

# CLIMATE CHANGE 101

## State Action



For years, U.S. states and regions have been taking action to address climate change in the absence of federal legislation. A wide range of policies have been adopted at the state and regional levels to reduce greenhouse gas emissions, develop clean energy resources, and promote more energy-efficient vehicles, buildings, and appliances, among other things. Although climate change will ultimately require a national and international response, the actions taken by states and regions will continue to play an important role by developing and testing innovative solutions, demonstrating successful programs, and laying the groundwork for broader action.

### TAKING THE INITIATIVE

Two trends are apparent with regard to state and regional efforts that address climate change: 1) more states are taking action and 2) they are adopting more types of policies. In this way, states and regions are acting as both leaders and innovators of climate change policy. State and regional efforts are wide ranging, including high-profile policies such as cap-and-trade programs, renewable portfolio standards, and climate action plans. The states and regions are acting as “policy laboratories,” developing initiatives that can serve as models for federal action, as well as for other states.

Since many individual states are major sources of greenhouse gas (GHG) emissions, state-level policies have the potential to produce significant reductions. Texas, for example, emits twice the amount of GHGs as Spain while California's emissions exceed those of Italy.<sup>1</sup> As state-level policies proliferate, so too do the climate benefits associated with these actions. Moreover, state actions are important because state governments have decision-making authority over many issues and economic sectors—such as power generation and agriculture—that are critical to addressing climate change.

Why are states taking action on this issue? State leaders and their constituents are concerned about the projected economic and environmental toll of climate change on their states.

Coastal states face concerns over rising sea levels. Agricultural states must confront the potential for lost farm productivity. And the dry western states must meet the dual challenges of worsening droughts and increasing wildfire risks.<sup>2</sup>

At the same time, many states view policies that address climate change as an economic opportunity, not as a burden on commerce. These states are trying to position themselves as leaders in new markets related to climate action: producing and selling alternative fuels, ramping up renewable energy exports, attracting high-tech business, and selling GHG emission reduction credits.

Economic issues are just one motivator for state policies that address climate change. Policies to improve air quality, reduce traffic congestion, and develop domestic, clean energy supplies can all have climate benefits. States also are discovering that climate policies often bring about benefits in these other areas as well.

Because reducing GHG emissions can deliver multiple benefits, it has been possible for many states to build broad coalitions around climate-friendly policies. In fact, climate change and clean energy policies have received bipartisan support in many states, with Democratic, Republican, and Independent governors signing climate change and



clean energy legislation and lawmakers of all political persuasions supporting state action. Governors are pursuing a wide range of policies that reduce GHGs while achieving multiple economic benefits tailored to the specific needs and resources of their states. Thus, in addition to offering models for specific policy solutions, the states also offer models for finding common ground.

### WORKING ACROSS STATE BORDERS

In working to address climate change, many states have reached beyond their borders to enlist their neighbors in collaborative efforts. Across the United States, climate-related regional initiatives have been designed to reduce GHG emissions, develop clean energy sources, and achieve other goals. Regional initiatives can be more efficient and effective than actions taken by individual states because they cover a broader geographic area (and, in turn, more sources of GHG emissions), eliminate duplication of work among the states, and help businesses by bringing greater uniformity and predictability to state rules and regulations.

Regional climate initiatives, including three cap-and-trade programs, are being developed and implemented among U.S. states and Canadian provinces (see Figure 1). Cap-and-trade programs set an overall emissions cap while allowing companies to trade emission allowances so they can achieve their reductions as cost effectively as possible. Similar programs have been successfully implemented in the United States and elsewhere to control other pollutants in an environmentally sound, cost-effective manner.<sup>3</sup>

**Regional Greenhouse Gas Initiative.** In December 2005, the governors of seven Northeastern and Mid-Atlantic states signed an agreement formalizing the first U.S. GHG cap-and-trade program, the Regional Greenhouse Gas Initiative (RGGI). RGGI now consists of ten Northeastern and Mid-Atlantic states that are implementing a cap-and-trade program to reduce carbon dioxide (CO<sub>2</sub>) emissions from power plants in the region. The RGGI cap-and-trade program began in January 2009 and is administered with the technical assistance of a regional organization called RGGI, Inc. The successful implementation of RGGI has been an example for other states and national governments.

