

Learning From State Action On Climate Change

While federal policy on climate change has not been forthcoming, states have taken the lead on developing climate policies and initiatives. These policies are being implemented across all economic sectors through a variety of approaches. States are setting targets for emissions reductions, increasing the efficiency of energy systems, and encouraging investment in renewable energy. State governments cite a variety of reasons for action, including promoting economic development, reducing vulnerability to fluctuating energy prices, and preventing damages from climate change to the states' resources. Such efforts continue the tradition of states as policy laboratories, functioning as test sites for initiatives that the federal

government could adopt, as well as providing significant reductions in domestic greenhouse gas emissions. States have implemented many different policies in response to the available economic and political opportunities, but some strategies have been more widespread, such as the development of renewable portfolio standards and public benefit funds. There is a new and important trend towards multistate regional initiatives that address climate change. Policies that are well suited to expansion to other states or integration into a mandatory federal policy provide the best opportunity for states interested in successful action on climate change.

In the absence of federal leadership to reduce greenhouse gas (GHG) emissions, many U.S. states and regions have begun taking actions to address the issue of climate change. States, for a variety of motives, have taken a broad range of actions that reduce greenhouse gases. While confronting the challenge of climate change will ultimately require a national and international regime, the states and regions have a valuable role to play.

One reason that state actions are important is that states often function as “policy laboratories,” developing initiatives that serve as models for federal action. This has been especially true with environmental regulation — most federal environmental laws have been based on state models. In addition, many individual states emit high levels of greenhouse gases. Texas, for example, emits more than France, while California's emissions exceed those of Brazil. State actions are also important because states have primary jurisdiction over many areas — such as electric

generation, agriculture, and land use — that are critical to addressing climate change.

It is important to understand that states have limited resources to devote to the climate issue, and their strict budget requirements can put long-term climate policies in jeopardy. States also lack certain powers that would be crucial to a comprehensive climate change policy, such as the authority to enter into international agreements. Finally, when states take individual approaches to an issue, a “patchwork quilt” of policies can result across the nation. This patchwork of policies may be inefficient for complying businesses and may result in some states duplicating the work done in other states. While some states are delivering real reductions of GHG emissions, only in a few cases are the reduction targets commensurate with what will be needed on a global scale.

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Ultimately, climate change is a global problem that will demand global action, including national action in the United States. State and regional action cannot substitute for a coordinated national response, but it can help provide the foundation for that response.

In crafting a national climate policy, it will be critical for the federal government to look to lessons from the states, which have accumulated significant experience. This experience will continue to benefit the states as well, as those states that have implemented climate change initiatives will be better positioned in the face of federal policy.

Motivation for Action

States that enact climate change policy almost always do so with long-term economic well-being in mind. Many states are concerned with the toll climate change is projected to take on their economies, many of which are closely tied to their natural resources. Coastal states consider the impact of rising sea levels, agricultural states worry about lost productivity, and the dry Western states are alarmed by the prospects of worsening

droughts. Many states, however, are also looking at policies that address climate change as economic opportunities: to produce and sell alternative fuels, to become renewable energy exporters, to attract high-tech business, or to sell carbon emission reduction credits. Some states will be better able to take advantage of these opportunities than others, and many are concerned about the economic impacts of climate policy.

But economic development is just one motivator. In fact, multiple drivers lead to state policies that address climate change. Efforts to improve air quality, lessen traffic congestion, secure energy supply and reliability, or even to reduce odors from livestock feedlots often indirectly result in GHG reductions. Likewise, policies designed explicitly to reduce GHG emissions often bring about benefits in these other areas. Because there are so many different drivers for policies that reduce GHG

Figure 1



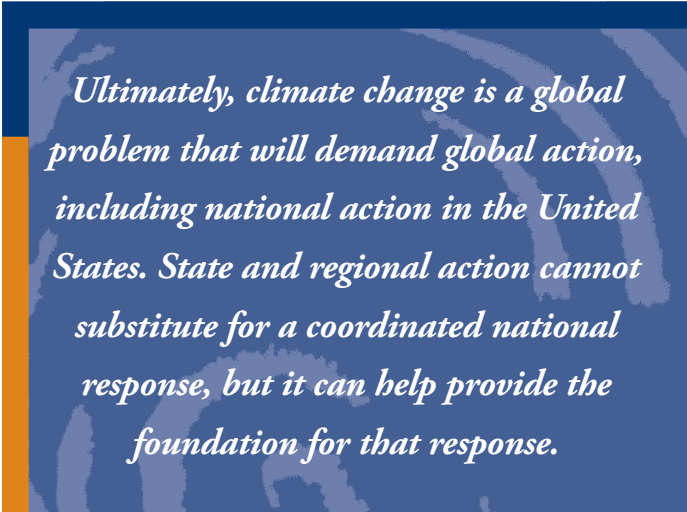
emissions, these policies have taken a wide variety of forms, covering a range of sectors.

