Buildings Working Group Meeting

AEO2019 debrief and AEO2020 updates

Office of Energy Consumption and Efficiency Analysis
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By
Buildings Energy Analysis Team
Overview

• AEO2019 debrief

• AEO2020
  – Major model updates
  – Policy assumptions
  – Historical updates

• Medium-term projects

• Long-term projects

• Discussion
AEO2019 debrief
AEO2019 debrief

• AEO2019 includes updated major end-use technology menus
  – Residential and commercial space heating and cooling, water heating, residential appliances, and commercial cooking
  – Updated report data posted to the web: www.eia.gov/analysis/studies/buildings/equipcosts

• AEO2019 also incorporates the 2015 Residential Energy Consumption Survey (RECS)
  – Consumption and revised characteristic microdata posted to the web: www.eia.gov/consumption/residential
AEO2019 Reference case residential sector energy consumption

quadrillion British thermal units

2018

history projections


electricity natural gas petroleum and other liquids other

AEO2019 Reference case
AEO2019 Reference case commercial sector energy consumption

quadrillion British thermal units

2018

history | projections


electricity natural gas petroleum and other liquids other
AEO2019 Reference case buildings solar photovoltaic capacity

Direct-current gigawatts

2018

History | Projections

Residential

Commercial

AEO2019 Reference case
AEO2020 (and beyond)
AEO2020 major model updates

• Update distributed generation and combined heat and power (CHP) cost and characteristic inputs
  – Updated report data will be posted to the web here: www.eia.gov/analysis/studies/buildings/distrigen
  – Report will include discussion of residential and commercial battery storage

• Incorporate data from Stanford University’s DeepSolar program into residential solar photovoltaic (PV) econometric hurdle model
  – Uses satellite imagery to identify existing solar PV installed in the Lower 48 states in 2018
  – web.stanford.edu/group/deepsolar/home.html

• Continue to incorporate data from the 2015 RECS
  – Wood consumption data published after modeling for AEO2019 was completed
  – Residential sub-census division niches for fuel cells and small wind
AEO2020 major model updates (continued)

• Update representation of commercial distributed generation
  – Refresh methodology to calibrate distributed generation model builds to recent historical data
  – Use statistical methods to estimate the shape, speed, and maximum levels of distributed generation diffusion
  – Ensure that assumptions such as diffusion start year, PV-suitable roof area, and treatment of existing and new buildings reflect the most recent available information

• Update for commercial minor fuel projections
  – Includes propane, motor gasoline, residual fuel oil, kerosene and coal
  – Current econometric method is based on historical consumption and energy prices
AEO2020 policy assumptions

• Identify any new ENERGY STAR specifications as they affect major end-use equipment and miscellaneous electric loads (MELs)
  – Also working with other DOE offices and national labs to develop consistent terminology and characterization of MELs

• Incorporate new federal rulemakings if finalized
  – A notice of proposed rulemaking (NOPR) issued in February 2019 proposes to roll back the 2017 expansion of General Service Lamp (GSL) and General Service Incandescent Lamp (GSIL) definitions
  – Proposed standards pending for appliances

• Review representation of state energy efficiency programs and policies
AEO2020 historical updates

• Update sectoral energy consumption by fuel
  – Monthly Energy Review (MER)
  – Short-Term Energy Outlook (STEO)

• Include the National Oceanic and Atmospheric Administration’s (NOAA) updated weather data and forecast

• Calibrate new residential heating equipment shares based on the U.S. Census Bureau’s Survey of Construction

• Continue to refine historical (and projected) impacts of utility energy efficiency incentives
  – Working with Northeast Energy Efficiency Partnerships (NEEP) to improve data collection for and understanding of utility energy efficiency programs, particularly for Middle Atlantic and South Atlantic Census Divisions
Medium-term projects

- Investigating impacts of low income energy efficiency and weatherization projects
- Characterizing whole-building sensor and control technologies
Long-term projects

• Research alternate distributed generation electricity rate policies (i.e., retail versus wholesale rate for sales back to the grid)

• Investigate modeling of battery storage technologies for buildings
Some reminders

• Interactive graphs are available as part of our online data table browser
  – www.eia.gov/outlooks/aeo/data/browser

• AEO and other select EIA data are available as part of our Application Programming Interface (API) tools
  – www.eia.gov/opendata
Questions or comments?
For more buildings information

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For more information

U.S. Energy Information Administration homepage | www.eia.gov

Buildings Working Group materials | www.eia.gov/outlooks/aeo/workinggroup/buildings

Today in Energy | www.eia.gov/todayinenergy

Annual Energy Outlook | www.eia.gov/aeo

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

State Energy Data System | www.eia.gov/state/seds

Monthly Energy Review | www.eia.gov/mer

Residential Energy Consumption Survey | www.eia.gov/consumption/residential

Commercial Building Energy Consumption Survey | www.eia.gov/consumption/commercial

International Energy Portal | www.eia.gov/international
Bonus Slides
Buildings-related reports

• Updated Buildings Sector Appliance and Equipment Costs and Efficiency: www.eia.gov/analysis/studies/buildings/equipcosts

• Analysis and Representation of Miscellaneous Electric Loads (MELs) in NEMS: www.eia.gov/analysis/studies/demand/miscelectric

• Distributed Generation System Characteristics and Costs in the Buildings Sector: www.eia.gov/analysis/studies/buildings/distrigen


• Price Elasticities for Energy Use in Buildings of the United States: www.eia.gov/analysis/studies/buildings/energyuse