

Annual Energy Outlook 2014

Renewable Electricity Working Group



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Agenda

- Review status of AEO 2013
- Discuss new model updates and development efforts for AEO 2014 and future AEOs
 - Model updates
 - Policy updates
 - Planned additions updates
 - Performance updates
- Obtain feedback from stakeholders on any key items that EIA should look at

Status of AEO 2013

- AEO 2013 was released in stages this year
 - Reference case on December 5, 2012
 - Other text and side-cases from April 15 – May 2
 - Expect that this will be the new model for release
- PTC extension came late in the development process
 - Inclusion in the Reference case and all side cases would have substantially delayed full AEO publication
 - Instead, the law was accounted for in a side case as part of the AEO
 - This side case will be used as a “current laws and policies” reference case for post-AEO analysis requests

Model Updates: Biomass Supply Integration

- Current supply curves for conventional and cellulosic biomass are exogenously determined
 - Static representation of dynamic process of planting decisions
 - Solutions for cellulosic and conventional feedstocks may diverge, even though they are tightly linked in the real world
- EIA expects to have the POLYSYS model integrated with NEMS for AEO 2014
 - Initial integration will endogenously determine a supply curve for energy crops and agricultural residues
 - Future work will allow an endogenously determined and internally consistent supply curve for conventional crops used as energy resources (especially corn and soy)

Model Updates: End-Use Solar Load Shape

- Output from commercial and residential solar installations is currently fed-back to the electricity model based on its impact on key end-use demand services (such as air conditioning load)
 - This is a reasonable approximation of solar value to the end-use sector
 - At high penetration levels it can distort the electric power sector dispatch curve
- EIA is exploring a number of options to ensure that the electricity market module is seeing a better approximation of the impact that end-use solar has on the load demand curve.

Model Updates: Wind Intermittency

- EIA has funded a task to look at several aspects of wind intermittency and impacts of variable operation on the efficiency of fossil generators
- EIA received a report with recommendations to better represent operating reserve requirements
 - Should allow for a more accurate representation of the impact of intermittent generation on ancillary service requirements such as spinning reserve and ramping
 - Should also allow for a fuller representation of the role of CTs, hydro, and other fast-response capacity on the grid
- Funding for implementation came late in the process, so full implementation may be delayed until AEO2015

Model Updates: Buildings Sector

- Annual updates
 - Interconnection limitations (DSIRE)
 - Historical generation by and capacity of combined heat and power and renewable distributed generation systems (EIA- 860, IREC, AWEA)

Model Updates: Hydro Uprates

- NEMS is not able to model increases in capacity at existing hydro units resulting from repowering or refurbishment
 - Note that we do represent additional capacity at existing plants from the addition of new units
- These increases in existing-unit capacity could be a significant source of capacity or generation growth for hydro
- We are currently evaluating FERC relicensing data to determine a basis for modeling these hydro uprates

Input Updates: Policy

- PTC extension was incorporated into AEO 2013 side case and will be the basis for AEO 2014
- We are monitoring state RPS modifications
 - We have found no new RPS policies so far this year, and only a few substantive modifications (Colorado, Connecticut, Minnesota). While there have been attempts in several to either weaken or repeal existing RPS policies, none of these efforts have yet been successful.
 - We will continue to consider modification through the end of August
- We are monitoring EPA rulemaking on carbon emissions from new and existing power plants
 - Recent Presidential pronouncement does not necessarily constitute formal rulemaking
 - We will consider new regulations as they are formally promulgated

