



Climate Solutions from Day One

12 Ways Governors Can Lead on Climate Now

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Foundation

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Contents

Executive Summary	1
Introduction	4
Governors Can Take Rapid Action to Reduce Climate Pollution	5
12 Ways America’s New Governors Can Take Climate Action Right Now	6
Set Goals.....	7
1. Set a statewide emission reduction goal	7
2. Set clean energy and energy reduction goals.....	8
3. Set an electric vehicle adoption goal	9
4. Set a statewide waste reduction goal	10
Lead by Example	11
5. Direct state government to reduce energy use and install clean energy.....	11
6. Direct state government to use electric vehicles for state fleets, public transit and schools	13
7. Direct state government to reduce waste from state operations	14
Make Statewide Policy Changes.....	14
8. Set strong building energy codes	14
9. Shift transportation spending and policies to encourage low-carbon modes	15
10. Incentivize electric vehicles and raise vehicle emission standards	17
11. Limit or slow the production of climate-altering fossil fuels.	18
12. Collaborate on regional climate initiatives.	19
The Power of Appointment.....	21
Recommendations for Effective Action	22
Notes	23

Executive Summary

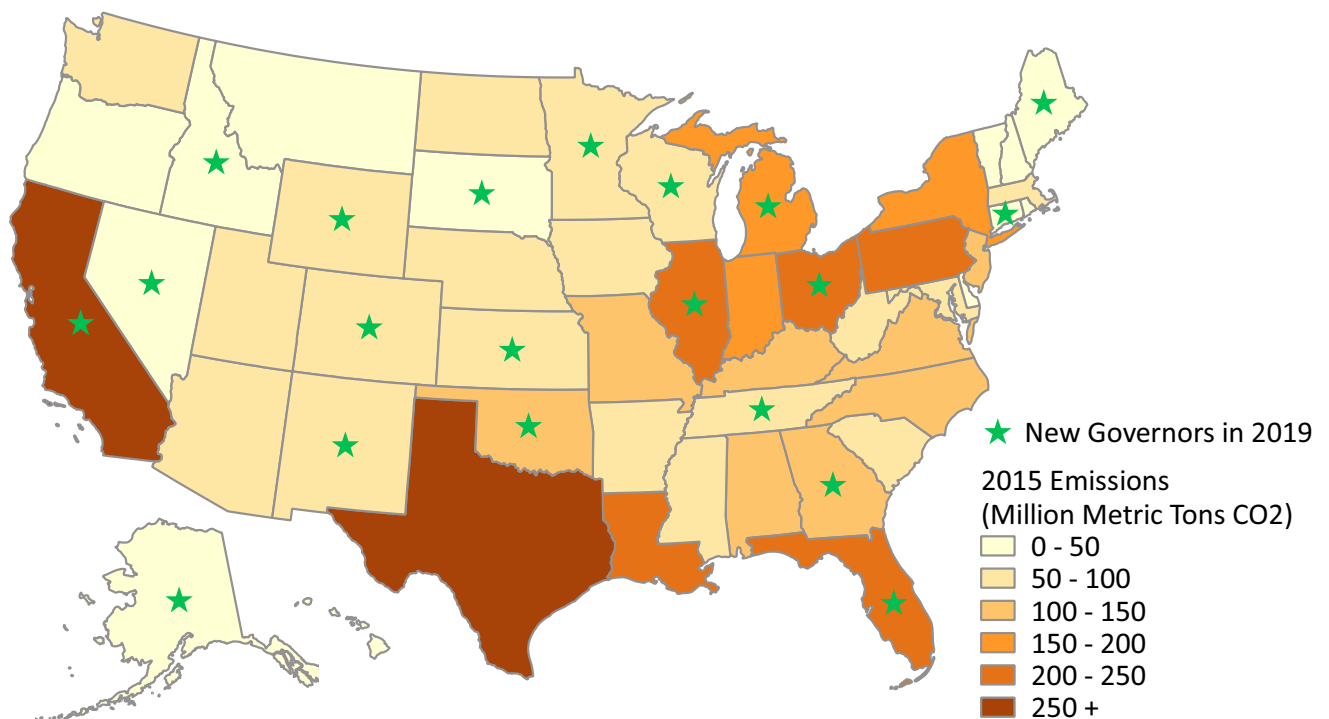
New governors are getting ready to take office in 20 states, from Florida to Alaska. As America's newly elected governors prepare to take on their states' biggest challenges, they should prioritize taking bold action on the greatest challenge of our time: climate change.

Governors have extensive power to reduce carbon pollution and put their states on a path to clean energy – often with just a stroke of the pen. Over the last decade, governors have adopted sweeping emission reduction goals, accelerated the transition to clean energy, forged regional agreements to tackle climate change, and appoint-

ed leaders of state agencies empowered to implement policies to reduce pollution in buildings, at electric utilities, in transportation and throughout the economy.

States with newly elected governors are home to 150 million people and emit 2.1 billion metric tons of carbon dioxide emissions each year – 45 percent of the United States total and more than any other country besides China and India.¹ **The 12 actions highlighted in this report can be taken by many of America's new governors right now – making an immediate difference in the fight against global warming.**

Figure ES-1. States with New Governors for 2019 Account for 45 Percent of U.S. Climate Emissions²



Governors should set ambitious goals for reducing carbon pollution and accelerate the transition to clean energy.

- **Action #1: Set a strong statewide emission reduction goal.** An ambitious emission reduction goal can focus the efforts of state agencies and rally the public behind climate solutions. In California, Governor Jerry Brown's 2015 order establishing a 40 percent emission reduction target led the state legislature to adopt the target by law one year later.³
- **Action #2: Set strong clean energy and energy reduction goals.** Clean energy goals help focus state agencies and the public on charting a path to less energy waste and more renewable energy. In New Jersey, Governor Phil Murphy's offshore wind goal led to the nation's largest offshore wind solicitation to date.
- **Action #3: Set goals for electric vehicles.** Electric vehicle (EV) goals help states measure the progress of policies such as rebates, commercial fleet programs and expansion of EV charging infrastructure, while highlighting the need for additional policies. In Oregon, Governor Kate Brown's executive order establishing a state EV goal also directed state agencies to begin rulemaking for an EV rebate program, and to plan and budget for the installation of EV charging infrastructure.⁴
- **Action #4: Set a waste reduction goal.** The process of producing and disposing of goods is responsible for 42 percent of all U.S. greenhouse gas emissions. A waste reduction goal can drive states to adopt policies to increase recycling, reduce packaging, or create composting programs. In Maryland, former Governor Martin O'Malley set a goal for the state to divert 85 percent of its waste away from landfills by 2040 and achieve an 80 percent recycling rate.

Governors can ensure state governments "lead by example" by requiring state agencies to make climate-friendly purchasing decisions.

- **Action #5: Direct state agencies to deploy clean energy.** State governments spend more than \$11 billion each year on energy.⁵ Governors can direct state agencies to reduce energy use and purchase clean energy. In Massachusetts, former Governor Deval Patrick's directive led to state operations reducing greenhouse gas emissions by 28 percent, increasing solar energy capacity nearly 400-fold, and lowering fuel oil consumption for heating by more than 19 million gallons.⁶
- **Action #6: Direct state agencies to adopt and encourage electric vehicles.** Governors can require state agencies to shift toward electric vehicle fleets and encourage transit agencies and education departments adopt electric buses. The nine governors who signed onto the Multi-State ZEV Task Force agreed to accelerate state agency adoption of zero-emission vehicles as one measure to help achieve a goal of 3.3 million ZEVs on the road across participating states by 2025.
- **Action #7: Direct state agencies to reduce waste from state operations.** State governments are major consumers of disposable goods, and initiatives to reduce waste and increase recycling can make an important impact. Some best practices recommended by the U.S. Environmental Protection Agency include purchasing products in bulk, making paper documents available electronically, reusing cardboard moving boxes, reusing office furniture and supplies, and using durable dining ware. In Pennsylvania, former Governor Ed Rendell directed state government to procure Energy Star and other efficient products, and to develop conservation measures for all state-owned buildings.⁷

Governors often have the power to make policy decisions with lasting benefits for the climate.

- **Action #8: Set strong energy building codes.** Homes, offices and other buildings account for almost 40 percent of U.S. energy use.⁸ Some governors have the authority to initiate the code amendment process and to recommend improvements in efficiency and clean energy readiness, particularly in states where building codes are amended at the state level through a regulatory rather than legislative process. In Oregon, Governor Kate Brown directed the amendment of state building codes to require, by 2025, that new homes and commercial buildings meet stringent efficiency standards and be constructed to accommodate installation of solar panels and EV charging.⁹
- **Action #9: Shift transportation spending and policies to support low-carbon modes.** Transportation is the nation's leading source of global warming pollution in the U.S.¹⁰ Many governors are empowered through state transportation departments to allocate federal and state transportation funds. By focusing additional resources on low-emission transportation modes like walking, biking and public transit, and changing state policies that hinder those modes, governors can reduce the climate impact of transportation. In Delaware, former Governor Jack Markell directed the Delaware Department of Transportation to, whenever possible, improve infrastructure for walking or biking when building or maintaining roadway.¹¹
- **Action #10: Incentivize electric vehicles and adopt Cleaner Cars standards.** Governors can direct state agencies to incentivize electric vehicles in a variety of ways. In some states, governors can initiate the process of adopting the cleaner vehicle standards currently in place in California and 12 other states, which set greenhouse gas standards for vehicles and increase the availability of zero-emission vehicles. In Colorado, Governor John Hickenlooper began the process of adopting cleaner vehicle standards through an executive order in 2018.¹²

Governors can limit or slow the production of climate-altering fossil fuels.