**Transportation and Climate Initiative (TCI).** In 2010, eleven Northeastern and Mid-Atlantic states formed the TCI with the aim to expand safe and reliable transportation options, attract federal investment, lower transportation costs, improve overall air quality and public health, and mitigate the transportation sector's impact on climate change.

**Western Climate Initiative.** In February 2007, five western governors signed an agreement establishing the Western Climate Initiative (WCI), a joint effort to reduce GHG emissions and address climate change. The WCI has since grown to include seven U.S. states and four Canadian provinces that have jointly set a regional GHG emissions target of 15 percent below 2005 levels by 2020. The WCI is planning to implement a regional cap-and-trade program that will initially cover emissions of six GHGs produced by electricity generators and large industrial sources, and then will expand to include emissions of these gases from the combustion of

Figure 1

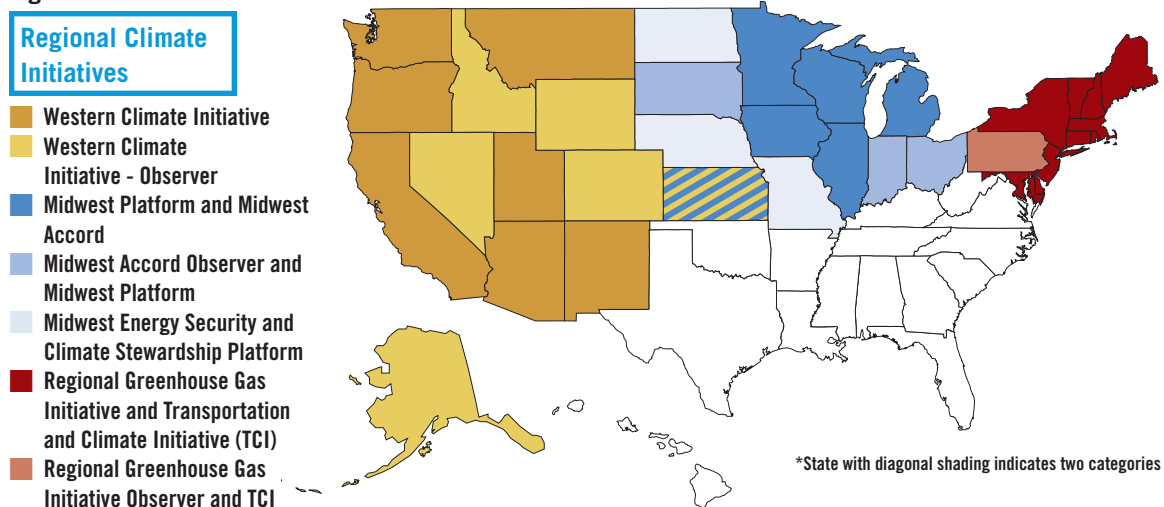
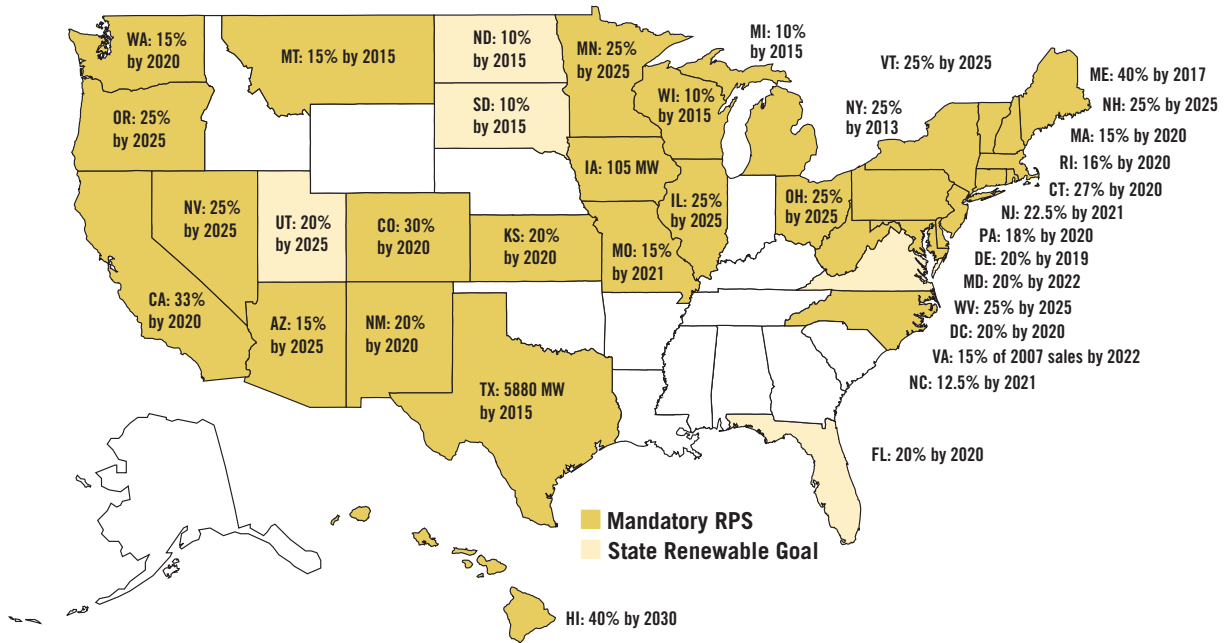


