

# **The Electric Power Generation Association**





**EPGA is a regionally-focused, Pennsylvania-based trade association of electric generating companies.**



# Pennsylvania: The Keystone State of Electric Generation



Coal



Nuclear



Gas



Wind



Solar



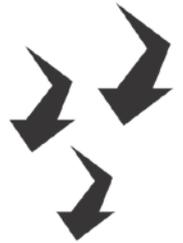
Hydro



Pumped Storage Hydro

# Electric Power Generation a Key Industry In the Commonwealth

- PA is the 2<sup>nd</sup> largest electricity producing state in the nation.
- PA is the No. 1 net exporter of electricity.
- PA home to one of the nation's most diverse and reliable generation fleets.
- The generation industry injects billions of dollars into PA's economy each year.





# Electric Power Industry Employment, Compensation and Economic Impact in PA

Direct Economic Impact	Jobs	Total Employee Wages	Average Wages per Employee	Economic Impact
<b>Electric Power (generation, transmission and distribution)</b>	<b>16,532</b>	<b>\$1,702,659,720</b>	<b>\$102,990</b>	<b>\$15,322,298,250</b>

Supplier Economic Impact	Jobs	Total Employee Compensation	Economic Impact
Maintenance and repair construction	3,694	\$201,366,100	\$459,163,910
Food and beverage services	2,921	\$53,079,690	\$151,626,830
Mining coal	2,635	\$239,625,180	\$758,615,380
Rail transport	967	\$90,205,740	\$290,834,940
Legal services	918	\$80,091,980	\$147,609,650
Other	10,541	\$654,841,550	\$1,919,363,290
<b>Total</b>	<b>21,675</b>	<b>\$1,319,210,250</b>	<b>\$3,727,223,000</b>

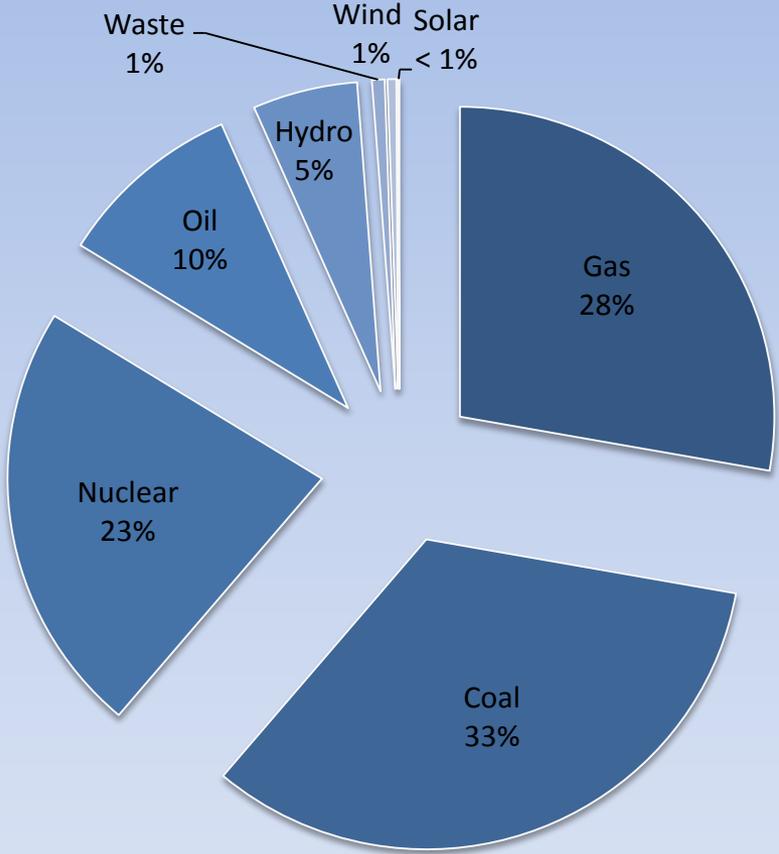
Induced Economic Impact	Jobs	Total Employee Compensation	Economic Impact
Food and beverage services	3,315	\$60,227,220	\$172,044,360
Hospitals	1,848	\$120,045,700	\$234,345,240
Health practitioners	1,710	\$137,368,070	\$213,331,160
Real estate, rental and housing services	1,418	\$22,646,600	\$185,189,720
Food and beverage retail	1,183	\$31,762,920	\$62,524,670
Other	22,236	\$990,057,740	\$3,058,085,070
<b>Total</b>	<b>31,709</b>	<b>\$1,362,108,240</b>	<b>\$3,925,520,230</b>

Total Employment, Compensation and Output	Jobs	Total Employee Compensation	Economic Impact
	<b>69,917</b>	<b>\$4,383,978,210</b>	<b>\$22,975,041,480</b>

Estimated Tax Impact	Direct Taxes	Supplier Taxes	Induced Taxes	Total Taxes
Federal Taxes	\$459,782,160	\$300,091,700	\$330,795,560	\$1,090,669,430
State and Local Taxes	\$1,253,202,150	\$218,686,540	\$245,073,270	\$1,716,961,950
<b>Total Tax Revenue</b>	<b>\$1,712,984,310</b>	<b>\$518,778,240</b>	<b>\$575,868,830</b>	<b>\$2,807,631,380</b>

