

# Policy Drivers for Research in Climate and Energy

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U.S. Environmental Protection Agency

December 10, 2014





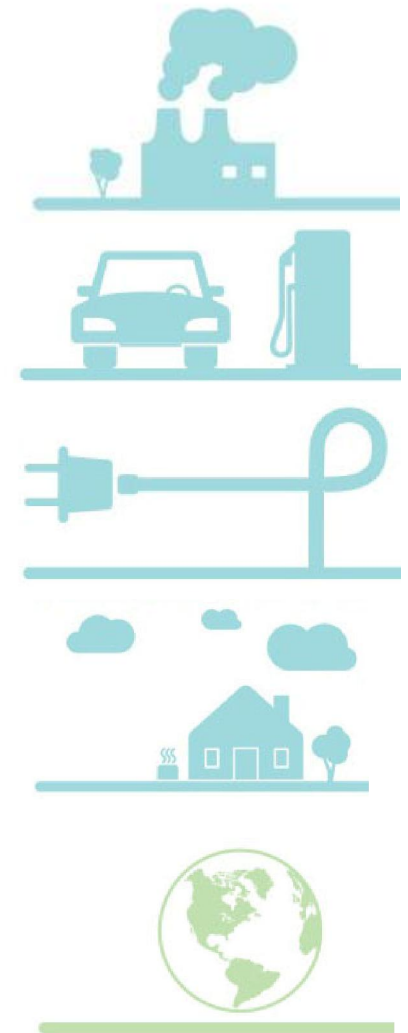
# PRESIDENT OBAMA'S CLIMATE ACTION PLAN

- 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

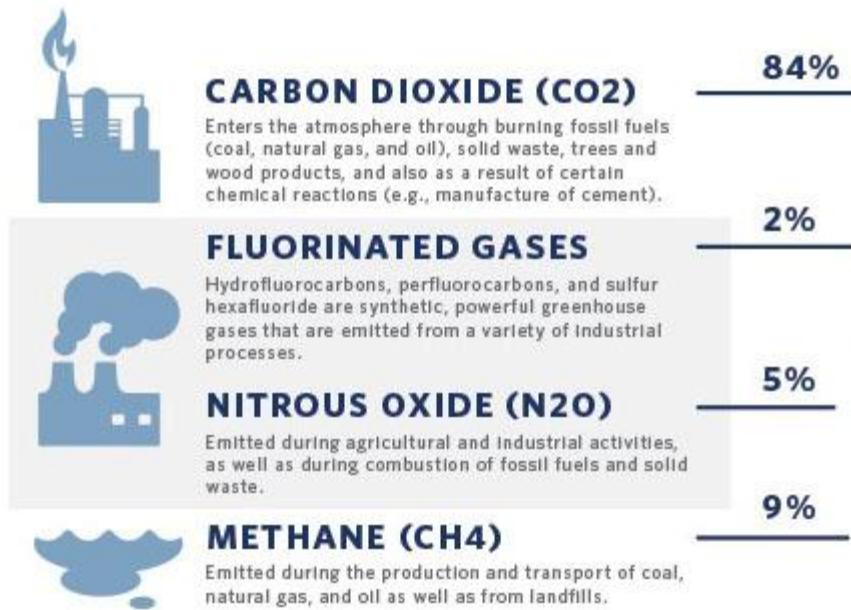
- Reducing carbon pollution from power plants
- Building a 21<sup>st</sup> century transportation sector
- Cutting energy waste in homes, businesses, and factories
- Reducing methane and HFCs
- Identifying vulnerabilities of key sectors to climate change
- Protecting our country from the impacts of climate change
- Leading international efforts to address global climate change



