



# Pennsylvania: Reinvigorating the Market

MDV-SEIA Solar Focus 2016

Allyson Browne

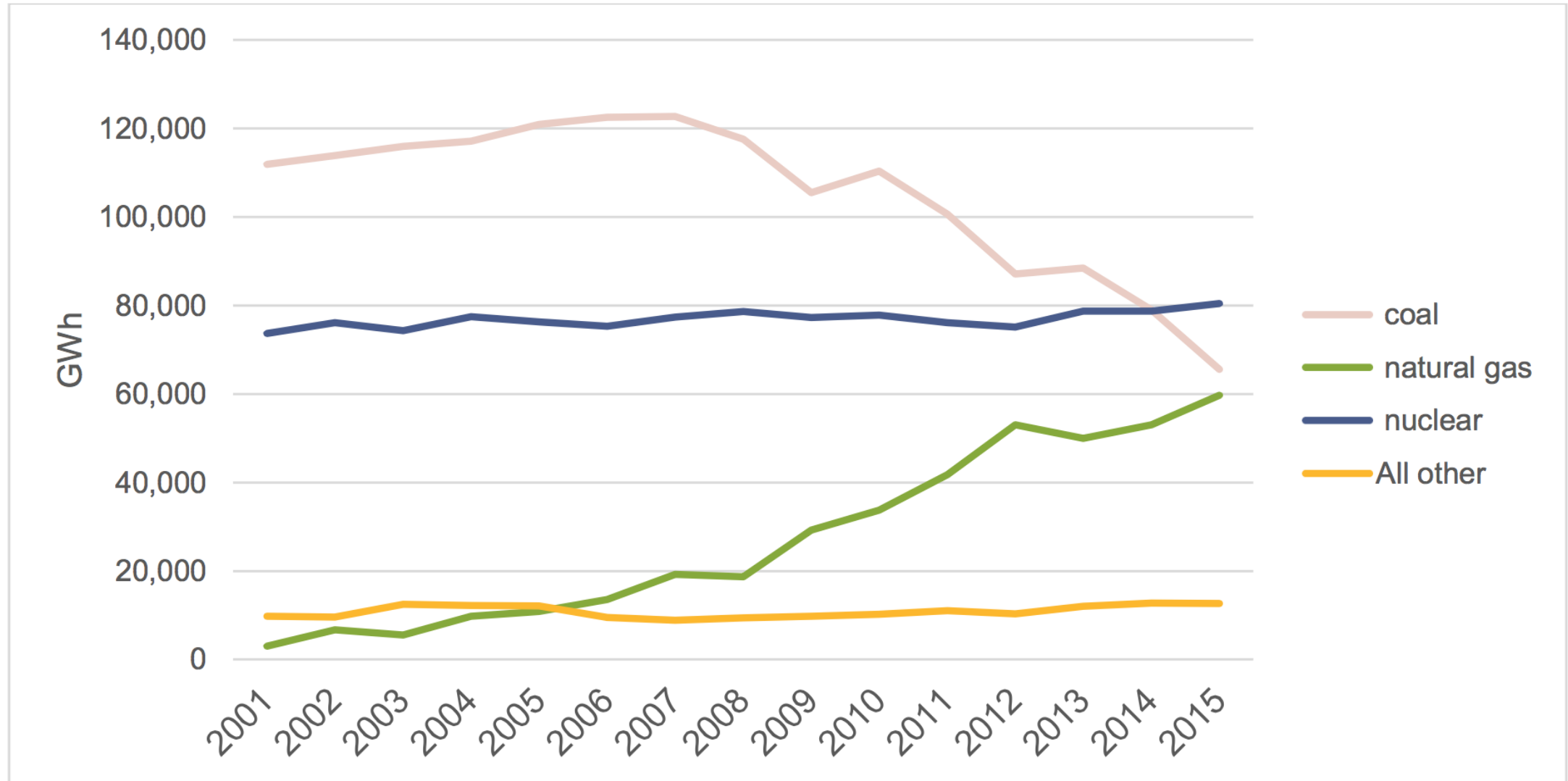
- Pennsylvania's Electricity Market and Generation Mix
- AEPS Design and SREC Market
- AEPS and the Clean Power Plan
- Recommendations for Reinvigorating the Market

- **Deregulated Electricity Market** – PA was one of the first states to deregulate its electricity market and offer customers choice in their electric generation supplier
  - 11 investor-owned EDCs, 14 electric distribution cooperatives, and munis
- **Electricity Rates**
  - **Residential** (\$0.1412/kWh) and **industrial** (\$0.0693) customers pay slightly *higher* than the national average electricity rates.
  - **Commercial** (\$0.093/kWh) customers pay slightly *below* national average electricity rates.
- **Industrial sector** represents approx. 35% of state's energy usage.

