CLEAN POWER PLAN

Proposal to Reduce Carbon Pollution From Existing Power Plants

DOE Electricity Advisory Committee Panel

June 17, 2014

This Proposal Deals With the Largest Source of GHG Emissions in the U.S.

U.S. GREENHOUSE GAS POLLUTION INCLUDES:

CARBON DIOXIDE (CO_2) 82%

Enters the atmosphere through burning fossil fuels (coal, natural gas, and oil), solid waste, trees and wood products, and also as a result of certain chemical reactions (e.g., manufacture of cement).

FLUORINATED GASES 3%

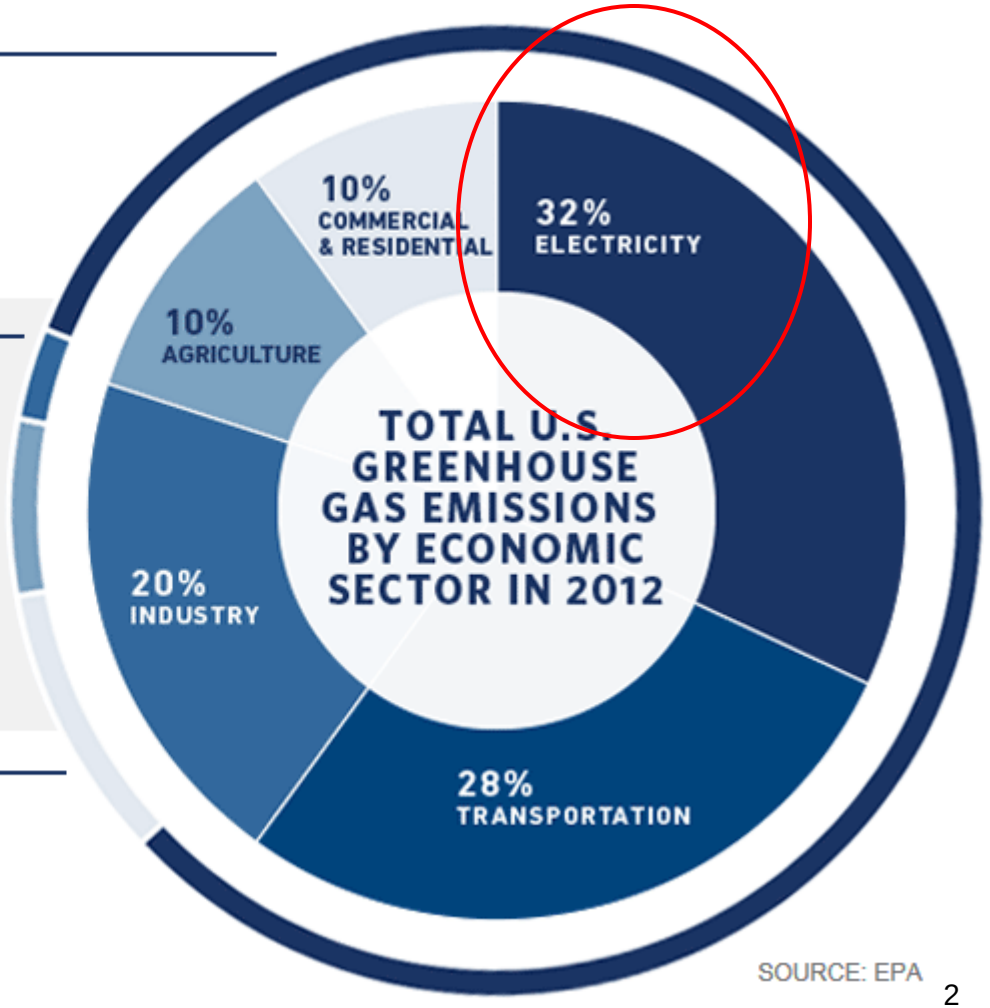
Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful greenhouse gases that are emitted from a variety of industrial processes.

NITROUS OXIDE (N_2O) 6%

Emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.

METHANE (CH_4) 9%

Emitted during the production and transport of coal, natural gas, and oil as well as from landfills.



SOURCE: EPA

Outline

- Summary of Proposal
- Background on Clean Air Act Section 111(d)
- Pre-proposal Outreach & What We Heard
- Setting State Goals
- State Plans for Meeting Goals
- Costs and Benefits
- Next Steps

Summary

This proposal will:

- Reduce carbon pollution from existing power plants, for which there are currently no national limits.
- Maintain an affordable, reliable energy system.
- By 2030, reduce nationwide carbon dioxide (CO_2) emissions, from the power sector by approximately 30% from 2005 levels.
  - Significant reductions begin by 2020.
- 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.