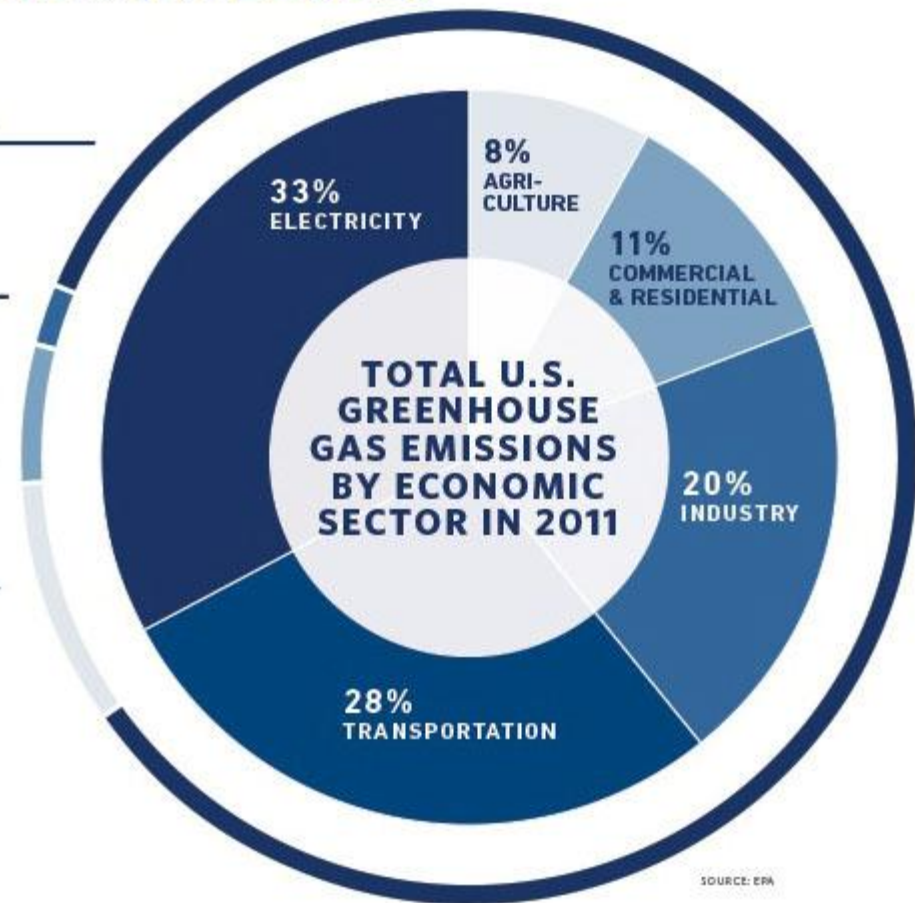
# CARBON POLLUTION IS THE BIGGEST DRIVER OF CLIMATE CHANGE



## U.S. GREENHOUSE GAS POLLUTION INCLUDES:



SOURCE: EPA



SOURCE: EPA

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

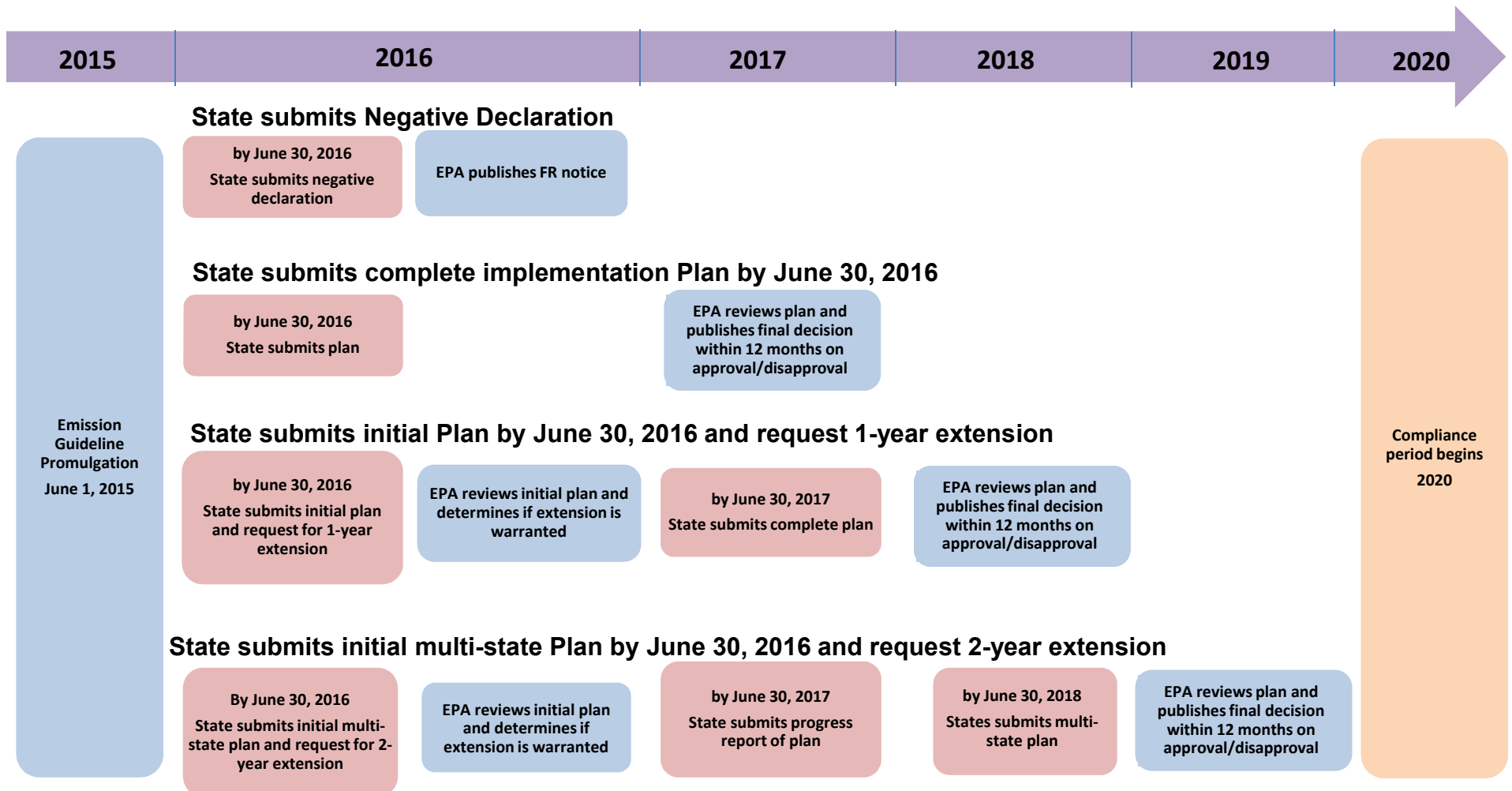
- By 2030, reduce nationwide carbon dioxide (CO<sub>2</sub>) emissions, from the power sector by approximately 30% from 2005 levels.
- Maintain an affordable, reliable energy system.
- Cut harmful particle pollution, sulfur dioxide and nitrogen oxides as a co-benefit.
- Provide important health protections 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.

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

# Proposed Implementation Timeline







# CUTTING ENERGY WASTE IN HOMES, BUSINESSES, AND FACTORIES

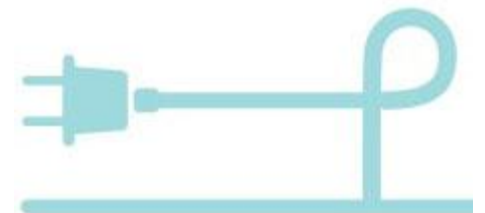
- Climate Action Plan calls for buildings to cut waste and become at least 20 percent more energy efficient by 2020.
- Partnership programs, like ENERGY STAR, will help achieve this goal.
  - Boost energy performance levels of across 70+ product categories and new homes, facilitate home energy improvements
  - 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.





