

August 16, 2012

MEMORANDUM FOR: John Conti  
Assistant Administrator for Energy Analysis

Alan Beamon  
Office Director  
Office of Electricity, Coal, Nuclear, and Renewables Analysis

FROM: Electricity Analysis Team

SUBJECT: August 9, 2012 AEO2013 Electricity Working Group Meeting Summary

Attendees: Michelle Adams (EIA OEA)  
\*Aaron Bergman (DOE: Office of Policy and International Affairs)  
\*Thomas Cochran (NRDC)  
\*Jarad Daniels (DOE: Office of Fossil Energy)  
Jim Diefenderfer (EIA OEA)  
\* Ronald Hagen (DOE: Office of Nuclear Energy)  
Tyler Hodge (EIA OEA)  
\*David Hunter (EPRI)  
Jeffrey Jones (EIA OEA)  
Jim Joosten (EIA OEA)  
Diane Kearney (EIA OEA)  
Kevin Lillis (EIA OEA)  
Perry Lindstrom (EIA OEA)  
Laura Martin (EIA OEA)  
Fred Mayes (EIA OEA)  
Mike Mellish (EIA OEA)  
Carrie Milton (EIA OEA)  
\*David Schoeberlein (DOE: Office of Policy and International Affairs)  
\* Matt Tanner (Navigant)  
\*Ellen Vancko (Union of Concerned Scientists)

WebEx Attendees: \*Mike Cashin (ALLETE)  
\*Dan Chalk (DOE: Office of Light Water Reactor Technologies)  
\*Dan Chartier (EEI)  
\*Leslie Coleman (National Mining Association)  
\*Brian Fisher (EPA)  
\*Kyler Gates (Westinghouse)  
\*Bryan Hannegan (EPRI)  
\*Eric Holdsworth (EEI)  
\*Serpil Kayin (EPA)  
\*Colleen Kelly (Bipartisan Policy Center)

WebEx (con'd)      \*Christopher Nichols (DOE: NETL)  
                         \*Seth Nowak (ACEEE)  
                         \*Anthony Paul (RFF)  
                         \*Gavin Pickenpaugh (DOE: NETL)  
                         \*Sharon Showalter (OnLocation)  
                         \*Michael Soni (University of Texas)  
                         \*Bill Stevens (EPA)  
                         \*Maggie Surface (Navigant)  
                         \*Frances Wood (OnLocation)

\*Non-EIA Attendees

Presenter:            Mike Leff (EIA OEA)

*Topics covered included a review of the electricity mix through 2035 in the AEO2012 Reference case, the coal plant retirements in the AEO2012 side cases, planned capacity additions for the AEO2013, and a comparison of reported coal plant planned retirements used as inputs for AEO2012 (from Form EIA-860 2010 data submissions) and AEO2013 (from Form EIA-860 2011 data submissions). The key modeling issues for AEO2013 were addressed, including (1) environmental regulations that will be included in the Reference case, (2) extending the projection through 2040, (3) coal retirements reported to EIA and capacity expansion throughout the horizon, and (4) fuel prices and electricity demand growth. Updated capital costs from SAIC Environment and Infrastructure (formerly RW Beck) and nuclear capacity considerations were addressed as well.*

Specific discussion relevant to electricity markets:

1. Mike Leff informed the group of the compressed timeline for the AEO2013, which limits the ability of modelers to incorporate extensive model changes. However, he pointed out that the Electricity Analysis Team will continue to best represent the electricity market outlook.
2. Mike Leff pointed out that the big change to the AEO2012 was the addition of MATS to the assumptions, and that for AEO2013 EIA will continue to model the environmental regulations that were assumed in the reference case for AEO2012 in addition to expanding California AB 32 to the other NEMS modules.
3. A participant asked whether EIA would be modeling electricity imported into California as part of AB 32. Mike Leff responded that EIA would be doing so.
4. A participant asked why EIA does not separate out the under construction versus the planned capacity visually in the planned units graph in order to make it more apparent how much capacity is not actually under construction. Another participant asked whether it was true that all capacity additions before 2018 were under construction, and if all capacity additions shown after 2018 were planned. Mike Leff responded that the graph was intended to show what capacity additions are going into the model as planned additions, and if attendees would like to know specifically which units are under construction, EIA could provide the data.