Figure 2

Renewable and Alternative Energy Portfolio Standards



transportation fuels as well as residential, commercial, and small industrial fuels not previously covered. When fully implemented, the WCI cap-and-trade program will have the broadest coverage of any regional GHG cap-and-trade program proposed to date. WCI is also working on a broader set of clean energy and climate policies.

**Midwest Energy Security and Climate Stewardship Platform.** In November 2007, Governors of twelve Midwestern states and the Premier of Manitoba adopted all or portions of the Platform, which includes goals for energy efficiency improvements, low-carbon transportation fuel availability, renewable electricity production, and carbon capture and storage development. Numerous policy options are described for states as they work toward these goals.

**Midwestern Greenhouse Gas Reduction Accord.** In parallel with the development of the Midwest Platform, the governors of six states, as well as the premier of Manitoba, established the Midwestern GHG Reduction Accord (MGGRA). Under the Accord, members agreed to establish regional GHG reduction targets, including a long-term target of 60 to 80 percent below current emissions levels, and develop a multi-sector

cap-and-trade system to help meet the targets. Final recommendations and a model rule were completed by the Accord’s Advisory Group in May 2010.

REDUCING ELECTRICITY EMISSIONS

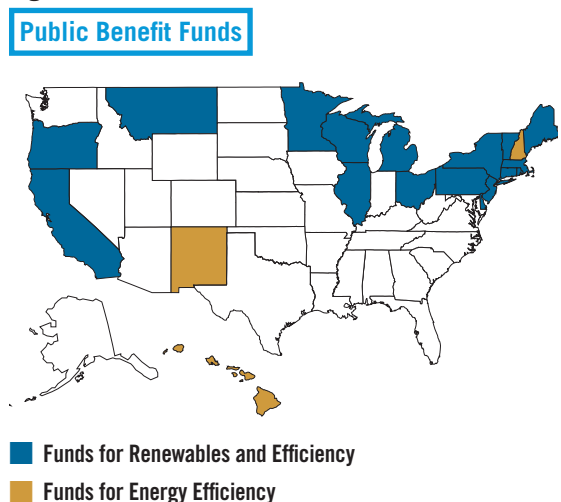
States have considerable authority over how electricity is generated and used in the United States. With the generation of electricity accounting for 33 percent of all U.S. GHG emissions and 40 percent of U.S. CO<sub>2</sub> emissions,<sup>4</sup> states can play a crucial role in reducing the power sector’s climate impacts by promoting low-carbon energy solutions and energy efficiency.

