

War on Coal/War on Energy Users

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Recent EPA/DEP Regulations Make Electricity

- ▶ More Expensive to Buy.
- ▶ More Difficult to Generate.

Energy Users - On Site Generation Regulations

▶ Boiler MACT

- ▶ Effective for area sources March 21, 2014
- ▶ Effective for major sources January 31, 2016

▶ RICE

- ▶ Effective for compression engines at area sources May 3, 2013
- ▶ Effective for spark ignition engines at area sources October 19, 2013

▶ PA RACT 2 (Proposed)

- ▶ Will be approved by AQTAC on November 6
- ▶ Will go to EQB in February 2015 at the earliest
- ▶ Scheduled to be effective January 1, 2016



Boiler MACT

Major/Area Rule Comparison

- ▶ Gas fired boilers are exempt at area sources of HAPS

	Area Source (Existing)	Major Source (Existing)
Emission Limits	Coal-fired >10 MMBTU/hr	All but Gas -1 fueled
Tune ups	2-yr (most), 5-yr except NG	1-yr (most), 2-yr, 5-yr
One time energy assess.	All >10 MMBTU except NG	All
Initial Notice	January 20, 2014	May 31, 2013
Compliance date, including tune-up, energy assessment	March 14, 2014	January 31, 2016

EPA RICE - Existing CI **Emergency** Engines-Area Sources (Example)

Emergency Engine Operational Limits

- ▶ Unlimited for emergency.
- ▶ 100 hours per year for:
 - ▶ Maintenance checks and readiness testing
 - ▶ Emergency Demand Response (Alert Level 2)
 - ▶ Frequency or voltage deviation $\geq 5\%$
- ▶ 50 hours per year (out of the 100 above) for non-emergency:
 - ▶ No Peak Shaving
 - ▶ To supply power to another entity if (area sources only)
 - ▶ Dispatched by ISO to mitigate local conditions following established protocols



PA RACT2

- ▶ PA only rule.
- ▶ More Stringent Emission Limits for all non de minimis sources at major NO_x or VOC facilities.
- ▶ In the energy field, limits apply to engines, boilers, turbines.
- ▶ Proposed limits for coal fired boilers are very controversial.
 - ▶ Environmental NGOs, adjoining non-coal states, and EPA have all commented toward making the rules more stringent.
 - ▶ Issue of operation of installed air pollution control equipment.

Coal -Fired EGU Regulations

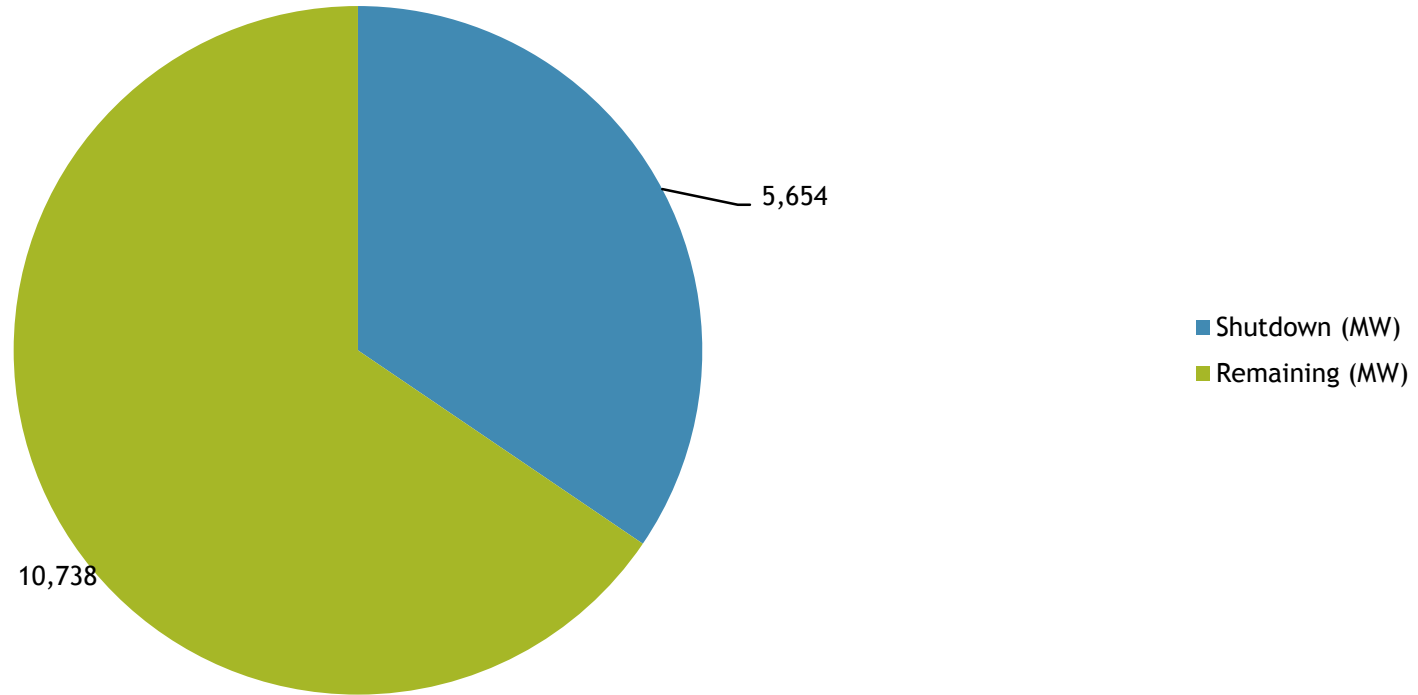
- ▶ Mercury and Air Toxics Rule (MATS)
 - ▶ Effective April 2015 (1-yr extension available for sources adding control).
- ▶ Clean Power Plan
 - ▶ 111(b) Rule for GHGs for new sources.
 - ▶ Effective upon operation.
 - ▶ 111(b) Rule for GHGs for modified sources.
 - ▶ Effective upon modification.
 - ▶ 111(d) Rule for GHGs for existing sources.
 - ▶ Phased in between 2020 and 2030.