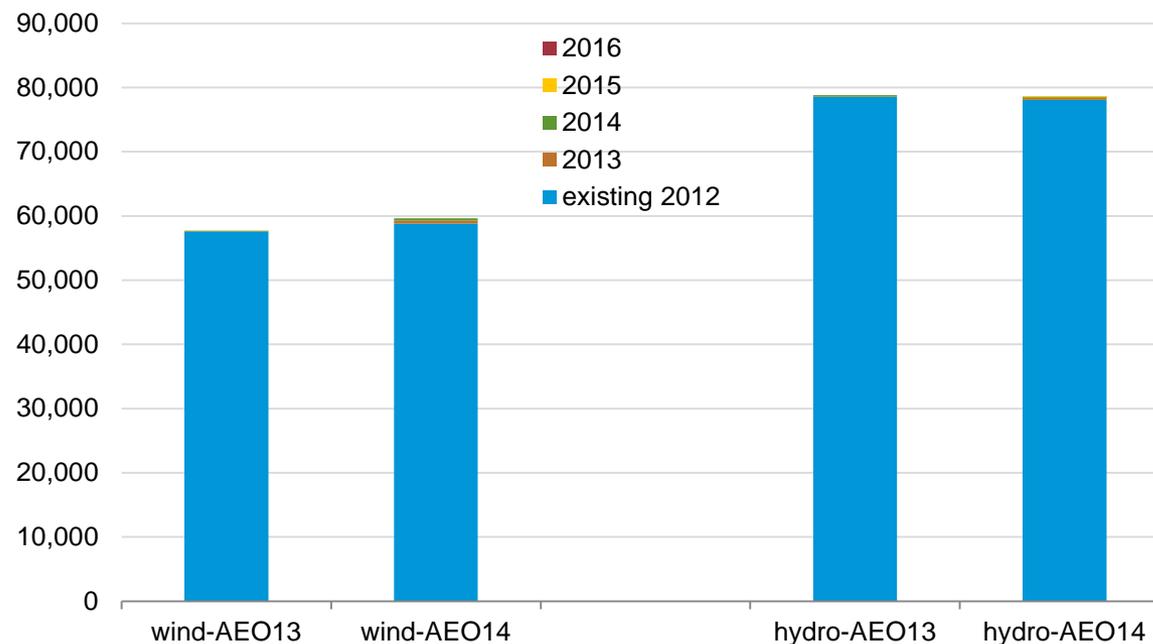
Input Updates: Planned Additions

- 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 most new plants, but is able to make projections for most plant types over the next 2 to 5 years
 - The planned additions are intended to account for plants known to be entering service during this period
- 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 some renewables, EIA has previously included plants that have received regulatory approvals as well
 - This is a result of the short lead-times and pressures of expiring tax credits
 - We will need to re-evaluate our inclusion criteria given the potential for tax credit expiration, extension, or modification

Input Updates: Planned Additions

Based on current data and inclusion criteria, we do not expect that planned additions for wind or hydro will be significantly different in the AEO2014 than AEO2013.

Existing and Planned Additions – AEO2013 and AEO2014*
megawatts

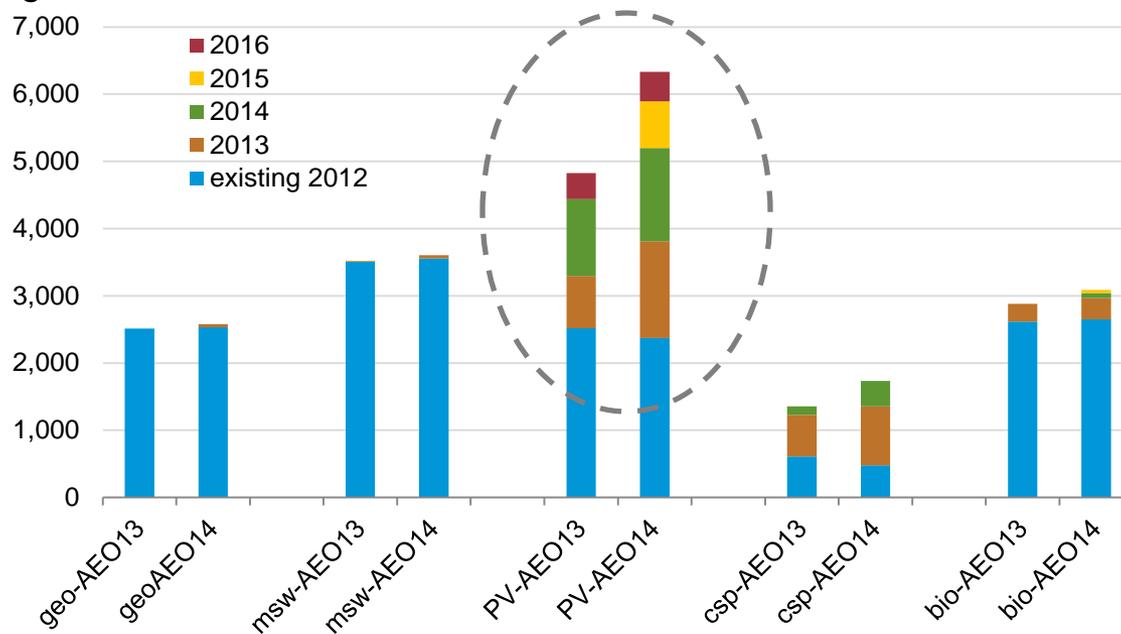


* = preliminary

Input Updates: Planned Additions

Solar PV exhibits the most dramatic increase in planned additions in the AEO2014 compared to the AEO2013, though we also see a little bit more planned solar thermal (CSP) and biomass 2014+.

Existing and Planned Additions – AEO2013 vs AEO2014*
megawatts



* = preliminary

Input Update: Cost and Performance

- We plan on updating wind and solar time-of-day performance profile
 - For solar, we would like a mix of performance profiles to add flexibility to our technology assumptions for both the electric power sector and the end-use sector (see previous item on end-use load shapes)
 - For wind, we would like a better offshore performance profile, and would like to update wind supply curves to account for transmission build-out
- Funding does not look like it will be available for AEO 2014
- We will not be commissioning an updated capital cost study for the *AEO2014*. For most technologies, this is unlikely to be problematic. However, for more dynamic technologies, we will monitor third-party data sources to evaluate whether it is necessary to update individual assumptions.

Feedback

- We will be soliciting feedback specifically on our capital cost updates, but any input on this issue would be welcome ahead of time.
- Are there any cost, performance, technology, or policy trends that we need to be aware of?
- Are there any other issues that we need to address?

For more information

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