- PA is the **3<sup>rd</sup> largest generator of electricity** in the nation, with approx. 200 major electric generation facilities.
- Traditional & Nuclear Resources
  - PA is home to **9 nuclear generators** at 5 power plants, which generated a majority of PA's electricity in 2015 (**37.4%**);
  - **Coal (30.5%)** and **natural gas [hydraulic fracturing] (27.8%)** account for most of the balance.
- **Renewable development** is driven primarily by the PA AEPS, and comprises a small but growing proportion of PA's generation mix.

# Pennsylvania's Generation Mix

## Sources of Electric Generation in PA, 2000-2015



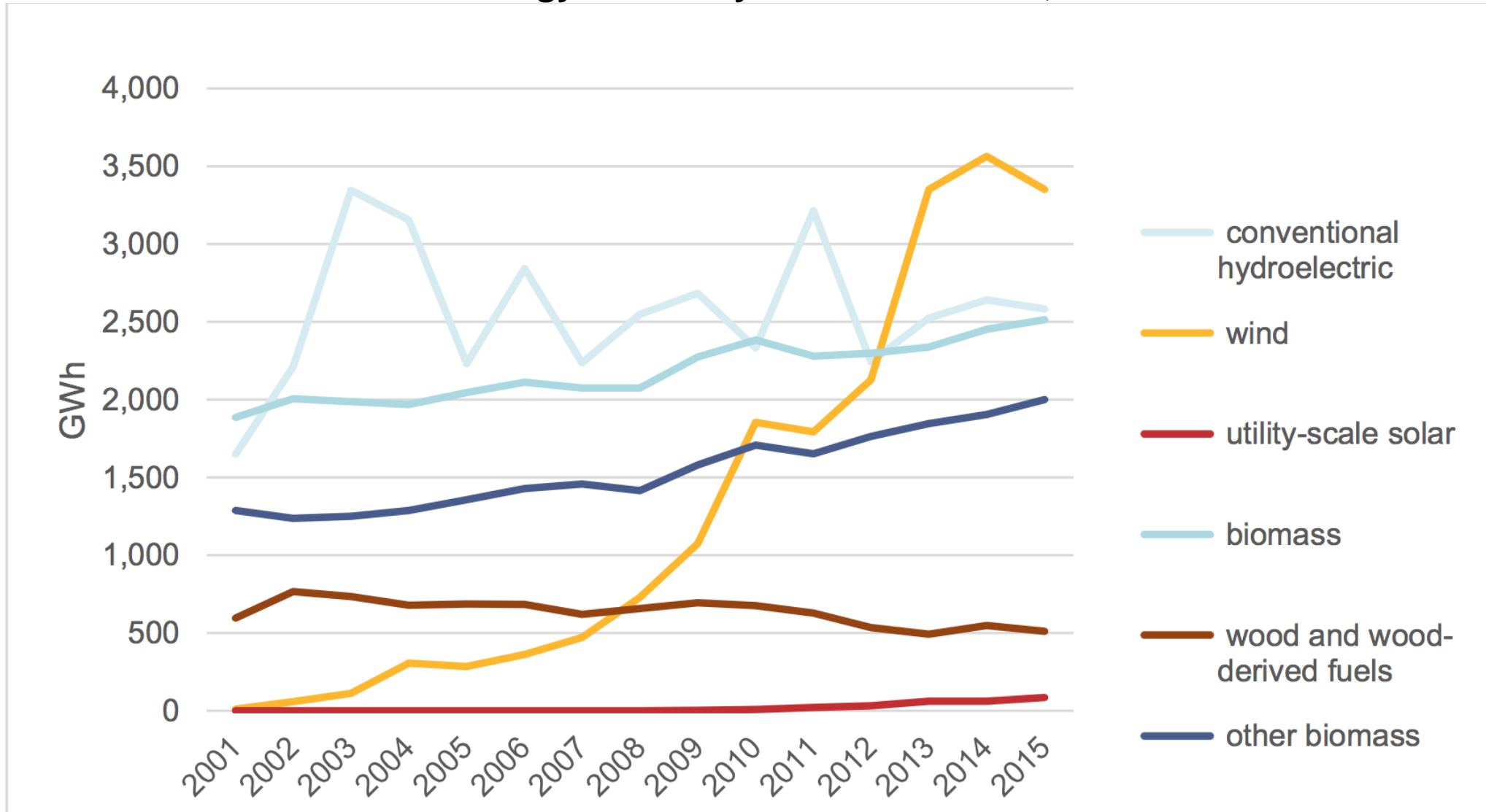
Source: EIA. "Electricity Data Browser."