# CHP AND RENEWABLE ENERGY

- 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





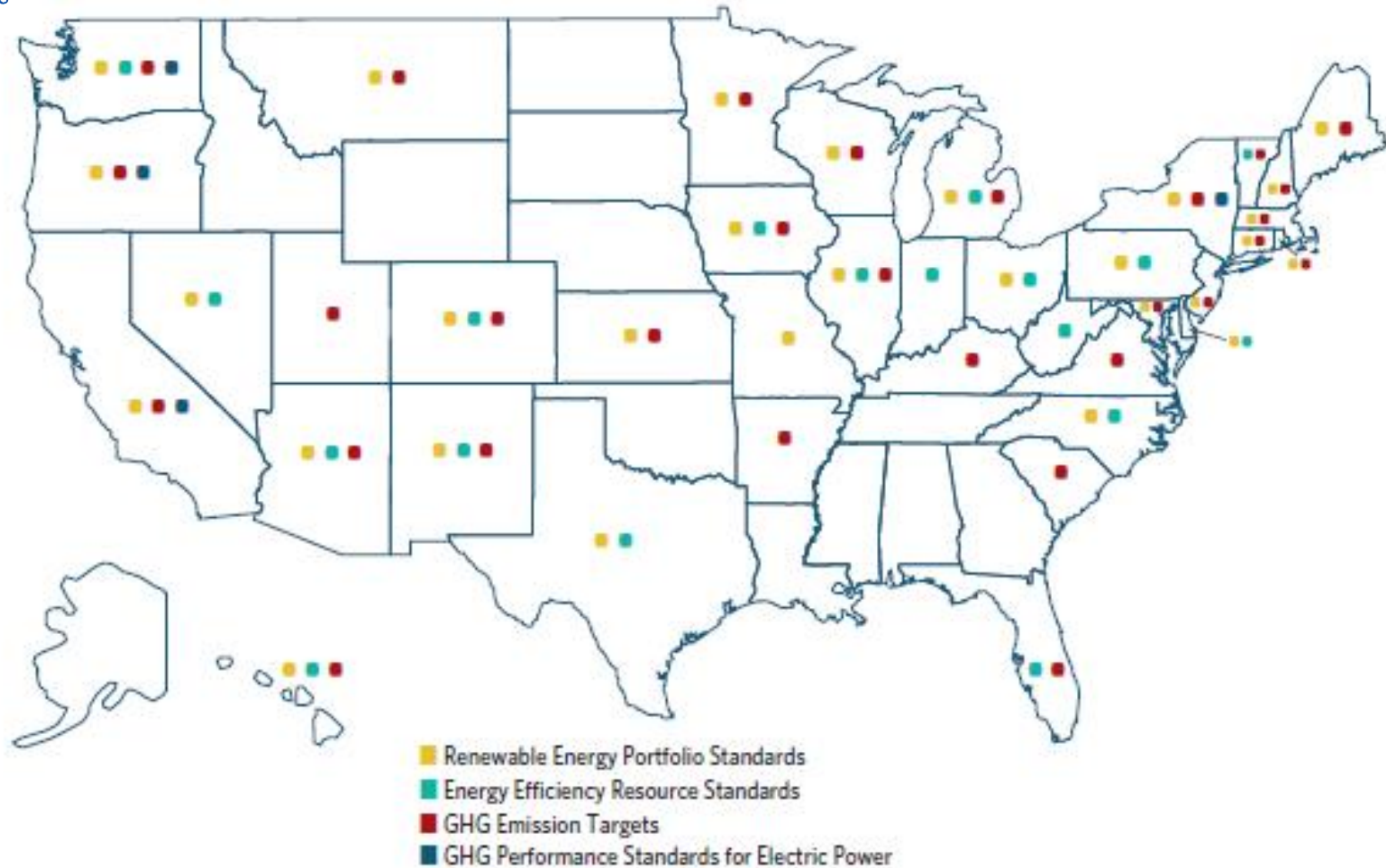
# REDUCING METHANE & HFCs

- Interagency Strategy to Reduce Methane Emissions Released on March 28, 2014.
  - 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:
  - Significant New Alternatives Policy (SNAP) Program approves climate-friendly chemicals, prohibits some uses of most harmful chemical alternatives.
  - Provide federal leadership by purchasing cleaner alternatives to HFCs whenever feasible
  - Montreal Protocol





