
  – draft report from Leidos for projected cost and performance – still a work in progress, but PV cost declines do not “level off” as much/as soon as in past AEOs
  – draft report also includes combined heat and power cost and performance

• Alternate modeling option for residential solar PV capacity penetration
  – econometric penetration model with logit function coefficients and ZIP code-level data instead of niche/ payback model oriented more toward customer-owned systems
  – currently investigating benefits/issues for both options

• Interconnection limitations based on Database of State Incentives for Renewables & Efficiency (DSIRE) and other sources
Annual updates

• Sectoral historical energy consumption by fuel
  – Monthly Energy Review
  – STEO

• Usual historical annual updates
  – weather data and projections
  – distributed generation capacity
  – combined heat and power generation

• Annual review/updates
  – annual “look” at commercial hurdle rates
Comments/Discussion

• Comments or suggestions for AEO2016
  – thoughts on growth of “other” electricity use (high, low, approach?)
  – references/research on approaches to incorporating water heating interactions for residential clothes washers and dishwashers
  – references/research – comprehensive look at energy impacts and costs of energy efficiency programs
  – references/research on building code compliance

• General comments or suggestions
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For more EIA information

Annual Energy Outlook | www.eia.gov/aeo

Short-Term Energy Outlook | www.eia.gov/steo

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Monthly Energy Review | www.eia.gov/mer

Today in Energy | www.eia.gov/todayinenergy

State Energy Profiles | www.eia.gov/state

Drilling Productivity Report | www.eia.gov/petroleum/drilling/

International Energy Portal | www.eia.gov/beta/international/?src=home-b1