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EPA's Clean Power Plan: 50 chefs stir the pot

In its ground-breaking “Clean Power Plan” released 2 June, the US Environmental Protection Agency (EPA) proposed to work with states to slash the CO2 intensity of fossil-fuel power generation by 2030. The headlines were simple enough: *US plans to cut its emissions 30% from 2005 levels*. But what the regulation actually does is lay out a series of (convoluted) state-level targets designed to reduce the carbon intensity of states’ power. We offer here a high-level look at these targets with more in-depth analysis to come in coming days.

- Headlining the regulations are a series of emissions rate (lb/MWh) targets unique to each state. And the variation among states is stark: some states face substantially stiffer reduction targets than others.
- Importantly, the rules do not set absolute limits on each state’s total emissions in 2030. Rather, they require that states reduce an ‘adjusted’ ratio between the amount of CO2 they produce from existing power plants and the number of MWh generated within state lines.
- The wide variation among states is based on the agency’s evaluation of what it calls each state’s emissions ‘framework’: existing fossil generation, zero-carbon generation, energy efficiency potential and the outlook for both coal-plant retirements and low-carbon deployment in the future.
- EPA was required to establish performance standards achievable under a best system of emission reduction (BSER) method, which includes consideration of cost and technical feasibility, among other factors.
- The BSER proposed by EPA is based on mechanisms that fall into four categories, which the EPA describes as ‘building blocks’: heat rate improvements, dispatch of lower-emitting power plants, zero-carbon generation and end-use energy efficiency
- The agency also solicited other technologies and strategies, which may include market-based trading programmes and multi-state compliance activities. In soliciting these so-called ‘outside-the-fence’ compliance methods, EPA is entering uncharted regulatory territory; all previous power-plant emissions regimes have focussed on technologies and operating mechanisms at the point of emissions only.
- On orders from President Obama, EPA must finalise the proposed standards by June 2015. Complete individual state plans are due June 2017. Complete multi-state plans are due June 2018. States may obtain extensions under certain circumstances.
- As a result of the lbs of CO2 per MWh produced metric, the joint rulemaking’s outcome could well be delayed and is subject to weakening by state inertia and legal challenges.

Updated report available to BNEF clients

This publicly available report presents our initial analysis of the EPA’s proposed rules. We have since published [a much more extensive analysis](#), which includes a calculation of actual emissions cuts (or growth) by state, and offers compliance outlooks for states and regions. This more detailed report is available to Bloomberg New Energy Finance clients.

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1. WHAT EPA PROPOSED

What made headlines on 2 June was the Obama administration's promise that its new rule would result in CO₂ emissions from the power sector falling 30% by 2030 from 2005 emissions levels. In reality, the rule offers a series of state targets built more around requiring states to produce power on a more CO₂-efficient basis.

Specifically, the EPA proposes to work with 49 of 50 states to slash the intensity of CO₂ emitted from power generation by 2030 (neither Vermont nor the District of Columbia has operating fossil plants sufficiently large enough to be affected). The intensity-reduction targets range from 72% in Washington State to 11% in North Dakota (See Appendix). The reductions would take place between EPA's base measurement year of 2012 and the proposed full-compliance deadline of 2030. Neither the timeline of these state goals (2012-2030, vs. 2005-2030) nor the metric being used (measure of CO₂ *intensity* usage vs. total CO₂ volume reduction) match.

The wide variation among states is based on the agency's evaluation of what it calls each state's emissions "framework": existing fossil generation, zero-carbon generation, energy efficiency and the outlook for both coal-plant retirements and low-carbon deployment in the future. Washington is an example of how the framework's moving parts operate. Its proposed CO₂-intensity reduction is higher than any other's. This is partly based on the expectation that the state's TransAlta's 1,340MW Centralia coal plant will be decommissioned between 2020 and 2030, an EPA official said during a background briefing for reporters and analysts.

Indiana is an example at the other end of the spectrum. While it was the country's fifth-highest CO₂ emitter in 2012, it was assigned a relatively modest goal of a 20% reduction in emissions intensity by EPA. A factor in that target is the state's limited access to incremental natural gas capacity for power generation relative to other states, an official said.

While the proposal sets forth state-specific goals in CO₂ intensity, it leaves the process of determining how to meet those goals to the states. EPA portrays the rulemaking as a federal-state "partnership." While that may be accurate, the partnership is hardly voluntary; the Clean Air Act mandates federal-state cooperation on the regulation of pollutants from existing stationary sources (see our 23 May Analyst Reaction, "Obama's last stand: previewing the new CO₂ rule"). As a result, the joint rulemaking's outcome could be delayed by legal challenges or weakened by state policy-making inertia.