The two major options for reducing GHG emissions from electricity are energy efficiency and low-carbon electricity production. Increasing energy efficiency is often the least expensive way to reduce GHG emissions and meet energy needs. Energy efficiency policies come in many forms, including funding and requirements for energy efficient products, buildings, appliances, and transportation and utility programs that reduce their customers’ energy demand. State actions to promote low-carbon electricity include incentives and mandates that reduce emissions by promoting a cleaner energy supply, for example by supporting renewable energy.

**Renewable Portfolio Standards.** Twenty-seven states and the District of Columbia have established mandatory Renewable Portfolio Standards (RPS), policies that require a certain percentage or amount of electricity generation from eligible renewable sources by a given date (see Figure 2). An additional five states have renewable energy goals. RPS design varies significantly across the states. The standards range from modest to ambitious, and what qualifies as “renewable energy” can vary from state to state. Four states have Alternative Energy Portfolio Standards that include a wider range of low- or no-emission technologies, such as carbon capture and storage. Many states have adjusted their RPS design over time, most often strengthening the previously established requirements. While the use of renewable electricity can deliver significant reductions in GHG emissions, a variety of factors can drive the implementation of an RPS, including job creation in the renewables industry, diversification of energy sources, and improved air quality.<sup>5</sup>

**Public Benefit Funds.** Almost half of U.S. states have funds, often called “public benefit funds,” that are dedicated to supporting energy efficiency and renewable energy projects (see Figure 3). The funds are collected either through a small charge on the bill of every electric customer or through specified contributions from utilities. Having a steady stream of funding ensures that money is available to pay for these projects, which often include low-income household energy assistance, weatherization programs, investment in renewable technologies, and subsidies for efficient appliances.

**Figure 3**



To date, 13 states with publicly managed clean energy funds have formed the Clean Energy States Alliance to coordinate public benefit fund investments in renewable energy.

**Net Metering and Green Pricing.** Forty-five U.S. states have at least one utility that permits customers to sell electricity back to the grid; this is referred to as “net metering.” Eighteen of these states offer net metering on a statewide basis for all utilities, 24 others have statewide net metering for certain utility types, and the remaining three have individual utilities that offer net metering. In addition, 42 states have utilities that offer green pricing, allowing customers the option of paying a premium on their electric bills to have a portion of their power provided from designated renewable sources. Eleven of these states—Colorado, Delaware, Iowa, Maine, Minnesota, Montana, New Mexico, Oregon, Vermont, Virginia and Washington—have made it mandatory for electricity suppliers to offer green pricing options.

**Limits on Power Plant Emissions.** Oregon and Washington require that new power plants offset a certain portion of their anticipated CO<sub>2</sub> emissions—for example, by reducing emissions on their own or by paying a specified fee to a designated organization that will then select and fund offset projects. California, Montana, Oregon, and Washington also require new power plants to meet a GHG emissions performance standard.

**Carbon Capture and Storage.** Acknowledging that coal is a vital economic resource and likely to remain in widespread use

