Independent Statistics & Analysis
U.S. Energy Information Administration

October 4, 2022

MEMORANDUM FOR: Angelina LaRose

Assistant Administrator for Energy Analysis

FROM: Jim Diefenderfer

Director, Office of Long-Term Energy Modeling

SUBJECT: Summary of *Annual Energy Outlook 2023* (AEO2023) Working Group for Electricity, Coal, and Renewables held on September 8, 2022

The working group presentation summarized the preliminary results from the *Annual Energy Outlook 2023* (AEO2023) for electricity, coal, and renewables. These updates are included in the presentation materials, which are posted on our website.

Overview

AEO2023 will include the eight core side cases (High and Low Economic Growth, High and Low Oil Price, High and Low Oil and Gas Supply, and High and Low Renewables Cost), along with the Reference case. We are considering topics for additional side cases around the Inflation Reduction Act of 2022 (IRA).

The working group meeting is an opportunity for stakeholders to comment and provide feedback on the model development work performed up to that point for AEO2023, as well as to comment on preliminary AEO2023 results.

Model updates

At the beginning of the meeting, we summarized the results from *Annual Energy Outlook 2022* (AEO2022), outlined the model updates and enhancements planned and completed for AEO2023, and presented the general preliminary results for AEO2023. We explained the current modeling efforts that will be a part of AEO2023:

- The adoption of a 3% cost-of-capital adder for natural gas combined-cycle generating plant additions
- Improvements to the representation of photovoltaic-battery (PV-battery) hybrid technology, including dispatch profile and capacity credits
- Improvements to the market sharing algorithm
- Adjustments to technology learning levels

- Inclusion of numerous provisions from the Inflation Reduction Act of 2022 (IRA)
- An update to current laws and regulations with regard to state renewable portfolio standards and clean energy standards

Our presentation portion of the meeting wrapped up with us discussing preliminary results for AEO2023 with respect to the IRA, which included:

- Modeling of the production tax credit (PTC) and investment tax credit (ITC) extensions for all zero-emission technologies through 2050, assuming only the base credit value and the prevailing wage five-times credit multiplier
- Providing for the ITC for standalone storage
- Assuming existing nuclear generators receive a modified version of the PTC

We also noted that we are still investigating the advanced manufacturing credit and the domestic manufacturing credit as they relate to zero-emission technologies.

We reminded participants that the results are still preliminary and that the final AEO2023 will be released in early 2023, but no date has been finalized.

In addition, we noted that we are modeling several state-level updates to renewable portfolio and clean energy standards, including state executive orders.

The presentation then opened up for questions and comments regarding updates for AEO2023 and beyond.

Discussion

The discussion following the presentation included a number of questions regarding our IRA modeling efforts.

Several participants asked us to clarify which PTC and ITC bonus credits we assumed eligible technologies would have access to under the IRA. Specifically, they asked whether projects were assumed to take advantage of the prevailing wage, domestic manufacturing, and energy community bonus credits and whether we assume that technologies differ in their access to these bonus credits.

We responded that as of the working group meeting, the current assumption was that all technologies that can receive the PTC or ITC under the IRA will receive either of the credits. Currently, only the prevailing wage bonus credit is assumed accessible by technologies taking the PTC or ITC, but we are evaluating scenarios in which the domestic manufacturing and energy community credits could also be accessible to qualifying technologies.

Following up on this question, a participant asked whether we were allowing solar technologies to endogenously take either the PTC or ITC. Although current modeling work is exogenously assuming that solar photovoltaic will opt to receive the PTC, we are examining circumstances that may change that assumption. In addition, EIA's Commercial Buildings and Manufacturing Demand Team pointed out that small-scale photovoltaic solar is being modeled to continue to take the ITC in AEO2023.

On the topic of exogenous versus endogenous assumptions for AEO2023, a participant asked whether we are treating the emission-based phase-out of the tax credits in the IRA endogenously.

We are currently not endogenously phasing out the tax credits, and given the timeline of implementing the IRA, we are not anticipating adopting such a model framework for AEO2023. We also pointed out that although we have not run every side case, we expect that phasing out the tax credits from hitting the reduction in emissions will occur in the Reference case and many side cases, but it may need to be re-examined for cases that have additional drivers toward renewable or carbon-free energy.

A participant asked if the appearance of wind builds leveling-off around 2032 in the preliminary results was the result of a modeled cap on wind resources. We indicated that the results likely show a tradeoff between solar photovoltaic and wind. In other words, some regions may have limited wind resources or they might find it more economical to use more solar for certain hours of the day.

A participant asked whether fuel prices for our preliminary results were dynamic. We responded that we use dynamic fuel prices for our modeling.

A participant inquired further about the release schedule and the possibility of having an additional working group to review preliminary results. We reiterated that schedule is still in flux but that the AEO2023 release would likely be delayed, so we have enough time to account for provisions of the IRA. We will consider an additional working group meeting, but it will depend on future schedule and resource considerations.

Attendees

The working group meeting, hosted by EIA, was held entirely online and was attended by 49 people, including EIA staff and external participants.

Guests

Name	Affiliation
Youngsun Baek	Union of Concerned Scientists
Andrew Baxter	American Petroleum Institute
Ann Benson	Great River Energy
Bruce Biewald	Synapse Energy
Jason Burwen	American Clean Power Association
Thomas Dandres	Environment and Climate Change Canada
Naveen Dasari	Rhodium Group
Dominique Davis	Midcontinent Independent System Operator
Paul Donohoo-Vallett	U.S. Department of Energy
Tyler Fitch	Synapse Energy
Andrew Foss	U.S. Department of Energy
Steve Frauenheim	Edison Electric Institute
Michael Gaffney	Rhodium Group
John Hensley	American Clean Power Association
Serpil Kayin	U.S. Environmental Protection Agency
Britny Kelley	Southern Company
Hannah Kolus	Rhodium Group
Cara Marcy	U.S. Environmental Protection Agency
Megan Pamperin	Midcontinent Independent System Operator
Logan Pollander	Midcontinent Independent System Operator

Dan Robicheaux	Midcontinent Independent System Operator
Nicole Ryan	U.S. Department of Energy
Selma Sharaf	Synapse Energy
Sharon Showalter	OnLocation
Patricio Silva	Synapse Energy
Quintin Thompson	Midcontinent Independent System Operator
Anna van Brummen	Rhodium Group
Ken Walsh	Leidos
Glenn Weinreb	Manhattan Project 2
Ryan Wiser	Lawrence Berkley National Laboratory, U.S. Department of Energy
Frances Wood	OnLocation

EIA staff attendees

Name
Erin Boedecker
Richard Bowers
Kien Chau
Michael Cole
Jim Diefenderfer
Mindi Farber-DeAnda
David Fritsch
Kevin Jarzomski
Augustine Kwon
Angelina LaRose
Vikram Linga
Laura Martin
Chris Namovicz
James Preciado
Sauleh Siddiqui
Edward Thomas
Stephanie Tsao