

Assessing the Affordable Clean Energy Rule

Or... Repeal and Replacement of the CPP

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Executive Summary

- ACE repeals and replaces Clean Power Plan (CPP)
- Applies to existing (as of Jan. 8, 2014) coal units
- Provides 6 candidate technologies
 - Neural Network/Intelligent Sootblowers
 - Boiler Feed Pumps
 - Air Heater & Duct Leakage Control
 - Variable Frequency Drives
 - Blade Path Upgrade (Steam Turbine)
 - Redesign/Replace Economizer
 - Improved Operation & Maintenance
- States have 3 years to develop plan; approximately 5 years (until 2024) to comply
- State discretion – remaining useful life and other factors
- Limits flexibility



Overview - CAA Section 111

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- Clean Air Act (CAA) § 111(d) covers existing sources for a subset of pollutants:
 - Those that are not covered by NAAQS
 - Those that are not covered by 112 as hazardous air pollutants
- Creates a “standard of performance”
 - “Standard of performance” defined as standard of emissions reflecting the degree of emission limitation achievable by reference to the “best system of emission reduction”, “adequately demonstrated” taking costs and non-air-quality health and environmental impacts and energy requirement impacts into consideration
- Federal/State division of responsibility
 - EPA provides “emission guidelines” to states – includes EPA’s determination of BSER
 - States submit plans with standards of performance reflecting BSER



How Did We Get Here – Obama Administration

2009:
Endangerment
finding for GHG
emissions
CAA § 202

Oct. 2015: CAA §
111(b) NSPS for
electric utility
generating units
(EGUs)

Oct. 2015: CAA §
111(d) ESPS for
EGUs (Clean
Power Plan, or
CPP)

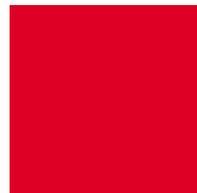
Court challenges,
US SCt stay (Feb.
2016) – briefing,
argument, but CPP
never takes effect

Source: CPP Repeal, Affordable Clean Energy Rule, Revisions to 111(d) – An Overview; Sam Boxerman, Sidley LLP for EEI.

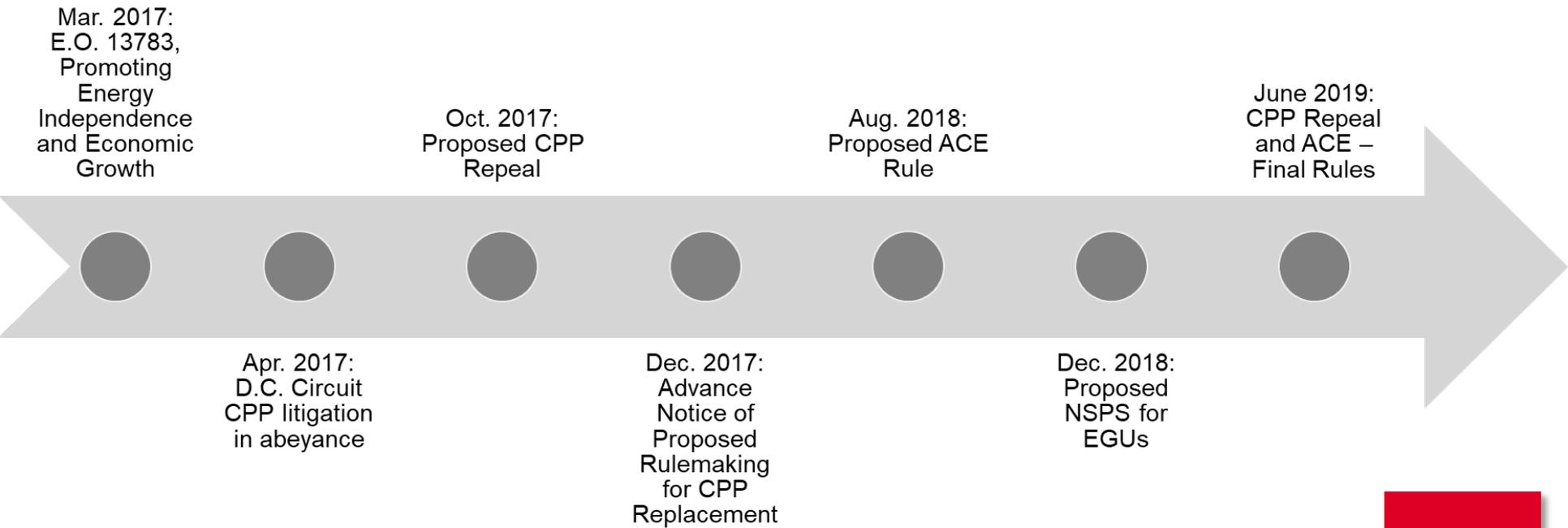


Clean Power Plan (CPP)