In part because reducing GHG emissions can deliver multiple benefits, it has often been possible to build broad coalitions around GHG reduction policies. Climate change has, in fact, often been a bipartisan issue in the states, with Democratic, Republican, and Independent governors signing climate change legislation. Even when governorships have changed hands, policies have remained in place. Policymakers at the national level may be able to learn from the states how to find common ground on this issue.

A State Climate Change Policy Portfolio

While a comprehensive program covering all greenhouse gases and sectors is the ultimate goal, states have generally taken an incremental approach to developing such policy. Such incremental steps give lawmakers a chance to judge feasibility, and focus on the sectors and strategies that suit the state's economy and political landscape, while providing state officials with an opportunity to build capacity to address GHG emissions.

States have jurisdiction over many areas that are relevant to climate change. While states have taken numerous approaches, the policies considered below have been implemented most broadly, show the most potential for successful mitigation of climate change impacts across many states, or provide lessons that are particularly relevant to the development of federal policy. For information about actions other states are pursuing, please see the list of further resources at the end of this *In Brief*.



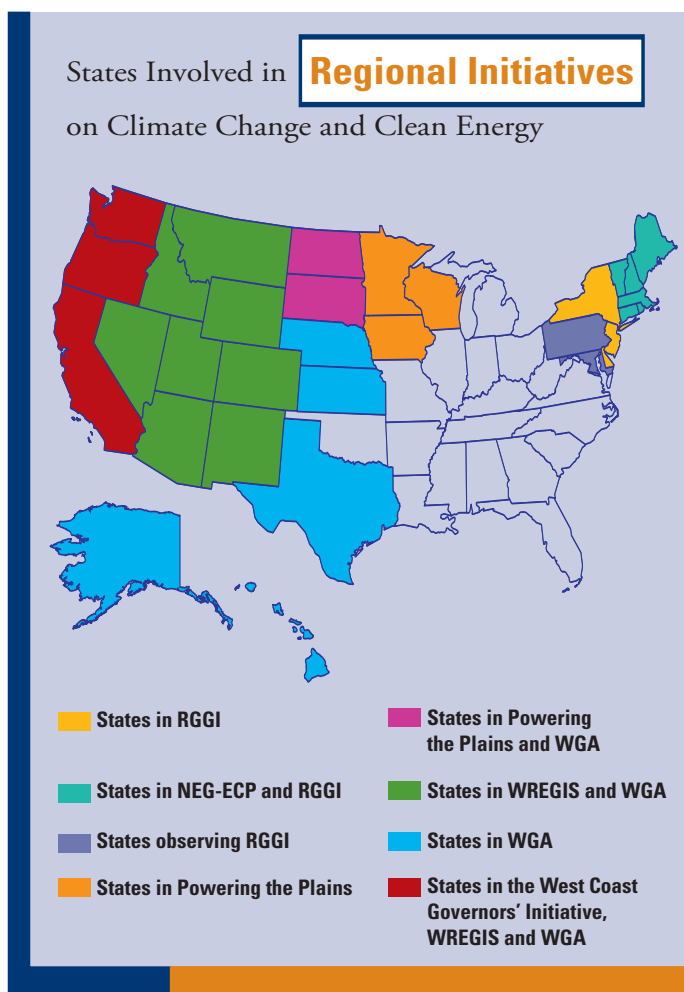
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Regional Initiatives on Climate Change and Clean Energy.

Recently, interest has increased in addressing climate change at the regional level. Nine **Northeastern and Mid-Atlantic states** are working together to develop a cap-and-trade system for carbon dioxide (CO₂) emissions from power plants called the Regional Greenhouse Gas Initiative (RGGI).¹ The **West Coast states — Washington, Oregon, and California** — are cooperating on a strategy to reduce GHG emissions, known as the West Coast Governors' Global Warming Initiative. The New England Governors and Eastern Canadian Premiers (NEG-ECP) prepared a climate action plan in 2001 that includes short- and long-term emissions reduction goals.² The **Western Governors' Association (WGA) Clean and Diversified Energy Initiative**, representing 18 western states, has begun investigating strategies to increase efficiency and renewable energy sources in their electricity systems.³ The WGA is also creating the Western Renewable Energy Generation Information System (WREGIS) to track renewable energy credits (RECs) across 11 western states⁴ in order to facilitate trading to meet renewable energy portfolio standards.