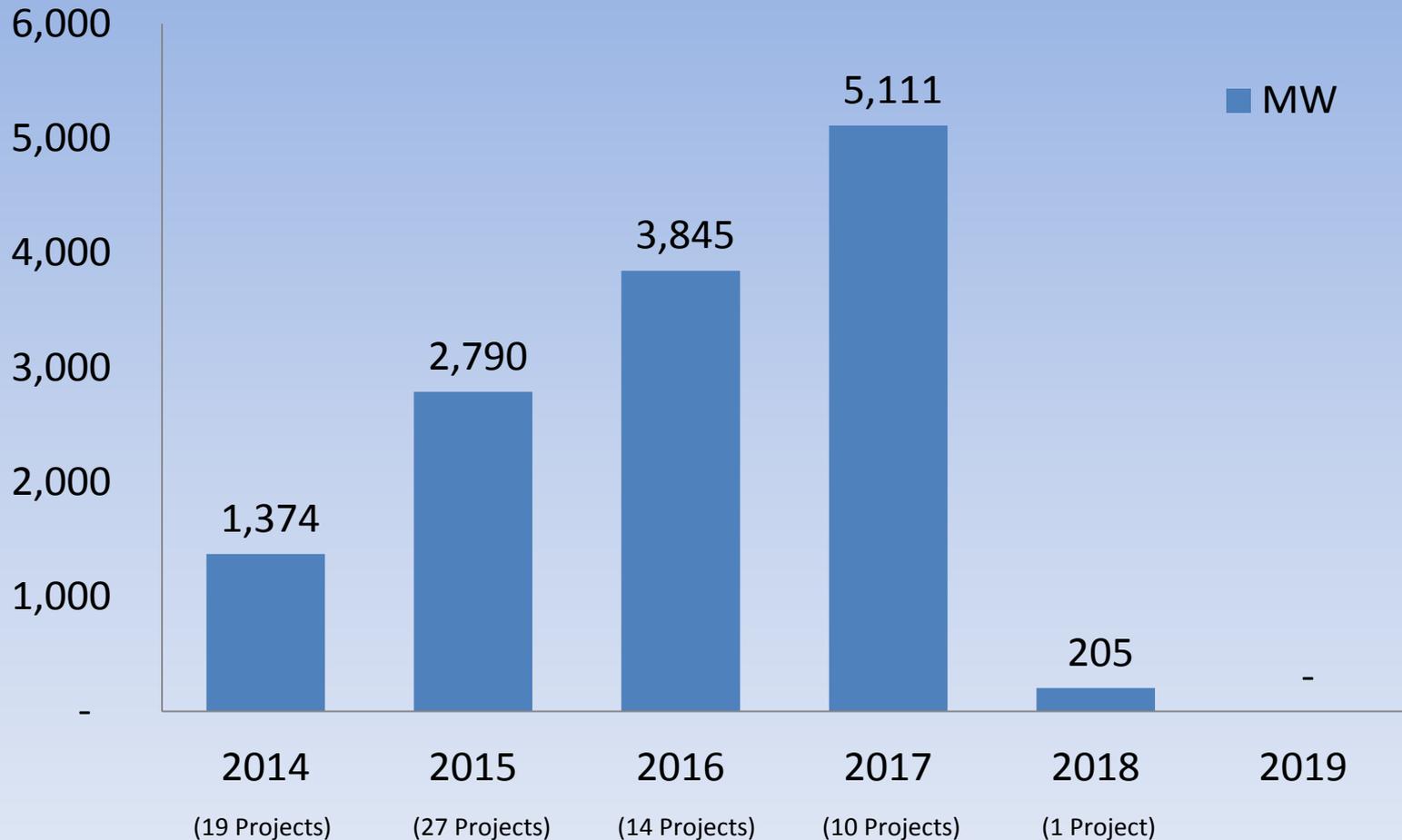
# Current Installed Capacity in Pennsylvania

Fuel Type	Capacity
Coal	14,772
Gas	12,293
Nuclear	10,005
Oil	4,250
Hydro	2,238
Waste	288
Wind	201
Solar	39
<b>Total</b>	<b>44,086</b>