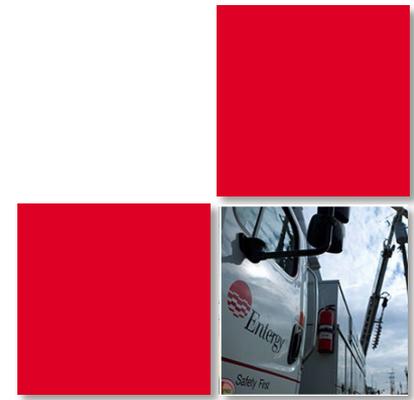
- Required states to submit plans designed to limit GHG emissions from EGUs
- CPP set emission guidelines for states to follow
 - Guidelines set GHG levels beyond what existing sources could achieve
 - Determined BSER was combination of heat rate improvement and generation shifting to achieve reductions
- In repeal, EPA reexamines/adopts revised reading of CAA § 111
 - Only permissible reading requires BSER to be applied at the source
 - Rejects generation shifting – major question doctrine, encroaches on FERC/State
 - Finds standard of performance cannot be based on reduced utilization



How Did We Get Here – Trump Administration



Source: CPP Repeal, Affordable Clean Energy Rule, Revisions to 111(d) – An Overview; Sam Boxerman, Sidley LLP for EEL.



ACE Designated Facilities

- Any coal-fired electric utility steam generating unit (EUSGU) that commenced construction on or before Jan. 8, 2014, and:
 1. serves a generator capable of selling greater than 25 MW to a utility power distribution system;
 2. has a base load rating greater than 250 MMBtu/hr heat input of coal fuel, either alone or in combination with any other fuel;
 3. is an EUSGU that burns coal for more than 10.0% of the average annual heat input during the three previous calendar years.
- With several exclusions...

EGUs Excluded under ACE

1. EUSGUs subject to NSPS Subpart TTTT due to modification or reconstruction
2. SGUs subject to federally enforceable permits limiting net-electric sales to $\leq 1/3$ of potential output or $\leq 219,000$ MWh annually
3. Combustion turbines that are simple cycle, combined cycle, or combined heat and power units
4. Integrated Gasification Combined Cycle (IGCC) units
5. Non-fossil fuel units (i.e., capable of combusting at least 50% non-fossil fuel) that historically limit fossil fuels to 10% or less of the annual capacity factor
6. An EGU with an effective generation capacity of 25 MW or less
7. An EGU municipal waste combustor subject to 40 CFR 60 Subpart Eb
8. An EGU commercial or industrial solid waste incineration unit subject to 40 CFR 60 Subpart CCCC
9. An SGU that fires more than 50% non-fossil fuels

