

JULY 24, 2017

MEMORANDUM FOR: Ian Mead
Assistant Administrator for Energy Analysis

FROM: Lynn Westfall
Director, Office of Energy Markets & Financial Analysis

SUBJECT: Summary of AEO2018 Macroeconomic Working Group held on July 20, 2017

This memorandum provides an overview of the presentation given for the only Macroeconomic Working Group meeting that will be held for AEO2018 and a summary of the resulting discussion that took place. The presentation materials are available in a separate document.

Model updates

The meeting began with EIA staff providing an overview of Macroeconomic Module (MAM) and the currently anticipated changes for AEO2018. The material covered both macroeconomic growth and industrial output and focused on the following highlights:

- Preliminary results include a newly aggregated employment model (to higher-level NAICS designations), an improved regional estimation model, and a data update (historical industry and employment information).
- Planned model updates include adding 70 energy-related variables to the overall model, a new industrial feedback model, and a new technology side case model.
- In preliminary AEO2018 runs, real GDP is projected to grow 2.1%/year on average from 2017-2050. This rate is similar to similar that in AEO2017 and the current forecasts of many others.
- The importance of consumption in the demand mix fades over the projection period as non-residential investment becomes more important.
- In preliminary AEO2018 runs, manufacturing output is projected to grow 2.2%/year on average from 2017-40. Nonmanufacturing output is expected to grow 1.5%/year on average over the same period. These results are similar to those from AEO2017.
- Employment growth is projected to become more concentrated in service and construction industries.

Discussion

The discussion began by focusing on the preliminary results before turning to modeling techniques.

Preliminary results

Participants asked how significant additional changes to GDP may be when assumptions are updated. EIA staff explained that the further changes in GDP would be a result of interaction with other modules in NEMS. However, staff does evaluate the change in GDP to determine if it is in line with our intuition about direction and magnitude given assumptions.

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Participants also asked what explains the difference in consumption and non-residential investment from 2040 to 2050 between the two AEOs. EIA staff explained that long-term trends in expenditures are primarily determined by changes in real permanent income, demographic conditions, and relative prices. Consumption in services rises mainly because of rising health care expenditures. This increase is only partially offset by declines in the consumption of goods. In addition, solid growth in demand and low interest rates keep investment healthy over the projection period.

An inquiry was made as to when new OASDI (social security) data would become available in 2017. EIA staff responded that the 2017 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds was released in spring.

The discussion then turned to employment sectors shares. Even though output shares were presented during the meeting, employment growth could only be seen as level additions from the base year. In 2017, manufacturing is estimated to be 59% of industrial sector employment, with construction being 33%. Yet the manufacturing share drops to 46% of industrial sector employment and construction employment rises to 47%. In other words, the growth rates for employment did not appear to be fully consistent with the growth of output, reflecting changes in how labor is used in various industries. EIA staff indicated they will further investigate this issue and make corrections where necessary.

Modeling techniques

Participants inquired about the inclusion of hydrocarbon trade in the projections and how to improve the investment portion of the NEMS Macro model. EIA staff clarified that NEMS includes detailed energy trade from other modules but only a single aggregate category was used in the IHS Markit US model until this year. Changes to model structure are also done only by IHS Markit. EIA use the same model that's available to all clients, and we are actively working with them on to try to improve the investment portion of the model.

More information about the new technology side case work in the macro model was requested. EIA staff explained that the new design includes an input breakout to allow incremental technical change for many sectors. The model then translates these increments into changes in economy-wide total factor productivity, which is then fed back to the U.S. model.

A few participants expressed concern about a mechanism for conceptual consistency in technology for Industrial Demand Module and MAM in NEMS. EIA staff expressed their long-term hope that future work would automate this process to ensure absolute consistency between the modules.

A discussion arose related to whether certain modules in MAM can be turned off to see impacts of individual series since the combined results can be hard to decipher for policy changes. EIA staff explained that is possible to exclude endogenous variables, which is currently done by EIA to checking the robustness of results during review. However, removing model sectors is not done because the IHS Markit US model is highly simultaneous. Removing a sector, such the finance, would impact the model's ability to find a stable solution.

Additional issues

Participants were informed that the slides on will soon become available the AEO Working Group webpage. An email notifying all attendees on the invitation list will also be sent once they are posed.

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Attendees

Guests (in person)

Bob Hershey	Private consultant
Andre Barbe	International Trade Commission
Keith Jamison	Energetics, Inc.
Aaron Bergman	DOE

Guests (WebEx/phone)

Alexis Cherry	
Bill Morrow	Lawrence Berkeley National Laboratory
Brett Smith	American Iron and Steel Institute
Neal Elliott	American Council for an Energy-Efficient Economy
Anmol Soni	Georgia Tech University
Allen Fawcett	Environmental Protection Agency
Whitney Herndon	Rhodium Group
Martha Moore	American Chemistry Council
Keri Heerman	USDA Economic Research Service
Francis Wood	On Location, Inc.
Sharon Showalter	On Location, Inc.
Bruce Lung	DOE
Shashank Mohan	Rhodium Group

EIA attendees (in person)

Tom Lorenz	EIA
Huma Seth	EIA
Allen McDonald	EIA
David Daniels	EIA
Ian Mead	EIA
Christopher Dickerson	EIA
Jacob Walloga	EIA

Kelly Perl EIA

Paul Otis EIA

EIA attendees (WebEx/phone)

N/A