- In 2014, **renewables produced less than 5%** of PA's electricity:
  - 3.2% from wind, water, and solar; and
  - 1.5% from biomass, biogas, landfill gas, and coal mine methane.
- Solar Development
  - **Cumulative Capacity = 273 MW**; 16<sup>th</sup> in the country (*EIA, SEIA*)
  - **2015 Capacity = 13 MW** (25% YoY), 26<sup>th</sup> nationally (*EIA, SEIA*)
- Distributed Generation
  - **85%** of PA's DG capacity is solar PV (188 MW)
  - More than **10,000 solar NM** customers to date
  - 2015: 44% commercial, 34% residential, and 21% industrial

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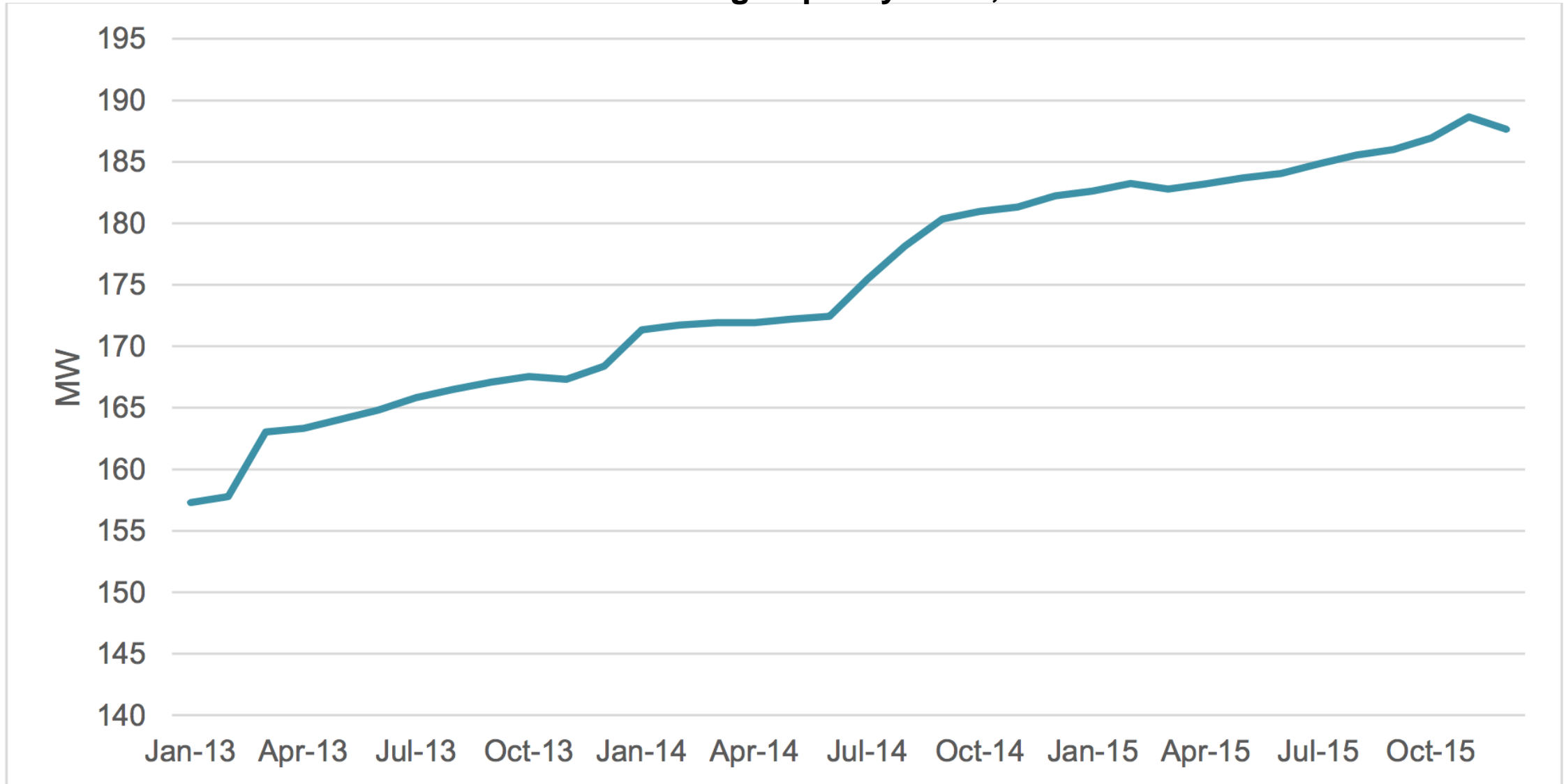