Summary (Cont'd)

- Build on actions states, cities and businesses across the country are already taking to address the risks of climate change.
- Spur investment in cleaner and more efficient technologies, creating jobs and driving innovation.
- Require a reasonable emission reduction glidepath starting in 2020.
- Provide a flexible timeline—up to 15 years from guideline issuance—for all emission reduction measures to be fully implemented in 2030.
  - Recognizing that investments in infrastructure can take time to put in place and
  - Avoiding stranded assets.
- Provide an array of tools states can use to formulate approvable plans.

Background: Clean Air Act Section 111(d) Best System of Emission Reduction

- Previous EPA rules under this section of the Clean Air Act have considered "add-on" control technologies – like scrubbers -- that are technically feasible to deploy at virtually any facility.
- In contrast, there are a wide variety of ways to reduce carbon pollution that are commercially available, technically feasible, and cost effective.
- The opportunities vary from state to state, depending on how electricity is generated, energy infrastructure, and other factors.
- In this proposal, EPA took an approach that viewed the Clean Air Act factors in determining Best System of Emission Reduction in light of the interconnected nature of power generation.
    - BSER factors
        - Costs
        - Size of reductions
        - Technology
        - Feasibility

Early Outreach Informed This Proposal

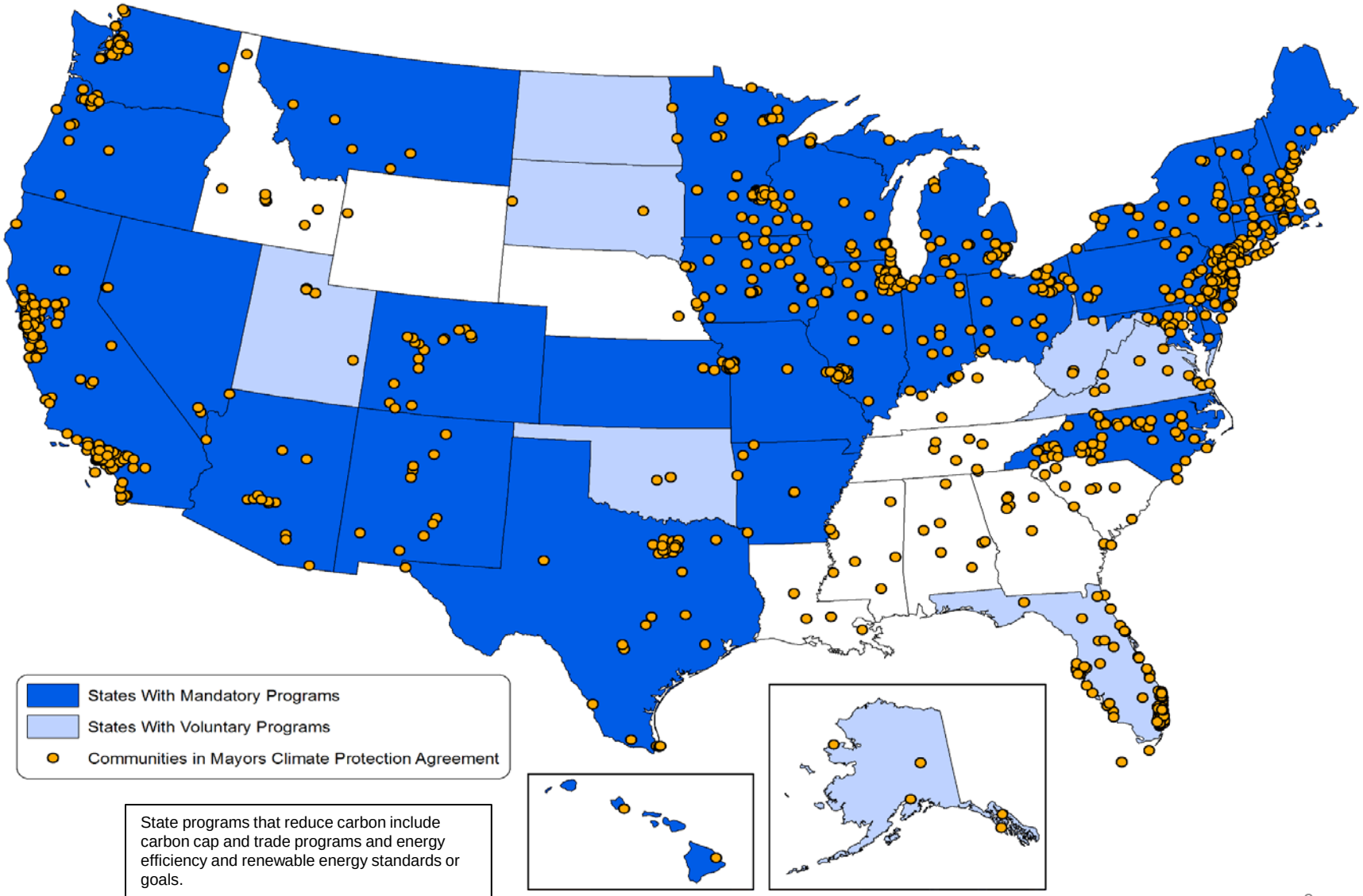
- EPA conducted a robust pre-proposal stakeholder engagement process.
  - Participated in meetings with over 300 utility, consumer, labor and environmental groups since June 2013.
  - Held 11 public listening sessions around the country.
    - 3,300 people attended.
    - More than 1,600 people offered oral statements.
- Reached out to all 50 states.
  - Some states noted their programs to address carbon evolved because of:
    - The need to address carbon pollution;
    - Electric system that is dynamic, and in the midst of market changes; and
    - Modernizing the power sector is good for the economy.
- Common themes included reliability, flexibility, affordability, time for plans and implementation.

