ACE Rule Overview

The EPA's recently published Affordable Clean Energy (ACE) Rule identifies heat rate improvements as the Best Source for Emissions Reductions (BSER) to control CO_2. ACE does not set any emissions limits, rather it outlines the framework for states to use to set achievable unit level heat rate improvements (HRI) at the plants.

The ACE Package includes three distinct, separate, and independent actions:

1. Repeal of the Clean Power Plan (CPP)
2. ACE Rule – 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

States must set source-specific standards of performance based only on emissions limitations achievable by six candidate technologies and best O&M practices. (See Figure 1.)

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
- EPA is evaluating information for other fossil fuel-fired EGUs

ACE Timeline

2018 – EPA published proposed ACE Rule

2019 – EPA published final ACE Rule

2022 – States are required to establish standards of performance for each designated facility within their jurisdiction and submit state plans to EPA for approval

2019 to 2024 – 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.

Figure 1
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.					

Source: EPA

Babcock & Wilcox Competencies to Support ACE

- ✓ B&W has a core competency of three of the six BSER candidate technologies listed in the final rule.
- ✓ Additionally, we can provide field engineering services and performance testing to identify other potential O&M and efficiency improvements.
- ✓ Steam turbine upgrades may require reheater modifications, another B&W core competency.

Plant owners may choose any means to improve heat rate, not just the State's recommendations, nor the six listed BSER technologies. B&W can help you support ACE Rule requirements and other efficiency improvements with the technologies shown in Figures 2 and 3.

continued ▶

Figure 2
B&W Competencies for ACE-Defined BSER Technologies

ACE-defined BSER (Best System of Emissions Reduction)	B&W Primary Technology	B&W Supplied Technology	Notes
Neural Network/ Intelligent Sootblowing	✓		Optimizes boiler heat absorption and sootblower steam consumption; minimize exit gas temperature and stack losses
Redesign/ Replace Economizer	✓		Reduces boiler exit gas temperature; may affect SCR operation
Blade Path Upgrade (Steam Turbine)			Requires boiler heating surface modifications (B&W technology) to match the boiler to the revised turbine conditions
O&M Improvements	✓	✓	Performance testing can identify various O&M improvements at the plants
Air Heater & Duct Leakage Control	✓		Air heater and boiler setting leakage degrades AH performance, increases UBC, and requires operation at higher total excess air
Variable Frequency Drives		✓	Allows fans to operate more efficiently; most significant efficiency gain potential during low load operation
Boiler Feed Pumps		✓	Reduces power consumption

Other technologies to improve heat rate and boiler efficiency may provide valuable fuel cost savings and other benefits, even though they are not identified as BSER candidate technologies within ACE.

Figure 3
B&W Competencies for Improved Heat Rate/Efficiencies

Heat Rate/Efficiency Improvement Opportunity	B&W Primary Technology	Notes
Pulverizer Performance	✓	Improves coal fineness, reduces motor power consumption
Split/Sliding Pressure Operation	✓	Permits increased load change rate capability; extends reheat steam temperature control range (better low load heat rate)
Flue Gas Recirculation	✓	Extends steam temperature control range and fuel flexibility
Burners and Overfire Air Systems	✓	Reduces total excess air and unburned carbon levels; maintains or reduces NO_x and CO emissions

For more details or to schedule a visit to discuss your options, contact your local sales or field service representative, or visit our website at babcock.com/ACEsupport.

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