## Renewable Energy Electricity Generation in PA, 2001-2015



Source: EIA. "Electricity Data Browser." Note that distributed solar is omitted from the chart due to a lack of data availability.

## Solar PV Net Metering Capacity in PA, 2013-2015



Source: EIA. "Form EIA-826 detailed data: Net Metering." (2013, 2014, 2015).



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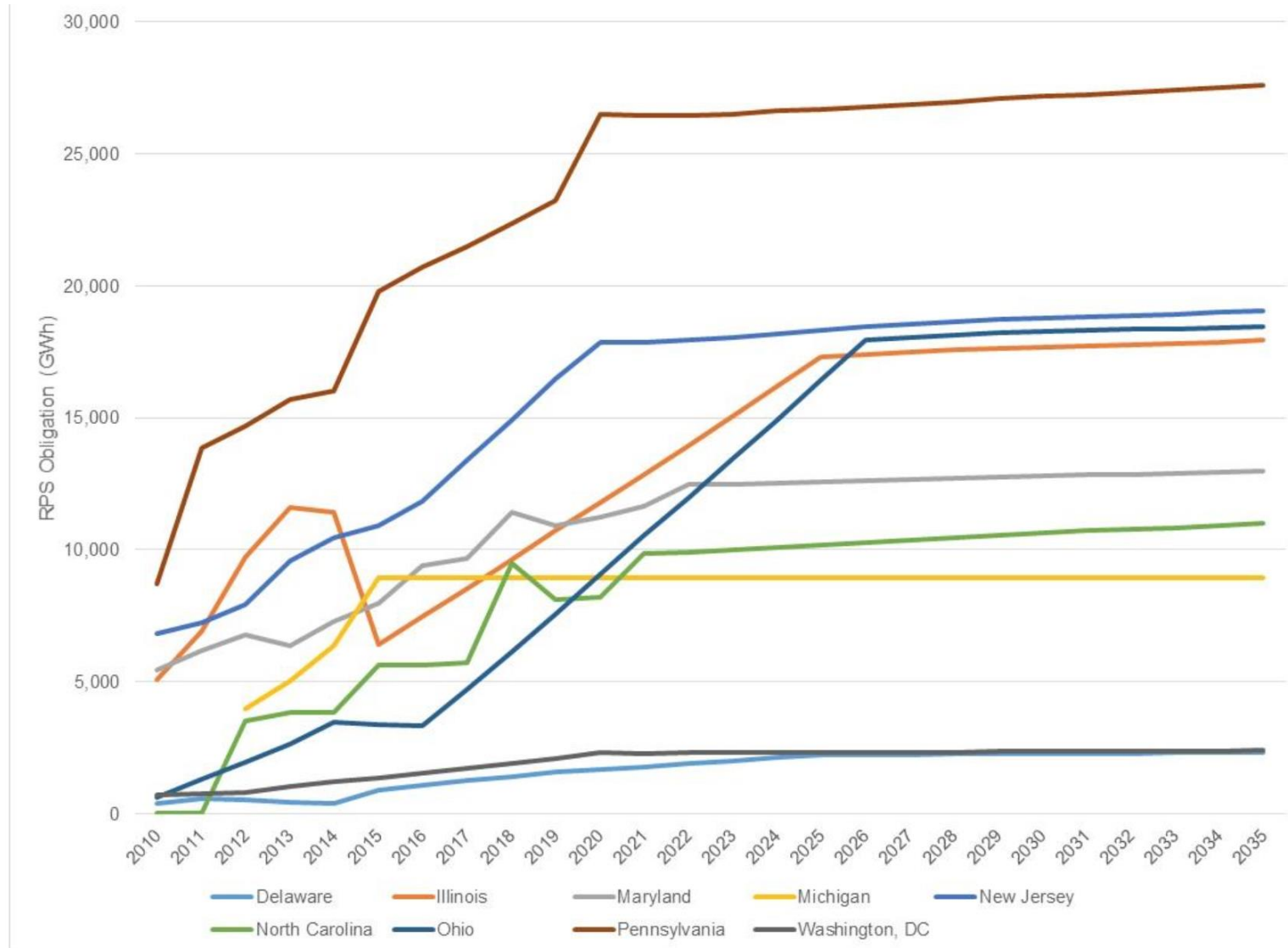
- AEPS enacted Nov. 2004
  - Requires each EDC and electric generation supplier to retail electric customers in PA to supply specific amounts of electricity sourced from “alternative” energy each year
  - End target is **18% by Compliance Year 2021** (June 2020 – May 2021)
- “Alternative” vs. “Renewable” Definition
  - AEPS allows for **non-renewable resources to qualify** for AEPS, including:
    - Coal byproducts: waste coal and coal mine methane;
    - Natural gas-powered facilities: fuel cells, small cogeneration units & industrial blast furnaces; and
    - Fossil generation-powered resources: pumped storage hydropower reservoirs.
- **Solar carve-out is merely 0.5%** of the 8% Tier I by CY2021
- PA allows most **PJM generators to qualify** for SRECs

