

# EPA's Proposed Clean Power Plan

U.S. Environmental Protection Agency





# Clean Power Plan Summary

- EPA's proposed Clean Power Plan looks across our whole power sector to take important steps to boost our economy, protect our health and environment, and fight climate change.
  - By 2030, reduce nationwide carbon dioxide (CO<sub>2</sub>) emissions, from the power sector by approximately 30% from 2005 levels.
  - Maintain an affordable, reliable energy system.
  - Cut hundreds of thousands of tons of harmful particle pollution, sulfur dioxide and nitrogen oxides as a co-benefit.
  - Provide important health protections to the most vulnerable, such as children and older Americans.
  - Lead to health and climate benefits worth an estimated \$55 billion to \$93 billion in 2030.
  - From soot and smog reductions alone, for every dollar invested through the Clean Power Plan – American families will see up to \$7 in health benefits.



# Clean Power Plan—How it Works

- The agency's proposal:
  - Was shaped by public input, present trends, proven technologies
  - Follows the law
  - Recognizes the progress states, cities and businesses have already made
  - Builds on ongoing efforts
- The proposal aims to cut energy waste and leverage cleaner energy sources by doing three things:
  - First, set achievable, enforceable state goals to cut carbon pollution per megawatt hour of electricity generated.
  - Second, layout a national framework that gives states the flexibility to chart their own, customized path to meet the goals in their state plans.



# EPA Proposes a Goal for Every State

- The Clean Power Plan works by setting state-specific goals, which aim to reduce a state’s carbon intensity rate, or “pollution-to-power ratio.”
  - More power, less pollution
- To set the goals, EPA started with emissions data from 2012—the most current information available.
- Then we looked ahead to see what states could reasonably accomplish by 2030. To do that, we looked at four strategies that are in widespread use:
  1. Measures to make coal plants more efficient
  2. Increased use of high efficiency, natural gas combined cycle (NGCC) units
  3. Generating electricity from low- or zero-emitting facilities
  4. Demand-side energy efficiency
- Each state goal is different because each state has a different power mix and each has different opportunities to cut carbon pollution going forward.

Building Block	Strategy EPA Used to Calculate the State Goal	Maximum Flexibility: Examples of State Compliance Measures
1. Make fossil fuel-fired power plants more efficient	Efficiency Improvements	Efficiency improvements Co-firing or switching to natural gas Coal retirements Retrofit CCS (e.g., WA Parish in Texas)
2. Use lower-emitting power sources more	Dispatch changes to existing natural gas combined cycle (CC)	Dispatch changes to existing natural gas CC
3. Build more zero/low-emitting energy sources	Renewable Energy Certain Nuclear	New NGCC Renewables Nuclear (new and up-rates) New coal with CCS
4. Use electricity more efficiently	Demand-side energy efficiency programs	Demand-side energy efficiency programs Transmission efficiency improvements Energy storage



# Strategies to meet the goals—Keys to state planning and flexibility

## 1. State-specific numeric rate

The numeric goal puts states in charge of choosing cost-effective strategies that reflect their particular circumstances and policy objectives. States are not limited to measures EPA used to set state goals.

## 2. States get to decide which mechanisms to use

States can consider a broad range of regulatory and design options that would lead to emission reductions at power plants. States can collaborate and develop plans on a multi-state basis.

## 3. 10- to 15-year time frame gives states flexibility

This much time provides opportunities to integrate state plans with existing power sector planning processes, tap into investments already under way to upgrade aging infrastructure, and explore innovative mechanisms to meet goals.



# Examples of Emission Reduction Actions

## Options to reduce emissions through changes at existing fossil plants

- Efficiency improvements
  - Best practices: controls tuning, reduce air heater leakage, minimize parasitic loads, focused operator training
  - Equipment/systems upgrades: steam turbine upgrade, economizer upgrade (lower exit gas temperature)
- Co-firing lower carbon fuels
  - Natural gas
- Switching completely to lower carbon fuels
  - Firing natural gas in an existing boiler
  - Repowering to NGCC
- Integrated concentrating solar and other renewable energy at the fossil fuel fired power plant
- Retrofit CCS
- Biomass could play a role



# Examples of Emission Reduction Actions

## Options to reduce emissions through the use of low- or non-emitting generation

- Increase use of existing NGCC
- Build new NGCC
- Use and/or increase use of existing utility scale renewables
- Build new utility scale renewables including:
  - Wind
  - Solar
  - Geothermal
  - New Hydro
- Build new distributed renewables
- Incremental hydro at existing facilities (capacity uprates)
- Uprates at existing nuclear power plants
- Use of energy storage to increase utilization of existing or new low- or zero-emitting technologies





# Examples of Emission Reduction Actions

## Options to reduce emissions through demand-side energy efficiency measures

- Demand side energy efficiency programs
- Building energy codes
- Smart Grid-enabled strategies including:
  - Consumer information and feedback supporting demand-side energy efficiency
  - Optimization of grid operations including through conservation voltage reduction (CVR)
  - Integration of low- and non-emitting generation (central station and distributed) and demand response
- Transmission improvements to reduce line losses