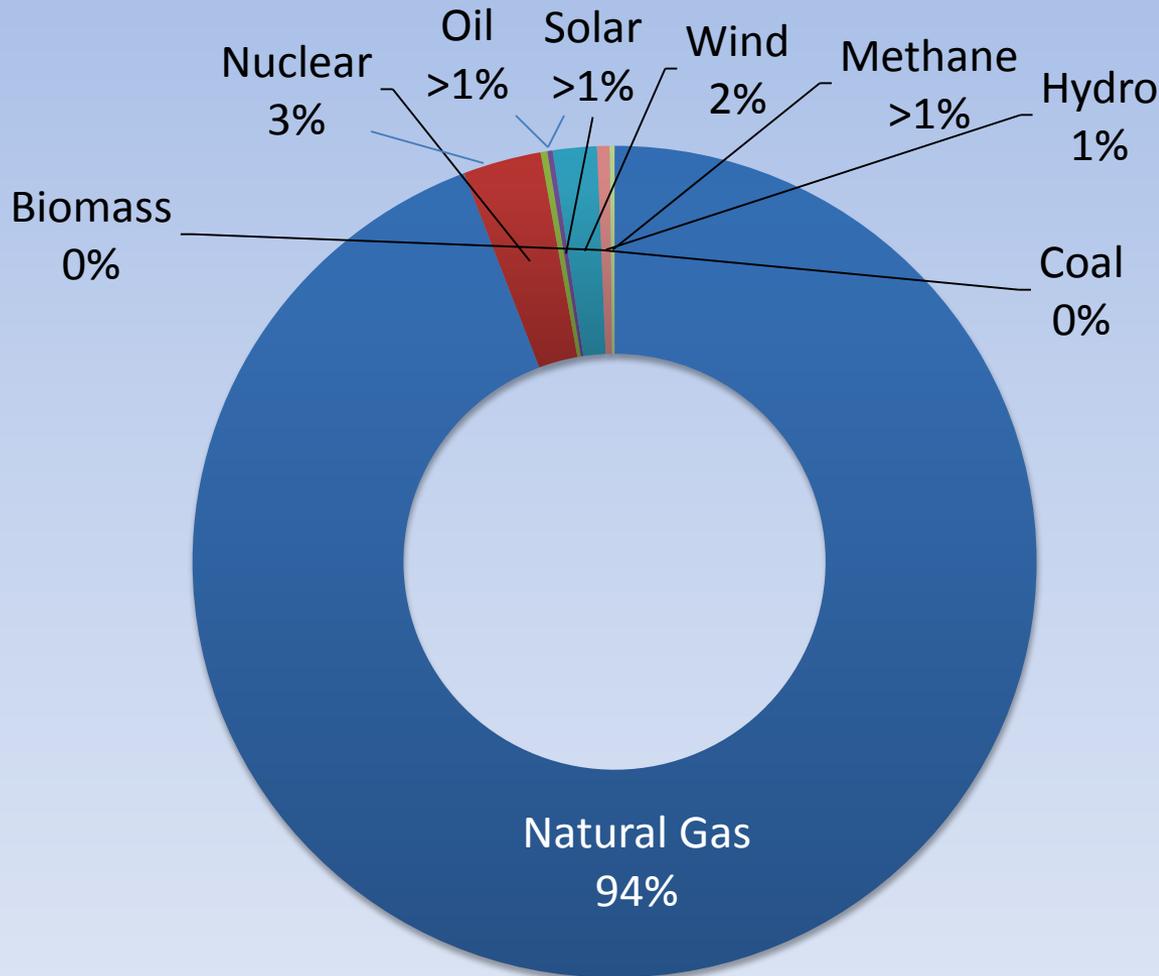
Source: PJM 2013 RTEP and SNL

# Anticipated New Generation in PA



*\* Includes all types of generation as of Dec. 31, 2013*

# Queued PA Capacity Additions



<u>Fuel Type</u>	<u>MWs</u>
Natural Gas	11,609
Nuclear	369
Coal	0
Hydro	59
Wind	207*
Solar	25**
Biomass	0
Methane	23
Oil	32
<b>Total</b>	<b>12,324</b>

\*Nameplate energy = 1,439 MW

\*\*Nameplate energy = 66 MW

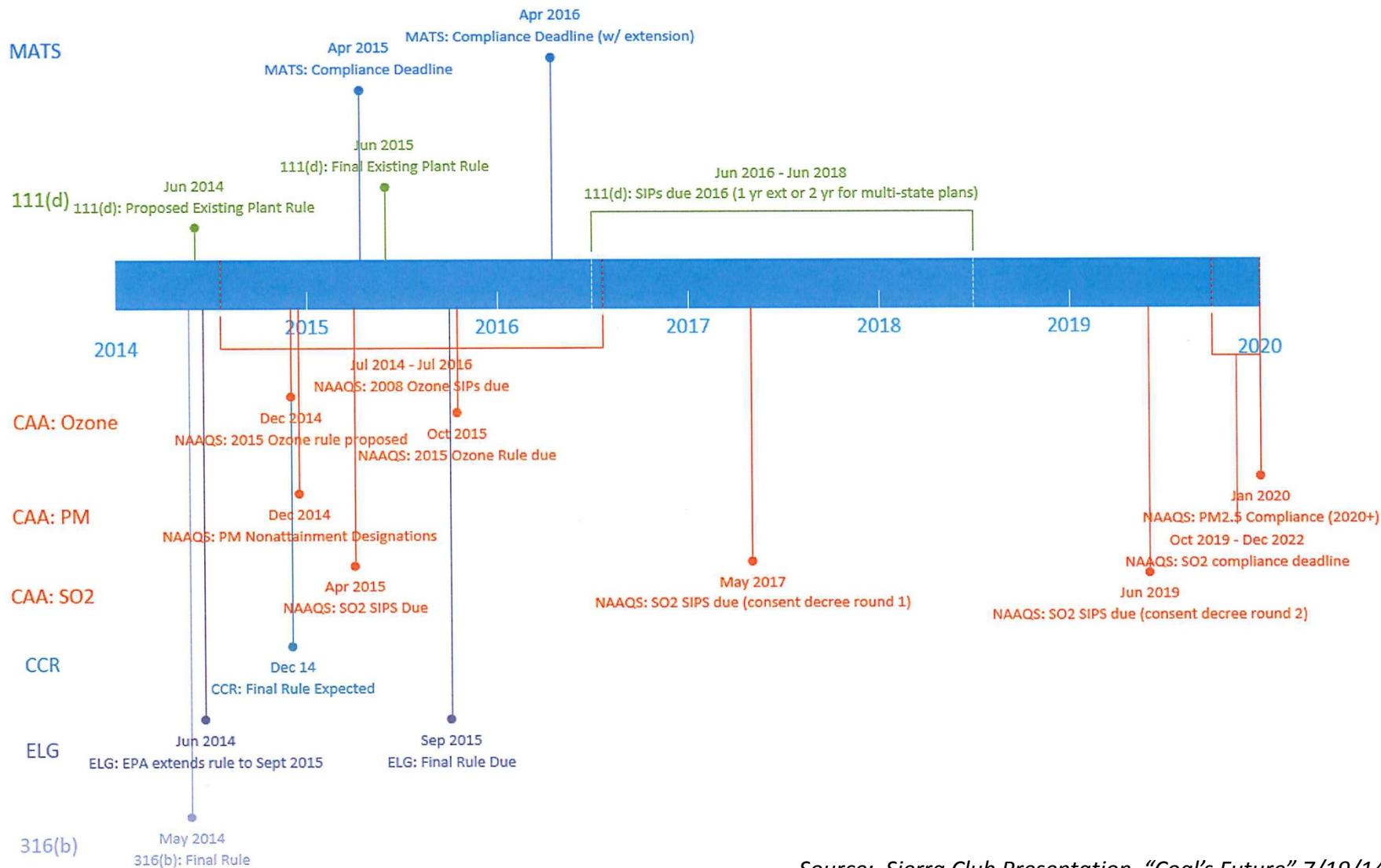
***NOTE: Not all queued capacity will be built***