5. Jim Joosten pointed out that respondents to the Form EIA-860 survey may change their plans due to changes in economic conditions, but companies are not required to file interim revisions based on a change in plans. For example, a company might report plans to install a base load coal plant in the year 2020 on the Form EIA-860. If economic conditions were to change dramatically (i.e. capital costs or financing costs increase, or gas prices drop) the company might make a different decision and proceed with a different generating technology. Should such conditions warrant a change in the company's planning assumptions, EIA would pick that information up the following year. Mike Leff responded that that is a reason that there is a timeframe associated with the responses, but after a certain period of time, the model takes over the decision. Jim Diefenderfer responded that companies give EIA their best estimates at the end of the reporting year, and Jeff Jones added that EIA limits the planned additions to account for uncertainty and to determine the level of commitment of the respondent. Jim Diefenderfer said that EIA is following up with respondents who have issued press releases concerning plans for new capacity additions or plant retirements, but who have not reported the same information to EIA. Mike Leff stated that plants are also reporting these plans to their RTOs. Michelle Adams asked whether EIA is looking at a comparison between the model and reality, and Mike Leff responded that EIA is. A participant claimed that if you were to add the model retirements to the announced planned retirements on the "Planned Coal-Fired Capacity Retirements in the Electric Power Sector by Coal Demand Region, 2011-2035" graph, the blue line would closely match the red line (announced coal plant retirements reported to EIA for AEO2013). Another participant questioned whether the EIA model was any good, and Jim Diefenderfer responded that the data presented in the graph were not model results, but rather planned coal retirements that were reported to EIA.
6. In the capital cost discussion, Mike Leff pointed out that SAIC is doing a reevaluation of capital costs from the 2010 study. EIA has asked SAIC to prioritize their efforts to focus on the technologies that have shown the biggest change in costs since 2010. EIA hopes to use the new information for the NEMS model this year. Mike Leff said that we would like to get feedback on the capital costs from the stakeholders, and EIA hopes to have the initial information by the next working group meeting. A participant asked whether the regional multipliers for new capacity will be updated, and Laura Martin replied that those were updated two years ago. Mike Leff explained that the full report will not be available until after the AEO2013 early release. Jim Diefenderfer said that the complete update will be available to use as a resource for AEO2014. Another participant asked about what financing assumptions are being used, and Mike Leff responded that EIA is using the same financing assumptions. Fred Mayes asked how SAIC will address the cost of PV panels, and Mike Leff replied that EIA expects SAIC to look heavily at PV, because that is one of the areas where the technology has changed considerably over the past two years. SAIC will be looking at the current market costs, and future learning improvements will be reflected endogenously in the model. Jim Joosten made a point that the best strategy may be to get SAIC to prioritize their results by the likelihood of that technology being built in the near future.
7. Mike Leff mentioned that EIA is also refining the calculations that we use for DSI, ACI and fabric filters, since these technologies are used for MATS compliance. A participant asked whether these are still based on EPA's numbers, to which Mike Leff replied "yes."

Another participant asked whether new retrofits include a 3% cost of capital adder, and Jeffrey Jones replied “yes.” Mike Leff added that we cannot model a carbon price, but there is evidence that utilities are including a CO<sub>2</sub> price in the cost of new facilities, and this is how EIA accounts for that. A participant asked what the payback time is for the retrofits, and Mike Leff replied that it is 20 years.