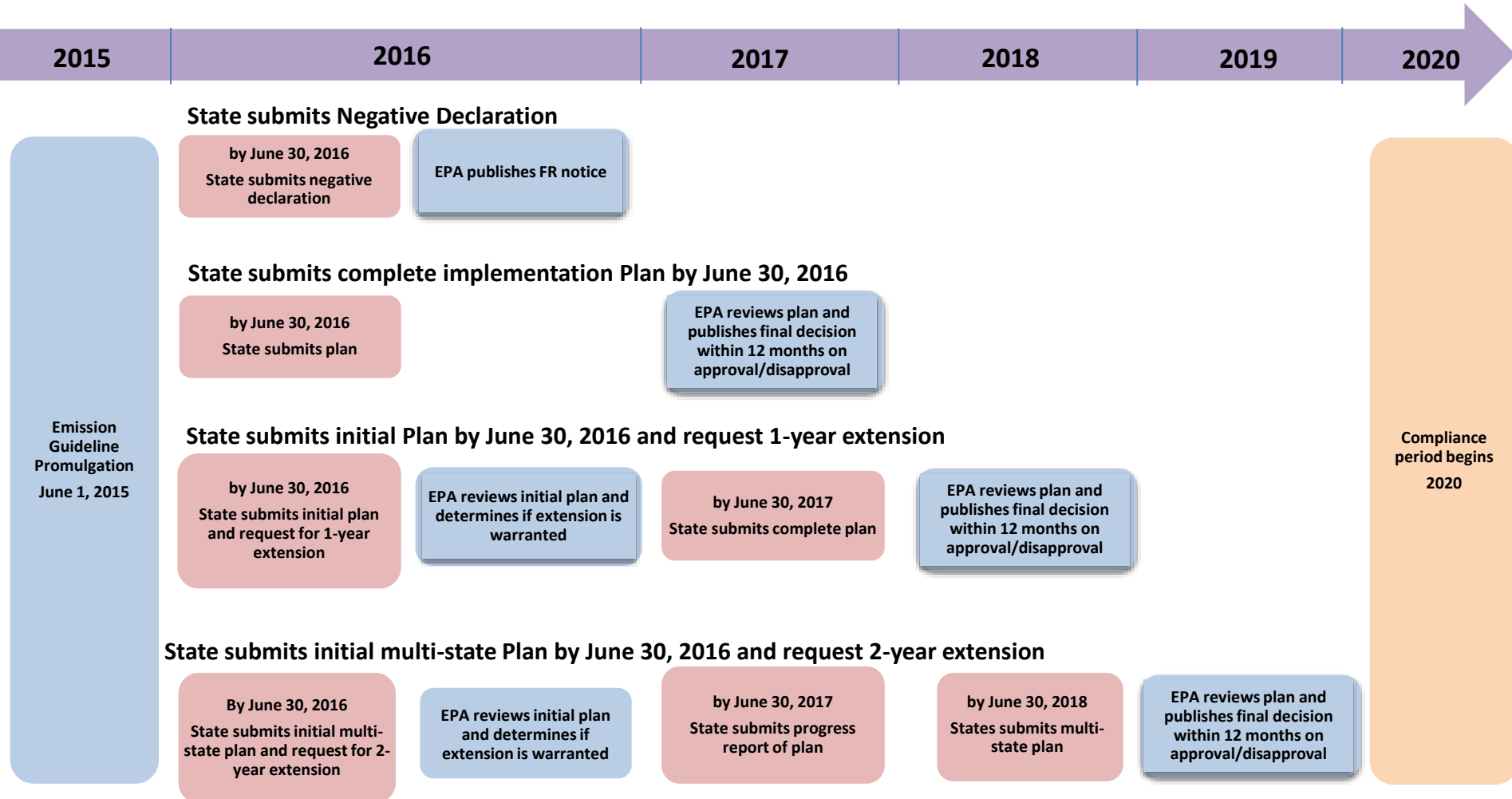
# Examples of Regulatory Mechanisms

States can consider a variety of approaches to ensure that limits on carbon pollution are addressed in the course of normal power sector planning and operation – just as limits on other air pollutants already are. (For example, existing NO<sub>x</sub> and SO<sub>2</sub> emission limits and related trading programs change the cost of generation of individual units and thus affect EGU dispatch.)

- Direct emission limits on power plants (rate- or mass-based)
  - Could be plant-specific, company-wide, state-wide, or region-wide
  - Could include emission rate averaging programs that allow crediting of renewables and energy efficiency
- Regional emission reduction agreements, such as multi-state emission averaging or budget trading programs
  - e.g. RGGI, which includes complementary EE and RE programs to lower costs and/or achieve other goals
- Legislation or regulations establishing EE resource standards (EERS) and/or renewable portfolio standards (RPS)
- Integrated resource plan (IRP)-type approaches for reducing utility fleet CO<sub>2</sub> emissions that use multiple measures (e.g., “portfolio” approach)
  - Approach similar to Colorado Clean Air- Clean Jobs Act that required utility plans to reduce SO<sub>2</sub> and NO<sub>x</sub> emissions, including consideration of power plant retirements and repowering, and use of EE/RE



# Proposed Implementation Timeline





# Input on the Proposed Plan

- 120-day public comment period open through October 16, 2014
- [Four public hearings](#)
  - Almost 3,000 attendees, with more than 1,300 speakers
- EPA Regional Offices
  - Our regional offices are great resources on specific state issues. I would encourage you to touch base with the 111(d) contact in each of the regions.
  - See next slide for a list of contacts.
- Outreach to States
  - EPA continues to meet with states and other stakeholders to answer questions and get input.
  - States will be working to develop state plans over the coming months and years. If you have ideas about what specific states should do in their plans, reach out to state officials.
    - State Energy Offices
    - State Environmental Agencies
    - State Public Utility Commissions



# Regional Contacts

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Thank you!

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