Government, industry and non-governmental stakeholders in **North Dakota, South Dakota, Iowa, Minnesota, Wisconsin** and the Canadian Province of Manitoba are collaborating on an initiative called Powering the Plains to develop policies for energy and agriculture that will mitigate climate change, focusing on the development of a renewable energy tracking system similar to WREGIS, a transition to coal gasification with CO₂ sequestration, and investment towards developing renewables and hydrogen infrastructure. Several other regions are cooperating on more specific projects, such as carbon sequestration research.

Figure 2



Regional programs can be more efficient than programs at the state level, as they encompass a broader geographic area, eliminate duplication of work, and create more uniform regulatory environments.

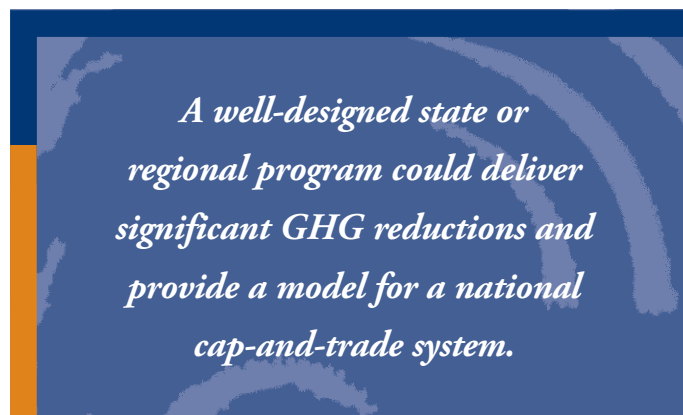
Emissions Cap-and-Trade. While a national policy would provide the most benefit at the least cost, a well-designed GHG emissions cap-and-trade system at the state or regional level could deliver significant GHG reductions and provide a model for a national cap-and-trade system. Currently, two states — **Massachusetts** and **New Hampshire** — have CO₂ caps on some existing power plants, and they will eventually allow trading of CO₂ allowances. In addition, RGGI is in the process of designing a regional CO₂ cap-and-trade system for power plants. RGGI is an example of an incremental approach to climate policy, focusing on one greenhouse gas emitted from one sector. The successful implementation of the RGGI cap-and-trade scheme will set the stage for other states to join or form their own regional caps and may encourage the program to expand to other greenhouse gases and other sectors. An ideal state or regional policy would begin with a moderate initial cap, subsequently declining on a reasonable timetable. It would include all GHGs from all major sources, and would also cover as wide a geographic area as possible. It would also allow flexibility in compliance, including emissions trading, offsets,⁵ and banking⁶ provisions. Finally, it would be designed with eventual expansion in mind.

Mandatory Reporting of Greenhouse Gases. To position themselves for more comprehensive climate policy, some states have required reporting of GHG emissions. Under federal law, utilities are required to report their CO₂ emissions to the U.S.

Environmental Protection Agency, but other GHG emission sources are not. **New Jersey** and **Wisconsin** have already implemented mandatory GHG reporting for other sources. The Northeast States for Coordinated Air Use Management is presently developing a Regional Greenhouse Gas Registry (RGGR) to support RGGI as well as voluntary and mandatory reporting requirements for individual states in the region.⁷ Requiring reporting of greenhouse gases allows a state to create a reliable inventory of emission sources, which provides information for future policies. It also causes companies to examine their emissions, leading to the discovery of cost-effective and cost-saving reduction opportunities. Reporting can also help companies establish their baseline emissions,⁸ which may be an advantage to them in the event of future regulation. Mandatory reporting can be implemented at relatively low cost, both because most major GHG emitters are already reporting their emissions of other pollutants and have a reporting infrastructure in place, and because most GHGs are emitted from well understood processes, such as the combustion of fossil fuels.

Emissions Targets and Climate Action Plans.

Comprehensive climate plans combined with enforceable GHG emissions targets provide the highest certainty of significant emissions reductions. In 1998 **New Jersey** committed to reducing the state's total GHG emissions to 3.5 percent below 1990 levels by 2005. To achieve this goal, the state signed "covenants" with several of its companies, all 56 of its colleges and universities, public schools, religious congregations, and other entities. The state's approach also involved a binding commitment to reduce carbon dioxide emissions per MWh from the state's largest electric utility, the Public Service Enterprise



Group. This commitment included reporting requirements and monetary penalties for noncompliance. New Jersey's combination of voluntary and mandatory emissions reduction agreements was a first step in building capacity and support for a broad climate strategy.