2. WHAT IT MEANS

In creating the package, EPA was required to establish performance standards achievable under a regulatory standard called the best system of emission reduction (BSER) and propose state-specific goals that each state can achieve through the application of BSER. The process includes consideration of cost and technical feasibility, among other factors.

The BSER proposed by EPA is based on mechanisms that fall into four categories, which the EPA describes as 'building blocks': heat rate improvements, dispatch of lower-emitting power plants, zero-carbon generation and end-use energy efficiency (See Table 1). However, in the rulemaking's proposal stage the agency advanced goals that it asserts to be 'reasonable' as well as others that it considers 'less ambitious' and requested public feedback. It also solicited other technologies and strategies, which may include market-based trading programmes and multi-state compliance activities.

Table 1: ‘Building blocks’ of state compliance plans

Building block	Affected industry segment(s)	Proposed state goal based on ‘reasonable assumptions’	Alternative state goal based on ‘less ambitious assumptions’
Heat rate improvement	Generation	6% improvement in state’s coal fleet	4% improvement in state’s coal fleet
Coal-to-gas redispatch	Grid, generation	A 70% capacity factor ceiling for the state’s gas combined-cycle fleet	A 65% capacity factor ceiling for the state’s gas combined-cycle fleet
Renewables and nuclear	Generation, grid	13% renewables share by start of 2030 and thereafter; 5.5GW of nuclear under construction with ~5.8GW nuclear capacity ‘at risk’	9.4% renewables share by start of 2025; nuclear component same as in proposed goal
End-use energy efficiency	Consumer	10.7% cumulative savings by start of 2030 and thereafter	5.2% cumulative savings by start of 2025 and thereafter

Source: EPA, Bloomberg New Energy Finance Note: Renewables values and efficiency savings rates are nationwide averages. Renewables shares do not include existing hydro generation.

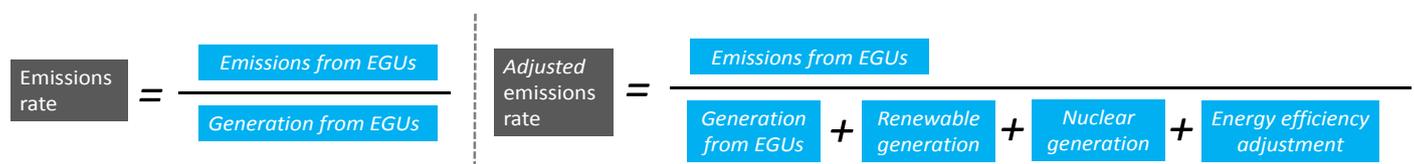
By anointing dispatch mechanisms, new zero-carbon generation and energy efficiency, EPA is offering to consider so-called “outside the fence” or “mass-based” compliance methods. In doing so, it is entering uncharted regulatory territory; all previous power-plant emissions regimes have focused on technologies and operating mechanisms at the point of emissions only.

Convolutd standards

The regulations do not establish ‘mass-based’ emissions targets for individual states, nor do they establish exact carbon intensity targets (lb/MWh) for states overall. Instead, at the centre of the regulations are targets for “*adjusted*” state-average emissions rates for *electricity generating units (EGU)*”.¹ The industry is still mulling over what these targets actually mean.

The word ‘adjusted’ is extremely important, because it creates a convoluted system of measuring emissions reductions. Figure 1 demonstrates how ‘adjusted’ emissions rates are calculated.

Figure 1: Emissions rates versus adjusted emissions rates



Source: Bloomberg New Energy Finance Note: EGU is an “electricity generating unit”

The regulations essentially target the emissions rates of each state – but they ignore emissions and generation coming from large hydro and new fossil units, and they include an adjustment to reward energy efficiency efforts. The result is a standard which may result in overall emissions trajectories that seem contradictory to the ‘adjusted emissions rate targets’ themselves. For example, the regulations call for a 23% cut in California’s adjusted emissions rate from 2012 to 2030, and yet the EPA’s own modelling runs suggest that the state could remain in compliance even if overall power-sector emissions within the state *grow* 14% over the same timeframe.