State Actions are Foundation of Proposal

- What we learned during the engagement process about what states are already doing has informed EPA's proposal.

- State actions provide the foundation for our analysis.
  - 10 states with market-based GHG emission programs .
  - 38 states with renewable portfolio standards or goals.
  - 47 states with utilities that run demand-side energy efficiency programs.
  - 27 states with energy efficiency standards or goals.

States and Communities with Programs That Reduce Carbon Pollution



State programs that reduce carbon include carbon cap and trade programs and energy efficiency and renewable energy standards or goals.

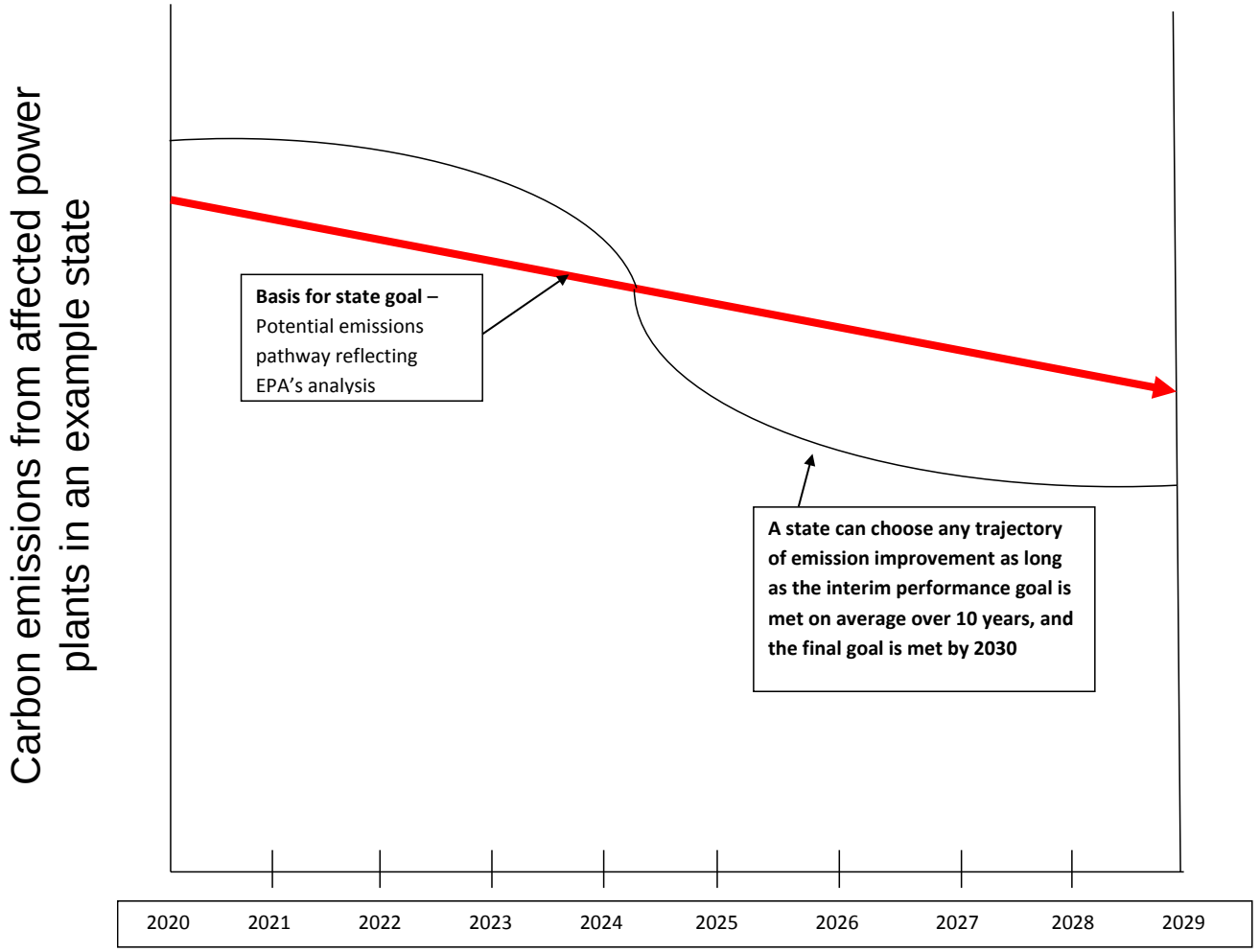
EPA Sets the Goals

EPA Establishes a Goal for Every State

- EPA analyzed the practical and affordable strategies that states and utilities are already using to lower carbon pollution from the power sector.
- Proposed goals are based on a consistent national formula, calculated with state and regional specific information.
- The result of the equation is the state goal.
- Each state goal is a rate – a statewide number for the future carbon intensity of covered existing fossil-fuel-fired power plants in a state.
  - Encompasses the dynamic variables that ultimately determine how much carbon pollution is emitted by fossil fuel power plants.
  - Accommodates the fact that CO_2 emissions from fossil fuel-fired power plants are influenced by how efficiently they operate and by how much they operate.
- The state goal rate is calculated to account for the mix of power sources in each state and the application of the "building blocks" that make up the best system of emission reduction.
- States will need to meet an interim goal and a final goal.

States Have Flexibility

As an example, states could do less in the early years, and more in the later years, as long as on average it meets the goal



Timing of Power Plant Emission Reductions

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

States Meet the Goals

When States Plan, They Can:

- Look broadly across the power sector for strategies that get reductions.