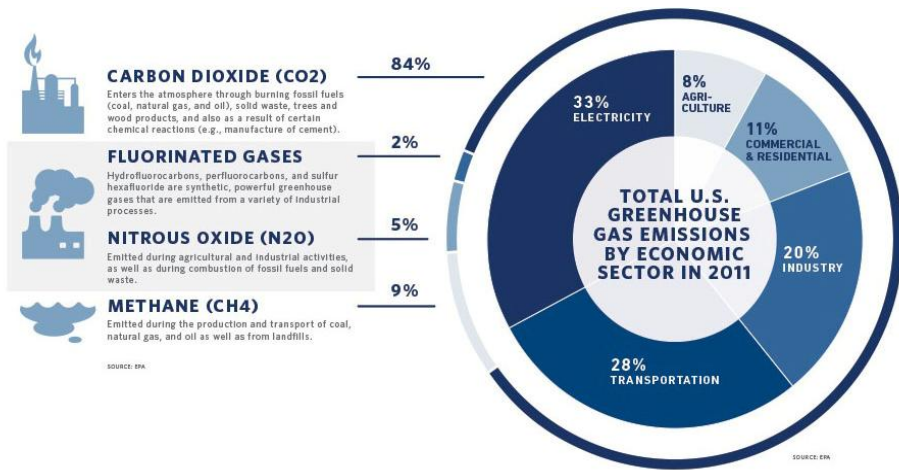
# Key State Climate and Energy Policies



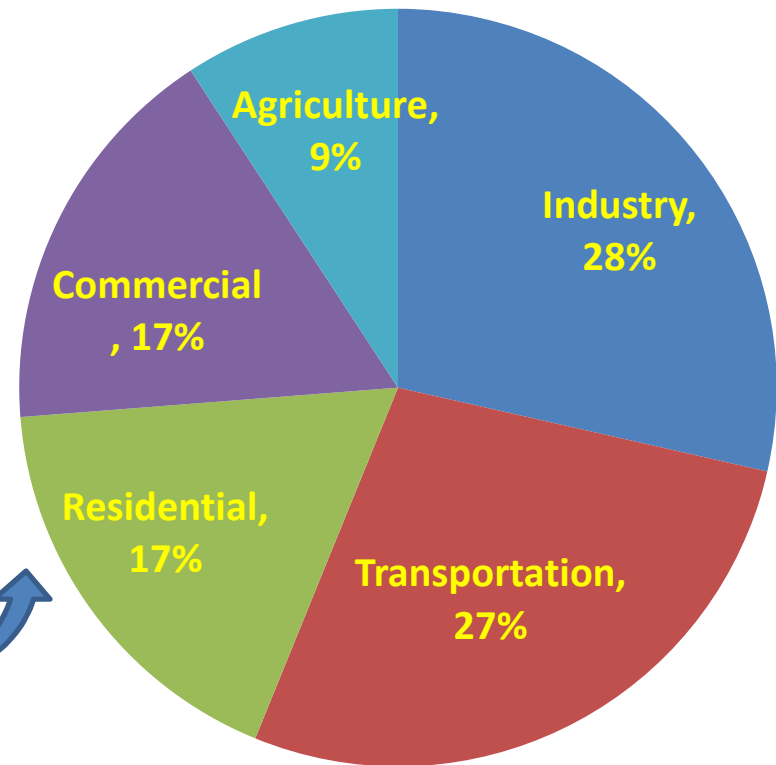
Note: The count is inclusive of mandatory portfolio and resource standards only.

Source: U.S. EPA State and Local Climate and Energy Program, as reported in the Sixth National Communication of the United States of America under the UN Framework Convention on Climate Change ([http://unfccc.int/files/national\\_reports/annex\\_i\\_natcom/submitted\\_natcom/application/pdf/2014\\_u.s.\\_climate\\_action\\_report\[1\]rev.pdf](http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/2014_u.s._climate_action_report[1]rev.pdf))