Mercury and Air Toxics Rule

- ▶ Requires Control of Mercury, other metals, and Acid Gases from coal/oil-fired EGUs.
- ▶ One of the prime reasons for the early shut down of many coal fired EGUs.
- ▶ While there is in theory a corresponding rule for NGCC units, no stand alone NGCC facility would actually trigger the rule.

PA Coal Fired Fleet

PA Coal Capacity - 2011 (MW)



Natural Gas Plants in the Planning Process

Plant	County	MW	Permit	Status
Panda Liberty	Bradford	900	9-11	~50% complete
Panda Patriot	Lycoming	900	1-12	Groundbreaking 8/14
Berks Hollow	Berks	855	12-13	Not started
Hickory Run	Lawrence	900	4-13	Not started
Sunbury	Snyder	1064	4-13	Not started
Future Power PA	Schuylkill	346	3-14	Not started
AES Beaver Valley	Beaver	120	2-14	Not started may end 2017
Tenaska	Westmoreland	900	No	App. 11-13
Lackawanna Energy	Lackawanna	1300	No	App. 6-14
New Castle	Lawrence	354	No	App. 12-13
Calpine York	York	535	No	App. 6-14
Brunner Island	York	1490	No	App. 3-14



111(b) Rule - GHG for New EGUs (Proposed January 2014)

- ▶ New Coal-Fired Steam Generating Units
 - ▶ Must meet emission limit of 1,100 lb. CO₂/MWh gross (12 month-rolling average).
 - ▶ PA's coal rate is currently at 2,108 lb/MWh.
 - ▶ 1,100 lb/MWh represents an efficiency of about 64%.
 - ▶ The highest efficiency for a state of the art supercritical boiler is around 40%.
 - ▶ EPA has determined that the Best System of Emission Reduction (BSER) is “partial” carbon sequestration and storage (CSS).
- ▶ New Combustion Turbines
 - ▶ Large turbines must meet limit of 1,000 lb. CO₂/MWh gross (12 month-rolling average).
 - ▶ PA's NGCC rate is currently at 855 lb/MWh.
 - ▶ 1,000 lb/MWh represents an efficiency of about 40%.
 - ▶ Efficiencies of F-Class NGCCs can approach or even exceed 50%.
 - ▶ EPA has determined that BSER is modern, efficient NGCC technology (No CSS).
- ▶ NO NEW COAL PLANTS