8. Mike Leff explained that since the forecast period is extending to 2040, five years beyond AEO2012, consideration will need to be given to several nuclear plants that will reach a 60 year life during this period.
9. Mike Leff also mentioned the update to the uprates methodology that was done for the AEO2012, which does not need to be changed for the AEO2013. A participant asked how the recent waste confidence rule affects EIA’s projections, to which Mike Leff replied that EIA does not have an answer yet, but that EIA is looking at this issue.
10. A participant asked how the 6-7 GW of uprates that EIA projects matches up with the NRC website. Jim Joosten responded that historically the NRC has approved 6 GW, they have 970 MW pending, and they anticipate more. The same participant asked how EIA is handling San Onofre, to which Mike Leff replied that EIA does not want to retire specific plants, but that we are monitoring the situation with San Onofre. The same participant followed up by asking whether EIA is modeling the cost of the new steam generators, to which Mike Leff replied that EIA models generic O&M and capital additions in NEMS. Jim Joosten mentioned that the economics for existing plants keep them running.
11. A participant raised concerns about including future operations at Bellefonte, due to cost overruns at Watts Bar that have been reported. He also mentioned that Indian Point and San Onofre may have issues getting their licenses extended due to the waste confidence rule and political issues. Jim Joosten added that we do economic modeling, not political modeling. The participant replied that maybe EIA should not do economic modeling for nuclear, especially in light of the fact that the World Nuclear Association does not do economic modeling. The World Nuclear Association assigns probabilities to planned nuclear plants. Mike Leff responded that that is the reason that EIA does side case analyses. Relating to the cost overruns that TVA is experiencing, Jim Joosten claimed that investors would be able to recapture their costs, plus a required return, no matter what the construction cost overruns are, given the structure of the TVA market. Jim Diefenderfer mentioned that owners are still required to get rates approved, but Jim Joosten argued that TVA is an exception.
12. A participant asked to what extent the model is supposed to be predictive as opposed to illustrative. Mike Leff responded that the model is meant to be illustrative. Jim Diefenderfer added that we know that the forecast will not be 100% correct, but EIA develops a reference case as a basis for comparison to the various side cases. Side case results can then be evaluated relative to the reference case. A participant pointed out that people are not using the model results in that way.
13. A participant mentioned that the dates for Levy coming online were reported to the Florida PUC as three years later than the dates they are reporting to EIA. Mike Leff replied that we would look into that. Additionally, the same participant questioned that since we are going out to 2040, are we considering adding small modular reactors (SMRs) or advanced reactors in the model. Mike Leff answered that due to the short

timeline for the AEO2013 and SAIC not having reliable cost estimates for SMRs, we will not include SMRs in the forecast for AEO2013.

14. A participant asked whether EIA asks utility companies what their planning horizons are, and whether these go to 2040. Mike Leff replied that as far as he is aware, there are no plans that go out that far.
15. Mike Leff pointed out that we will likely have high and low gas price cases, high and low coal price cases, high and low nuclear cases, and high and low macro cases in the AEO2013. He also welcomed any additional ideas that stakeholders may have for side cases.
16. A participant brought up the possibility of a side case involving improved heat rates at existing fossil plants. Two additional people indicated that they would also be interested in seeing this kind of side case. Mike Leff and one of the participants agreed to coordinate on details of what this would entail.
17. A participant suggested that EIA look more closely at historical fuel prices as a way to project future fuel prices. The same participant asked to see a 100-year timeline of fuel prices in constant dollars. Michael Mellish pointed out that he had already supplied a 100-year timeline of coal prices to that individual in constant dollars following the Electricity Working Group Meeting from 2011. The participant claimed that EIA is “just doing it wrong” when it comes to projecting future fuel prices and proposed that EIA rely more heavily on historical data.
18. A participant mentioned water usage at thermal plants, and as more data comes in, would be interested in seeing how temperatures affect plant output. Mike Leff responded that while we do have the data, we have not looked closely at the changes in capacity as they relate to water temperatures.
19. A participant inquired about how EIA modeled natural gas prices and whether pipeline capacity and export capability was taken into account. Mike Leff indicated that the NEMS electricity market module determines the demand for natural gas and links with the natural gas module to achieve a balance between demand and prices. Natural gas pipeline considerations are represented by the natural gas transmission and distribution module (NGTDM).