- **Action #11 : Limit new fossil-fuel infrastructure.** Infrastructure for the production and transportation of fossil fuel – including wells, refineries, pipelines and shipping terminals – typically requires state permitting and approval. By setting high environmental standards for these facilities, or denying permission for them to operate, governors can limit the production or flow of fossil fuels through their state. In Pennsylvania, Governor Tom Wolf issued an executive order reinstating a moratorium on new leases for oil and gas development in state parks and forests.¹³

Governors can rally neighboring states to join regional agreements to address climate change.

- **Action #12. Collaborate in regional climate initiatives.** Electric grids, highways and pipelines cross state lines. Collaborative efforts among states can make certain types of climate action easier and create a “race to the top” dynamic that leads to more ambitious action. By entering or forming partnerships with neighboring states, governors can push forward region-wide action to reduce global warming pollution, and enlist a broad set of resources across state lines for achieving climate progress. In Virginia, former Governor Terry McAuliffe's executive order set the state on a course to take part in the Regional Greenhouse Gas Initiative, a regional power plant emissions cap-and-invest program.

In addition to these specific actions, governors can use their **appointment power** to name climate champions to key posts in state government.

Because each state has different laws, the actions new governors can take will vary by state. But by taking action where possible, governors have an opportunity to make a meaningful difference in the effort to protect their states and the world from the worst impacts of global warming.

Introduction

Imagine that you had the power to reduce your state's contribution to global warming. Tomorrow. With a stroke of a pen.

What would you do first?

Twenty newly elected governors in states across the country will wake up one morning in January with that power in their hands. In the U.S. system of government, states have the power to make a tremendous difference in the fight against global warming. And as elected officials with the power to appoint the heads of state agencies, propose budgets, spend money, set policy, issue executive orders, and use their "bully pulpit" to rally the public, governors have tremendous influence over their states' responses to climate change.

Actions taken by leading states are already ensuring that the United States will continue to act on climate,

despite President Trump's decision to withdraw from the Paris Climate Agreement. Emission reduction commitments made to date by states, cities and counties will reduce greenhouse gas emissions by 500 million metric tons in 2025 when they are fully implemented.¹⁴ As the level of government that regulates energy utilities, transportation and building energy efficiency, states have the authority to go even further, even without action from Washington, D.C.

The days and weeks immediately following Inauguration Day 2019 represent an opportunity for newly elected governors to stake their claim to climate leadership. This report provides 12 ideas for actions that governors can take right away to reduce their states' contribution to climate change and send a message to the nation and the world that America is "still in" the fight against global warming.

Governors Can Take Rapid Action to Reduce Climate Pollution

As new governors prepare to take office in January 2019, one of the most urgent tasks they face is to take part in the effort to prevent the worst impacts of global warming. Each new governor has the opportunity to use their executive powers to take rapid action against climate change. Many of these actions can take place immediately, or be implemented within just a few months.

In most states, the most likely avenue for governors to take rapid action is through executive orders that direct state agencies to carry out their responsibilities in ways that reduce their impact on the climate.¹⁵ The authority available to governors through executive order varies by state, but generally includes the power to:¹⁶

- Give guidance on implementation of existing law.
- Direct agencies to implement policies related to the execution of their duties or internal management.
- Set non-binding state goals.

- Enter regional agreements with other state governments.

Each year, U.S. governors issue hundreds of executive orders on a wide variety of topics.¹⁷ They can be important tools for policy changes on a wide variety of issues. For example, a study published in the journal *Public Health Reports*, the official journal of the U.S. Surgeon General and the U.S. Public Health Service, found that gubernatorial executive orders can help improve public health by establishing new public health programs, directing public health agencies, and controlling state operations.¹⁸

Indeed, executive orders have already been used to set climate policy for current and past state administrations. The following pages document examples from governors in 26 states, including executive orders that set emission reduction goals in North Carolina, kickstarted development of offshore wind in New Jersey, initiated efficient building code amendments in Oregon, banned fossil fuel production in state forests in Pennsylvania, and more.

12 Ways America's New Governors Can Take Climate Action Right Now

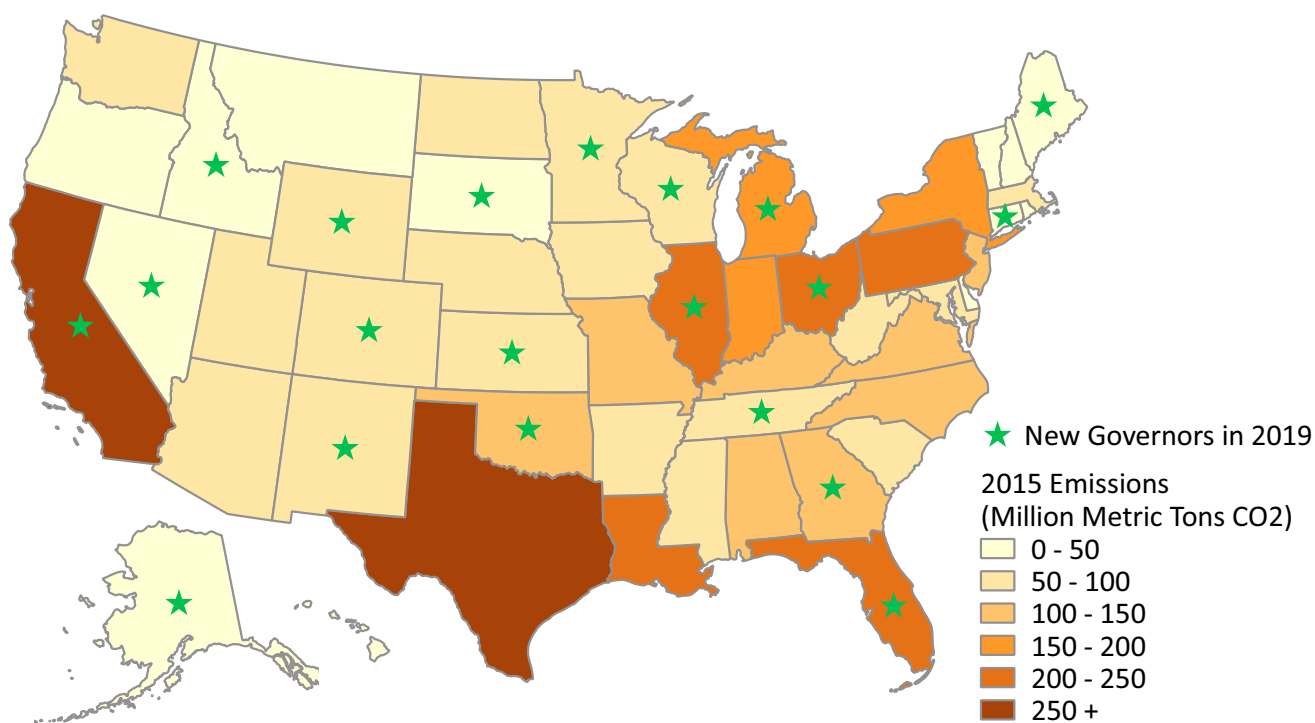
In November 2018, the American people elected 20 new governors in states across the country, from Florida to Alaska. Those states are home to 150 million people, have a combined GDP of nearly \$9 trillion, and each is home to its own traditions, history, laws and culture.¹⁹ Those states also emitted 2.1 billion metric tons of global warming pollution in 2015, accounting for 45 percent of United States emissions and more emissions than any country besides China and India.²⁰

If the United States is to do its share to prevent the worst impacts of global warming, each newly elected

governor must make reducing climate emissions an immediate priority. Fortunately, as new governors take office in January, they have a suite of tools at their disposal to take rapid action.

Because each state has different laws and circumstances, the actions new governors can take will vary by state. The following pages provide 12 ideas for immediate actions that many governors are empowered to take to reduce carbon pollution, along with examples of similar steps taken by previous governors.

Figure 1. The 20 States with New Governors Account for 45 Percent of U.S. Climate Emissions²¹



The actions fall into the following categories:

- Setting goals
- Leading by example
- Setting clean energy policy
- Limiting production of fossil fuels
- Forming regional climate agreements

Set Goals

By setting climate goals, governors can guide state agency rulemaking and operations, encourage new legislation, and motivate the broader public to act. In several states, executive orders have unleashed policy shifts with far-reaching consequences.

