



Independent Statistics & Analysis

U.S. Energy Information
Administration

May 30, 2019

MEMORANDUM FOR: Stephen K. Nalley
Acting Assistant Administrator for Energy Analysis

FROM: Jim Diefenderfer
Director, Office of Electricity, Coal, Nuclear, and Renewables Analysis

SUBJECT: Summary of AEO2020 Renewable Electricity Working Group held on
April 23, 2019

The working group presentation fostered discussion about the data and modeling updates expected for the AEO2020 Reference case in relation to renewables, along with potential side case scenarios. The presentation materials, provided in a separate document on EIA's website, include these updates.

Overview

The meeting began with a presentation of the proposed updates for AEO2020, followed by an overview of possible side cases to be included. In addition to the Reference case, which is based on current laws and policies, the following side cases will be in AEO2020:

- High/Low Oil and Natural Gas Resource and Technology
- High/Low Macroeconomic
- High/Low Oil Price

Based on past AEOs and current developments, the following candidates will be considered as alternative scenarios:

- High/Low Renewable Technology Cost
- State Requirements for Offshore Wind

However, because we have not explored the details surrounding the final set of side cases, we encouraged meeting participants to propose additional side case options.

Assumptions and Model Updates

The presentation then highlighted potential electric power sector updates for AEO2020 and beyond:

- Enhanced representation of Renewable Portfolio Standards (RPS) and the increasing number of states adopting 100% carbon-free or renewable standards
- Updates to the capital cost assumptions and performance characteristics for electricity generating technologies
- Redefinition of NEMS Electricity Market Module regions

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- Discussion of EIA's updated regional resource tool for supply curves for renewable technologies
- Enhanced time-gradient resolution to the renewable storage (ReStore) module

Participants also discussed additional areas to consider for AEO2020, including the following topics:

- Incorporating components for the levelized cost of electricity (LCOE) to reflect risk associated with fuel and carbon emissions costs
- Presenting combustion turbine in the LCOE and levelized avoided cost of electricity (LACE) report
- Adding energy storage to the LCOE and LACE report
- Adding a new landfill gas fuel supply model

Discussion

The discussion following the presentation focused on a number of more detailed topics, ranging from wind turbine project assumptions for the capital cost update to renewable financing assumptions. Participants also recommended several additional side cases to consider.

Wind Turbine Project Assumptions

Several participants raised concerns about the proposed turbine size EIA selected for the capital cost and performance characteristics study. We outlined a 2.3 MW wind turbine size for a 200 MW project for the Great Plains region and a 50 MW project for the coastal region. Participants suggested a larger size, ranging from 2.6 MW to 2.8 MW, especially in the coastal region where projects have limited space.

A participant suggested that once EIA updates the study for the values from the capital cost and performance characteristics, we should compare it to other sources, especially those that other offices within the U.S. Department of Energy developed. EIA staff responded that our general practice when updating a study is to send out the preliminary results to key stakeholders for review and comment before we finalize the report.

Renewable Financing Assumptions

A participant raised a concern about the assumptions for debt ratios EIA used as part of the financial assumptions. The participant suggested a side case with a different debt-equity ratio. EIA staff responded that we would consider all side case suggestions.

Additional Side Case Recommendation

Participants suggested possible side cases they would be interested in, including

- A case in which all pending/proposed RPS legislation becomes law
- A low battery storage cost case
- A low/high financing cost case
- A carbon tax or carbon cap case
- A 100% national renewable generation case
- A low/high nuclear and coal retirements case
- A low electric vehicle cost case (or another case that shows incentives for widespread adoption of electric vehicles)

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- A debt-equity ratio sensitivity analysis case

In addition to the suggested cases, participants asked when the deadline to suggest other side cases to EIA would be. We responded that although we are always taking suggestions for side cases, suggestions should be submitted to us as soon as possible. Those interested in submitting suggestions for side cases can email: AnnualEnergyOutlook@eia.gov.

A participant also requested information on how industry can best advocate for side cases in the AEO. EIA responded that we are more likely to consider a side case if we see an apparent demand by our users for that scenario.

Additional issues

Participants raised a concern about the learning rate for onshore wind used in the NEMS model. Several participants commented that they felt the learning rate NEMS uses for wind technologies is too low. EIA staff discussed the issues with participants and agreed to follow up on the parameters we use in NEMS.

Participants also raised a concern about how EIA will address the resource quality for wind and solar with the change to the regional redefinition for the Electricity Markets Module regions. EIA responded that a contract is currently in place to develop a tool that creates new resource curves for wind and solar based on a dynamic regional definition that we can adjust based on the new regional definitions.

Attendees

The working group meeting had 39 participants, 16 in person and 23 via WebEx, and included both EIA staff and external participants.

Participants via WebEx (external to EIA)

Name	Affiliation
Jason Burwen	American Energy Storage Association
Celeste Wanner	American Wind Energy Association
David Shin	API
Jay Lucey	Coalition of Northeastern Governors
Edward Yim	DC Government
Robin Bedilion	Electric Power Research Institute
Kaita Albanese	General Electric
Boddu Venkatesh	ICF
Sanjay Chandra	ICF
Aaron Barr	MAKE Consulting
Anthony Logan	MAKE Consulting
Trieu Mai	National Renewable Energy Laboratory
Wesley Cole	National Renewable Energy Laboratory
Michael Leitman	National Rural Electric Cooperative Association
Sharon Showalter	On Location
Hannah Kolus	Rhodium Group
David White	Synapse Energy
Sandra Sattler	Union of Concerned Scientists
Youngsun Baek	Union of Concerned Scientists

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EIA participants via WebEx

Name

Jim Diefenderfer
Meera Fickling
Scott Jell
David Daniels

In-person participants (external to EIA)

Name

Affiliation

John Hensley	American Wind Energy Association
Richard Tusing	Office of Energy Efficiency and Renewable Energy

EIA in-person participants

Name

Erin Boedecker
Michelle Bowman
Angelina LaRose
Kenny Dubin
Manussawee Sukunta
Thaddeus Huetteman
Fred Mayes
Chris Namovicz
Richard Bowers
Terry Yen
Greg Adams
April Lee
Kien Chau
Cara Marcy