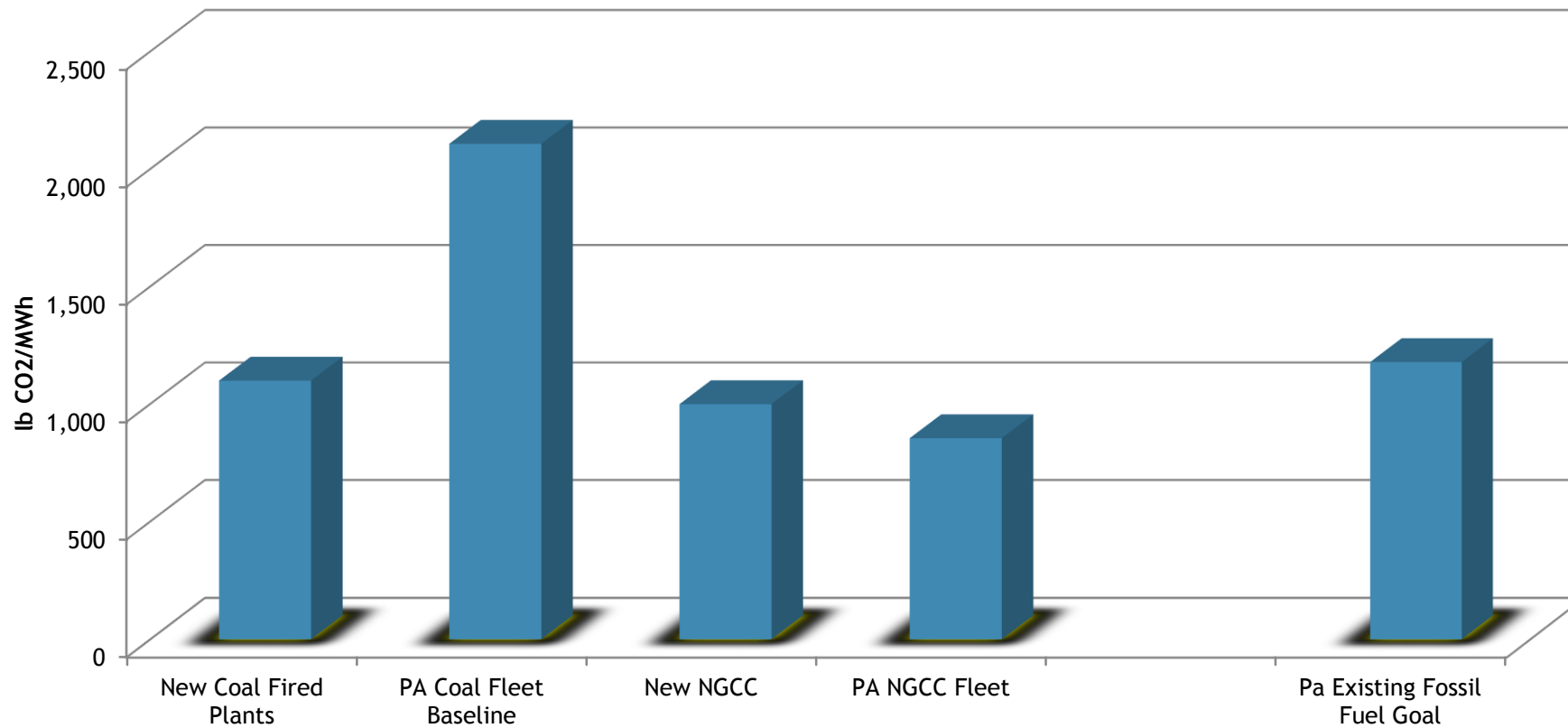
111(b) Rule - GHG for Modified EGUs (Proposed June 2014)

- ▶ Modified Coal-Fired Steam Generating Units
 - ▶ Must exceed by 2%, the best ever observed efficiency from 2002 until the time of the modification.
 - ▶ The EPA proposal fails to recognize that:
 - ▶ Boilers run less efficiently in a turned-down mode, which has been a more frequently occurring status.
 - ▶ It is problematic for any boiler to continuously exceed its best performance in a 12-year period.
- ▶ Modified Combustion Turbines
 - ▶ Large turbines must meet limit of 1,000 lb. CO₂/MWh gross (12 month-rolling average).
 - ▶ Easily achievable by a modern NGCC turbine.
- ▶ NO MODIFIED COAL PLANTS

111(d) Rule - GHG for Existing PA EGUs (Proposed June 2014)

- ▶ Rule establishes a CO₂ rate for EGUs in PA of 1,179 lb/MWh net (2020-2030)
- ▶ Rate is established from 2012 baseline with the following modifications:
 - ▶ Coal-fired emissions are reduced by 6% under the assumption that this can be met.
 - ▶ Total NGCC dispatch is increased to 70% with corresponding reduction in coal/oil.
 - ▶ A factor for “nuclear at risk” is used to further reduce the fossil fuel rate by incenting nuclear to remain in operation (even though PA has no nuclear at risk).
 - ▶ A factor for renewables is factored in to offset fossil fuel generation.
 - ▶ And finally a factor for energy efficiency is included to further reduce the fossil fuel rate.