# Major Environmental Rules Have Been Changing the Generation Landscape



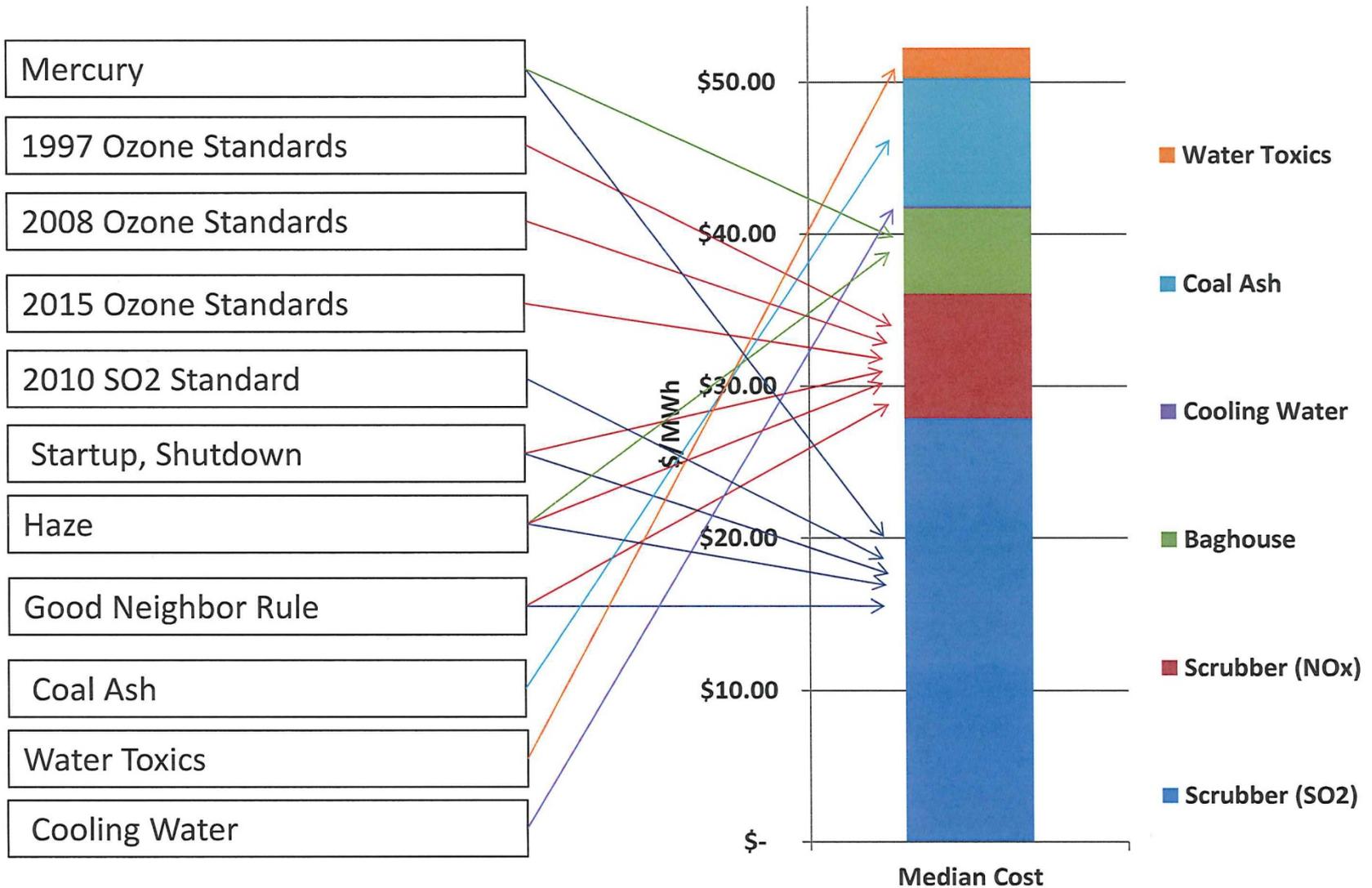
- Mercury and Air Toxics Rule (MATS).
  - Cross States Air Pollution Rule (CSAPR).
  - 316(b) Water Intake Rule.
  - Regulation of coal combustion residuals (CCRs) still being considered.
  - New Effluent Limitation Guidelines (ELGs).
- 
- PA Regional Haze.
  - PA NO<sub>x</sub> RACT out for public comment.
  - HB 1699 designed to address dirty diesel behind-the-meter generators being used in DR programs.
  - Greenhouse Gas (GHG) Rule for new power plants.