- Choose to rely to varying degrees on measures that EPA used to calculate the goal, or on other measures that were not part of the state goal-setting analysis.
- Invest in existing energy efficiency programs or create new ones.
- Consider market trends toward improved energy efficiency and a greater reliance on lower carbon energy.
- Tap into investments already being made to upgrade aging infrastructure.
- Expand renewable energy capacity.
- Integrate their plans into existing power sector planning processes.
- Design plans that use innovative, cost-effective regulatory strategies.
- Develop a state-only plan or collaborate with each other to develop plans on a multi-state basis.
- Decide how to treat plants nearing the end of their useful life and how to help plants avoid “stranded investments.”

Flexibilities Available To States

- Timing:
  - Up to 15-year window in which to plan for and achieve reductions in carbon pollution.
  - Up to two or three years to submit final plans.
- Form of goal: States can use either a rate-based or mass-based goal.
- Single or multi-state plans: States can collaborate and develop plans on a multi-state basis.
- Selection of measures:
  - States will choose how to meet the goal through whatever collection of measures reflects its particular circumstances and policy objectives.
  - State measures may impact and, in fact may be explicitly designed to reduce, CO_2 emissions from utilities on a regional basis.
  - EPA would support building off existing reduction programs.

States Choose How to Meet the Goals

- Demand-side energy efficiency programs.*
- Generating electricity from low/zero-emitting facilities.*
- Expanding use of existing NGCC units.*
- Transmission efficiency improvements.
- Energy storage technology.
- Working with utilities to consider retiring units that are high emitting.
- Energy conservation programs.
- Retrofitting units with partial CCS.
- Use of certain biomass.
- Efficiency improvements at higher-emitting plants.*
- Market-based trading programs.
- Building new renewables.
- Dispatch changes.
- Co-firing or switching to natural gas.
- Building new natural gas combined cycle units.