1. Set a statewide emission reduction goal

A goal to reduce statewide emissions can help guide a state toward a future of cleaner energy and lower carbon emissions. In some cases, executive orders have served as a catalyst for legislative action. In California, for example, Governor Jerry Brown's 2015 order establishing a 40 percent emission reduction target led the state legislature to establish the target as law one year later.²²

Emissions goals can be powerful tools for organizing the public and raising awareness of the threat of climate change. In North Carolina, Governor Roy Cooper referenced the damage wrought by Hurricane Florence in announcing his executive order establishing a 40 percent emission reduction goal.²³

The inherently broad nature of an economy-wide goal adds to the importance of issuing accompanying directives for state agencies to draft detailed plans, strategies and technology-specific goals to help bring the overall goal within closer reach. These studies can help inform future legislative or rulemaking efforts. Governor Cooper's goal, for example, also

set a state zero-emission vehicle goal, and directed the state's Department of Environmental Quality to develop a North Carolina Clean Energy Plan.²⁴



In North Carolina, Governor Roy Cooper referenced the damage wrought by Hurricane Florence in announcing his executive order establishing a 40 percent emission reduction goal.²⁵ Credit: North Carolina Governor's Office

Examples

- **North Carolina, 2018, Governor Roy Cooper: Executive Order No. 80: North Carolina's Commitment to Address Climate Change and Transition to a Clean Energy Economy.**²⁶ Governor Cooper's executive order established that North Carolina will "strive to accomplish" by 2025 a 40 percent reduction in greenhouse gas emissions below 2005 levels, an increase in the number of electric vehicles on the road to 80,000, and a reduction in energy consumption per square foot in state-owned buildings by 40 percent. Among its other provisions, the order directed the North Carolina Department of Environmental Quality to create an energy plan "that fosters and encourages the utilization of clean energy resources" and directed all cabinet agencies to "prioritize ZEVs [zero-emission vehicles] in the purchase or lease of new vehicles" and to "use ZEVs for agency business travel when feasible."

- **California, 2018, Governor Jerry Brown: *Executive Order B-55-18 to Achieve Carbon Neutrality*.**²⁷ This executive order established a new state-wide goal “to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter.” In addition, the executive order directed the California Air Resources Board to work with “relevant state agencies” to “develop a framework for implementation and accounting that tracks progress toward this goal.” The order also stated that all policies formed in pursuit of the carbon neutrality goal should also seek to improve air quality and “support the health and economic resiliency of urban and rural communities, particularly low-income and disadvantaged communities.”
- **Colorado, 2017, Governor John Hickenlooper: *Executive Order D 2017-015 Supporting Colorado’s Clean Energy Transition*.**²⁸ This executive order set a goal of reducing statewide greenhouse gas emissions by more than 26 percent from 2005 levels by 2025. In addition, the order set a goal to reduce CO₂ emissions from the electricity sector by 25 percent by 2025, compared to 2012 levels, and by 35 percent no later than 2030. The order also directed various state agencies to develop a plan to build electric vehicle charging corridors across Colorado.

2. Set clean energy and energy reduction goals

Electricity generation accounts for 28 percent of U.S. global warming pollution, and reducing dependence on fossil fuels for the grid is necessary in order to prevent the worst impacts of global warming.²⁹

At least five governors-elect have already signaled their intention to put their state on a path to being powered entirely, or almost entirely, by clean energy.³⁰ Setting a clean energy goal can be a good start. Clean energy goals can help chart a path to a clean energy future, either through targets for deployment of a specific technology, or broader goals to coordinate efforts around a range of clean energy technologies.

In New Jersey, Governor Phil Murphy has set both economy-wide and technology-specific clean energy goals. Murphy issued one executive order directing state agencies to update the state’s Energy Master Plan to include a path to 100 percent clean electricity by 2050.³¹ Murphy also built on the state’s existing Offshore Wind Economic Development Act by establishing a goal of 3,500 megawatts of offshore wind and directing relevant state agencies to help achieve the goal.³² Following that order, New Jersey began to solicit developer proposals for a 1,100-megawatt offshore wind farm, the largest such solicitation in the U.S. to date.³³

Goals to reduce energy use can guide state efforts toward energy efficiency and conservation, which are among the cheapest and easiest ways for states to reduce global warming emissions. Many energy efficiency solutions are available today and can be deployed quickly. Improved efficiency also makes it easier to achieve a future renewable grid by reducing the need for new clean energy infrastructure.³⁴ Legislatures can give energy reduction goals the force of law by creating policies like an energy efficiency resource standard, which generally require utilities to meet energy savings targets through customer-facing efficiency programs.³⁵

Examples

- **New Jersey, 2018, Governor Philip Murphy: *Executive Order No. 28 Committing to a Plan for 100% Clean Energy*.**³⁶ Governor Murphy’s executive order called for a new Energy Master Plan with directives to include a “blueprint” for 100 percent clean energy before 2050 and recommendations to set energy storage goals.
- **New Jersey, 2018, Governor Philip Murphy: *Executive Order No. 8 Supporting the Development of Offshore Wind*.**³⁷ Murphy’s executive order directed state agencies to “take all necessary actions” under the 2010 Offshore Wind Economic Development Act to meet a goal of

3,500 megawatts of offshore wind energy by 2030. The order also directed the Board of Public Utilities to create an Offshore Wind Strategic Plan, and required the board to open a discussion with neighboring states about forming a regional collaboration to pursue offshore wind and other avenues for fighting climate change.

- **Massachusetts, 2018, Governor Charlie Baker: Offshore wind power commitment.**³⁸ During his 2018 re-election campaign, Governor Charlie Baker signed a commitment to “take all necessary steps to ensure that Massachusetts remains a leader in the effort to launch the nation’s offshore wind industry.” Under the commitment, Baker pledged to fulfill and act quickly on the state’s existing offshore wind requirements, complete the study of “an additional 1,600 MW of offshore wind” by May 2019, and explore the development of a joint offshore wind procurement agreement with other New England states.³⁹
- **California, 2008, Governor Arnold Schwarzenegger: Executive Order S-14-08 Expanding California’s Renewables Portfolio Standard.**⁴⁰ Governor Schwarzenegger’s executive order expanded the state’s renewable electricity portfolio by requiring that California’s electricity suppliers serve 33 percent of their electricity sales with renewables by 2020.
- **Colorado, 2017, Governor John Hickenlooper: Executive Order D 2017-015 Supporting Colorado’s Clean Energy Transition.**⁴¹ As part of the executive order targeting greenhouse gas emissions from the electricity sector, Governor Hickenlooper set a goal for Colorado to achieve “electricity savings of 2 percent of total electricity sales per year by 2020 through cost-effective energy efficiency.”
- **New York, 2018, Governor Andrew Cuomo: Executive Order to Develop an Energy Efficiency Initiative.**⁴² Governor Cuomo’s executive order

directed the Department of Public Service and the New York State Energy Research and Development Authority (NYSERDA) to develop a proposal for a new energy efficiency initiative and to develop a 2025 efficiency target by Earth Day of that year. The order culminated in NYSEDA’s “New Efficiency: New York” report, which established an efficiency target of 185 trillion Btu of cumulative energy savings relative to the state’s 2025 forecast and proposed an efficiency initiative to meet that target.⁴³

3. Set an electric vehicle adoption goal

In 2016, transportation became the nation’s leading source of global warming pollution.⁴⁴ Passenger cars and trucks are the largest source of transportation emissions, and together are responsible for nearly a quarter of U.S. global warming pollution.⁴⁵

The adoption of electric vehicles (EVs) is an effective tool for reducing vehicle emissions.⁴⁶ EVs are far cleaner and more efficient than gas- and diesel-powered vehicles and, if powered by renewable energy, electric vehicles are a nearly emission-free form of transportation.⁴⁷ A study by the Natural Resources Defense Council and the Electric Power Research Institute found that, combined with a cleaner electric grid, widespread adoption of electric vehicles could reduce annual emissions by 550 million metric tons by 2050, equivalent to taking 100 million gas-powered passenger vehicles off the road.⁴⁸

Governors setting an EV goal can help to ensure its success by directing state agencies to undertake supportive efforts such as providing rebates for electric vehicles, establishing programs to encourage the use of EVs in commercial fleets, and deploying EV charging infrastructure. Oregon Governor Kate Brown’s executive order establish a goal of 50,000 EVs by 2020, for example, was accompanied by an order for state agencies to begin rulemaking for an EV rebate program in support of the goal, and to plan and budget for the installation of EV charging infrastructure.⁴⁹

Examples

- **California, 2018, Governor Jerry Brown: *Executive Order B-48-18 Zero-Emission Vehicle Executive Order*.**⁵⁰ This directed state entities to “work with the private sector and all appropriate levels of government” to put at least 5 million zero-emission vehicles (ZEVs) on the road by 2030 and develop the charging and re-fueling infrastructure to support these vehicles.
- **Oregon, 2017, Governor Kate Brown: *Executive Order 17-21 Advancing Vehicle Electrification*.**⁵¹ This order set a goal to have at least 50,000 electric vehicles registered and in operation by 2020. To facilitate this goal, the order directed the Oregon Department of Environmental Quality to oversee rulemaking for the state’s electric vehicle rebate programs, and instructed several state agencies to advise school districts and transit agencies on making decisions about bringing ZEVs into their fleets.
- **Governors of nine states, 2013: *Signers of the State Zero-Emission Vehicle Programs Memorandum of Understanding*.**⁵² Governors who signed the *State Zero-Emission Vehicle Programs Memorandum of Understanding*, the establishing document of the Multi-State ZEV Task Force, committed their states to “a collective target of having at least 3.3 million zero-emission vehicles on the road in our states by 2025,” to lead by example through state agency ZEV purchases, and to “evaluate the need for, and effectiveness of, monetary incentives to reduce the upfront purchase price of ZEVs,” among other measures.⁵³