- Why does the “alternative” energy definition and out-of-state generators market design matter?
  - AEPS can be satisfied by non-renewable resources, which results in **less incentive for EDCs to procure RE**;
  - Allowing for out-of-state generators to qualify has the effect of **under-incentivizing in-state development** due to market oversupply; and
  - PA generates more total electricity than other states in PJM, so its annual AEPS targets on an *absolute* basis *exceed* those of other state RPS targets. But, in effect, it’s **not incentivizing the same amount of RE growth** as other states with more refined/restrictive RE definitions coupled with more aggressive carve-out targets.

# AEPS Design and SREC Market



## RPS/AEPS Obligations for States in PJM Interconnection, 2010-2035



Source: LBNL. See Sources Page.

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- Future of CPP may be dependent on Trump SCOTUS Nomination.
- PA DEP has already issued a Draft 2015 Climate Change Action Plan in furtherance of complying with CPP.
- How does the AEPS come into play?
  - **AEPS can contribute directly or indirectly to CPP compliance**, whether PA pursues a mass- or rate-based plan.
  - **AEPS will need to be modified to harmonize** its objectives/targets and enforcement mechanisms with its CPP plan.
    - *Ex. Modifying definition of “alternative” energy to be in line with spirit of CPP.*

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- What can PA do today to fix the AEPS?
  1. **Remove unclean “alternative” energy technologies from AEPS definition to allow RE to be sole source for compliance** > disallows EDCs to shortcut compliance obligations with non-RE resources.
  2. **Increase solar carve-out** > directly incentivizes solar development.
  3. **Geographically limit market participation to in-state resources without violating Dormant Commerce Clause** > balances market to appropriately incentivize in-state solar development.
- Ron will elaborate on the state of the PA SREC market & state legislation under consideration.



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- Pennsylvania Department of Environmental Protection (PA DEP). 2015. *Draft 2015 Climate Change Action Plan*, 9.  
[www.portal.state.pa.us/portal/server.pt/document/1612924/draft\\_2015\\_climate\\_change\\_action\\_plan\\_update\\_\(10-21-2015\)\\_pdf](http://www.portal.state.pa.us/portal/server.pt/document/1612924/draft_2015_climate_change_action_plan_update_(10-21-2015)_pdf).
- U.S. Department of Energy Efficiency & Renewable Energy. “State & Local Data.”
- PA PUC. 2016. *2014 Annual Report: Alternative Energy Portfolio Standards Act of 2004*.
- EIA. “Form EIA-826 detailed data: Solar PV estimate.” [www.eia.gov/electricity/data/eia826/](http://www.eia.gov/electricity/data/eia826/).
- **For RPS/AEPS Obligations for States in PJM Interconnection, 2010-2035 Graph:** Lawrence Berkeley National Laboratory. Compiled from “RPS Compliance Data” (February 2016) and “RPS Demand Projections” (March 2016). Note that renewable energy technologies other than wind, water, and solar and some non-renewable energy technologies are included in this figure, depending on the state-specific eligible technology criteria.
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- Barbose, Galen. Lawrence Berkeley National Laboratory. April 2016. *U.S. Renewables Portfolio Standards: 2016 Annual Status Report*.
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