Maine, Massachusetts, and New York have also set their own targets for GHG emissions reductions.

The process of developing a climate action plan can identify cost-effective opportunities to reduce GHG emissions that are relevant to the state. The individual characteristics of each state's economy, resource base, and political structure provide different opportunities for dealing with climate change. However, without targets for emissions reductions, incentives for cleaner technologies, or other clear policies, climate action plans will not achieve real reductions in GHG emissions.

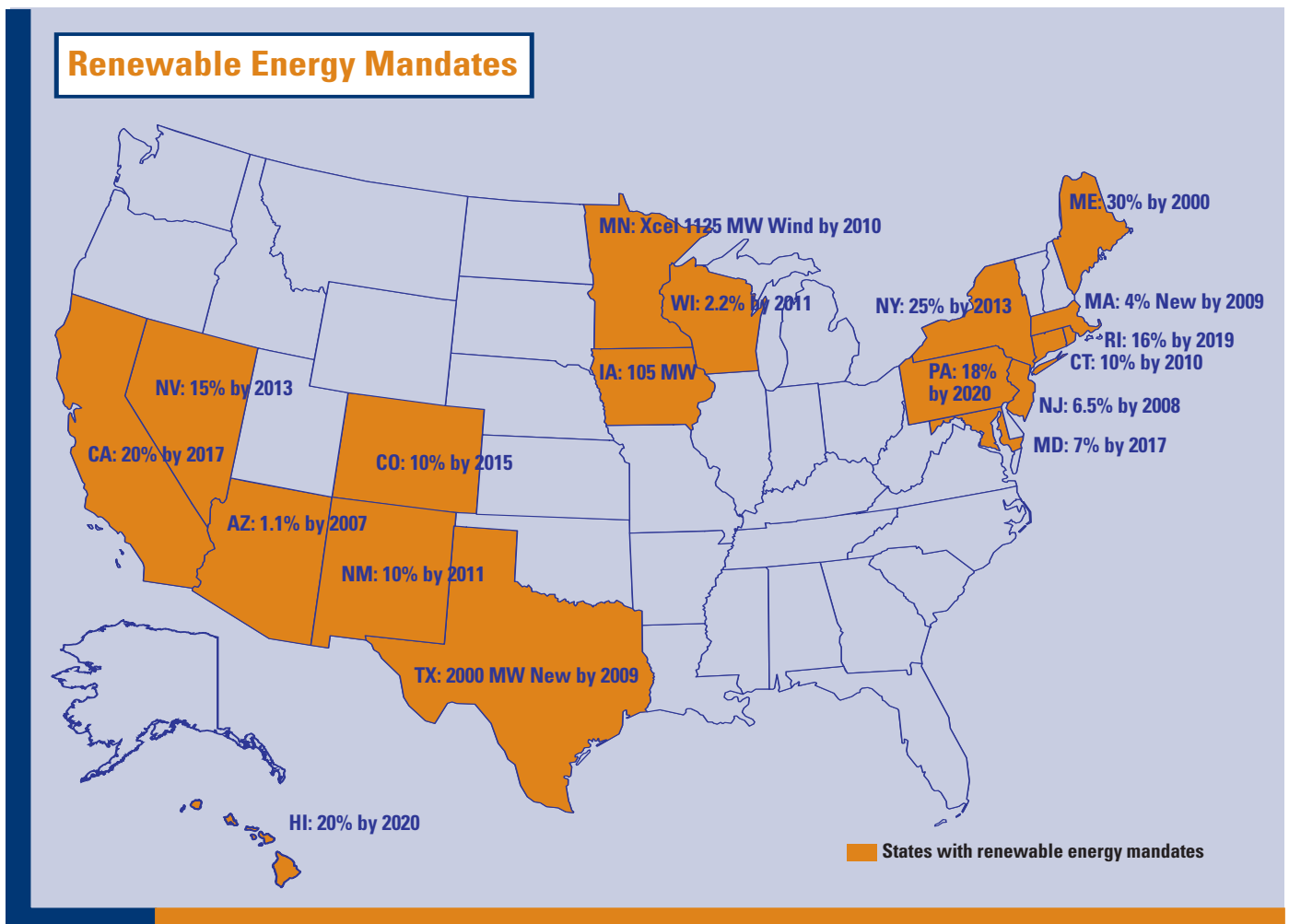
Low-Carbon Electricity Policies. The generation of electricity accounts for 30 percent of all GHG emissions in the United States. States have considerable authority over the production of electricity within their borders, and many options are available to them to promote low-carbon energy production. Restructuring the economic regulation of the electric power

industry has provided an opportunity in many states to adopt climate-friendly electricity policies, but several states have found ways to adopt these policies in the absence of restructuring.