**Figure 4**

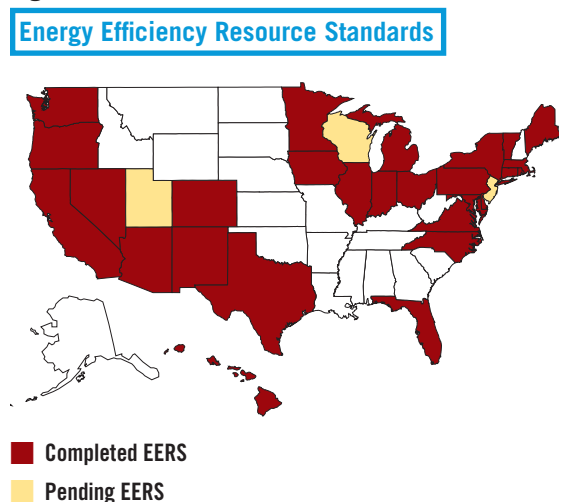
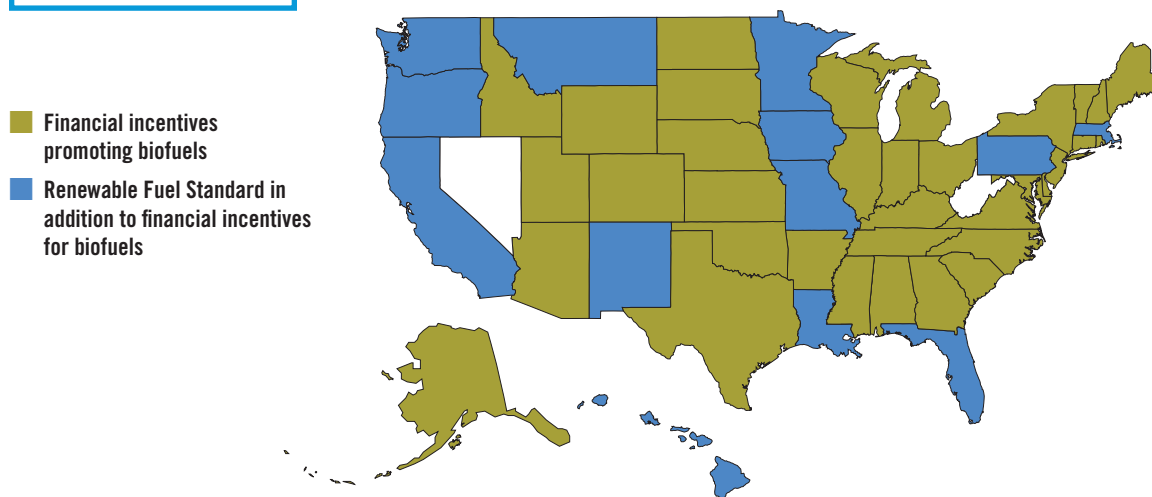


Figure 5

Alternative Fuel Policies



for decades, states have recognized the need to channel this resource into cleaner and lower-emission technologies. Carbon capture and storage is an emerging technology for reducing GHG emissions from large sources, primarily coal-fueled power plants. Colorado, Florida, Illinois, Indiana, Kansas, Kentucky, Louisiana, Minnesota, Mississippi, Montana, New Mexico, North Dakota, Rhode Island, Texas, Virginia and Wyoming have direct financial incentives for carbon capture and storage, including state bonds for construction, tax incentives, and utility cost recovery mechanisms. Many states also provide incentives for the development and use of technologies that may make carbon capture easier, such as integrated gasification combined cycle (IGCC) power plants.

**Energy Efficiency Resource Standards.** Twenty-six states have Energy Efficiency Resource Standards (EERS), which establish a target for utilities to increase energy savings by a specified amount over time from electricity and/or heating fuels (see Figure 4). This encourages utilities to either promote energy-efficient technology for consumers or integrate more efficient technology for generation. In addition, some states allow savings from energy efficiency measures to count toward their RPS requirements rather than having a separate EERS.

**Appliance Efficiency Standards.** The federal government has established minimum efficiency standards for approximately 30 kinds of residential and commercial products, including washers and dryers, refrigerators and freezers, dishwashers, and air conditioners. Numerous states—including Arizona,

California, Connecticut, Maryland, New Jersey, New York, Rhode Island, and Washington—have set standards on products not covered by federal standards. Many states have also implemented a variety of incentive programs, including rebates and tax exemptions, to promote energy efficiency.

TRANSPORTATION POLICIES

Transportation accounts for 27 percent of all U.S. GHG emissions and 32 percent of U.S. CO<sub>2</sub> emissions.<sup>6</sup> State options for reducing these emissions range from adopting more stringent emission standards for cars and trucks to offering incentives for alternative fuels and fuel-efficient vehicles.

**New Vehicle Standards.** California adopted a requirement for GHG emissions from new light-duty vehicles that would reduce new vehicle emissions on average 30 percent by 2016. California has unique authority among the states to set vehicle emissions standards because of a provision in the federal Clean Air Act that allows it to set stricter standards if granted a waiver by the EPA. Under the provision, other states have the option of either following federal or California standards. Rather than grant a waiver, the Obama administration opted to move federal standards to match California's fuel economy requirements—35.5 mpg by 2016.