# New EPA Rules Timeline



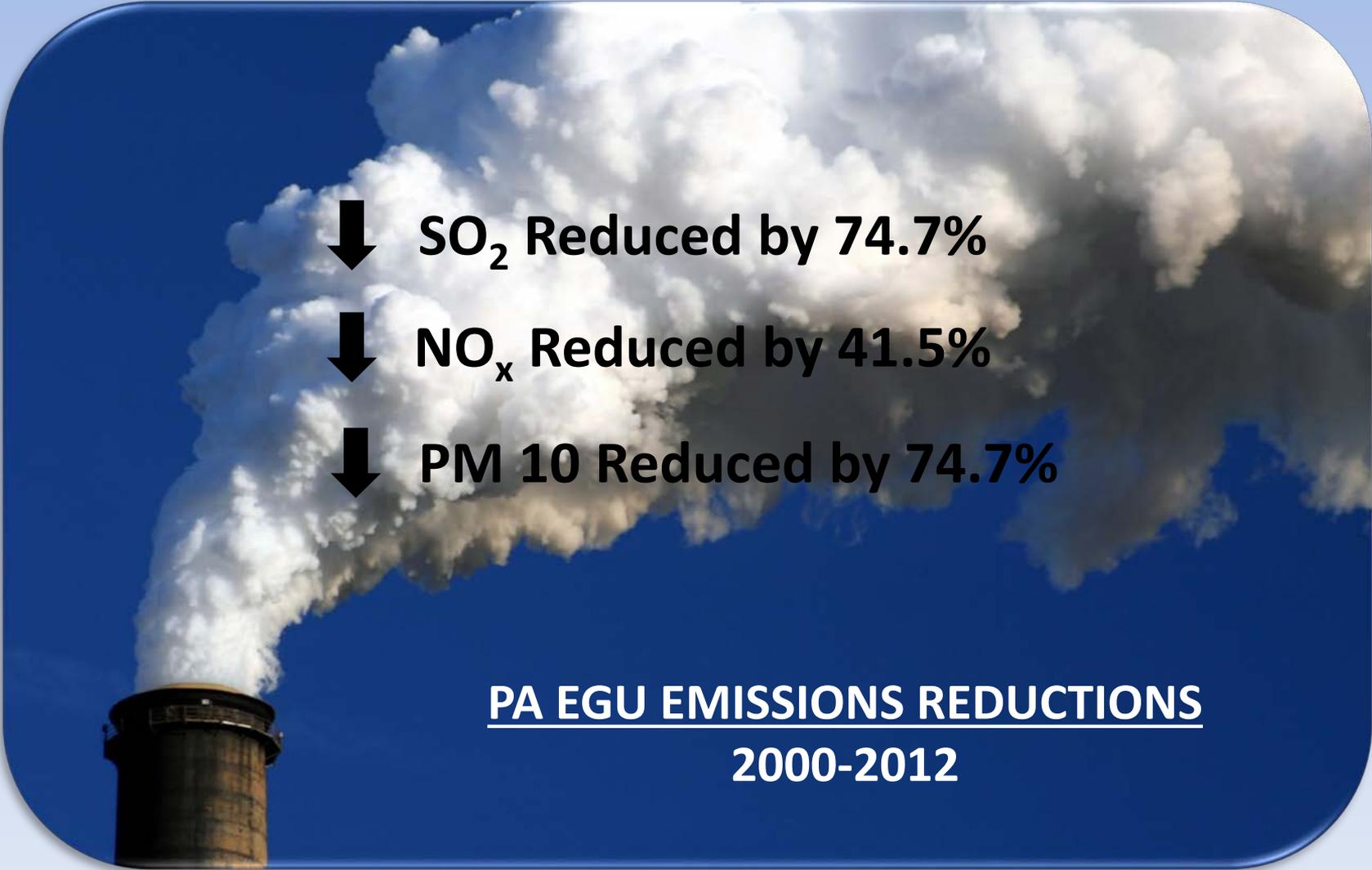
Source: Sierra Club Presentation, "Coal's Future" 7/19/14

# New and Existing Rules Drive Costs



Source: Sierra Club Presentation, "Coal's Future" 7/19/14

# PA Electric Generator Emissions

- 
- ↓ **SO<sub>2</sub> Reduced by 74.7%**
  - ↓ **NO<sub>x</sub> Reduced by 41.5%**
  - ↓ **PM 10 Reduced by 74.7%**

**PA EGU EMISSIONS REDUCTIONS**  
**2000-2012**

# EPA's Latest Rule

## Regulation of CO<sub>2</sub> from Existing Power Plants

- Began through Executive Action by President Obama.
- Signed by EPA on June 2, 2014, published in Federal Register on June 18, 2014.
- Requires nationwide reduction of GHG emissions, with each state given interim and final reduction goals.
- Significant reductions to begin no later than 2020.
- States may develop their own plan and submit it to EPA for approval.
- States may work collaboratively with other states in regional efforts.



