

# Annual Energy Outlook 2014

## Renewable Electricity Working Group



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*Chris Namovicz, Renewable Electricity Analysis Team*

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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

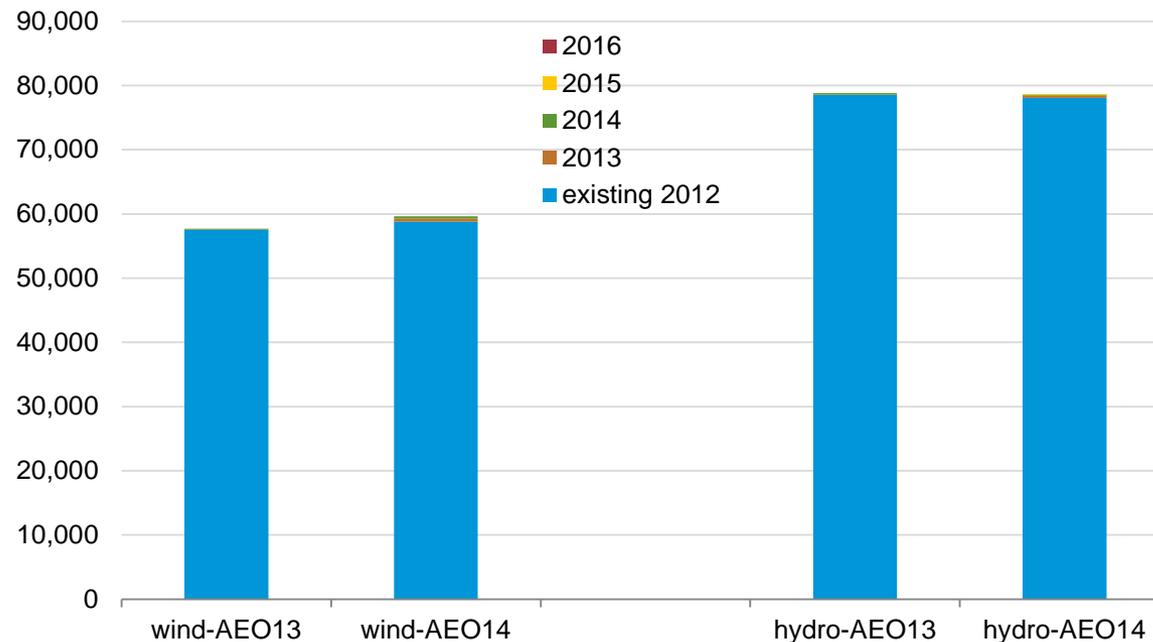
# Input Updates: Planned Additions

- 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

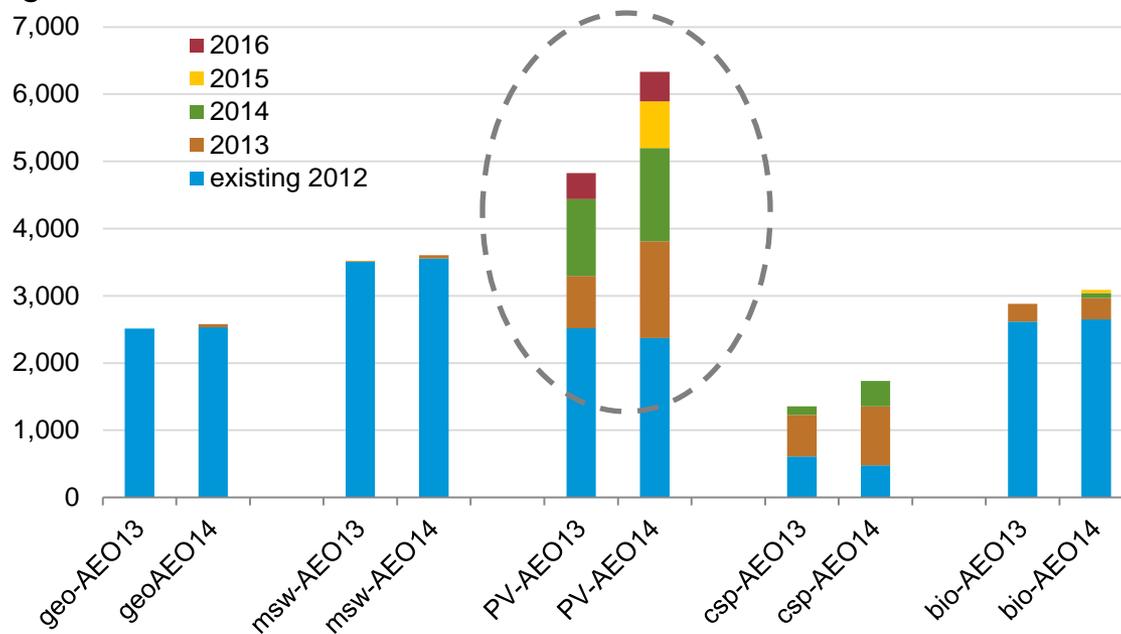


\* = preliminary

# 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

U.S. Energy Information Administration home page | [www.eia.gov](http://www.eia.gov)

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