**Alternative Fuels.** More than half of U.S. states provide incentives for alternative fuels, gasoline/ethanol blends, alternative-fuel vehicles, and low-emission vehicles; there are also state incentives for converting traditional vehicles

to run on alternative fuels. These incentives to promote biofuel production and use include excise tax exemptions, tax credits, and grants. In addition to these incentives, 13 states have established Renewable Fuels Standards (see Figure 5). These are requirements that gasoline sold in the state must contain a certain percentage of renewable fuel, such as ethanol or biodiesel. Some states also 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 specified fuel efficiency standard. While biofuels' emission performance can vary on a life-cycle basis depending on how the fuel is made, they have the potential to diversify the energy supply and promote energy security. States that ensure the production of low-emitting biofuels are well placed to utilize this resource as an alternative to fossil fuels.

**Incentives for Low-Carbon Fuels and Vehicles.** Building on their policies to promote biofuel use, several states are in the process of implementing performance standards (e.g., a low-carbon fuel standard) to lower the carbon content of the fuels used in transportation. In January 2007, California announced the first low-carbon fuel standard, which set a goal of reducing the life-cycle carbon intensity<sup>7</sup> of transportation fuels by a minimum of 10 percent by 2020. The California LCFS was formally adopted in January 2010 and took effect in January

2011. Market-based mechanisms, such as credit trading, will allow fuel providers to meet the standard in a cost-effective manner. In the Midwest, an advisory group comprised of members of the Midwestern Governors Association's Energy Security and Climate Stewardship Platform, the North Central Bioeconomy Consortium, and various other stakeholders, is considering a regional low-carbon fuel policy as an option to reduce emissions in the transportation sector.

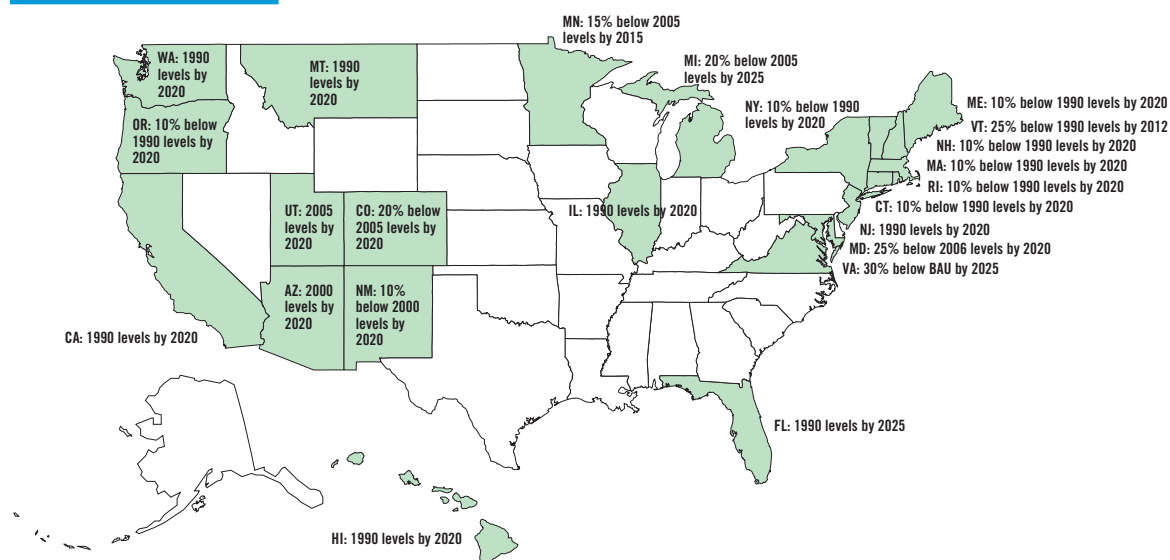
## AGRICULTURAL POLICIES

Agriculture contributes approximately 7 percent of total U.S. GHG emissions, primarily nitrous oxide and methane from livestock, agricultural soils, and the use of fertilizers.<sup>8</sup> In addition to reducing these emissions through more strategic land and crop management and more efficient use of agricultural inputs, farmers can store carbon in plants and soils and substitute biofuels for fossil fuels to "offset" emissions from other sectors of the economy.

