

August 8, 2014

MEMORANDUM FOR: JOHN CONTI
ASSISTANT ADMINISTRATOR FOR ENERGY ANALYSIS

FROM: ANGELINA LAROSE
TEAM LEAD
NATURAL GAS MARKETS TEAM

JOHN STAUB
TEAM LEAD
EXPLORATION AND PRODUCTION ANALYSIS TEAM

EXPLORATION AND PRODUCTION and NATURAL GAS
MARKETS TEAMS

SUBJECT: First AEO2015 Oil and Gas Working Group Meeting Summary
(presented on August 7, 2014)

Attendees: Tien Nguyen (DOE)
Joseph Benneche (EIA)
Dana Van Wagener (EIA)*
Troy Cook (EIA)*
Angelina LaRose (EIA)
Laura Singer (EIA)
Michael Schaal (EIA)
John Staub (EIA)
Peri Ulrey (NGSA)
Rob Smith (DOE)
Theodore Pirog (Exxon-Mobil)
David Manowitz (EIA)
Chetha Phang (EIA)
Phyllis Martin (former EIA)
David Daniels (EIA)
Peter Whitman (DOE)
Richard Nehring (Nehring Associates)*
Troy Cook (EIA)*
David Shin (API)*
Gurcan Gulen (Univ of TX)*
Beth Lau (CAPP)*
Doug Tierney (Encana)*
Chris Gardner (

Justin Adder (NETL)*
Melissa Whitten (LaCapra)*
Katrina McLaughlin (RFF)*
Robert Hugman (ICF)*
Gavin Pickenpaugh (NETL)*
Kara Callahan (OnLocation)*
Nick Jones (ExxonMobil)*
Emil Attanasi (USGS)*
Jay Ratafia-Brown (SAIC)*
Jeffery Eppink (Enegis)*
Svetlana Ikonnikova (Univ of TX)*
John Browning (Univ of TX)*
Carol Lenox (EPA)*
Maria Vargas (NETL)*
Shashank Mohan (Rhodium Group)*
Deborah Rogers (EPF)*
Andrew Stocking (CBO)*
Ozge Kaplan (EPA)*
Dana Van Wagener (EIA)*
John Pyrdol (DOE)*
Michelle Foss (Univ of TX)*
Sara Banaszak (ExxonMobil)*

*Attendance via WebEX

Presenters: Joseph Benneche (NGTDM)
John Staub (OGSM)

Presentation:

The Annual Energy Outlook 2015 (*AEO2015*) is shorter this year to highlight the International Energy Outlook (IEO) and EIA's international efforts. The shorter *AEO2015* will have 6 cases – Reference case, High/Low Oil Price cases, High/Low Macroeconomic Growth cases, and the High Oil and Gas Resource case.

The presentation provided an overview of the areas under focus for the *AEO2015* in the Oil and Gas Supply Module (OGSM) and the Natural Gas Transmission and Distribution Module (NGTDM). Additionally, as preliminary results are not available as of yet, the presentation included a look back at the oil and gas results from the *AEO2014*. It is important to note that the oil production presented encompasses crude oil and lease condensate. Lastly, questions regarding changes to EIA's standard reporting tables were posed to the group.

For oil and gas supply modeling, the following were presented:

- What has changed and what was learned from the analysis for the Drilling Productivity Report (DPR)
- Natural Gas Plant Liquids (NGPL) production and ethane rejection
- Crude oil quality (API gravity)

- Lower 48 offshore discoveries and timing of project start-ups
- New modeling innovation that adds GIS-based geologic dependency tools to obtain better resolution for developing county-level estimated ultimate recovery (EUR) factors
- Resource and technology assumption changes from Reference to High Resource case
- World oil price outlooks based on updated resource and demand analysis

For natural gas markets modeling, the following were presented:

- U.S. liquefied natural gas (LNG) exports
- Mexico consumption and production and imports to Mexico

Questions and answers regarding the OGSM:

- 1) For the projections of U.S. tight oil production, how are you distinguishing between conventional and unconventional formations, especially for the Permian?
EIA RESPONSE: EIA does not use specific permeability criteria to draw the distinction. The reservoir formation names and production changes from the DrillingInfo (DI) database are used by a group in EIA's Office of Energy Statistics to classify whether the formation is tight or not. The OGSM team analyzes production from a given formation. If a reservoir has been historically producing and experiences a recent increase in production, it is possible that production from tight and other areas will be commingled.
- 2) Also regarding the projections of U.S. tight oil production, how do you control for wells that used one mile horizontal laterals versus those that used two mile horizontal laterals?
EIA RESPONSE: The analysis does not distinguish between wells drilled using different horizontal lateral lengths. We review available information regarding companies' development and plans in specific plays to estimate the number of wells per square mile. Assumptions are provided in Tables 9.3 and 9.4 of the AEO's OGSM's Assumptions report.
- 3) For NGPL production, are the changes going to affect historical and future amounts?
EIA RESPONSE: Changes in NGPL production in the upcoming AEO will only affect the projection, and not EIA's historical data.
- 4) For crude quality by API gravity, why is California not broken out into API gravity categories?
EIA RESPONSE: The California refinery market is independent from the rest of the country and the crude oil produced in California has very little variance over time in API gravity.
- 5) Regarding the Lower 48 offshore discoveries, are you looking at projects that are reworking old fields?
EIA RESPONSE: Yes.

- 6) Regarding the addition of GIS-based geologic dependencies to EUR estimates, is the change going to affect the economic (i.e. net present value of wells) ranking of projects and thus the order in which wells are drilled?

EIA RESPONSE: The approach to ranking will not change, but as with all new data, there could be data driven changes. Each county has different contours representing the different productivity areas. Within each contour, there are different wells with different EURs. The model will continue to use the net present value for each potential well within each contour in each county to select the projects that will be developed.

- 7) How is EIA projecting the amount of gas that is flared?

EIA RESPONSE: The amount of gas that is flared is captured in the gross production totals.

- 8) Regarding U.S. dry shale gas production (slide 34), what is captured in the “rest of U.S. shale” category?

EIA RESPONSE:

The rest of the U.S. shale is comprised of:

Baxter (WY) (minor shale play)

Huron (WV) (minor shale play)

Mancos (CO & NM) (minor shale play)

Monterey (CA) (shale oil play)

Pearsall (TX) (minor shale play)

Pierre (ND) (minor shale play)

Wolfcamp (NM & TX) (tight oil play)

Delaware (NM & TX) (tight oil play)

Yeso-Glorieta (NM & TX) (tight oil play)

Bonespring (NM & TX) (tight oil play)

Spraberry (NM & TX) (tight oil play)

Niobrara-Codell (CO & WY) (shale-sand oil play)

- 9) Does EIA review cumulative production over the projections and compare with proved reserve and resource estimates? Tight gas had been in decline for 15 years and the outlook shows that it will eventually grow substantially.

EIA RESPONSE: EIA does review projected cumulative production and compares that to current proved reserves and resource estimates. The model does not produce more than the total resource estimates in the model, which by the end of the projection period are usually higher than those published in the AEO Assumptions report tables (tables 9.1 through 9.4) because the model includes some improvements in technology which can increase technically recoverable resource estimates.

- 10) EIA QUESTION: EIA is considering dropping associated dissolved (AD) and non-associated (NA) gas, and adding gas from tight oil plays into the shale gas line in Table 14 of the AEO. The model will likely need to retain the AD and NA categories but we are asking this from the perspective of the value to stakeholders in reporting the categories.

STAKEHOLDER RESPONSE: There was some interest in keeping the reporting of the distinction between AD and NA gas, though there was recognition that the distinction between a gas well and oil well is a point on a continuum of well types.

11) EIA QUESTION: EIA is considering splitting offshore oil and gas production by state and federal jurisdictions.

STAKEHOLDER RESPONSE: No problems. The Congressional Budget Office (CBO) and Bureau of Ocean Energy Management (BOEM) are interested in the additional detail.

Questions and answers regarding the NGTDM:

1) Some of the graphs are in trillion cubic feet per year (Tcf/y) and others in billion cubic feet per day (Bcf/d) – is there a trend towards using Bcf/d?

EIA RESPONSE: The EIA internal tables are still in Tcf/yr; however, we are trying to provide information in alternative units to simplify comparisons with other data sources.

2) EIA QUESTION: EIA would welcome feedback from stakeholders regarding the location of LNG exports.

STAKEHOLDER RESPONSE: Stakeholders commented that they had no issues with the approach used in AEO2014.