- **Renewable energy mandates.** Eighteen states have mandated that electric utilities generate a specified amount of electricity from renewable sources (see Figure 3). Most of these requirements take the form of “renewable portfolio standards,” or RPS’s, which require a certain percentage of a utility’s power

plant capacity or generation to come from renewable sources by a given date. The standards range from modest to ambitious, and definitions of renewable energy vary. Though climate change may not be the prime motivation behind some of these standards, the use of renewable energy does deliver significant GHG reductions. For instance, **Texas** is expected to avoid 3.3 million tons of CO₂ emissions annually with its RPS, which requires 2000 MW of new renewable generation by 2009. Increasing a state’s use of renewable energy brings other benefits as well, including job creation, energy security, and cleaner air. Some of these efforts have been particularly successful.

Figure 3



For example, **Connecticut** increased its RPS in 2003, extending the standard to all utilities in the state; **Iowa** met its standard in 1999. Many states allow utilities to comply with the RPS through tradeable renewable energy credits. While the success of state efforts to increase renewable energy production will depend in part on federal policies such as production tax credits, states have shown their considerable efficacy in encouraging clean energy generation.

- **Public benefit funds.** Almost half the states have funds, often called “public benefit funds,” dedicated to supporting energy efficiency and renewable energy projects (see Figure 4). The funds are collected either through a small charge on the bill of every electric customer or through specified contributions from utilities. The charge ensures that money is available to fund these projects. Publicly managed clean energy funds from twelve of these states have formed the Clean Energy States

Alliance to coordinate public benefit fund investments in renewable energy.⁹

- **Promoting clean power.** States create incentives for clean power with a variety of policies:
 - Both **Washington** and **Oregon** require that new power plants offset a certain portion of their anticipated CO₂ emissions, by either undertaking emission reduction or mitigation projects themselves, or by paying a specified fee to a designated organization that will then select and fund offset projects.
 - Most states have adopted some form of tax incentive for renewable energy, which helps renewables compete with traditional forms of electric generation.
 - To facilitate the connection of small clean energy systems to the power grid, most states have enacted net-metering and uniform interconnection standards (see Figure 5).

Figure 4

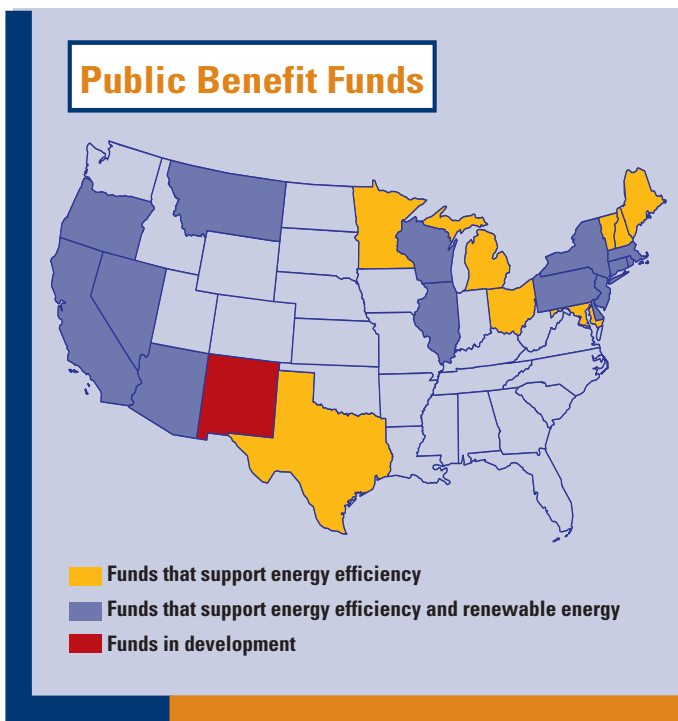
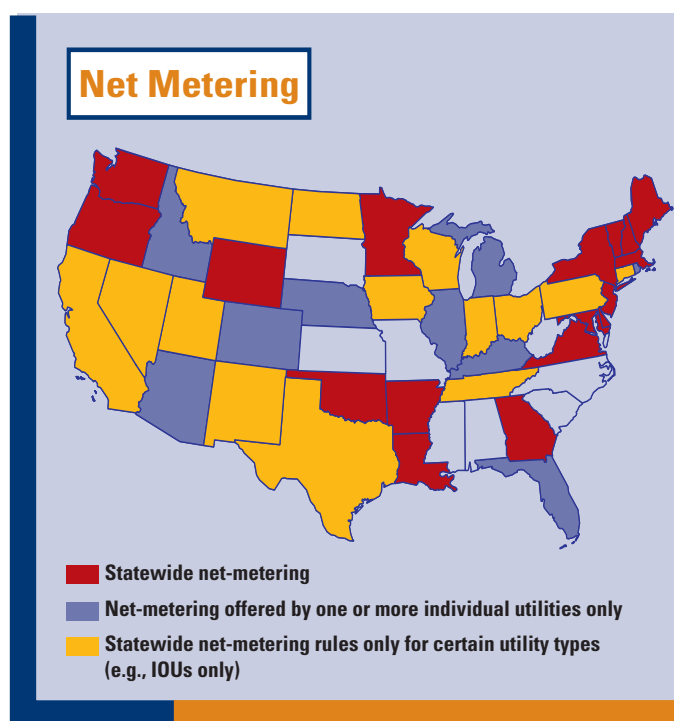