* Measures EPA used in calculating the state goals

Details About State Plans

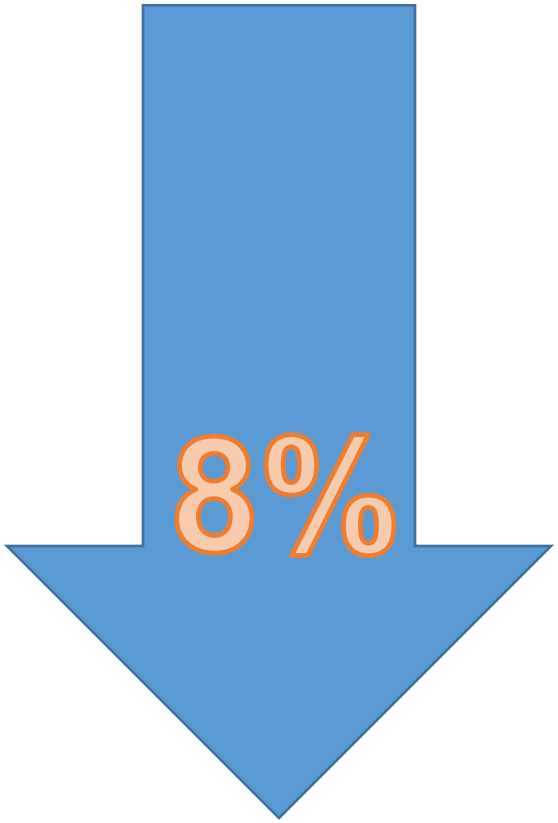
- EPA will provide a list of about a dozen components that will need to be included in the plan.
- Measures to meet the state's interim goal and final goal.
  - Interim goal -- meet on average over a 10-year period from 2020-2029;
  - Final goal -- meet in 2030 and thereafter.
- Individual and multi-state plans due June 30, 2016.
- Proposed timing of extensions to submit a complete plan, if justified and supported:
  - Submit initial plan by June 30, 2016;
  - Individual state plans: a one-year extension (June 30, 2017); and
  - Multi-state plans: a two-year extension (June 30, 2018).

