

September 30, 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: Second AEO2015 Oil and Gas Working Group Meeting Summary
(presented on September 16, 2014)

Attendees: John Pyrdol (DOE)
Kenneth Vincent (DOE)
Ben Schlesinger (BSA)
Joseph Benneche (EIA)
Dana Van Wagener (EIA)*
Troy Cook (EIA)*
Angelina LaRose (EIA)
David Manowitz (EIA)
Chetha Phang (EIA)
Phyllis Martin (former EIA)
David Daniels (EIA)
John Staub (EIA)
Terry Yen (EIA)
Philip Budzik (EIA)
David Hughes
David Shin (API)*
Richard Nehring (Nehring Associates)*
Erik Lindstrom*
Gavin Pickenpaugh (NETL)*
Alan Krupnick (RFF)*
Brianna Mordick (NRDC)*
Darryl Rogers (IHS)*
Dave Schmalzer*

Shashank Mohan (Rhodium Group)*
Gurcan Gulen (Univ of TX)*
Jeffery Eppink (Enegis)*
Jose Benitez (NETL)*
Mason Inman*
Melissa Whitten (LaCapra)*
Whitney Ketchum*
John Steelman (NRDC)*
Charlie Shephard*
Carol Lenox (EPA)*
Robert Anderson (DOE)*
*Attendance via WebEX

Presenters: John Staub (OGSM)
Angelina LaRose (NGTDM)

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 preliminary oil and natural gas production and price results. For oil and gas supply modeling, the following were presented:

- Production (crude oil, natural gas, and natural gas plant liquids (NGPL))
- Liquids imports

For natural gas markets modeling, the following were presented:

- Natural gas supply and delivered prices
- Natural gas consumption
- Pipeline imports/exports
- U.S. liquefied natural gas (LNG) exports

Questions and answers regarding both oil and gas supply and natural gas markets:

- 1) The higher tight oil production suggests the resources are larger or produced more quickly than last year. It would be helpful to see the cumulative production by play. University of Texas BEG group's play studies are more detailed and better documented.
EIA RESPONSE: EIA revised the drilling schedule to reflect another year of drilling level experiences and re-estimated the estimated ultimate recovery (EUR) factors and well spacing patterns. We will follow-up with interested stakeholders on the cumulative production.

- 2) It seems surprising that tight gas production is increasing at prices below \$5 per mmbtu?
EIA RESPONSE: There are substantial tight gas resources available in the model that are economically competitive in the model and have probably been ignored during the rush to acquire shale gas assets.
- 3) What are the main sources of NGPL, in terms of plays?
EIA RESPONSE: The parts of the Marcellus in Southwestern Pennsylvania, West Virginia, and Ohio, and the Eagle Ford in Texas. The ratios of NGPL to dry gas production from three EIA surveys were used to update parameters for individual plays at the play level or down at the county level (if the information was available).
- 4) What is the reason behind the decrease in EIA's AEO2015 natural gas consumption and production projections as compared to EIA's AEO2014 projections?
EIA RESPONSE: The decrease is driven largely by the decrease in consumption in the electric power sector.
- 5) What is driving the drop in natural gas consumption in the electric power sector for 2014-2015 and the significantly lower AEO2015 projection for 2020-2040 (compared to the AEO2014 projection)?
STAKEHOLDER RESPONSE: The Electricity Working Group meeting was held yesterday. The drivers are lower electricity demand, higher capacity utilization by nuclear plants, and an increase in renewables. There are no unforced nuclear retirements, allowing for more nuclear capacity usage.
- 6) What is the reason behind the increase in EIA's AEO2015 LNG exports projection as compared to EIA's AEO2014 projection?
EIA RESPONSE: The increase in LNG exports is driven by lower domestic supply prices earlier in the projection period and higher oil prices later in the projection period. The higher oil prices are a driver because the European and Asian natural gas supply prices are tied to the world oil price, although the connection weakens over time, largely as the U.S. exports more LNG.
- 7) EIA QUESTION: Is the increased LNG exports projection (~11 billion cubic feet (Bcf) per day in 2040) sensible?
STAKEHOLDER RESPONSE: The level is reasonable, unless there are significant changes in the international natural gas market mechanisms.
EIA RESPONSE: The future evolution of the world gas market is highly uncertain with the potential of many likely outcomes.
- 8) How does EIA model the building of LNG export facilities? Does the model select endogenously from the existing DOE-approved export requests?
EIA RESPONSE: The Sabine Pass facility is assumed to be completed. After that the model compares the expected supply price in the U.S., plus assumed costs for liquefaction and transport to Asia and Europe against an estimated alternative price in Asia in Europe (assuming a candidate inflow of U.S. gas) over the next 20 years

(discounted to the present), to see if a new project is economic. The citing of the selected project is based in part on DOE-approved export facilities.

- 9) Why are EIA's AEO2015 Brent price projections higher than EIA's AEO2014 projections?

EIA RESPONSE: The higher price path in the longer term is due to stronger demand for oil in the longer term and a higher OPEC share.

- 10) When modeling LNG exports, does EIA treat the rest of the world as a sink for LNG, subject only to Brent prices? Or does EIA take into account other factors, such as nuclear usage capacity?

EIA RESPONSE: Though EIA's modeling approach is a bit simplified, with the Asian and European prices driven in part by the world oil price, we also are factoring in an exogenous projection of world consumption, production in China, and an estimate of the freely traded LNG volumes from the IEO. There is an indirect assumption that world gas demand will move with the world oil price. In addition, the relationship of the world gas price with the oil price becomes more de-linked as more gas is exported from the United States.

- 11) What is EIA's preliminary AEO2015 projection for Brent oil prices?

EIA RESPONSE: The price starts out at today's prices and declines to about \$87/barrel to about 2018-2020. After 2020, it increases steadily to around \$147 in 2040 in inflation adjusted (real) dollars.

- 12) Last year, there was a section on natural gas and vehicles/trains. Are there any changes in this AEO's projections?

EIA RESPONSE: There is no change.

- 13) How is EIA modeling pipeline infrastructure?

EIA RESPONSE: After the first couple of years, the model automatically builds if there is a need. This demand need is driven by price.