4. Set a statewide waste reduction goal

Reducing waste is an important tool for reducing climate emissions. Landfills are the United States’ third-largest source of human-related methane emissions, a global warming pollutant many times more potent than carbon dioxide.⁵⁴ Incinerators emit global warming pollution, along with other forms of pollution that are directly harmful to human health.⁵⁵ The process of

producing and disposing of goods – extracting resources, manufacturing goods, disposing of waste, and transporting materials throughout the process – produces 42 percent of all U.S. greenhouse gas emissions.⁵⁶ Producing goods from recycled materials is significantly less energy intensive than from virgin inputs.⁵⁷ Making aluminum from recycled material uses 95 percent less energy than making aluminum from raw materials.⁵⁸

A waste reduction goal can help states coordinate a broad variety of waste reduction efforts, from increasing recycling to reducing packaging to launching composting programs. Goals can be used to guide future legislative efforts including legislation creating or expanding state and local recycling and composting programs, laws protecting consumers’ right to repair products without voiding warranty, bans on single-use items that are not easily recyclable (like plastic bags), and laws that require producers to take more responsibility for their products during their entire lifecycle.⁵⁹

Executive orders to reduce waste are most effective when they include supportive policies. In Maryland, Governor Martin O’Malley’s waste reduction order also created a moratorium on new landfills and directed state agencies to reduce waste and to “consider source reduction in procurement.”⁶⁰

Examples

- **Maryland, 2015, Governor Martin O’Malley: *Executive Order 01.01.2015.01 to Create a Zero Waste Plan for Maryland*.** Governor O’Malley’s executive order set a goal for the state to divert 85 percent of its waste away from landfills by 2040 and achieve an 80 percent recycling rate.⁶¹ The order created a moratorium on new landfills and directed the Maryland Department of the Environment to “provide local governments with information on alternatives to land-filling.”⁶² The order was later repealed by Governor Larry Hogan and replaced with a new executive order that rescinds the moratorium on permits for new landfills and modifies the original order’s recycling goals.⁶³

Lead by Example

Governors generally have the power to make decisions over the daily operations of state agencies and have some authority over how they spend money appropriated for their use by the legislature. This includes the ability to direct agencies to adopt practices that reduce emissions. These “lead by example” measures create opportunities for immediate emission reductions, support innovative businesses, and demonstrate the potential for emission reductions to the public, businesses and local governments.

5. Direct state government to reduce energy use and install clean energy

State governments spend more than \$11 billion each year on energy.⁶⁴ Directives for state government to reduce energy use and install clean energy, therefore, can help states quickly achieve emission reductions, while also helping develop the state clean energy market.

Most states have significant opportunities to reduce energy use and install clean energy. According to the U.S. Environmental Protection Agency, improving efficiency in state facilities can decrease energy consumption by 35 percent in existing buildings, and by 50 percent in new or renovated buildings.⁶⁵ And according to the American Council for an Energy-Efficient Economy, by reducing state government building energy use by 20 percent, the average state can save nearly 1.2 trillion Btu of energy annually, equivalent to the annual energy use of nearly 15,000 households.⁶⁶ States also own extensive property on which to install clean energy technologies like solar panels and electric vehicle chargers.

In addition to climate benefits, leading by example can bolster wider state efforts to transition to a clean energy system. According to the U.S. EPA, leading by example can support the development of state markets for clean energy products, make technical and financial resources available, and help develop

and implement programs that can ultimately assist constituents with their own clean energy projects.⁶⁷

Clean energy “lead by example” programs have achieved real results. In Massachusetts, Governor Deval Patrick’s 2007 executive order called for state government to achieve a variety of clean energy and energy reduction targets.⁶⁸ That order led to state operations reducing greenhouse gas emissions by 28 percent, increasing solar energy capacity nearly 400-fold, and lowering fuel oil consumption for heating by more than 19 million gallons.⁶⁹



As part of Rhode Island’s clean energy “lead by example” efforts, established through executive order by Governor Gina Raimondo in 2015, these electric vehicle chargers were installed in a state parking lot in Providence.⁷⁰ Photo: Rhode Island Office of Energy Resources

Examples

- **Rhode Island, 2015, Governor Gina Raimondo: Executive Order 15-17 State Agencies to Lead by Example in Energy and Clean Energy.**⁷¹ This order created a “lead by example” program within the state’s Office of Energy Resources to “oversee and coordinate efforts at State agencies to reduce energy consumption and greenhouse gas emissions.” These efforts will work toward the goals of lowering the energy consumption of state agencies to at least 10 percent below 2014 levels by 2019, as well as transitioning their buildings to be powered by

100 percent renewable energy by 2025 (subject to funding constraints). This order also seeks to make 25 percent of state agencies' fleet purchases and leases zero-emission vehicles by 2025.⁷²

- **New York, 2012, Governor Andrew Cuomo: *Executive Order 88 Directing State Agencies and Authorities to Improve the Energy Efficiency of State Buildings.***⁷³ This order directed state government to reduce the average energy use intensity in state-owned and managed buildings by 20 percent under fiscal year 2010/2011 levels by April 2020. To do this, the order created a management team that will oversee reforms and set up an energy monitoring and auditing system for large, state-owned buildings.
- **Minnesota, 2017, Governor Mark Dayton: *Executive Order 17-12 Directing State Agencies to Conserve Energy and Water, and Reduce Waste to Save Money.***⁷⁴ Governor Mark Dayton's executive order directed state agencies to "improve their operational practices," including reducing building energy consumption per square foot by 30 percent by 2027, reducing vehicle fleet fuel consumption by 30 percent by 2027, and ensuring that 25 percent of spending on "priority contracts" are "sustainable purchases" by 2025. To achieve these goals, the order created an "enterprise governance system" including a "sustainability steering team" and sustainability workgroups.
- **Minnesota, 2011, Governor Mark Dayton: *Executive Order 11-12 Providing for Job Creation through Energy Efficiency and Renewable Energy Programs for Minnesota's Public Buildings.***⁷⁵ Dayton's executive order directed state agencies to achieve a 20 percent reduction in energy use in state facilities and to collect data on internal energy consumption and other performance metrics. After receiving their data, state agencies are required to establish site-specific goals and work towards the implementation of renewable energy resources and energy efficiency improvements.⁷⁶
- **Oregon, 2017, Governor Kate Brown: *Executive Order 17-20 Accelerating Efficiency in Oregon's Built Environment.***⁷⁷ This order stipulated that all new state-owned buildings be carbon-neutral by 2022, and that state agencies adhere to "high performance energy use targets" when remodeling existing buildings. Additionally, the order directed the Department of Energy (ODOE) and Department of Administrative Services (DAS) to "develop a statewide plug load management strategy" to reduce energy usage of state buildings through measures like installing time-sensitive outlets. The order also directed state government to only purchase new equipment meeting high energy and water efficiency standards, and to consider the lifecycle costs for energy and water usage whenever analyzing possible upgrades.⁷⁸
- **Pennsylvania, 2004, Governor Ed Rendell: *Executive Order 2004-12 Energy Management and Conservation in Commonwealth Facilities.***⁷⁹ Governor Rendell's executive order directed the state's Department of General Services to take on responsibility as coordinator of state efforts to reduce energy use and improve conservation in state facilities. The order directed all state agencies to develop "no-cost or low-cost energy conservation measures for all Commonwealth-owned and leased buildings" and to adopt a variety of specific measures including the reduction of energy during peak demand periods, ensuring "that lighting systems are turned off during non-operating hours," and "conversion to more energy efficient lighting systems and bulbs as existing systems and bulbs reach the end of their life cycles."
- **Massachusetts, 2009, Governor Deval Patrick: *Executive Order 515 Establishing an Environmental Purchasing Policy.***⁸⁰ Governor Patrick's executive order directed all state agencies to procure environmentally responsible products and services whenever they are available, perform well and are the best value.

6. Direct state government to use electric vehicles for state fleets, public transit and schools

By one government estimate from 1996, U.S. state government fleets operate 525,000 vehicles and burn 490 million gallons of fuel each year.⁸¹ Burning that much fuel produces emissions equivalent to running a coal-fired power plant for more than a year.⁸²

Because state governments operate such a large number of vehicles, initiatives to adopt electric vehicles for state fleets not only reduce emissions, but also drive forward the broader electric vehicle market. State vehicles also generally follow predictable travel routes, making charging easier in states with limited charging infrastructure.

In addition, increasing use of EVs by state government:

- Grows the market for EV charging infrastructure, creating incentive for both the private and public sectors to invest in charging stations.
- Creates new comfort with EVs among government employees who drive fleet vehicles, encouraging their private use of EVs.
- Helps to establish a vibrant market for electric medium- and heavy-duty vehicles.
- Can save money over vehicle lifetimes, because charging and maintaining EVs is cheaper than for gas- and diesel-powered vehicles.⁸³

Governors can also create initiatives for state government to assist transit agencies and school districts in adopting electric buses. In Oregon, for example, Governor Kate Brown issued an executive order directing the state's energy department to assist the Oregon Department of Education "in making decisions about zero emission vehicle bus options when replacing school buses," and directed Oregon's transportation department to similarly assist transit agencies.

