

# Affordable Clean Energy Rule (ACE)

Office of Air and Radiation  
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# Affordable Clean Energy Rule (ACE)

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- ▶ Final ACE Package includes three distinct, separate, and independent actions:
  1. Repeal of the Clean Power Plan (CPP)
  2. ACE (Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units)
  3. Revisions to Clean Air Act section 111(d) Emission Guidelines Implementing Regulations
- ▶ ACE published in the **Federal Register** on July 8, 2019 [84 FR 32520]
- ▶ New Source Review (NSR) reform not promulgated with ACE
  - ▶ EPA intends to take action at a later date

# Overview

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- ▶ Repeal of the Clean Power Plan (CPP)
- ▶ Affordable Clean Energy Rule (ACE)
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  - ▶ Designated Facilities
  - ▶ Best System of Emission Reduction (BSER)
  - ▶ State Plan Development
  - ▶ State Plan Submissions
  - ▶ Regulatory Impact Analysis
- ▶ Revisions to Emission Guidelines Implementing Regulations

# The Repeal of the Clean Power Plan

# Repeal of Clean Power Plan (CPP)

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- ▶ 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

## Background

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

# The Affordable Clean Energy Rule (ACE)

# ACE Background

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- ▶ ACE is an emission guideline promulgated under CAA section 111(d)
- ▶ Emission guidelines are a less common type of regulation; rely on cooperative federalism to achieve emission reductions
- ▶ Roles and responsibilities can be summarized by a three-step process:
  1. EPA identifies BSER
  2. States establish standards of performance for designated facilities within jurisdiction – standards consistent with emission limitation achievable by application of BSER – and will 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)

## Background

- ▶ ACE proposal published August 30, 2018
  - ▶ EPA received more than 500,000 public comments
  - ▶ EPA held 1 public hearing

# ACE Designated Facilities

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- ▶ Designated facilities are 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

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- ▶ 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

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- ▶ 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.					

# ACE State Plan Development

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- ▶ States are required to establish standards of performance for each designated facility within their jurisdiction and submit state plans to EPA for approval by July 8, 2022 (within three years of ACE publication date)
- ▶ 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 CO<sub>2</sub> per megawatt hour (lb CO<sub>2</sub>/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

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- ▶ 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:
  - ▶ Remaining useful life of designated facility
  - ▶ 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

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- ▶ Owners/operators of designated facilities may comply with standard of performance however they choose as long as compliance measures:
  1. Are capable of being applied to and at affected source
  2. 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

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- ▶ State plans must detail approach or methods used to apply BSER and establish standards of performance
- ▶ State plans must identify EGUs within their borders that meet applicability requirements and are, therefore, considered a designated facility under ACE
- ▶ State plans must include calculations relied upon when applying BSER to establish standards of performance
- ▶ State plans must 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

# Regulatory Impact Analysis (RIA)

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- ▶ RIA for ACE presents benefit-cost analysis of illustrative policy scenario that models HRI at coal-fired EGUs
- ▶ Impacts of ACE are measured against baseline that does not assume implementation of CPP because updated analysis shows CPP would have no effect on future CO<sub>2</sub> emissions
- ▶ States afforded considerable flexibility in ACE, and thus, impacts could be different, to extent states make different choices than those assumed in illustrative analysis
- ▶ EPA estimates ACE would reduce 2030 CO<sub>2</sub> emissions from EGUs by 11 million short tons from projected levels absent rule



# Revisions to the Emission Guidelines Implementing Regulations

# Emission Guidelines Implementing Regulations

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## Overview

- ▶ Applicable to ACE and any future emission guidelines established under CAA section 111(d)
- ▶ Will be promulgated as 40 CFR part 60 subpart Ba
- ▶ Large portions of existing implementing regulations (40 CFR part 60 subpart B) are being carried over to subpart Ba, but some portions are being revised to modernize and clarify Federal and state roles and align with 1990 revisions to CAA section 110
- ▶ Subpart B will be maintained for existing CAA section 111(d) emission guidelines and for all CAA section 129 emission guidelines

## Background

- ▶ Implementing regulations proposed with ACE on August 30, 2018

# Emission Guidelines Implementing Regulations

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## Revisions

- ▶ Completeness criteria for determining whether a state plan satisfies a minimum threshold of content for submission and evaluation
- ▶ Includes provision that EPA may supersede applicability of Ba, as appropriate, to future 111(d) emission guidelines
- ▶ Updates timing requirements to align with requirements for state plan submissions under CAA section 110:
  - ▶ State plans due July 8, 2022 (three years from publication of final rule)
  - ▶ EPA has 6 months from date of state plan submission 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

# Emission Guidelines Implementing Regulations

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## Revisions

- ▶ Compliance schedules for designated facilities must initiate within 24 months after a state plan submission
  - ▶ If completeness schedule initiates beyond 24 months, increments of progress must be included for those designated facilities
- ▶ Clarifies provision that states may account for remaining useful life and other factors in establishing standards of performance without distinction for health- or welfare-related pollutants