Policy Drivers for Research in Climate and Energy

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PRESIDENT OBAMA’S CLIMATE ACTION PLAN

• Released on June 25, 2013
• Calls on the federal government to work together with states, tribes, cities, industries, consumers and the international community to address one of the greatest challenges of our time.
• Reinforces the federal commitment to:
  — Cutting harmful pollution,
  — Protecting our country from the impacts of climate change, and
  — Leading an international effort to address a changing climate.
EPA ACTIONS UNDER PRESIDENT OBAMA’S PLAN

• Reducing carbon pollution from power plants
• Building a 21st century transportation sector
• Cutting energy waste in homes, businesses, and factories
• Reducing methane and HFCs
• Identifying vulnerabilities of key sectors to climate change
• Protecting our country from the impacts of climate change
• Leading international efforts to address global climate change
CARBON POLLUTION IS THE BIGGEST DRIVER OF CLIMATE CHANGE

U.S. GREENHOUSE GAS POLLUTION INCLUDES:

**CARBON DIOXIDE (CO₂)**
Enteres 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**
Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful greenhouse gases that are emitted from a variety of industrial processes.

**NITROUS OXIDE (N₂O)**
Emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.

**METHANE (CH₄)**
Emitted during the production and transport of coal, natural gas, and oil as well as from landfills.

SOURCE: EPA

TOTAL U.S. GREENHOUSE GAS EMISSIONS BY ECONOMIC SECTOR IN 2011

- **28% TRANSPORTATION**
- **20% INDUSTRY**
- **11% COMMERCIAL & RESIDENTIAL**
- **33% ELECTRICITY**
- **8% AGRICULTURE**

SOURCE: EPA
EPA’s proposed Clean Power Plan looks across whole power sector to boost our economy, protect health and environment, & fight climate change.

- By 2030, reduce nationwide carbon dioxide (CO$_2$) emissions, from the power sector by approximately 30% from 2005 levels.
- Maintain an affordable, reliable energy system.
- Cut 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 - $93 billion in 2030.
- American families will see up to $7 in health benefits from soot and smog reductions alone for every dollar invested through the Clean Power Plan.
Clean Power Plan—how it works

• The agency’s proposal released June 2014:
  – Shaped by public input, present trends, proven technologies, and 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:
  – Setting achievable, enforceable state goals to cut carbon pollution per megawatt hour of electricity generated.
  – Providing a national framework that gives states the flexibility to chart their own customized path to meet the goals in their state plans.

• Public comment period closed December 1, 2014.
<table>
<thead>
<tr>
<th>Building Block</th>
<th>Strategy EPA Used to Calculate the State Goal</th>
<th>Maximum Flexibility: Examples of State Compliance Measures</th>
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</table>
| 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 |
Proposed Implementation Timeline

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<tr>
<td><strong>State submits Negative Declaration</strong></td>
<td>by June 30, 2016</td>
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<td>EPA publishes FR notice</td>
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<td><strong>State submits complete implementation Plan by June 30, 2016</strong></td>
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<td>by June 30, 2017</td>
<td>State submits progress report of plan</td>
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Emission Guideline Promulgation June 1, 2015

Compliance period begins 2020
CUTTING ENERGY WASTE IN HOMES, BUSINESSES, AND FACTORIES

• Climate Action Plan calls for buildings to cut waste and become at least 20 percent more energy efficient by 2020.
• Partnership programs, like ENERGY STAR, will help achieve this goal.
  – Boost energy performance levels of across 70+ product categories and new homes, facilitate home energy improvements
  – Encourage savings through certifications, competitions, and other recognition
  – Continue improvements to ENERGY STAR Portfolio Manager
  – Provide technical guidance and support across sectors, states
• Additional actions across other federal agencies, including DOE, HUD, and USDA
MULTIFAMILY HOUSING

• Supporting interagency efforts to increase efficiency of multifamily housing.
  – In January, EPA and Freddie Mac signed an agreement that will help cut carbon pollution, while increasing the affordability of multifamily housing properties.
  – Based upon data collected by Fannie Mae, EPA recently announced a 1-100 ENERGY STAR score specific to existing multifamily housing.
  – EPA and HUD are encouraging benchmarking in federally-assisted housing, utilizing Portfolio Manager.
  – EPA works with HUD and state housing finance agencies to incorporate ENERGY STAR guidelines into funding requirements.
  – On November 13, EPA recognized 17 apartment and condo buildings across the country as certified existing multifamily housing buildings.
In support of the President’s Climate Action Plan, EPA recently announced a new initiative under Green Power Partnership Program (GPP): the On-site Renewables Challenge.

- As part of this challenge the GPP will strive to double the use of on-site renewable energy at partner facilities by the end of the decade.
- Currently, 254 Green Power Partners are using close to one billion kWh of on-site green power annually. The Challenge will aim to double this amount to two billion kWh by the end of 2020.

- Combined Heat and Power (CHP) Partnership also releasing new or updated resources and webinars to promote the deployment of CHP
REDUCING METHANE & HFCs

  – Sets forth a plan to reduce both domestic and international methane emissions.
  – Building on progress to date, EPA will take steps to further cut methane emissions from landfills, coal mines, agriculture sources, and oil and gas sector.
  – Identifies ways to improve methane measurement and monitoring.

• Address HFCs through domestic and international action:
  – Provide federal leadership by purchasing cleaner alternatives to HFCs whenever feasible
  – Montreal Protocol
Key State Climate and Energy Policies

Note: The count is inclusive of mandatory portfolio and resource standards only.
EERS Policies Help Reduce GHGs Attributable to Energy Use Across Sectors

2011 Total Greenhouse Gas Emissions by Sector with Electricity Apportioned to End Use

Cost-Effective Energy Efficiency Opportunities Exist Across Sectors


Note: Analysis does not specifically consider additional savings from changes in energy end use behavior
How Does an EERS Typically Deliver Energy Savings?

• An EERS can apply to retail distributors of either electricity or natural gas, or both, depending on the state.

• Utilities or third-party program administrators typically meet multi-year targets for energy savings through energy efficiency programs targeting customer facilities, but also through other approaches, such as peak demand reductions; impacts of building codes; etc.

• The energy, environmental, and economic benefits of EERS are well documented by retrospective evaluations.

• ACEEE found that states generally exceeded their savings targets with overall savings of 20 million MWh surpassing combined 2012 targets of 18 million MWh.
What is the State Efficiency Policy and Program Connection to Behavior?

Priority Areas Identified by the SEE Action’s Customer Information and Behavior Working Group

**Data Access**
1. Assistance for Regulators and Policymakers
2. Appropriate Access to Utility Data and Privacy
3. *Data Security and Communications Standards*
4. *Access to Federal Energy Data*

**Program Design**
1. Scale-Up Pilots
2. Outreach to Improve the Understanding of Programs Targeting Behavior Changes
3. Provide Information to Decision-makers
4. Highlight Model Programs
5. Support Additional Research

**Measuring Savings**
1. *Smart Grid Consumer Behavior Studies*
2. Cost-Effectiveness of Behavior Programs
3. Methods for Measuring Savings
4. Validate Experimental Design and Other Existing Methods
5. Examine Persistence of Savings

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*Denotes non-SEE Action work

www.seeaction.doe.gov
What are Potential Issues to Consider?

- Is there potential for behavior interventions to support greater and/or faster climate and energy benefits?
- Are these benefits in addition to energy efficiency potential estimates focused on greater technology adoption?
- Will the benefits persist?
- How can the opportunities from behavior research be communicated to policy makers?