**Supporting Biomass as a Climate Solution.** The use of renewable "biomass" resources—including crops and residual material from agriculture, forestry, or animal wastes—as a low-carbon energy source offers an opportunity for the agricultural sector to address climate change in a profitable way. Biomass can be burned directly for electricity, or it can be converted to other usable fuels, including biofuels.

Figure 6

### State Emission Targets



States promote the development and use of biomass resources in a variety of ways. Biomass is an eligible resource under many state Renewable Portfolio Standards, and a variety of grant, tax, and other incentive programs also encourage the use of biomass. Illinois, for example, uses revenue from its Public Benefit Fund to provide grants for on-site electricity generation that uses biogas or biomass gasification.

**Promote Soil Conservation.** The agricultural sector also can help protect the climate by promoting farming techniques that increase the amount of carbon stored in soil. A variety of practices, including low-till and no-till farming, can increase the amount of carbon naturally stored in soil. In addition to this climate benefit, these practices have other beneficial effects, such as improved soil quality, reduced erosion, and improved water quality. State policies promoting conservation practices come in a variety of forms, including no-interest loans and tax incentives.

#### EMISSION TARGETS AND CLIMATE ACTION PLANS

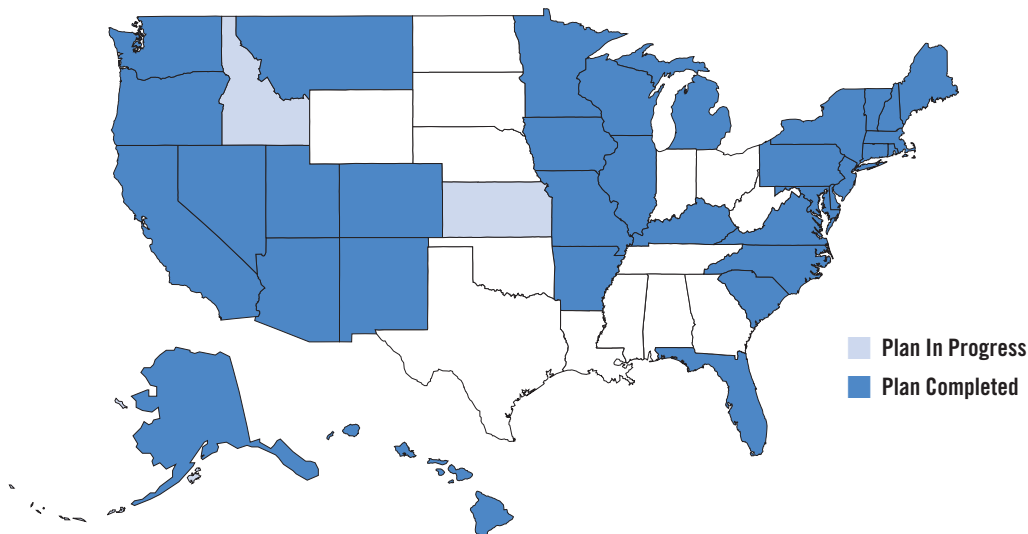
Many states are taking a comprehensive approach to climate policy by establishing statewide GHG emission reduction targets and developing climate action plans that provide a range of policy recommendations to address climate change, including measures to reduce emissions and respond to impacts.

**Emission Targets.** Twenty-three states have adopted statewide emission targets and goals (see Figure 6). The stringency and timelines associated with these targets varies by state. Each state is using a different suite of actions to achieve its greenhouse gas targets. The first enforceable statewide GHG emissions target was established in 2006 by California with A.B. 32, the Global Warming Solutions Act.

**Climate Action Plans.** Thirty-six states have completed comprehensive climate action plans or are in the process of revising or developing one (see Figure 7). In addition, more than half of the states have set up advisory boards or commissions to develop and/or implement climate action plans. The process of developing a climate action plan can help state decision-makers identify cost-effective opportunities to reduce GHG emissions in ways that are most appropriate for their states, taking into account the individual characteristics of each state's economy, resource base, and political structure. In addition to addressing measures to reduce GHG emissions, a number of climate action plans have also focused on what the state must do to adapt to some degree of climate change. Note: please see *Climate Change 101: Adaptation* for more information on state adaptation efforts.