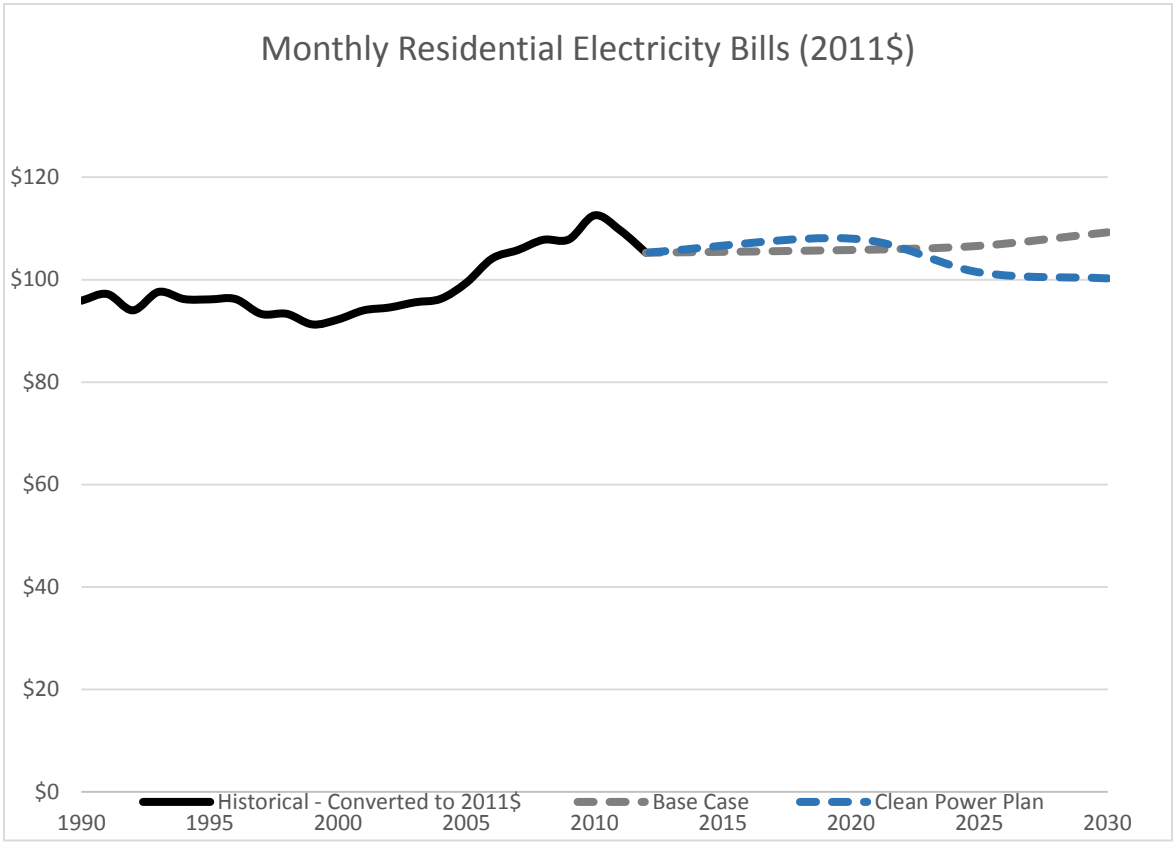
Benefits and Costs

- Nationwide, by 2030, this rule would help reduce CO_2 emissions from the power sector by approximately 30% from 2005 levels.
  - Also by 2030, reduce by over 25% pollutants that contribute to the soot and smog that make people sick.
- These reductions will lead to public health and climate benefits worth an estimated $55 billion to $93 billion in 2030.
- Proposal will avoid an estimated 2,700 to 6,600 premature deaths and 140,000 to 150,000 asthma attacks in 2030.
- Health and climate benefits far outweigh the estimated annual costs of meeting the standards.
  - Estimated at $7.3 billion to $8.8 billion in 2030.
- Proposal protects children and other vulnerable Americans from the health threats posed by a range of pollutants.
- Move us toward a cleaner, more stable environment for future generations.
- Ensures an ongoing supply of the reliable, affordable power needed for economic growth.

