Overview

- Background
- Clean Power Plan Basics
- Focus on Key Issues for Utilities
The Evolving Generation Mix

Source: DOE – Energy Information Administration, Electric Power Monthly, December 2014; Short-Term Energy Outlook, December 2014
Different Regions of the Country Use Different Fuel Mixes

* Includes generation by agricultural waste, landfill gas recovery, municipal solid waste, wood, geothermal, non-wood waste, wind, and solar.

** Includes generation by tires, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

Sum of components may not add to 100% due to independent rounding.


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Utilities Have Substantially Reduced Air Emissions While Increasing Electricity Production

1990 represents the base year. Graph depicts increases or decreases from the base year.

Sources: U.S. Department of Energy, Energy Information Administration (EIA), U.S. Environmental Protection Agency (EPA), and U.S. Bureau of Economic Analysis.

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CO₂ Emissions and Intensity

Electric Power Sector CO₂ Emissions Tonnage and Intensity, 2000-2013

What is the Clean Power Plan?

- Clean Air Act (CAA) section 111(d) guidelines for states to regulate CO₂ emissions from existing electric generating units (EGUs)
  - Coal-, gas- and oil-based steam electric generators
  - Natural gas combustion turbines (combined & simple cycle)

- EPA proposed state goals (lb CO₂/MWh)
  - Interim average goal (measures over 2020-2029)
  - Final goal (measured annually 2030 and beyond)
  - Can be converted into mass-based goal (tons of CO₂)

- New units, modified and reconstructed units addressed by separate CAA section 111(b) rules
Clean Power Plan: Timeline

- **Rulemaking**
  - Proposed guidelines issued June 2014
  - Comment period ended December 1
  - EPA to finalize guidelines in summer 2015

- **Compliance**
  - States submit compliance plans to EPA for approval
    - Due 2016; EPA has to approve (or not) in one year
    - Extension to 2017 if making progress on plan
    - Extension to 2018 if working with other states

- Interim compliance period starts in 2020
  - States file annual reports starting in 2022
State Goals

- State goals based on the “best system of emission reduction” (a.k.a. BSER)
  - CAA section 111(a)(1) requires that standards be based on BSER, taking into consideration costs, energy requirements and other environmental impacts, that EPA determines has been “adequately demonstrated”

- EPA’s BSER considers reductions achievable throughout entire interconnected power system
  - Historically, BSER focused on reduction technologies that could be applied to sources of pollution (EGUs) to reduce emissions
  - Proposed BSER goes “beyond the fence”
Each state can achieve 1.5% annual incremental savings (compounded over 10-year interim period)
Clean Power Plan: Key Issues for Power Sector

- Pace and timing of compliance/reliability
- Assumptions and approach to BSER
- Treatment of zero-emissions generation: nuclear & hydropower
- Treatment of new NGCC unit emissions
- Treatment of interstate renewables
Interim Goals

- Proposed interim average goal is actually a 2020 goal
  - Reductions from increased use of existing NGCCs must occur by 2020
  - Creates emission reduction “cliff”

- For 80 percent of states, more than 50 percent of 2030 goal must be achieved by 2020
  - For 11 of those states, 75 percent or more of 2030 goal must be achieved by 2020

- Only real option is to close coal plants by 2020
Interim Goal Reduction “Cliff”


EPA takes action on state plans

EPA assumes all in-state coal-based generation will be replaced by other generation resources by 2020

EPA Interim Goal (2020–2029 Average): 735 lb/MWh

EPA 2030 Goal: 702 lb/MWh

Single State Example: Arizona

Annual progress reports
Corrective measures

State plans due

Emissions rate (lb/MWh)
4 Out of 5 States Would Have to Achieve Most of Their 2030 Goals by 2020

Percentage of 2030 goals that would have to be achieved by 2020

- **>75%**
- **50% to 74%**
- **<50%**
The Cliff: 2020 is Tomorrow

- How do you comply with the cliff?
  - Close coal plants (Other options? Not really.)

- If coal plants close, how do you maintain reliability?
  - Build new EGUs (natural gas)
  - Expand natural gas pipeline infrastructure
  - Make adjustments to transmission system

- How long does that take?
  - Plan, site, permit, build
  - New EGUs = 3 years (or more)
  - Gas pipelines = 3-5 years (or more)
  - Transmission lines = as many as 10-15 years

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\begin{align*}
2017 + 5 & = 2022 > 2020 \\
2017 + 10 & = 2027 > 2020
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Potential Reliability Impacts

- “The proposed timeline does not provide enough time to develop sufficient resources to ensure continued reliable operation of the electric grid by 2020. To attempt to do so would increase the use of controlled load shedding and potential for wide-scale, uncontrolled outages.”

- “The CPP introduces potential reliability concerns that are more impactful than prior environmental compliance programs due to the extensive impact to fossil-fired generation.”
The Solution: Revise or Eliminate Interim Goal

- There should be no reduction “cliff”
  - This will reduce reliability concerns
  - States can choose when to close units, can wait for NGCCs and new infrastructure to be built
  - Allows states to make investments in renewables and end-use efficiency

- EPA most likely to revise approach to interim goal calculation in final rule
Interstate Treatment of Renewable Energy

- Many companies buy renewable power across state lines, but draft guidelines fail to indicate clearly which states get credit
  - Two states might include same renewable power in compliance plans
  - EPA will reject plans that double count reductions
  - Creates confusion and inefficiencies; not helpful for promoting further renewable energy deployment

- EPA’s approach creates inequities in state goals
  - State goals based partially on renewable generation levels in 2012
  - If EPA allows a different state to take credit for one state’s renewable power, will make it harder for latter state to meet its goal
Interstate Treatment of Renewable Energy

- To avoid double counting, EPA should be clear in the final guidelines which states get credit for renewable generation and how out-of-state generation can be included in approvable state plans
  - Will prevent states from wasting their time developing plans that EPA cannot or will not approve

- If EPA allows states to use out-of-state renewables for compliance, it must adjust the goals for those states that cannot count their in-state generation toward compliance
Questions?

Emily Sanford Fisher
Deputy General Counsel, Energy & Climate
Edison Electric Institute

efisher@eei.org
202-508-5616