Switching to electric buses has the potential to bring significant health benefits to vulnerable populations. Approximately 95 percent of America's school buses and 60 percent of transit buses run on diesel, and exposure to diesel exhaust is associated with respiratory disease, cancer and higher mortality rates.⁸⁴ Negative effects are particularly pronounced in children.⁸⁵

Examples

- **Colorado, 2015, Governor John Hickenlooper: *Executive Order D 2015-013 Greening of State Government.***⁸⁶ This order sets a goal for a 20 percent reduction in "average petroleum-based fuel consumption per vehicle" in state agencies by 2020. To help them meet their targets, the executive order created a council to help create and implement policies that can reduce the petroleum consumption of agency fleets.
- **Rhode Island, 2015, Governor Gina Raimondo: *Executive Order 15-17 State Agencies to Lead by Example in Energy and Clean Energy.***⁸⁷ Among other measures, this order stipulated that 25 percent of the state's new vehicle purchases and leases will be zero-emission vehicles by 2025.
- **Washington, 2018, Governor Jay Inslee: *Executive Order 18-01 State Efficiency and Environmental Performance.***⁸⁸ This order dictates that purchases and leases of new vehicles by state agencies shall prioritize battery-electric vehicles (BEVs), and that if a BEV is not available, the agency shall "prioritize the most cost-effective low emission options available." To facilitate their use, Governor Inslee also stipulated that every state agency trip will be made with a BEV when it is feasible.⁸⁹ Additionally, the order states that the Washington State Ferry system will begin its transition to zero-carbon status by undergoing ferry electrification and "operational improvements that will conserve energy and cut fuel use."⁹⁰

- **Oregon, 2017, Governor Kate Brown: *Executive Order 17-21 Accelerating Zero Emission Vehicle Adoption in Oregon to Reduce Greenhouse Gas Emissions and Address Climate Change*.**⁹¹ In addition to setting a statewide EV goal, this order directed the state energy department, along with several other state agencies, to “develop tools and provide information” to school districts about zero-emission vehicle options when they are replacing older buses. The order also directed the state transportation department to assist transit agencies when they are making decisions about adopting zero-emission vehicle buses.⁹²

7. Direct state government to reduce waste from state operations

State governments consume large quantities of goods. In California, for example, state government is the state’s largest purchasing entity.⁹³ Reducing waste sent to landfills, and procuring products made from recycled materials, can reduce the climate impact of state government. (See “Set waste reduction goal,” page 10.)

State governments have many opportunities to reduce waste and increase recycling. Best practices recommended by the U.S. EPA for reducing waste include purchasing products in bulk, making paper documents available electronically, reusing cardboard moving boxes, reusing office furniture and supplies, and using durable dining ware.⁹⁴ State government can also commit to purchasing recycled materials, which both reduces environmental impact and can help create or maintain a stable market for recycled goods.⁹⁵

Examples

- **Maryland, 2015, Governor Martin O’Malley: *Executive Order 01.01.2015.01 Zero Waste Plan for Maryland*.**⁹⁶ This order stipulated that the state “shall consider source reduction in procurement, including the avoidance of unnecessary

packaging and the return of reusable packaging to vendors.” To facilitate this, Maryland’s Green Purchasing Committee created a “source-reduction checklist” for the state agencies, which gives government offices a variety of actions and policies that they can take to reduce their waste footprint.

- **Massachusetts, 2009, Governor Deval Patrick: *Executive Order No. 515 Establishing an Environmental Purchasing Policy*.**⁹⁷ Governor Patrick’s executive order made it the policy of state government to, whenever possible, procure environmentally preferable products. Such products include those that contain recycled material, conserve energy or water, or minimize waste. The order also directed state agencies to “ensure that they integrate increased recycling practices in the disposal of their own waste materials.”

Make Statewide Policy Changes

Many governors can directly influence state energy, efficiency or transportation policy, depending on the regulatory authority granted to them and their administration by state law. Those cases where meaningful regulatory change is possible present opportunities for governors to rapidly reduce emissions on a wide scale.

8. Set strong building energy codes

Changes in policy to improve the efficiency of building energy use can have an enormous impact on overall state energy use and emissions. Homes, offices and other buildings account for almost 40 percent of U.S. energy use.⁹⁸ Buildings can also host clean energy technologies, including solar panels and EV charging stations.

One way to reduce building energy use and increase installation of clean energy technology is to amend building energy codes. Building energy codes es-

establish minimum standards for elements of a building that influence energy use, like windows, doors, insulation and duct systems, and can require building designs that support the installation of solar panels.⁹⁹ Many such improvements will deliver reductions in energy use for years or decades, because of the long life of buildings and installed equipment.

The process of amending building codes varies by state and often entails a process entailing both stakeholder and public review. Most governors lack direct authority over code amendments.¹⁰⁰ However, many governors can either initiate or recommend initiation of the code amendment process, particularly in states where building codes are amended at the state level through a regulatory rather than legislative process.¹⁰¹ In Oregon, for example, Governor Kate Brown issued an executive order calling on the state's Building Code Division to conduct a code amendment to require, by 2025, that new homes and commercial buildings meet stringent efficiency standards and be constructed to accommodate future installation of solar panels and EV charging equipment.¹⁰²

In many states, levels of building code compliance are low, undercutting the energy savings they deliver.¹⁰³ But in places where they are implemented effectively, stronger building codes can make a big difference in reducing energy use. According to a Department of Energy analysis, adoption of energy codes with modest updates could, from 2010 to 2040, reduce carbon dioxide pollution by 841 million metric tons, an amount "equivalent to the greenhouse gases emitted by 177 million passenger vehicles driven for one year or the carbon dioxide emissions from 245 coal power plants for one year."¹⁰⁴

Examples

- **Oregon, 2017, Governor Kate Brown: Executive Order 17-20 Accelerating Efficiency in Oregon's Built-Environment.**¹⁰⁵ This order directed state agencies to amend the state building code to require all newly constructed residential buildings

to meet the 2017 Zero Energy Ready Standard by 2023, and that new commercial buildings will exceed the International Energy Conservation Code and American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 90.1 standards when averaged across building types. The order also directed the amendment of the code to ensure that all new residential buildings are "solar ready" by 2020 and commercial buildings by 2022, and that all new buildings can support the installation of a Level 2 electric vehicle charger by 2022. Additionally, the order directed the Oregon Department of Energy to identify energy intensive industries that "have the potential to realize significant cost savings and energy savings through building code amendments," and to submit a report recommending possible reforms.

9. Shift transportation spending and policies to encourage low-carbon modes

State policies that have historically focused transportation spending on encouraging automobile use are a big part of the reason why transportation is the leading source of global warming pollution in the U.S.¹⁰⁶ Low-emission modes like walking, biking and public transit, by contrast, often receive limited state investment, leading to public transit that is unreliable or in disrepair; crumbling or nonexistent sidewalks; and inadequate or unsafe facilities for people who bike.¹⁰⁷

In many states, governors and their appointees have at least some discretion over how transportation spending is allocated and invested.¹⁰⁸ Governors and their appointees also establish policies for the selection of transportation projects and the measurement of transportation outcomes. In many states, governors can direct state DOTs to:

- Prioritize low-carbon transportation modes. For example, state DOTs can re-allocate federal transportation dollars apportioned through the nation's primary federal transportation funding

legislation, the FAST Act. Under the FAST Act, programs like the Surface Transportation Block Grant Program provide funds that can be used by states for a variety of purposes, including spending on transit, walking or biking.¹⁰⁹

- Establish criteria for the selection of transportation projects that include alignment with climate goals. Most states do not have a rigorous, data-driven process for comparing transportation projects across modes – a shortcoming that likely wastes taxpayer money on low-value projects and makes it more difficult for states to achieve public policy goals. Project rating methods like Virginia’s Smart Scale, which uses established goals and metrics to prioritize transportation projects, can lead to smarter investments.¹¹⁰ By including climate change, energy conservation and quality-of-life metrics in those criteria, states can help ensure that the billions of dollars spent annually on transportation projects support, rather than undercut, their efforts to combat climate change.
- Reexamine proposals for new road capacity. Highway expansion projects often do not make fiscal sense and can encourage additional driving that produces carbon pollution. Some states have reexamined the need for these projects. In Wisconsin, for example, Governor Scott Walker asked the federal government to rescind its authorization for a project to widen Interstate 94.
- Include walking and biking infrastructure during road construction or maintenance, as Delaware Governor Jack Markell directed through an executive order.¹¹¹

Besides shifting spending, governors can take other actions to encourage low-carbon transportation modes. Governors or their appointees can ensure that transportation rules do not discourage low-carbon forms of travel or development. California, for instance, eliminated the use of “level of service” standards for evaluating the transportation impacts of

new development, which had made it more difficult for communities to add new housing or businesses in walkable or transit-oriented areas of cities.¹¹² Governors can also establish transportation mode shift goals, setting a measurable target for increasing the number of trips taken on transit, by foot or by bike. And governors can use policy tools to boost ridership or usage of public transportation. Under Maryland law, for example, the governor and secretary of transportation have authority to designate areas for transit-oriented development.¹¹³

