



SESARM 2019 Fall Meeting

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**Kenneth L. Mitchell, Ph.D.
U.S. Environmental Protection Agency
Atlanta, GA**

Affordable Clean Energy Rule (ACE)

- Final ACE Package includes three distinct, separate, and independent actions:
 - Repeal of the Clean Power Plan (CPP)
 - ACE (Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units)
 - Revisions to Clean Air Act section 111(d) Emission Guidelines Implementing Regulations
- ACE published in the *Federal Register* July 8, 2019
- New Source Review (NSR) reform not promulgated with ACE
 - EPA intends to take action at a later date



Repeal of the CPP

- ▶ CPP repeal proposal published October 16, 2017
 - ▶ EPA received 1.3 million public comments
 - ▶ EPA held 1 public hearing and 3 listening sessions

- ▶ Legal rationale for repeal:
 - ▶ CPP exceeded EPA's authority under Clean Air Act by dictating generation shifting as part of best system of emission reduction (BSER) determination
 - CPP Building Blocks 2 and 3 employed measures designed to shift balance of power generation across grid (*i.e.*, coal vs. gas vs. renewables)
 - ▶ BSER must be limited to measures that can be applied to and at an individual source (Building Block 1)

- ▶ The CPP was never put into effect due to Supreme Court intervention



ACE Background

- ACE proposal published August 30, 2018
 - EPA received > 500K comments, held 1 public hearing
- ACE is an emission guideline (EG) promulgated under CAA section 111(d)
 - EGs are a less common type of regulation
 - Rely on cooperative federalism to achieve emission reductions
- Roles can be summarized by a three-step process:
 1. **EPA** identifies Best System of Emission Reduction (BSER)'
 2. **States**
 - Establish standards of performance for designated facilities within jurisdiction – standards consistent with emission limitation achievable by application of BSER
 - Submit plans to EPA for approval
 3. **Affected sources** comply with standards of performance (set by states) using most appropriate technologies or techniques (sources do not have to apply BSER technologies to comply with standards)



ACE Designated Facilities

- Coal-fired electric utility steam generating units (EGUs) with nameplate capacity greater than 25 MW-net and commenced construction on or before January 8, 2014
- States in contiguous U.S. are affected by this subpart
 - States are required to submit a plan or negative declaration to regulate designated facilities by July 8, 2022 (within three years of publication)
- EPA still evaluating information and data for other fossil fuel-fired EGUs



ACE BSER

- Consistent with legal rationale to repeal CPP, EPA may only consider systems of emission reduction that can be applied at and to a designated facility and that lead to continuous emission reductions
- For ACE, EPA determined BSER for existing coal-fired EGUs to be heat rate improvements (HRI, also referred to as efficiency improvements)
- EPA evaluated other systems of reductions but did not include them as part of BSER:
 - Natural gas repowering
 - Natural gas co-firing and refueling
 - Biomass co-firing
 - Carbon capture and storage



ACE BSER

- Even though a large number of potential HRI options may apply, EPA limited list of BSER technologies to ones that are broadly applicable with significant HRI at reasonable cost
- These “candidate technologies” include:
 - Neural Network/Intelligent Sootblower
 - Rebuild/Replace Boiler Feed Pumps
 - Air Heater and Duct Leakage Control
 - Variable Frequency Drives
 - Steam Turbine Blade Path Upgrades
 - Redesign/Replace Economizer
 - Implement Best Operating and Maintenance (O&M) Practices
- EPA also provided, as part of its obligation, the degree of emission limitation achievable (*i.e.*, level of stringency) as ranges of expected improvement associated with each candidate technology



Most Impactful HRI Measures and Range of their HRI Potential (%) by EGU Size

| HRI Measure | < 200 MW | | 200 - 500 MW | | > 500 MW | |
|--|---|-----|--------------|-----|----------|-----|
| | Min | Max | Min | Max | Min | Max |
| Neural Network/Intelligent Sootblowers | 0.5 | 1.4 | 0.3 | 1.0 | 0.3 | 0.9 |
| Boiler Feed Pumps | 0.2 | 0.5 | 0.2 | 0.5 | 0.2 | 0.5 |
| Air Heater & Duct Leakage Control | 0.1 | 0.4 | 0.1 | 0.4 | 0.1 | 0.4 |
| Variable Frequency Drives | 0.2 | 0.9 | 0.2 | 1.0 | 0.2 | 1.0 |
| Blade Path Upgrade (Steam Turbine) | 0.9 | 2.7 | 1.0 | 2.9 | 1.0 | 2.9 |
| Redesign/Replace Economizer | 0.5 | 0.9 | 0.5 | 1.0 | 0.5 | 1.0 |
| Improved Operating and Maintenance (O&M) Practices | Can range from 0 to > 2.0 % depending on the unit's historical O&M practices. | | | | | |

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ACE State Plan Development

- States establish standards of performance for each designated facility within their jurisdiction and submit state plans to EPA by July 8, 2022
- Each source-specific standard of performance must be based on emission limitation achievable by application of BSER
- Standards must be in form of an emission rate, *e.g.*, pounds of CO₂ per megawatt hour (lb CO₂/MWh)
- States have flexibility establishing standards of performance and designing compliance requirements, such as:
 - How to determine applicability of candidate technologies for each source
 - How to establish baseline emissions prior to application of BSER
 - How to account for variable emission performance (*e.g.*, due to changes in utilization rate, performance degradation, etc.) at designated facilities
 - How to establish appropriate compliance timelines



ACE State Plan Development

- CAA section 111(d) also provides that states shall be permitted, in establishing a standard, to take into consideration, among other factors, remaining useful life of existing source to which such standard applies
- Other factors states may consider:
 - Unreasonable cost of control resulting from plant age, location, or basic process design (*e.g.*, physically impossible to install necessary control equipment)
 - Recent, independent installation of a candidate technology (or technologies)
 - Interactions that cause some HRI candidate technologies to not be as effective and therefore not cost-reasonable



ACE State Plan Development

- Owners/operators of designated facilities may comply with standard of performance however they choose as long as compliance measures:
 - Are capable of being applied to and at affected source
 - Achieve emission reductions at source that are measurable using data, emissions monitoring equipment, or other methods to demonstrate compliance

(These two criteria notably exclude averaging and trading options (including within facility averaging and trading) and biomass co-firing as compliance options)

- Owners/operators of designated facilities may use for compliance purposes:
 - Non-BSER HRI measures
 - Natural gas co-firing
 - Carbon capture and storage



ACE State Plan Submissions

- ▶ State plans must:
 - ▶ detail approach or methods used to apply BSER and establish standards of performance
 - ▶ identify EGUs within their borders that meet applicability requirements and are, therefore, considered a designated facility under ACE
 - ▶ include calculations relied upon when applying BSER to establish standards of performance
 - ▶ include appropriate requirements for monitoring, reporting, and recordkeeping to ensure they adequately provide for implementation and enforcement of standards of performance

- ▶ EPA plans to provide an electronic means (*e.g.*, SPeCS) for states to submit plans



ACE Timing

- State plans due **July 8, 2022** (three years from publication of final rule)
- Once submitted, EPA has **6 months** to determine completeness
- EPA has **12 months** from completeness determination to approve a plan submission
- EPA has 2 years from a state's failure to submit a state plan or disapproval of a plan submission to promulgate Federal plan
- Compliance schedules for designated facilities must initiate within 24 months after a state plan submission
 - If compliance schedule initiates beyond 24 months, increments of progress must be included for those designated facilities