Figure 5

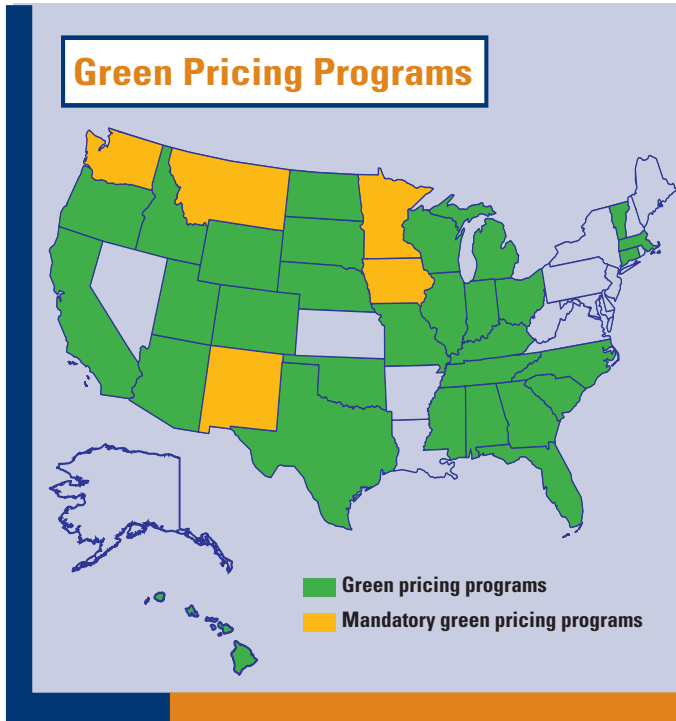


Source: Database of State Incentives for Renewable Energy. www.dsireusa.org

– Utilities in 34 states offer customers “green pricing,” in which customers opt to pay a premium on their electric bills to have a portion or all of their power provided from renewable sources (see Figure 6). While the electricity generated by renewable sources is not delivered directly to the customers who pay for it, the utility certifies that renewable energy has been generated in an amount equal to the customer’s purchase.

- **Carbon capture and storage research.** Technology may eventually make it practical to extract CO₂ from the stream of emissions from fossil fuel combustion and then store it underground in geologic formations, preventing its release into the atmosphere. Many states provide incentives for the development of technologies that make carbon capture easier, such as IGCC (integrated gasification combined cycle), and some are also investigating the potential to store carbon in

Figure 6



geologic formations within their borders. **West Virginia** and **Ohio**, for example, are supporting a pilot project to sequester carbon in a deep underground rock formation on the border between the two states. The ability to capture and store carbon would facilitate the continued use of coal, a vital economic resource in many states.

Energy Efficiency. Increasing energy efficiency is often the least costly way to meet energy needs. At the same time, energy efficiency improvements reduce GHG and other air emissions. Policies to promote energy efficiency are in place in every state, encompassing a variety of programs to address the ways energy is used.