Examples

- **Delaware, 2009, Governor Jack Markell: Executive Order Number 6 - Creating a Complete Streets Policy.**¹¹⁴ Governor Markell’s executive order directed the Delaware Department of Transportation to create a Complete Streets Policy that would, among other provisions, establish that “any time DelDOT builds or maintains a roadway or bridge, the agency must whenever possible accommodate other methods of transportation.”
- **Wisconsin, 2017, Governor Scott Walker: Action to stop widening of Interstate 94.** Governor Walker abandoned the billion-dollar expansion of Interstate 94, both by leaving funding for the highway out of his proposed budget, and by submitting a letter to the Federal Highway Administration asking it to rescind authorization for the project.
- **Illinois, 2015, Governor Bruce Rauner: Suspension of Illiana toll road project.**¹¹⁵ In June 2015, Governor Rauner suspended the \$1.3 billion highway project. Governor Rauner directed the Illinois Department of Transportation to “remove the project from its current multi-year plan.”¹¹⁶
- **Massachusetts, 2012, Governor Deval Patrick and Secretary of MassDOT Richard Davey: Establishing transportation mode shift goal.**¹¹⁷ To meet their state’s greenhouse gas emission

reduction goal, the Massachusetts Department of Transportation (MassDOT) established a mode shift target of tripling the number of people in the state who commute by walking, biking or transit.

- **Virginia, 2014, Governor Terry McAuliffe: *Implementation of Virginia Smart Scale.***¹¹⁸ Governor Terry McAuliffe of Virginia and the state legislature established a project selection system that prioritizes transportation projects for funding based on how well they address safety, congestion, access to jobs, environmental protection, economic development and coordination with land use decision-making.

10. Incentivize electric vehicles and raise vehicle emission standards

Most consumers want their cars to be clean.¹¹⁹ But the higher upfront price of an electric vehicle can be a barrier, while potential rollbacks in federal emission standards could make more efficient gasoline-powered vehicles harder to find. Governors can help solve both of these problems by strengthening incentives to support the purchase of electric vehicles, and raising emission standards to increase the availability of zero-emission vehicles and ensure improved efficiency for the overall market.

Legislation is typically required to create new incentives for electric vehicles, since incentives require either new funding or a change to the tax structure. However, governors can propose new or strengthened incentives or ensure that incentives align with broader goals.

While incentive programs can help consumers purchase EVs, statewide standards can ensure that the overall vehicle market is low-emission by requiring vehicle manufacturers to sell a certain number of low- and zero-emission vehicles. Governors can direct state agencies to adopt standards that align with California's Advanced Clean Cars program.¹²⁰ The program requires vehicle manufacturers to meet

average emission standards for all new vehicles, while also offering a steadily increasing number of zero-emission vehicles (such as EVs).

In states where regulatory bodies have the authority to update standards, governors may have the ability to initiate emission standards updates.¹²¹ In Colorado, for example, Governor John Hickenlooper began the process of adopting California standards through an executive order.¹²²

Examples

- **Colorado, 2018, Governor John Hickenlooper, *Executive Order B 2018 006, Maintaining Progress on Clean Vehicles.***¹²³ This order directed the Colorado Department of Public Health to develop low emission vehicle standards that would "incorporate the requirements of the California LEV program." The Colorado Air Quality Control Commission later voted to adopt the vehicle emission standards into the state regulatory code.
- **Oregon, 2017, Governor Kate Brown, *Executive Order 17-21 Accelerating Zero Emission Vehicle Adoption in Oregon to Reduce Greenhouse Gas Emissions and Address Climate Change.***¹²⁴ This order set the statewide goal of having 50,000 or more electric vehicles on Oregon's roads by 2020. To accomplish this, the order directed the Department of Environmental Quality (DEQ) to "conduct rulemaking for electric vehicle rebate programs." These rebate programs were established by legislation earlier in the year. The order directed the DEQ to develop outreach strategies to make sure that the public is informed about rebate opportunities. In addition, the order directed the state energy department, along with several other state agencies, to "develop tools and provide information" to school districts about zero-emission vehicle options when they are replacing older buses.¹²⁵ The order also directed the state transportation department to assist transit agencies

when they are making decisions about adopting zero emission vehicle buses. They are to help the agencies and stakeholders assess the impacts of adopting this technology on emissions, cost and public health.¹²⁶

11. Limit or slow the production of climate-altering fossil fuels.

To prevent runaway global warming, most remaining fossil fuel reserves must not be burned. To limit warming to 2 degrees Celsius above pre-industrial levels, 82 percent of known coal, 49 percent of gas and 33 percent of oil reserves must remain unburned worldwide.¹²⁷ Therefore, preventing the worst impacts of global warming will require limiting production of fossil fuels, as well as their use.

Infrastructure for the production and transportation of fossil fuels, including wells, refineries, pipelines, and shipping terminals, typically requires permitting and approval for construction and operation. By holding infrastructure to high environmental standards, enforcing laws designed to protect the public, or denying permission for them to operate, governors and their administrations can limit the production or flow of fossil fuels through their state.

The avenues by which governors can limit new fossil fuel infrastructure vary by state and circumstance. In Washington, Governor Jay Inslee rejected a construction permit for an oil-by-rail terminal.¹²⁸ In California, to prevent offshore drilling in federal waters outside of state jurisdiction, the California State Lands Commission announced that it would refuse to approve new pipelines or the use of existing pipelines to transport oil produced by Pacific offshore drilling.¹²⁹ In New York state, Governor David Paterson issued an executive order in 2010 placing a moratorium on the issuance of permits for hydraulic fracturing.¹³⁰ And in Pennsylvania, Governor Tom Wolf issued an executive order reinstating a moratorium on new leases for oil and gas development in state parks and forests.¹³¹



Washington Governor Jay Inslee, left, has worked to hold oil-by-rail infrastructure to high safety and environmental standards.¹³² In 2018, he rejected a permit for what would have been America's largest oil-by-rail terminal, citing risks to the environment and public health.¹³³ Photo: Washington Governor's Office

Examples

- **New York, 2008, Governor David Paterson: Executive Order No. 41, Requiring Further Environmental Review of High-Volume Hydraulic Fracturing in the Marcellus Shale.** This executive order declared that no permits could be issued for high-volume hydraulic fracturing for oil and gas until an environmental impact review of the process was completed.¹³⁴ In 2015, under Governor Andrew Cuomo, the state made the ban permanent, following a study by the state's Department of Health.¹³⁵
- **Pennsylvania, 2015, Governor Tom Wolf: Executive Order 2015-03, Leasing of State Forest and State Park Land for Oil and Gas Development.** In January 2015, Governor Tom Wolf signed this executive order to reinstate a moratorium on new leases for oil and gas development in state parks and forests.¹³⁶
- **Washington, 2018, Governor Jay Inslee: Rejection of permit for Vancouver oil-by-rail terminal.** Governor Inslee rejected a permit to build North America's largest terminal to accept crude oil delivered by rail, citing risks to the environment and public health.¹³⁷

12. Collaborate on regional climate initiatives.

Electric grids, highways and pipelines all cross state lines, making collaboration among states essential to reducing global warming. By entering or forming partnerships with neighboring states, governors can push forward region-wide action to reduce global warming pollution and enlist a broad set of resources across state lines for achieving climate progress.

Regional climate agreements have already proven critical to the nation's climate efforts, none more so than the Regional Greenhouse Gas Initiative, or RGGI. RGGI is a cooperative effort between northeastern and mid-Atlantic states to reduce global warming pollution from power plants. The program caps power plant emissions, puts a price on carbon pollution, and reinvests much of the revenue into programs that advance the region's transition from fossil fuels to clean energy. Since RGGI began in 2009, emissions by member states have dropped by half (due to RGGI and other factors).¹³⁸

Governors have wide discretion to form partnerships with other states. The governors of both New Jersey and Virginia set their states on a course for joining (or in the case of New Jersey, rejoining) RGGI through executive orders.¹³⁹ Governors can also enter meaningful partnerships that are non-binding, and consist of agreements to mutual goals, general statements of purpose or broad strategies. For example, the Pacific Coast Action Plan on Climate and Energy, entered into by the governors of California, Oregon, and Washington and the premier of British Columbia, consists of an agreement to a broad set of principles, strategies and goals related to climate change. Under the plan, signers agree that they will "[d]irect our relevant agencies and officials to work together" to "[a]ffirm the need to inform policy with findings from climate science" and develop "2050 targets for greenhouse gas reductions."¹⁴⁰



This charging station is part of the 1,350-mile West Coast Green Highway, a charging network built along Interstate 5 through a collaboration between California, Oregon, Washington and British Columbia.¹⁴¹ Those four governments pledged to expand the regional charging network by forming the Pacific Coast Collaborative.¹⁴² Photo: Oregon Department of Transportation

Examples

- **New Jersey, 2018, Governor Philip Murphy: *Executive Order 7.***¹⁴³ Governor Murphy signed an executive order for New Jersey to rejoin RGGI, a regional "cap-and-trade" initiative in the power sector. While initially part of the regional partnership, New Jersey pulled out under Governor Chris Christie in 2012 and gave up \$279 million in revenue from the program. Negotiations for the state to rejoin are currently ongoing.¹⁴⁴
- **Virginia, 2017, Governor Terry McAuliffe: *Executive Directive 11 Reducing Carbon Dioxide Emissions from Electric Power Facilities and Growing Virginia's Clean Energy Economy.***¹⁴⁵ Virginia Governor Terry McAuliffe issued an executive directive to his Department of Environmental Quality to develop a "proposed regulation under existing state law" to limit the amount of carbon dioxide released in the state's electric power sector. The directive also stated that the regulation should be "trading-ready," which was seen as an important indicator of their possible entrance into RGGI.

