AEO 2013 Electricity Working Group

1st Presentation for stakeholders

Electricity Analysis Team
August 9th, 2012 | Washington, DC

WORKING GROUP PRESENTATION FOR DISCUSSION PURPOSES
DO NOT QUOTE OR CITE AS RESULTS ARE SUBJECT TO CHANGE
AEO 2013 Working Group Meetings

• Macroeconomic/Industrial

• Buildings - Residential/Commercial

• Oil and Gas
  – Petroleum Markets
  – Natural Gas Production/Natural Gas Markets

• Renewables

• Coal

• Electricity

• Transportation
AEO 2013 - Expected timeline

• Compressed timeline
  – AEO 2012 (full version) was released in late June, 4 months latter than planned
  – As a result, the AEO 2013 development cycle got off to a late start

• 1st electricity working group meeting (Today)
  – to discuss key modeling and assumption changes, and cases we are considering for inclusion.

• 2nd electricity working group meeting (Mid Sept – Early October)
  – Second meeting, date to be determined, to present preliminary results.

• Early release (Mid November)

• Full release (February 2013)
A look back to *AEO 2012* - Electricity mix through 2035

Electricity net generation (trillion kilowatthours per year)

<table>
<thead>
<tr>
<th></th>
<th>History</th>
<th>2010</th>
<th>Projections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil and other liquids</td>
<td>45%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Nuclear</td>
<td>10%</td>
<td>20%</td>
<td>15%</td>
</tr>
<tr>
<td>Renewables</td>
<td>1%</td>
<td>10%</td>
<td>18%</td>
</tr>
<tr>
<td>Coal</td>
<td>38%</td>
<td>24%</td>
<td>28%</td>
</tr>
<tr>
<td>Natural gas</td>
<td>1%</td>
<td>2%</td>
<td>38%</td>
</tr>
</tbody>
</table>

Source: EIA, Annual Energy Outlook 2012
Coal plant retirements through 2020 in side cases

Source: EIA, Annual Energy Outlook 2012
Key electricity related modeling issues for AEO 2013

• Environmental regulations

• Projection horizon extended to 2040
  – Evaluate the potential for new technologies
  – Evaluate whether any new resource or operational constraints may be introduced for existing technologies

• Reported coal retirements and capacity expansion

• Fuel prices and electricity demand growth
  – The electricity market module (EMM) takes these as inputs from other NEMS modules
Environmental Regulations in *AEO 2013*

- Mercury and Air Toxics Rule - *Yes*
- Cross State Air Pollution Rule - *Yes*
- Cooling Water Intake 316b - *No*
- Coal Combustion Residuals - *No*
- GHG New Source Performance Standards - *Maybe*
- California AB 32 - *Yes*
  - Integrated with other NEMS modules
Planned Capacity Additions

gigawatts, net summer

- Nuclear
- Solar
- Wind
- Coal
- Natural Gas
- Other Renewables

Reported coal-fired capacity retirements in the electric power sector by coal demand region, 2011-2035
gigawatts, net summer

Updated capital costs

• EIA has funded a task with R.W. Beck/SAIC (now SAIC Energy, Environment & Infrastructure, LLC) to update technology costs used in the electric power sector
  – R.W. Beck did a similar report for EIA in 2010, which serves as the basis for AEO 2011 and AEO 2012 capital costs
  – The contract was recently awarded, and work should be substantially completed by mid September
  – We will try to prioritize preliminary data to focus on technologies that have seen the biggest changes in cost over the past 2 years

• Refining methodology for calculating Dry Sorbent Injection, Fabric Filter, and Activated Carbon Injection costs
  – Better representation of costs for MATS compliance
Focus on nuclear

• Uprates – No Change from AEO 2012
  – No change from AEO 2012

• Retirements – No Change from AEO 2012
  – Limited amount of capacity is retired that is meant to represent older, smaller, costly plants to operate.
  – Between 2036 and 2040, 13 additional units reach their 60 year operating mark. However, these units are relatively younger & are already equipped with post – TMI retrofits. Therefore, we assume they will cross the 60 year hurdle

• New plants
  – Levy Project is added to planned capacity
  – Joins Vogtle, VC Summer, Watts Bar 2 & Bellefonte 1
Planned Additions for *AEO 2013*

- Planned additions are power plants that have reported to EIA as being in the process of planning and construction
  - Our model cannot pick-up very near-term demand for new plants, but is able to make projections for most plants types over the next 2 to 5 years
  - The planned additions are intended to account for growth during this “blind spot” in model coverage

- In general, EIA only includes plants that have started construction in the AEO projections
  - Past experience suggests a high degree of uncertainty over plants that report earlier planning milestones
  - For nuclear we relax these assumptions to reflect the long lead times and regulatory steps involved in new nuclear power plant construction
Feedback from the Working Group

• Issues with Prior AEO Studies
  – Assumptions
  – Results

• Suggestions for AEO2013 Analyses
  – Input Assumptions
  – Scenarios/Sensitivity Analyses

• Questions/Comments
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