# Initial Reaction:

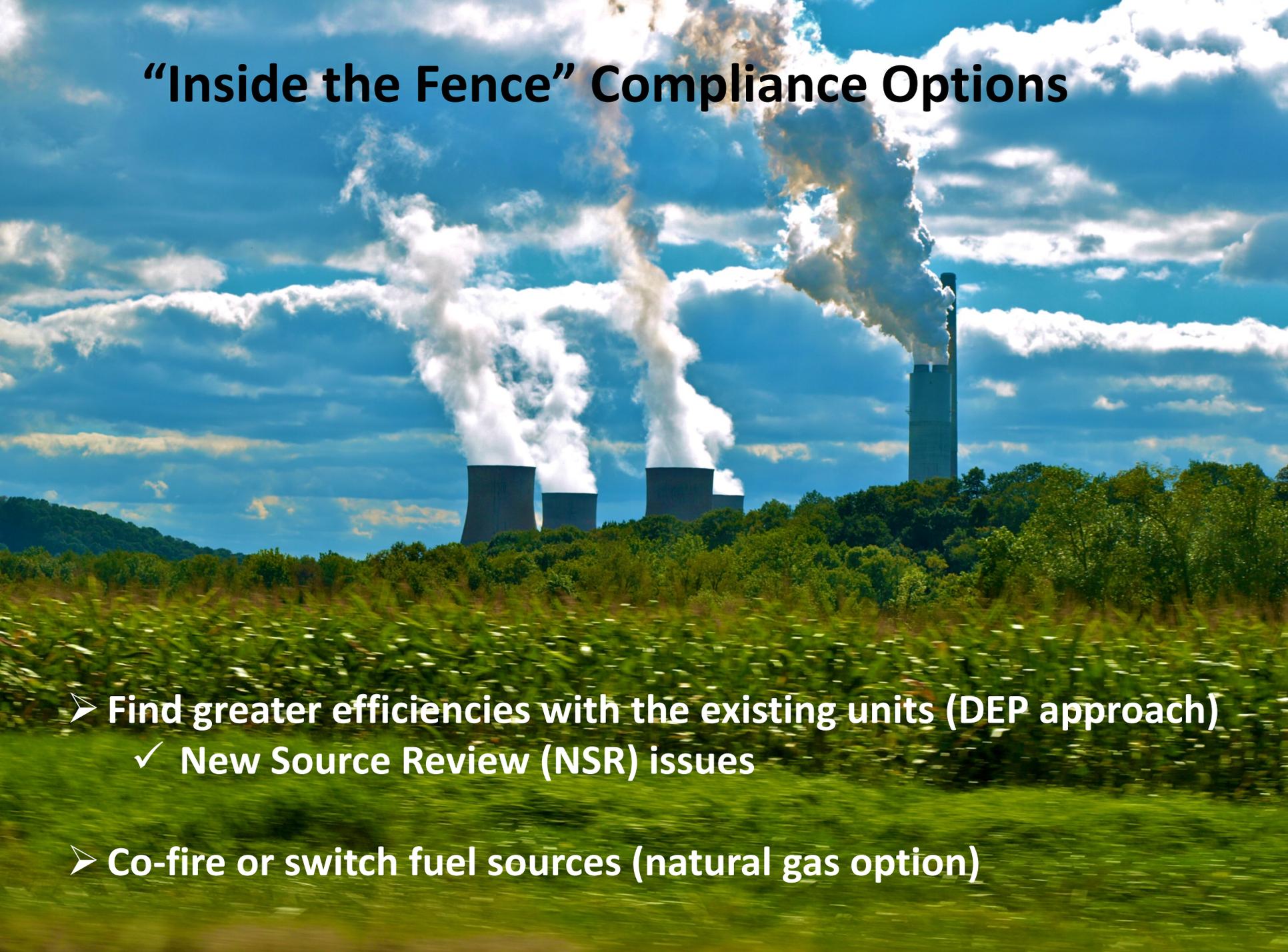
## Some Good News, Some Difficult News

- EPA did outreach and attempted to incorporate some broad suggestions offered by the electric power industry:
  - ✓ Provide for more than one compliance path.
  - ✓ Allow the states to implement compliance under federal guidance.
- EPA's emission reduction goals appear to be very aggressive, may be unachievable, and could result in unintended consequences with the bulk power system, which is already in a significant state of transition.
- The "flexibility" under the rule is actually very limited. PA's goals would require each "building block" to be used, giving the State very little discretion in meeting the federal requirements.
- Use of 2012 baseline problematic given number of deactivations and retirements that have occurred since 2005.
- Specific heat-rate requirements are problematic for many power plants, which have already made efficiency improvements and have little opportunity to do additional upgrades.
- Overall GHG reductions in United States will still be minor compared to growth of emissions in developing countries and emerging markets.

# State Specific Approach to Compliance With New GHG Rule

- PA can write its own compliance plan based on “building blocks” identified by EPA.
  - ✓ Make fossil fuel power plants more efficient.
    - Improve equipment and processes to get as much electricity as possible from each unit of fuel.
    - Using less fossil fuel to create the same amount electricity.
  - ✓ Use low-emitting power sources more.
    - Using lower-emitting power plants more frequently to meet demand.
  - ✓ Use more zero and low emitting power sources.
    - Expand renewable generating capacity.
  - ✓ Use electricity more efficiently.
    - Reduce demand through energy efficiency and demand response.
- PA could also work collaboratively with other states or, if it wanted, enter into a regional compliance plan.