Other Impacts

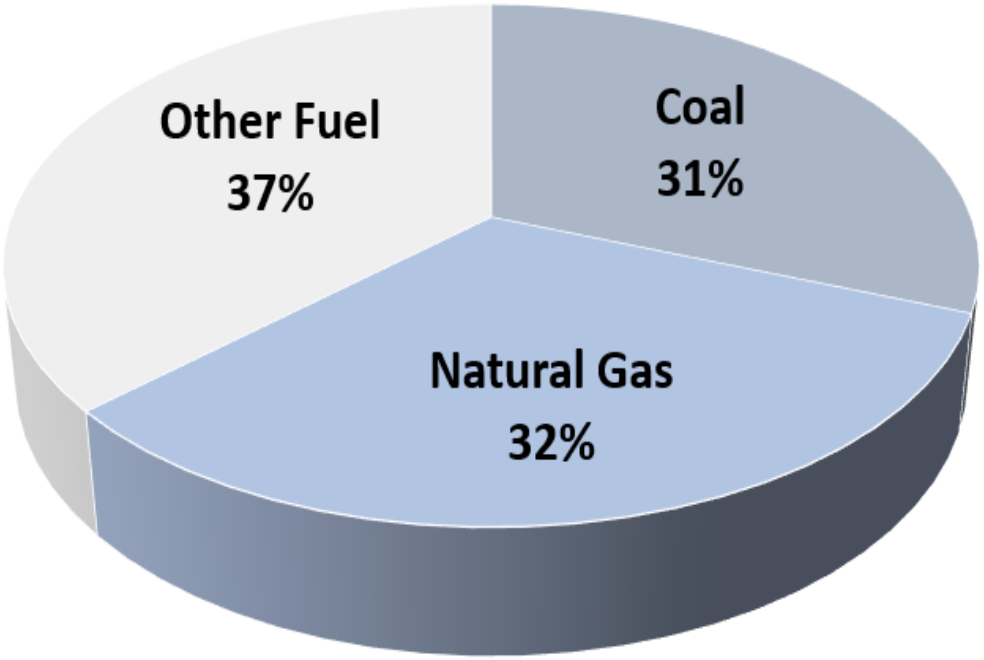
Electricity bills down 8% in 2030



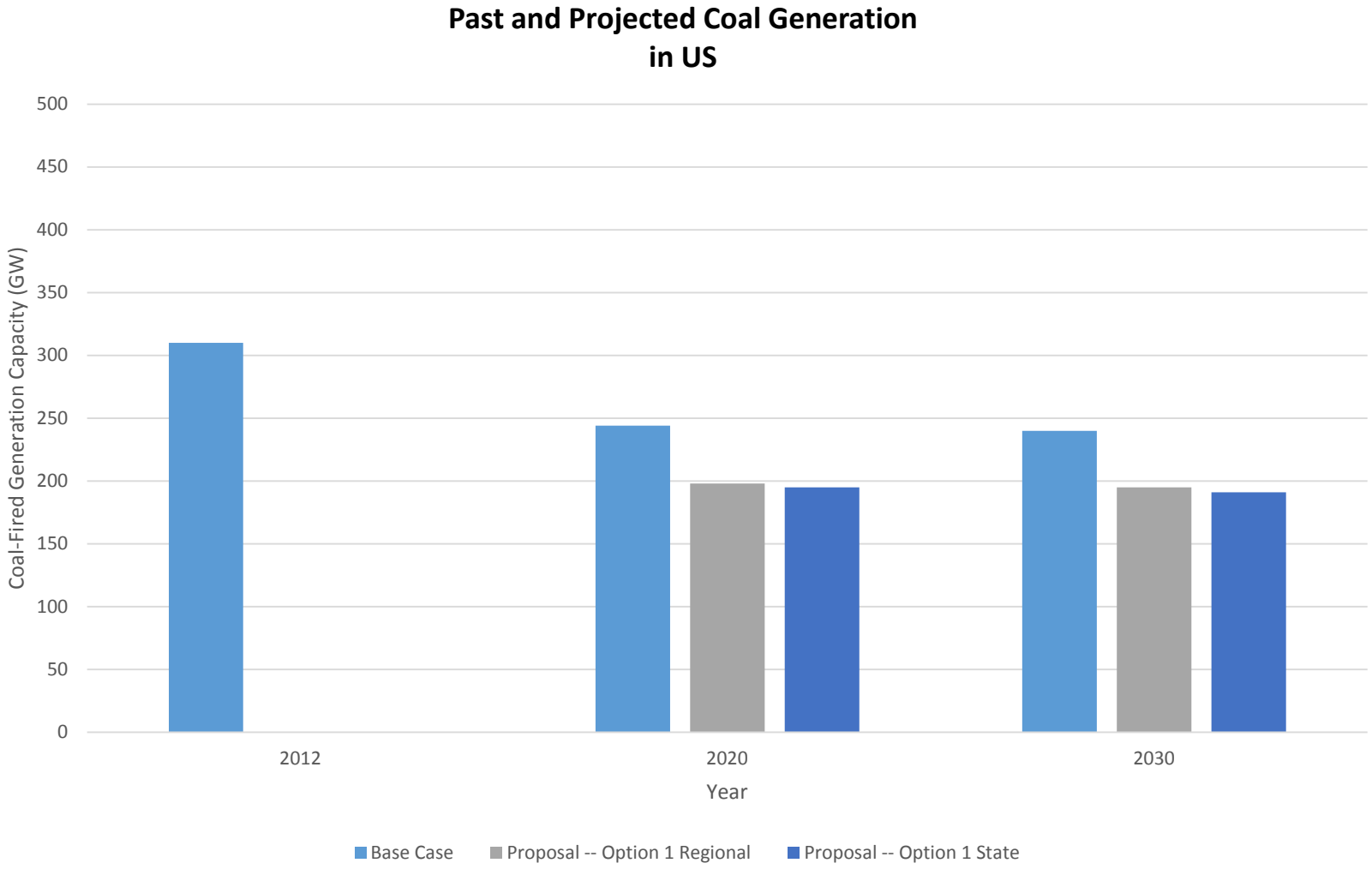


After Proposal, Coal & Natural Gas Remain Leading Sources of Electricity Generation

Each more than 30% of projected generation in 2030



Other Impacts



For More State-By-State Information

http://www.epa.gov/cleanpowerplan

Next Steps

- The proposed rule, as well as information about how to comment and supporting technical information, are available online at: http://www.epa.gov/cleanpowerplan

- EPA will hold 4 public hearings the week of July 28th in Denver, Atlanta, Pittsburgh and Washington, D.C.

- There will be a 120-day public comment period on the proposal.

- Comments on the proposal should be identified by Docket ID No. EPA-HQ-OAR-2013-0602.

Proposed Implementation Timeline