August 9, 2017

MEMORANDUM FOR: Ian Mead
Assistant Administrator for Energy Analysis

FROM: Jim Turnure
Director, Office of Energy Consumption and Efficiency Analysis

SUBJECT: Summary of AEO2018 Buildings Working Group held on August 3, 2017

The purpose of this memorandum is to provide an overview of the presentation given at the AEO2018 Buildings Working Group meeting and a summary of the discussion between participants. The purpose of the meeting was to go over the planned updates from AEO2017 to AEO2018 including a review of potential AEO2018 side cases, major updates, policy assumptions, and historical updates. The full presentation associated with the working group is attached to this document.

Model updates

Major model updates include major end-use technology menus, residential and commercial building shells, commercial miscellaneous electric loads (MELs), and distributed generation (DG). Policy assumptions include incorporating federal equipment standards, identifying new ENERGY STAR specifications, and investigating effects of building code compliance levels on building shell efficiency. Policy assumptions on the Clean Power Plan, California's Assembly Bill 32, and current utility energy efficiency spending were discussed.

Discussion

The main discussion centered on distributed generation, appliance standards and building codes, and utility energy efficiency programs.

Distributed Generation
EIA staff explained that both models currently assume consumers receive net metering. Residential solar photovoltaic (PV) receives the retail rate for all generation. Other residential DG technologies and all commercial generation technologies receive the retail rate for own-use generation and the marginal generation price for electricity sold to the grid. Because some states and utilities are changing how they reimburse for electricity fed back into the grid for DG, this is a topic area that we are currently looking into for AEO2018.

Participants wanted to know more about the econometric model for residential PV adoption. For the residential solar PV ZIP code-level model, the econometric penetration model looks at ZIP code-level retail electricity rates, demographic characteristics, solar insolation, and a contagion effect. EIA does not currently model storage as part of DG. Participants discussed the usefulness of NREL's REopt and SAM models. REopt allows the user to put in a load profile from which the model figures an optimal adoption level of PV. SAM allows the user to specify tariffs enabling analysis of the relationship between tariff structures and rates.

Appliance Standards and Building Codes

In response to questions, EIA staff explained that the residential model will look at reducing a portion of the energy use of the aggregated pool pump & heater miscellaneous electric load based on the updated pool pump standard that goes into effect in 2021. The commercial model assumes building shell compliance with ASHRAE 90.1-2007 or better by 2016 and compliance with ASHRAE 90.1-2013 or better by 2024 (near-term adoption rate may be adjusted for AEO2018 based on updated information).

Utility Energy Efficiency Programs

EIA staff explained that because the effects of utility energy efficiency rebates were implicit in projections prior to AEO2017, adding them explicitly should not change estimates of near-term energy consumption. Consumer choice parameters were adjusted for AEO2017 to produce end-use energy consumption with explicit utility EE rebates similar to results obtained with the embedded or implicit rebates.

Participants wanted to know more about EIA's methodology behind these adjustments. EIA staff explained that consumer choice parameters act as implicit discount rates, determining the extent to which consumers prioritize the upfront capital cost of equipment versus the energy cost of operating it (which is, in turn, determined by the equipment's energy efficiency). For AEO2017, parameters were adjusted so that capital costs were prioritized more.

EIA staff also explained that consumers purchased less efficient appliances than with the previous choice parameter assumptions, counteracting the effects of the explicit rebates and raising energy consumption to previous levels. The extent to which parameters were adjusted varied by end use. EIA staff plans to refine assumed rebate levels and consumer choice parameters for AEO2018 based on the latest available data.

Participants also asked to know more about the contractor report on which most of the end-use technology rebate levels were based. The report sampled two residential and two commercial energy efficiency programs within each U.S. Census division. Utilities were selected from approximately the 90th and 50th percentiles according to the amount of energy savings they reported to the EIA-861 survey. The sample included both electricity and natural gas programs, as does the EIA-861 survey itself.

Additional issues

Participants asked about the scenario assumed for future weather. EIA staff responded that projected heating and cooling degree days for the AEO use a trend based on the last 30 years of NOAA historical data. Heating and cooling degree days are projected at the state level then population-weighted to the Census division level. EIA staff also explained that some planned major updates are dependent on receiving contractor reports in time.

Attendees

Guests (in person)	Affiliation
John Agan	DOE
Paul Donohoo-Vallett	DOE
Robert Fares	DOE
Peter Kobylarek	Leidos
Valerie Nubbe	DOE
Jonah Steinbuck	DOE
Erik Tucker	Leidos
Frances Wood	OnLocation

Guests (WebEx/phone)	
Jennifer Amann	ACEEE
Erin Boyd	DOE
Beth Conlin	EPA
Alan Cooke	PNNL
Katie Coughlin	LBNL
Paritosh Das	NREL
David Feldman	NREL
Eric Fox	Itron
Pieter Gagnon	NREL
Michael Leitman	NRECA
Aris Marantan	Navigant
Travis Michalke	ICF
Elizabeth Titus	NEEP
David White	Synapse

EIA Attendees (in person)

Chip Berry
Tyler Hodge
Carolyn Hronis
Bill McNary
Manussawee Sukunta
Carol White
Team Members:
Erin Boedecker
Meera Fickling
Kevin Jarzomski
Kimmie Klaiman
David Peterson