# “Inside the Fence” Compliance Options



- Find greater efficiencies with the existing units (DEP approach)
  - ✓ New Source Review (NSR) issues
- Co-fire or switch fuel sources (natural gas option)

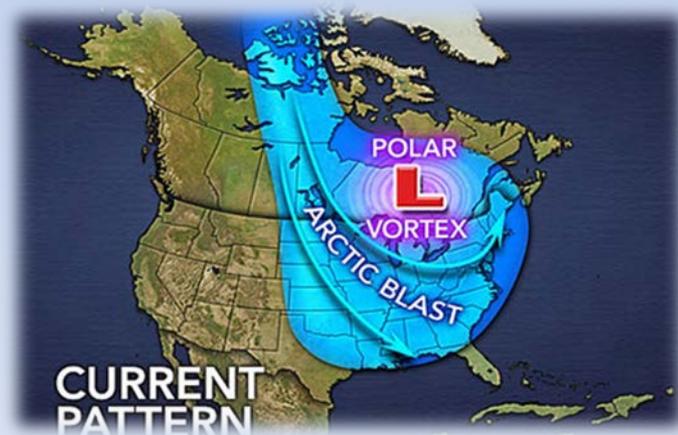
# “Outside the Fence” Compliance Options

- **Demand side energy efficiency**
  - ✓ PA’s Act 129 of 2008
- **Renewable energy standards**
  - ✓ PA’s AEPS
- **Transmission efficiency improvements**
- **Energy storage technologies**
- **Expansion of nuclear energy**
- **Market-based trading programs**
- **Other energy conservation**

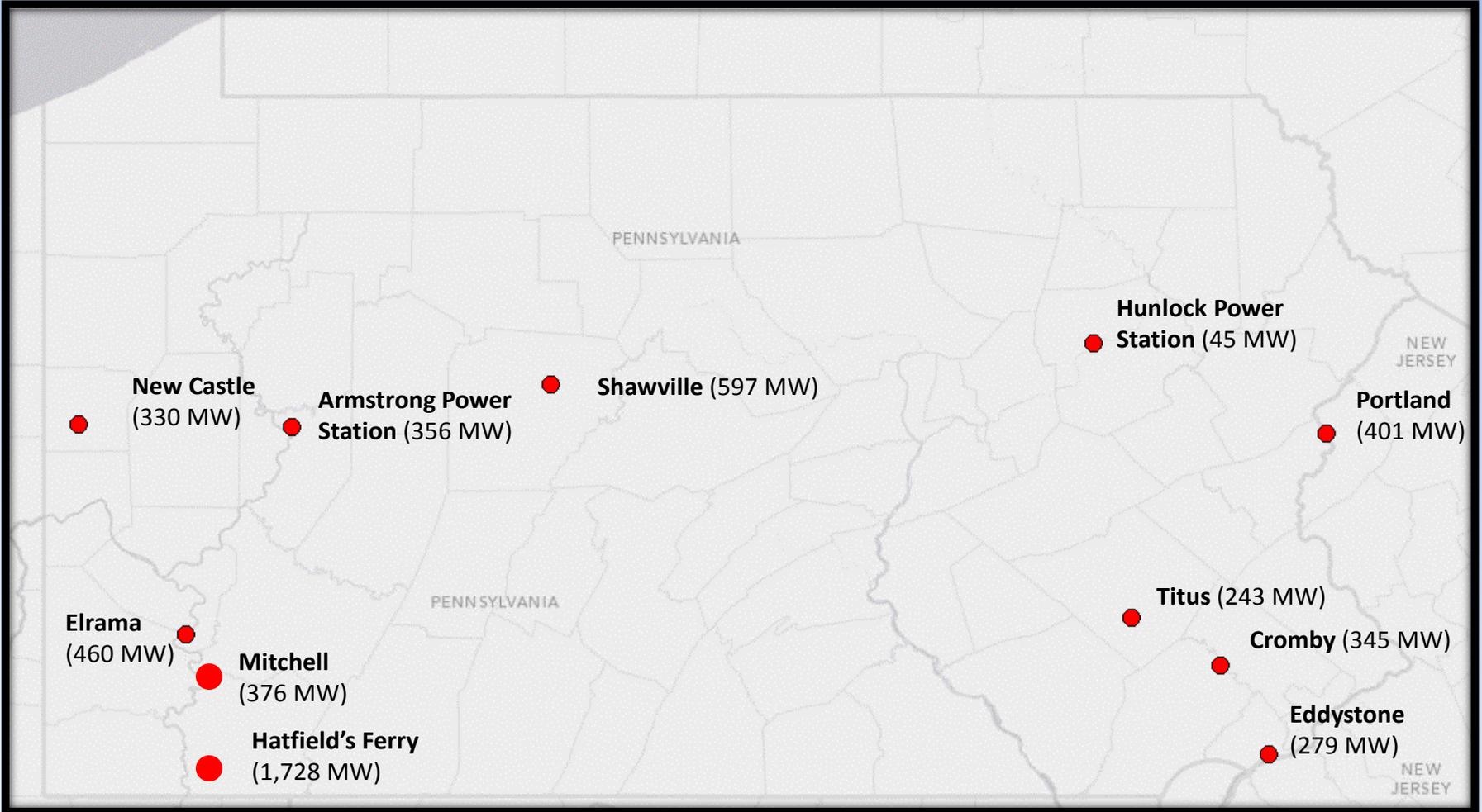


# Bulk Power System Already in Significant State of Transition

- Natural gas has been game changer.
- Coal dominance continues to decline due to increased environmental regulation and market conditions.
- Nuclear Renaissance slowed by Fukushima and market conditions – baseload nuclear under very real threat.
- Demand response and energy efficiency have dominated growth in system due to state incentives and overcompensation in wholesale markets.
- Wholesale markets continue to be skewed by RPS mandates and other subsidized forms of energy.
- Events in January, 2014 demonstrate just how real different resources in the system are and how management of those resources can be difficult.