Graphical Comparison of CO₂ Limits

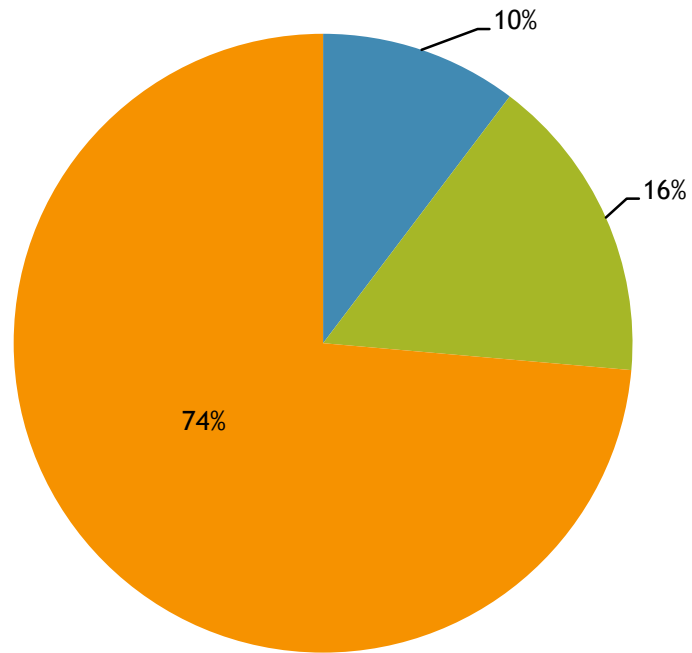


111(d) Rule - GHG for Existing PA EGUs (Proposed June 2014) - Effects in PA

- ▶ PA has eleven coal-fired plants in the baseline that will be shut down or converted.
 - ▶ 14.7 GWh emitting 16 million tons of CO₂ (2,157 lb/MWh).
 - ▶ Armstrong Elrama Hatfield AES Beaver Valley
 - ▶ Mitchell Piney Creek Portland New Castle
 - ▶ Shawville Sunbury Titus
- ▶ If all remaining fossil fuel plants are allocated emissions based on their 2012 baseline, all fossil fuel would be curtailed at 84% of their baseline, a loss of 23 GWh, equivalent to 10 1X1 F-Class NGCC facilities.
- ▶ If NGCC argued that they are already below the rate and should not be curtailed, coal would be curtailed to 66% of its baseline, a loss of 49 million MWh of coal.

Scheduled and Required Shutdowns in Fossil Fuel Generation

PA 2012 Fossil Fuel Fired Generation - 143 GWh



- Scheduled Shutdown (GWh)
- 111(d) reduction (GWh)
- Remaining (GWh)

111(d) reduction assumes a proportionate reduction based on current CO₂ emissions

Why it Matters to Users

- ▶ Less supply, higher cost.
- ▶ Less fuel diversity, higher cost.
- ▶ More renewables, higher cost.
- ▶ Energy Efficiency and Renewables are speculative. Failure to achieve goals will mean further reductions in supply with no CO₂ to allocate.

What you need to do!!!

- ▶ Comment on the Clean Power Plan rule!

- ▶ Modified and New EGU comment periods have closed.
- ▶ Existing EGU comment period has been extended to December 1.
- ▶ This is the most critical component of the three rules.
- ▶ Details of the rule may be found at:

<http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule>

Problems with the War on Coal

- ▶ If Coal Plants Shut Down they will Not Come Back.
- ▶ No studies on the adequacy of gas to take-up the slack.
- ▶ No studies on the adequacy of infrastructure to deliver the gas.
- ▶ Capacity is much better assured with a well-stocked coal yard than with a pipeline that is expected to deliver the fuel needed for generation.

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