# EERS Policies Help Reduce GHGs Attributable to Energy Use Across Sectors

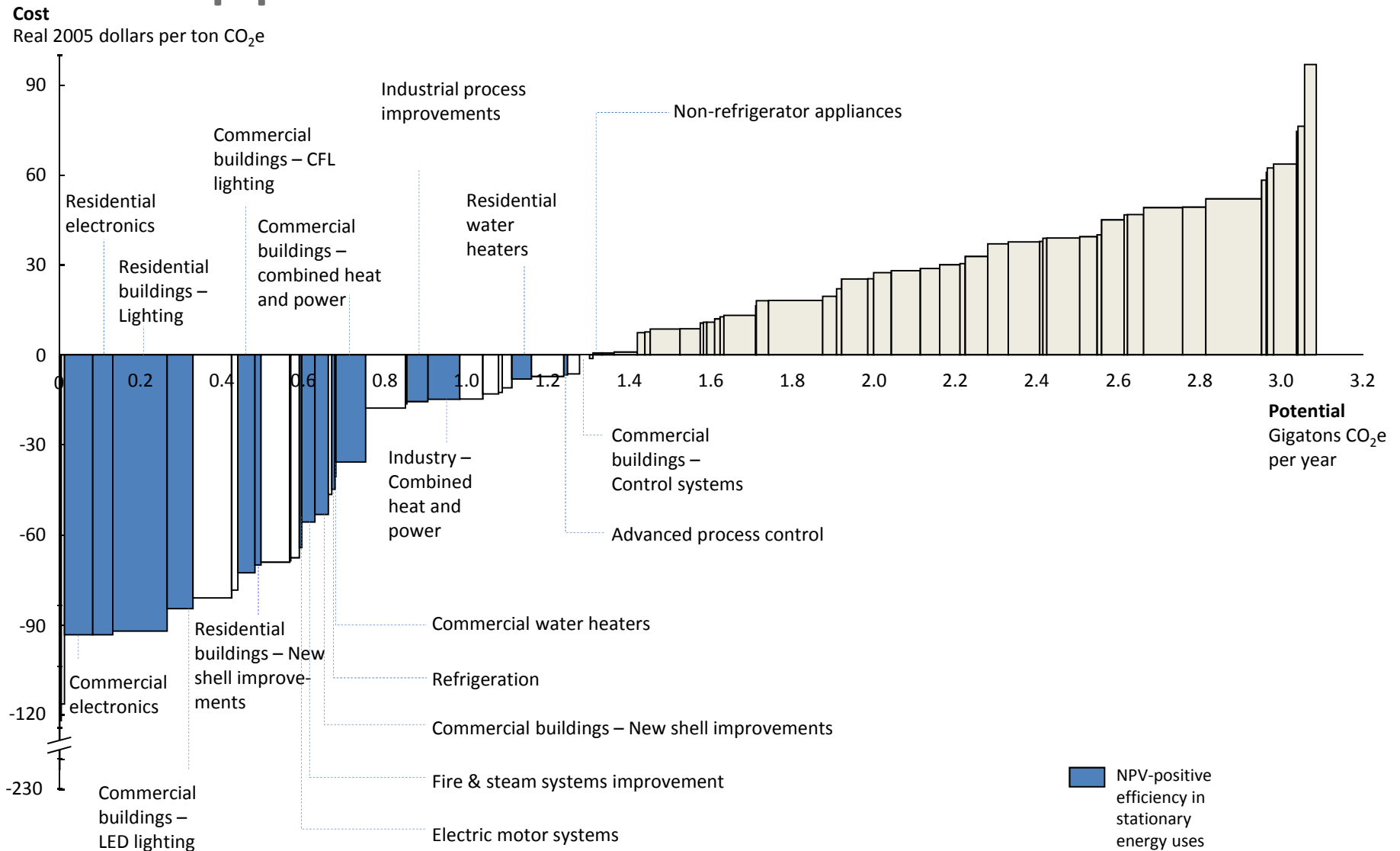


**2011 Total Greenhouse Gas Emissions by Sector  
with Electricity Apportioned to End Use**



Source: EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011  
(<http://www.epa.gov/climatechange/ghgemissions/usinventoryreport.html>)

# Cost-Effective Energy Efficiency Opportunities Exist Across Sectors



Source: McKinsey U.S. Mid-Range Greenhouse Gas Abatement Curve – 2030

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

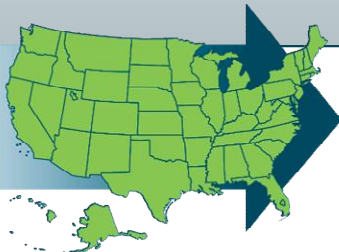
1. Assistance for Regulators and Policymakers
2. Appropriate Access to Utility Data and Privacy
3. \*Data Security and Communications Standards
4. \*Access to Federal Energy Data

### 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



**SEE Action**

STATE & LOCAL ENERGY EFFICIENCY ACTION NETWORK

[www.seeaction.doe.gov](http://www.seeaction.doe.gov)

\*Denotes non-SEE Action work

# 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?