- **California, Oregon and Washington, 2013: Entered regional climate partnership.**¹⁴⁶ Governors of these three states entered into the Pacific Coast Collaborative with the province of British Columbia. This agreement sets up a partnership between the jurisdictions to limit regional carbon emissions, invest in climate-friendly transportation options, integrate electricity grids, and press their respective federal governments for climate reforms.
- **Governors of 17 states and Puerto Rico: Signers of the U.S. Climate Alliance agreement.**¹⁴⁷ The U.S. Climate Alliance is a “bipartisan coalition of governors committed to reducing greenhouse gas emissions consistent with the goals of the Paris Agreement.” Signatories have committed their states to “[i]mplement policies that advance the goals of the Paris Agreement, aiming to reduce greenhouse gas emission by at least 26-28 percent below 2005 levels by 2025,” “[t]rack and report progress to the global community,” and “[a]cceler-

ate new and existing policies to reduce carbon pollution and promote clean energy deployment at the state and federal level.”¹⁴⁸

- **Governors of eight states, 2017: Signers of the Regional Electric Vehicle Plan for the West.**¹⁵⁸ Governors of eight western states entered an agreement to create “an Intermountain West Electric Vehicle (EV) Corridor that will make it possible to seamlessly drive an electric vehicle across the Signatory States’ major transportation corridors.” Signers agreed to take a variety of actions, including setting minimum standards for charging stations and collaborating with neighboring states to ensure optimal siting of new charging stations. Signers also agreed to “[i]dentify and develop opportunities to incorporate EV charging station infrastructure into planning and development processes, such as building codes, metering policies, and renewable energy generation projects.”

The Power of Appointment

Many decisions important to climate policy are made by state agencies, commissions and boards appointed by governors.¹⁴⁹ Governors can lay the groundwork for climate progress by appointing regulators and agency heads who are committed to reducing emissions and supporting a shift to a cleaner energy and transportation system. State organizations that governors may have the authority to make appointments to include:

- **State energy agencies:** State energy departments and public utility commissions can set requirements and implement programs to encourage the rapid deployment of renewable energy sources and energy efficiency measures.¹⁵⁰ For example, in 2017 Nevada's utility commission reinstated the practice of net metering, bolstering the state solar market and ensuring that homeowners with solar panels would be compensated for the energy they send back to the grid.¹⁵¹ By appointing directors and board members committed to promoting clean energy, governors can ensure that future commission decisions will promote a rapid transition to a clean energy future.
- **State environmental agencies:** Directors of state environmental agencies can determine policy related to the regulation of emissions and enforcement of environmental laws. Agency directors and staff can oversee rulemaking for policies like the adoption of vehicle emission standards and tighter emission standards for power plants.¹⁵²
- **State departments of transportation:** Directors of state DOTs often have the ability to guide their state's transportation future, and help decide which transportation projects to carry out. By appointing directors with a record of supporting infrastructure for low-emission transportation modes such as walking, biking and public transit, governors can help states reduce future emissions from transportation.
- **Building code boards:** State building code boards can often set energy efficiency and clean energy requirements for homes and commercial buildings – affordable and effective ways to cut greenhouse gas emissions.¹⁵³ For example, the California Energy Commission, which controls the state's Building Energy Efficiency Standards, will require all new homes to install solar PV panels starting in 2020.¹⁵⁴ These standards also include energy efficiency requirements and incentives for homes to adopt batteries.¹⁵⁵ By appointing officials committed to moving toward low and zero-net energy buildings, governors can help reduce energy consumption and greenhouse gas emissions.
- **Pension boards:** Nationwide, state employee pension funds invest billions of dollars in publicly traded companies. Setting policy to eliminate or reduce investment in the fossil fuel industry is an important measure to limit state support for an industry that exacerbates climate change through its daily operation and political activity. In 2015, the California legislature passed a law compelling the California Public Employees' Retirement System to divest from coal.¹⁵⁶ Such decisions are also likely possible through state pension boards that make investment decisions.¹⁵⁷ Gubernatorial appointments to state pension boards can help reduce state pension fund investment in activity that causes global warming, potentially having an impact that extends well beyond state lines.

Recommendations for Effective Action

As America's new governors step into office in 2019, they will find themselves leading some of the world's largest economies at a time of incredible urgency in the fight to prevent the worst impacts of climate change. Sea level is rising, extreme weather is becoming more common and more dangerous, and a changing climate is resulting in damage to communities across the country.

Governors can take immediate action – often with the stroke of a pen – to reduce the dangers that global warming poses to the citizens of their states and people around the world. To ensure that those actions are as effective as possible, governors should:

- **Support accompanying legislative efforts.** While non-binding goals are important, legislation is necessary to create durable and democratic policies to reduce climate emissions. Legislation can also create enforcement mechanisms for achieving goals, and can provide appropriate resources for achieving real climate progress.
- **Set concrete, science-based goals.** Timelines for emission reductions should reflect what science deems necessary to prevent the worst impacts of global warming, and should align with broader state efforts to reduce climate emissions. Goals should also account for all global warming pollutants, all sectors of the economy, and where applicable, fossil fuel exports.
- **Give agencies timelines for action and ensure follow-through.** Many executive orders direct agencies to lead by example, form new commissions or study groups, or begin the process of adopting new policies. Such orders should include timelines for action. Governors must be prepared to ensure that those timelines are followed, and their orders are carried out fully.
- **Ensure that resources follow policy.** Governors should use their authority to allocate financial and staffing resources toward accomplishment of the policies they establish.
- **Publicize action and rally the public.** Preventing the worst impacts of global warming will only be possible with the support of the public and voters. New actions are an opportunity to share information about climate solutions and motivate the public to join and support future efforts.

Notes

1 U.S. Energy Information Administration, *Energy-Related Carbon Dioxide Emissions by State, 2000-2015*, January 2019, available at <https://www.eia.gov/environment/emissions/state/analysis/>; U.S. Energy Information Administration, *International Energy Statistics*, accessed at <https://www.eia.gov/beta/international/data/browser/> on 30 November 2018.

2 Ibid.

3 David Roberts, "California Gov. Jerry Brown Casually Unveils History's Most Ambitious Climate Target," *Vox*, 12 September 2018, archived at <http://web.archive.org/web/20181031003038/www.vox.com/energy-and-environment/2018/9/11/17844896/california-jerry-brown-carbon-neutral-2045-climate-change>.

4 Oregon Office of the Governor, *Executive Order 17-21: Accelerating Zero Emission Vehicle Adoption in Oregon to Reduce Greenhouse Gas Emissions and Address Climate Change*, 6 November 2017, archived at https://web.archive.org/web/20181113215148/www.oregon.gov/gov/Documents/executive_orders/eo_17-21.pdf.

5 American Council for an Energy-Efficient Economy, *State Government Lead by Example*, archived on 14 November 2018 at <https://web.archive.org/web/20181114165617/http://aceee.org/sector/state-policy/toolkit/lbe>.

6 Massachusetts Department of Energy Resources, *Leading by Example Progress: Overview*, archived on 27 November 2018 at <http://web.archive.org/web/20181127142005/www.mass.gov/info-details/leading-by-example-progress-overview>; more details available at Massachusetts Department of Energy Resources, *Measuring Progress on Executive Order 484*, October 2014, archived at <http://web.archive.org/web/20180912085518/www.mass.gov/files/documents/2017/09/05/lbe-eo484-report.pdf>.

7 Commonwealth of Pennsylvania Governor's Office, *Executive Order 2004-12: Energy Management and Conservation in Commonwealth Facilities*, 15 December 2004, archived at http://web.archive.org/web/20161231221156/http://www.oa.pa.gov/Policies/eo/Documents/2004_12.pdf.

8 U.S. Energy Information Administration, *How Much Energy Is Consumed in U.S. Residential and Commercial Buildings?*, 3 May 2018, archived at <https://web.archive.org/web/20181113215538/www.eia.gov/tools/faqs/faq.php?id=86&t=1>.

9 Oregon Office of the Governor, *Executive Order 17-20: Accelerating Efficiency in Oregon's Built Environment to Reduce Greenhouse Gas Emissions and Address Climate Change*, 6 November 2017, archived at http://web.archive.org/web/20180309093031/http://www.oregon.gov/gov/Documents/executive_orders/eo_17-20.pdf.