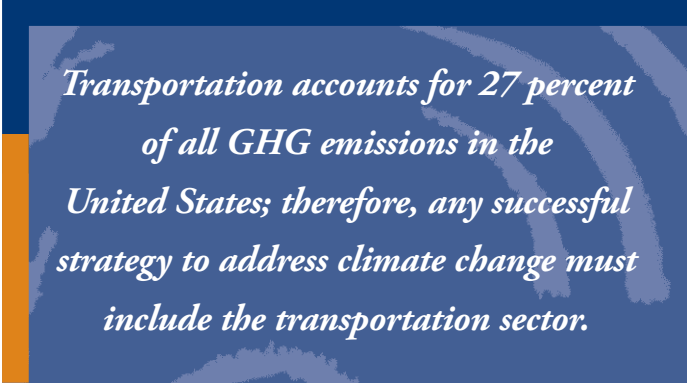
- **Building codes.** Energy efficiency measures implemented during the design and construction of a building can significantly reduce its energy needs in a cost-effective way. However, builders rarely have an incentive to build a building that is more energy efficient than code requires, because they will not receive the savings from reduced energy costs. Increasing the required energy efficiency of buildings compensates for this disconnect. Codes for new commercial and residential buildings are set at the state and local level. Of states that have adopted building codes, some craft their own codes, while many adopt the national model codes. For residential buildings, 38 states have adopted a code at least as stringent as the national model code; for industrial buildings, 32 have done so. Of these states, however, approximately half have not adopted the most recent versions of the model codes. Adopting or updating building codes is a way for states to save money while reducing emissions.

- **Product standards.** The federal government has established minimum efficiency standards for approximately 20 kinds of residential and commercial products, including washers and dryers, refrigerators and freezers, dishwashers, and air conditioners. States may not set their own standards for these

products without obtaining a waiver from the federal government, but they are free to set standards on products not covered by federal regulations. **Connecticut** and **Maryland** have adopted efficiency standards for many additional products, and several other states are considering such standards. Coordinating the development of new product standards, for example, through model standards that could be applicable to any state, provides a good opportunity for harmonization.

Transportation policies. Transportation accounts for 27 percent of all GHG emissions in the United States; therefore, any successful strategy to address climate change must include the transportation sector. States have many options to address GHG emissions from transportation.

- **GHG emission standards for vehicles.** **California** is in the process of adopting a requirement to reduce GHG emissions from new light-duty vehicles. California has unique authority among states to set vehicle emissions standards, because of a special provision in the federal Clean Air Act. Other states have the option of either following federal standards or adopting California's, and seven states are poised to follow the California rule. If upheld by the courts, California's standard will reduce annual greenhouse gas emissions from the light-duty fleet by an estimated 17% in 2020, and the potential for reductions is higher if additional states adopt California's standards.
- **Cleaner fuels and more efficient vehicles.** Several states have policies requiring that a certain percentage of state-owned vehicles run on alternative fuels, such as ethanol or natural gas, or that the state fleet meet a fuel efficiency standard. Some states offer tax breaks for alternative fuels, gasoline/ethanol blends, alternative fuel vehicles, low-emission vehicles, or for converting traditional vehicles to run on alternative fuels.



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Several states allow or have proposed to allow hybrid vehicles to use High Occupancy Vehicle (HOV) lanes during rush-hour traffic. The U.S. Department of Transportation recommended legislative changes in 2003 that would allow this under certain circumstances.

- **Smart growth policies.** Smart growth strategies control “sprawl” by promoting concentrated development and discouraging further expansion into suburban and rural areas. Smart growth measures include providing a variety of public transportation options in densely developed areas; zoning laws to permit mixed land uses; cleanup and redevelopment of “brownfields,” or former industrial areas; pedestrian and biker-friendly features, such as wide sidewalks and bike paths; and financial incentives to encourage people to live near their workplaces. Studies show that residents of smart growth communities drive less than residents of traditional communities, lowering their fuel use and greenhouse gas emissions.

Agricultural Policies. Agriculture contributes approximately 7 percent of total U.S. GHG emissions, with nitrous oxide (N₂O) accounting for two-thirds and methane (CH₄) for one-third of agricultural emissions. In addition to reducing these emissions, there are opportunities in agriculture to offset emissions from other sectors. In doing so, farmers may be able to tap additional revenue sources.