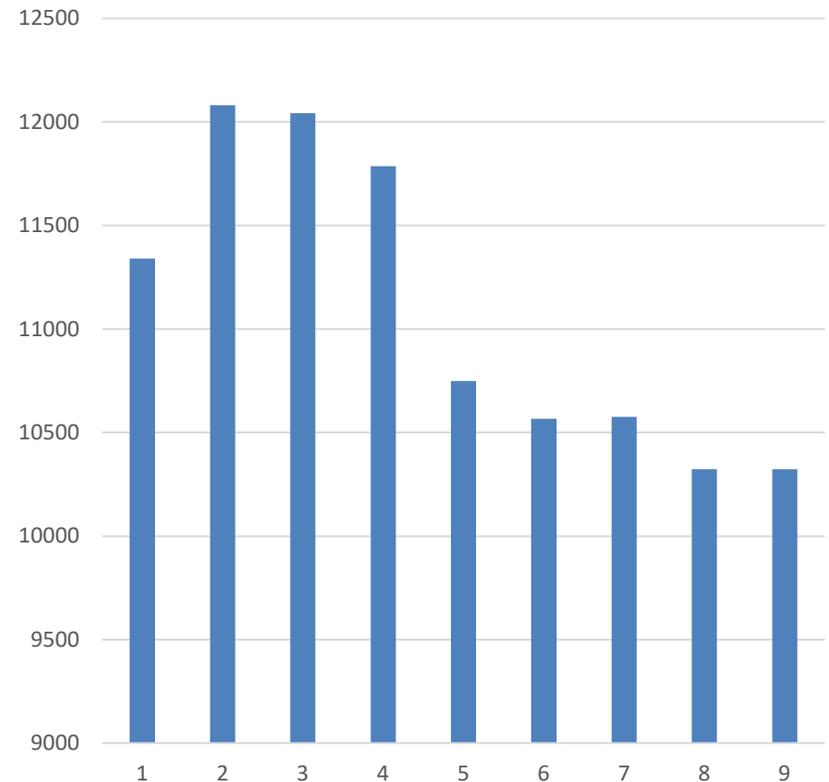
HRI is the New BSER

- Heat Rate –

- The amount of heat input required to generate a unit of electricity, Btu/kWh
- Measures the efficiency of the EGU
- Varies from one coal EGU to the next
- U.S. 2017 average coal steam generator heat rate is 10,043 Btu/kWh

Source: U.S. Energy Information Administration, https://www.eia.gov/electricity/annual/html/epa_08_02.html

Louisiana Coal SGUs
Heat Rate (Btu/kWh)



Source: EPA National Electric Energy Data System, NEEDS v6 rev: 9-30-2019

Heat Rate Improvement Candidates

- Neural Network/Intelligent Sootblowers
 - Computer model predictive process control
 - Automated steam injection targeting ash buildup
- Boiler Feed Pumps Upgrades or Rebuilds
 - Reduce auxiliary power load
- Air Heater and Duct Leakage Control
 - Replace seals, improve pre-heater efficiency
- Variable Frequency Drives (VFDs)
 - Improve flue gas flow control across operating rates
- Blade Path Upgrade/ Steam Turbine Overhauls
- Redesign/Replace Economizer
- Best Operating and Maintenance Practices
- Range of projected HR improvements of these individual measures
 - 0.1% to 2.9%

- Must evaluate each HRI measure for each designated facility
 - Consider applicability of “each and all” HRI measures
 - Individually and in combination
 - May conclude that some are not applicable
- Calculate a rate-based performance standard for each EGU
 - Lb CO₂/MWh-gross or –net
- Should set performance standards to account for variability
 - Load levels, Weather conditions, Maintenance timeline
 - Could be achieved by requiring annual compliance demonstration at standard conditions
- No trading or averaging across EGUs
- Can set the same performance standard for a group of EGUs or for all affected EGUs in the state
 - Must demonstrate standard is achievable for all

- The State may consider the remaining useful life of the source, and may demonstrate that a less stringent standard is significantly more reasonable:
 - Unreasonable cost resulting from age, location or design
 - Physical impossibility of applying BSER
 - Other factors ...
 - Investment pay-back period
 - Timing of regulatory requirements
 - “Most often a reflection of cost”
- The State may set the compliance schedule for each EGU based on application of the specific performance standard
 - No outside deadline established
 - If compliance date is more than 24 months after State plan submittal date, compliance schedule must include enforceable interim milestones

- EPA Proposed to add a new 2nd Step in NSR Applicability for Existing EGUs
 - Step 1 – physical change or change in operation
 - Step 2 – hourly emissions increase test
 - Step 3 – Significant Project-related Emissions Increase
 - Step 4 – Significant Net Emissions Increase
- EPA did NOT take final action to adopt this NSR reform
 - Intends to take final action at a later date
- Blade Path Upgrade (Steam Turbine) and Redesign/Replace Economizer are 2 HRI Measures most likely to trigger NSR review
- States may consider costs of NSR in considering whether these HRI technologies are economically feasible

- Designated facilities inventory
 - Identify sources and most recent CO₂ annual emissions inventory
- Standards of performance and compliance periods
- Monitoring, recordkeeping and reporting requirements
- State reporting plan and schedule
- Additional information
 - Summary of State's evaluation of HRI measures for each designated facility
 - Include evaluation of the degree of emission limitation achievable
 - Demonstration that standards are quantifiable, permanent, verifiable, and enforceable
- Summary of each facility's future operations through 2035
 - Annual generation, CO₂ emissions, Fuel use, Fuel price, O&M costs, heat rates, generation capacity and capacity factors, electricity prices

How Do We Get There — Implementation Timeline



What's Next?

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- Litigation – filed same day rule was published
- Request to stay ACE Rule?
- Existing CPP litigation – dismissed as moot
- Work with State agencies on state plans!!
- Assessment of candidate technologies and each affected unit
- Assessment of other statutory factors such as remaining useful life for each unit
- November 2020 Election
- 2022 – State plans due to EPA



Thank you!

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Questions and Discussion

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