Figure 7

#### State Climate Action Plans





## LEARNING FROM THE STATES

In recent years, states have acted as leaders on climate action. Climate-friendly policies have emerged across the country to address key sectors, from electricity to transportation to agriculture, with significant variation in design. By acting as policy laboratories, states have been able to tailor policies to their own circumstances, test innovative approaches, and build experience with program design and implementation. The experiences of early acting states have already helped shape other state policies and will similarly be able to inform future state, regional, and federal action.

For example, state and regional experience to date suggests that some programs, such as emission inventories or cap-and-trade programs, should be designed so they can easily be expanded, linked to, or integrated with other programs at the regional and national levels. Since regional action can be more efficient and effective than individual state programs, designing easily expandable programs or joining a regional program can be an effective way to deal with climate change within the strict budget requirements that states face.

A key issue is the appropriate respective roles of different levels of government. The history of environmental protection in the United States shows that very few areas have been vested in the exclusive control of either the state or federal governments alone; rather, most are areas of overlapping or shared competence. Federal climate policy will be most successful if it is designed with the relative strengths of each level of government in mind.<sup>9</sup> Thus, policy makers need to ensure that state-level efforts are taken into account in the design of federal programs.

## ENDNOTES

- 1 Climate Analysis Indicators Tool (CAIT UNFCCC) version 2.0. (Washington, DC: World Resources Institute, 2008). Available at <http://cait.wri.org>. Climate Analysis Indicators Tool (CAIT US) version 2.0. (Washington, DC: World Resources Institute, 2008). Available at <http://cait.wri.org>. [http://www.arb.ca.gov/cc/inventory/data/tables/rpt\\_Inventory\\_IPCC\\_Sum\\_2007-11-19.pdf](http://www.arb.ca.gov/cc/inventory/data/tables/rpt_Inventory_IPCC_Sum_2007-11-19.pdf)
- 2 IPCC 2007. *Climate Change 2007—Impacts, Adaptation and Vulnerability. Contribution to Working Group II to the Fourth Assessment Report of the IPCC*. Cambridge University Press, UK, 976pp.
- 3 To learn more about how cap and trade works, see “Climate Change 101: Cap and Trade.” Pew Center on Global Climate Change, 2008.
- 4 EPA. 2010. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2008*. EPA 430-R-08-005. Washington, D.C. [http://www.epa.gov/climatechange/emissions/downloads10/US-GHG-Inventory-2010\\_Report.pdf](http://www.epa.gov/climatechange/emissions/downloads10/US-GHG-Inventory-2010_Report.pdf)
- 5 For more information see *Race to the Top: The Expanding Role of U.S. State Renewable Portfolio Standards*. Pew Center on Global Climate Change, 2006.
- 6 EPA. 2010. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2008*. EPA 430-R-08-005. Washington, D.C. [http://www.epa.gov/climatechange/emissions/downloads10/US-GHG-Inventory-2010\\_Report.pdf](http://www.epa.gov/climatechange/emissions/downloads10/US-GHG-Inventory-2010_Report.pdf)
- 7 Life-cycle carbon intensity is defined as the amount of GHG emissions per unit of energy consumed over the entire life-cycle of the fuel, from production or extraction, processing and combustion.
- 8 EPA. 2010. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2008*. EPA 430-R-08-005. Washington, D.C. [http://www.epa.gov/climatechange/emissions/downloads10/US-GHG-Inventory-2010\\_Report.pdf](http://www.epa.gov/climatechange/emissions/downloads10/US-GHG-Inventory-2010_Report.pdf)
- 9 For further discussion of the roles of the state and federal governments in climate policy, see Litz, Franz T. *Toward a Constructive Dialogue on Federal and State Roles in U.S. Climate Policy*. Pew Center on Global Climate Change, 2008.

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