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- **Energy crops.** Biomass, as a low-carbon energy source, provides an opportunity for the agricultural sector to address climate change in a profitable way. Plant materials can be burned to generate electricity or converted into transportation fuels. States can promote energy crops by supporting research to determine which crops and areas are especially well suited to energy production. They can also provide production incentives. **Iowa** has pilot programs to improve production of switch grass to co-fire in coal power plants.
- **Animal waste management.** Where large amounts of animal wastes are available in a concentrated location, as in large confined animal feeding operations, methane can be captured and used to generate electricity, rather than being released into the atmosphere. Some states support methane recovery technology by funding related R&D; others exempt the technology from property and other taxes; and **Minnesota** offers a per kWh payment for electricity generated by on-farm anaerobic digesters.
- **Farming practices that increase sequestration.** Soil conservation techniques increase the amount of carbon stored in soil while improving soil quality. Compared to conventional tilling techniques, soil conservation techniques such as “no till”

reduce fuel use, time, and cost of farmland preparation. Eventually, carbon credits created by sequestering carbon on farmland may provide additional revenue sources for farmers. States can encourage the use of techniques that increase carbon sequestration in soils by providing information to farmers, leasing equipment, and offering tax credits for the purchase and use of qualifying equipment. **Nebraska, Oklahoma, Wyoming, North Dakota,** and **Illinois** have formed carbon sequestration advisory committees to investigate the potential for in-state agricultural carbon sequestration.


Technology Policy. Dramatic technological innovation will be needed to mitigate global climate change. Necessary developments include technologies that use less energy to deliver services, technologies that expand the use of low-carbon energy sources, and technologies to capture and sequester CO₂. The **Ohio** Coal Development Office partners with private industry and universities to fund innovative technology projects that separate, capture, and sequester carbon dioxide emissions from coal combustion. The **South Carolina** Hydrogen Coalition is promoting economic development by building expertise in hydrogen technology. Many states have programs to support research and development of new technologies; it is also critical that states support the *deployment* of new technologies as well, which they can do by distributing information, purchasing new climate-friendly products, and providing incentives. Public-private partnerships between industries, state offices, and state universities have also encouraged important technology development. In addition to the other benefits delivered by new technologies, investing in technology development can help states create desirable jobs and attract high-tech industries.

Conclusion

While most state climate change efforts have been implemented relatively recently, some lessons are already emerging for future state, regional and federal efforts. State programs such as emissions reporting and cap-and-trade systems should be designed so that they can easily be expanded or integrated into other programs. Design foresight and flexibility will help facilitate future policies at the state, regional, and federal level. Although garnering support for mandatory goals is sometimes difficult, these policies are generally more effective at achieving significant reductions than voluntary measures. States considering their options to effectively deal with climate change may consider beginning or joining a regional initiative in order to more efficiently reduce climate impacts while avoiding a regulatory patchwork and helping businesses more easily adapt to new policies.

As states move forward, they should be guided by a specific long-term emissions goal and a commitment to minimizing costs to achieve that goal. States may want to move toward a comprehensive approach incrementally, focusing first on policies that are relatively easy to implement and yield multiple benefits.

The actions undertaken by states to reduce GHG emissions are a collective first step on the United States' path to confronting climate change. The policy and technology lessons taken from these efforts should do much to inform future efforts at the national and international levels. 🌍



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Further Resources

The Pew Center on Global Climate Change

www.pewclimate.org

State Solutions

www.pewclimate.org/what_s_being_done/in_the_states/

States News

www.pewclimate.org/what_s_being_done/in_the_states/news.cfm

States Database

www.pewclimate.org/what_s_being_done/in_the_states/database.cfm

Pew Center Report: *Statehouse and Greenhouse: The Evolving State Government Role in Climate Change* by Barry Rabe, 2002, www.pewclimate.org/global-warming-in-depth/all_reports/greenhouse_and_statehouse_/index.cfm

A Look at Emissions Targets

www.pewclimate.org/what_s_being_done/targets/#_edn1

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¹ Connecticut, Delaware, New Hampshire, New Jersey, New York, Maine, Massachusetts, Rhode Island, and Vermont are participating in RGGI.

² The targets are 1990 levels of greenhouse gases by 2010, and 10% below 1990 levels by 2020.

³ The member states of the Western Governors’ Association are Alaska, Arizona, California, Colorado, Hawaii, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming.

⁴ The states participating in WREGIS are Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming.

⁵ An offset is the reduction or sequestration of emissions by entities not covered by an emissions reduction scheme.

⁶ Banking allows an entity to reduce emissions early and accumulate credits or allowances that can be used for compliance in future periods.

⁷ NESCAUM consists of Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont. Delaware and Pennsylvania are also participating in the RGGR process.

⁸ A baseline is the best estimate of GHG emissions that would have occurred in the absence of new policies and programs.

⁹ The Clean Energy States Alliance is composed of funds in California, Connecticut, Illinois, Massachusetts, Minnesota, New Jersey, New York, Ohio, Oregon, Pennsylvania, Rhode Island, and Wisconsin.

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straight answers, and innovative solutions in the
effort to address global climate change.



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