We advise our readers against trying to interpret the ‘adjusted’ emissions rate reduction goals (listed in Table 1) without a thorough understanding of how these rates are calculated. It will take time (and heavy modelling efforts) to determine exactly what the EPA’s Clean Power Plan means

1 Electricity generating units are defined as generators 25MW or larger in size, with capacity factors of 33% or more, and taking into account certain adjustments for combined heat and power (CHP) units.

in terms overall reduction targets, implications for state implementation plans, effects on the electric fleet, and power prices.

3. WHAT TO EXPECT

On orders from President Obama, EPA must finalise the proposed standards by June 2015 (see Figure 1). However, the agency detoured from the president's milestone 12 months later for the approval of state plans. "The EPA recognizes that some states may need more than one year to complete all of the actions needed for their final state plans, including technical work, state legislative and rulemaking activities, coordination with third parties, and coordination among states involved in multi-state plans," the proposal says.

It directs states to submit plans with "certain required components" by June 1 2016, on which a state may obtain more time by providing the reasons and committing to send a complete version by either June 2017 (if it is a single-state undertaking) or June 2018 (if it is a multi-state approach).

Figure 2: Milestones for state GHG reduction compliance plans



Source: Bloomberg New Energy Finance

While mass media coverage of the proposal – fed by pre-release leaks and EPA's own news release – highlighted a 30% reduction in emissions nationwide below 2005 levels, agency officials downplayed that comparison during a background briefing. "This rule does not operate with a baseline," said one of the officials, adding that the 2005-2030 comparison was used because 2005 "is a number people use to measure progress" on carbon reduction.

Appendices

Appendix A: Reductions in CO2 Intensity

EPA state CO2 intensity reduction goals – expressed as ‘adjusted state-average emissions rates for existing generating units’

State	2012 Emission Rate (Fossil, Renewable and Nuclear) (lbs Co2/MWh)	2030 State Goal (lbs CO2/MWh)	Percentage reduction in emissions rates 2012-2030
Washington	763	215	-72%
Arizona	1,453	702	-52%
South Carolina	1,587	772	-51%
Oregon	717	372	-48%
New Hampshire	905	486	-46%
Arkansas	1,640	910	-45%
Georgia	1,500	834	-44%
New York	983	549	-44%
New Jersey	932	531	-43%
Minnesota	1,470	873	-41%
Louisiana	1,466	883	-40%
North Carolina	1,646	992	-40%
Texas	1,298	791	-39%
Tennessee	1,903	1,163	-39%
Mississippi	1,130	692	-39%
Florida	1,200	740	-38%
Massachusetts	925	576	-38%
Virginia	1,297	810	-38%
Maryland	1,870	1,187	-37%
Oklahoma	1,387	895	-35%
Colorado	1,714	1,108	-35%
South Dakota	1,135	741	-35%
Nevada	988	647	-34%
Wisconsin	1,827	1,203	-34%
New Mexico	1,586	1,048	-34%
Illinois	1,895	1,271	-33%
Idaho	339	228	-33%
Delaware	1,234	841	-32%
Pennsylvania	1,540	1,052	-32%
Michigan	1,696	1,161	-32%
Connecticut	765	540	-29%
Ohio	1,850	1,338	-28%
Utah	1,813	1,322	-27%
Alabama	1,444	1,059	-27%
Nebraska	2,009	1,479	-26%
Alaska	1,351	1,003	-26%
California	698	537	-23%
Kansas	1,940	1,499	-23%
Missouri	1,963	1,544	-21%

These goals do not represent reductions in total emissions – some states may in fact increase total emissions under the EPA’s plan.

State	2012 Emission Rate (Fossil, Renewable and Nuclear) (lbs Co2/MWh)	2030 State Goal (lbs CO2/MWh)	Percentage reduction in emissions rates 2012-2030
Montana	2,245	1,771	-21%
Indiana	1,923	1,531	-20%
West Virginia	2,019	1,620	-20%
Wyoming	2,115	1,714	-19%
Kentucky	2,158	1,763	-18%
Iowa	1,552	1,301	-16%
Hawaii	1,540	1,306	-15%
Rhode Island	907	782	-14%
Maine	437	378	-14%
North Dakota	1,994	1,783	-11%

Source: EPA, Bloomberg New Energy Finance

Appendix B: Reductions in absolute CO2 emissions

Drawing on the results from the EPA's own Integrated Planning Model and historical emissions inventories, we have produced state-by-state estimates of absolute emissions reductions – or growth – allowable under the proposed rules.

A [summary map](#) is publicly available on the Bloomberg New Energy Finance homepage. Clients of Bloomberg New Energy Finance may access the full report, which includes more detailed analysis of states and regions and the potential impact on power markets, through our website.

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