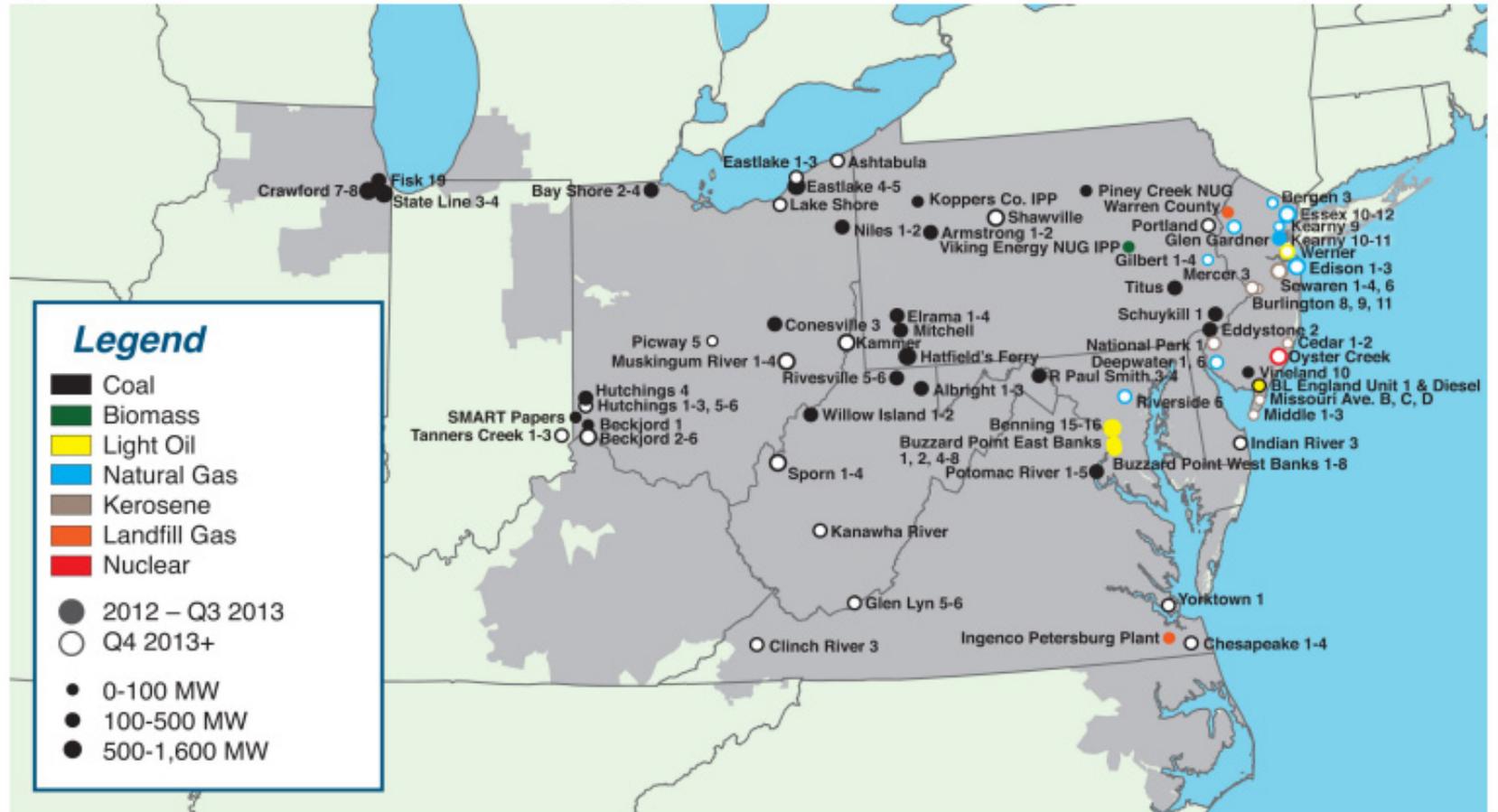


# Announced Pennsylvania Deactivations and Retirements



# PJM Generator Retirements

Figure 12-1 Map of unit retirements in PJM: 2012 through 2019



2012 – 2019

# Next Steps

- EPA Preliminary GHG Rule out for public comment
- EPA holding several public hearings, including one in PA
- Final Rule expected by June, 2015
- States to submit State Implementation Plans beginning June, 2016 – 2018
- If a State does not submit a SIP, EPA will write a Federal Implementation Plan for the State
- Significant reductions to begin no later than 2020
- EPA's full GHG reduction goals must be met by 2030



# Lots of Questions Remain

- What should/will Pennsylvania do in implementation?
- How will the generation and coal extraction industries be affected?
- Will electricity prices rise?
- Will electric reliability be impacted?
- Can coal-fired generators absorb another significant regulation and maintain operations in a competitive market?



- What other economic impacts will result?
- What will our bulk power system look like?
- What electric generating resources are we going to be more dependent on?
- Is this regulation going to produce a meaningful result and the benefits EPA promises?
- When will other CO<sub>2</sub> emitters be subject to regulation?

# One Undeniable Conclusion: New GHG Rule Will Be Subject of Much Debate

According to EPA, the new GHG Rule will, by 2030, result in:

- \$93 billion in public health and climate benefits.
- 150,000 fewer asthma attacks each year.
- 6,600 fewer premature deaths each year.



According to the U.S. Chamber of Commerce, the new GHG Rule will:

- Cost as many as 442,000 jobs in 2022 and put 224,000 Americans out of work, on average, annually.
- Cost \$51 billion in GDP loss annually.
- Lower disposable household income by \$586 billion.
- Increase electricity costs by more than \$289 billion.



Thank you!



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