10 U.S. Environmental Protection Agency, *Sources of Greenhouse Gas Emissions*, archived on 13 November 2018 at <http://web.archive.org/web/20181113121125/www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>.

11 Delaware Governor's Office, *Executive Order Number Six - Creating a Complete Streets Policy*, 24 April 2009, archived at <http://web.archive.org/web/20180706202052/governor.delaware.gov/wp-content/uploads/sites/24/2016/12/EO006.pdf>.

12 Colorado Office of the Governor, *Executive Order B 2018 006: Maintaining Progress on Clean Vehicles*, 18 June 2018, archived at https://archive.org/wayback/available?url=https://www.colorado.gov/governor/sites/default/files/b_2018-006_maintaining_progress_on_clean_vehicles.pdf.

13 Pennsylvania Department of Conservation and Natural Resources, *Gov. Corbett Issues Executive Order Protecting State Forests, Parks from Gas Leasing That Involves Surface Disturbance*, 28 May 2014, archived at <http://web.archive.org/web/20170926022538/http://www.apps.dcnr.state.pa.us/news/resource/res2014/14-0528-execorder.aspx>.

14 America's Pledge Initiative on Climate, *Fulfilling America's Pledge: How States, Cities, and Businesses Are Leading the United States to a Low-Carbon Future*, 2018, archived at <http://web.archive.org/web/20180912184218/www.bbhub.io/dotorg/sites/28/2018/09/Fulfilling-Americas-Pledge-2018.pdf>.

15 Maxim Gakh et al., "Using Gubernatorial Executive Orders to Advance Public Health," *Public Health Reports*, 2013 Mar-Apr; 128(2): 127–130, available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3560871/>.

16 The Council of State Governments, *The Council of State Governments Survey of Governors' Offices: Gubernatorial Executive Orders: Authorization, Provisions, Procedures*, September 2017, archived at <https://web.archive.org/web/2018113220859/http://knowledgecenter.csg.org/kc/system/files/4.5.2018.pdf>.

17 See note 15.

18 Ibid.

19 State GDP: U.S. Department of Commerce Bureau of Economic Analysis, *Regional Economic Accounts*, downloaded from <https://apps.bea.gov/regional/downloadzip.cfm> on 8 November 2018.

20 See note 1.

21 Ibid.

22 See note 3.

23 Order: State of North Carolina, Roy Cooper, Governor, *Executive Order No. 80: North Carolina's Commitment to Address Climate Change and Transition to a Clean Energy Economy*, 29 October 2018, archived at <https://web.archive.org/web/20181113221219/files.nc.gov/governor/documents/files/EO80-%20NC%27s%20Commitment%20to%20Address%20Climate%20Change%20%26%20Transition%20to%20a%20Clean%20Energy%20Economy.pdf>; John Murawski and Will Doran, "Cooper Sets Global Warming Goal to Cut NC Greenhouse Gas Emissions by 40 Percent," *The News and Observer*, 29 October 2018, available at <https://www.newsobserver.com/news/politics-government/state-politics/article220789175.html>.

24 Ibid.

25 Ibid.

26 Ibid.

27 California Executive Department, *Executive Order B-55-18 to Achieve Carbon Neutrality*, 10 September 2018, available at <https://www.gov.ca.gov/wp-content/uploads/2018/09/9.10.18-Executive-Order.pdf>.

28 United States Climate Alliance, *2018 Annual Report*, 2018, archived at https://web.archive.org/web/20181113221737/static1.squarespace.com/static/5a4cfbfe18b27d4da21c9361/t/5b9bda1d1ae6cf830c7f80a7/1536940617096/USCA_2018+Annual+Report_20180911-FINAL.pdf.

29 See note 10.

30 William Driscoll, "Five New Governors Aim for 100% Renewables," *PV Magazine*, 9 November 2018, archived at <http://web.archive.org/web/20181109183808/pv-magazine-usa.com/2018/11/09/five-new-governors-aim-for-100-renewables/>.

31 State of New Jersey Governor's Office, *Governor Murphy Signs Measures to Advance New Jersey's Clean Energy Economy*, 23 May 2018, archived at http://web.archive.org/web/20180929021159/www.nj.gov/governor/news/news/562018/approved/20180523a_cleanEnergy.shtml.

32 Ibid.

33 Julia Pyper, "New Jersey Approves Largest Single-State Offshore Wind Solicitation to Date," *Greentech Media*, 18 September 2018, available at <https://www.greentechmedia.com/articles/read/new-jersey-approves-largest-singe-state-offshore-wind-solicitation-to-date#gs.iH5OK3s>.

34 Michael Rufo et al., American Council for an Energy-Efficient Economy, *Energy Efficiency as the First Resource: Opportunities, Challenges, and Beating the Next Bust*, 2008.

35 American Council for an Energy-Efficient Economy, *Energy Efficiency Resource Standard*, archived on 11 July 2018 at <http://web.archive.org/web/20181107011012/aceee.org/topics/energy-efficiency-resource-standard-eers>.

36 State of New Jersey Governor's Office, *Executive Order No. 28*, 23 May 2018, archived at <https://web.archive.org/web/20181113222139/nj.gov/infobank/eo/056murphy/pdf/EO-28.pdf>.

37 Ibid.

38 Environmental League of Massachusetts, *Gubernatorial Candidates Commit to Double Down on Offshore Wind Power*, 3 October 2018, archived at <https://web.archive.org/web/20181114221435/www.elmaction.org/gubernatorial-candidates-commit-to-double-down-on-offshore-wind-power/>.

39 Ibid.

40 California Energy Commission, *Renewables Portfolio Standard*, archived on 6 April 2018 at <http://web.archive.org/web/20181120141306/www.energy.ca.gov/portfolio/>.

41 See note 28.

42 New York State Energy Research and Development Authority, *New Efficiency: New York*, archived on 14 May 2018 at <http://web.archive.org/web/20180514192858/www.nyserda.ny.gov/About/Publications/New-Efficiency>; New York State Governor's Office, *Governor Cuomo Announces New Energy Efficiency Target to Cut Greenhouse Gas Emissions and Combat Climate Change (press release)*, 20 April 2018, archived at <http://web.archive.org/web/20181004115530/www.governor.ny.gov/news/governor-cuomo-announces-new-energy-efficiency-target-cut-greenhouse-gas-emissions-and-combat>.

43 New York State Energy Research and Development Authority, *New Efficiency: New York*, April 2018, archived at <http://web.archive.org/web/20181201001433/www.nyserda.ny.gov/-/media/Files/Publications/New-Efficiency-New-York.pdf>.

44 Brad Plumer, "Power Plants Are No Longer America's Biggest Climate Problem. Transportation Is.," *Vox*, 13 June 2016, archived at <http://web.archive.org/web/20181006034458/www.vox.com/2016/6/13/11911798/emissions-electricity-versus-transportation>.

45 U.S. Environmental Protection Agency, *Fast Facts on Transportation Greenhouse Gas Emissions*, archived on 8 November 2018 at <http://web.archive.org/web/20181108120337/www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions>.

46 Luke Tonachel, Study: *Electric Vehicles Can Dramatically Reduce Carbon Pollution from Transportation, and Improve Air Quality (blog)*, 17 September 2015, archived at <http://web.archive.org/web/20180813112220/www.nrdc.org/experts/luke-tonachel/study-electric-vehicles-can-dramatically-reduce-carbon-pollution>.

47 Rachael Nealer, David Reichmuth and Don Anair, Union of Concerned Scientists, *Cleaner Cars from Cradle to Grave*, November 2015, archived at <http://web.archive.org/web/20180811031211/www.ucsusa.org/sites/default/files/attach/2015/11/Cleaner-Cars-from-Cradle-to-Grave-full-report.pdf>.

48 See note 46.

49 See note 4.

50 California Governor's Office, *Executive Order B-48-18*, 26 January 2018, archived at <http://web.archive.org/web/20181130113904/www.gov.ca.gov/2018/01/26/governor-brown-takes-action-to-increase-zero-emission-vehicles-fund-new-climate-investments/>.

51 See note 4.

52 Governors Jerry Brown, California; Dannel Malloy, Connecticut; Martin O'Malley, Maryland; Deval Patrick, Massachusetts; Andrew Cuomo, New York; John Kitzhaber, Oregon; Lincoln Chafee, Rhode Island; Peter Shumlin, Vermont; Phil Murphy, New Jersey. Multi-State ZEV Task Force, *State Zero-Emission Vehicle Programs Memorandum of Understanding*, 24 October 2013, archived at <https://web.archive.org/web/20181115170619/http://www.nescaum.org/documents/zev-mou-9-governors-signed-20180503.pdf>.

53 Multi-State ZEV Task Force, *About the ZEV Task Force*, archived on at <https://www.zevstates.us/about-us/>.

54 U.S. Environmental Protection Agency, *Basic Information about Landfill Gas*, archived on 24 October 2018 at <http://web.archive.org/web/20181024170444/www.epa.gov/lmop/basic-information-about-landfill-gas>.

55 Mariel Vilella, Climate Home News, *Should the Green Climate Fund Back Waste to Energy Plants?*, 18 March 2015, archived at <http://web.archive.org/web/20180117071651/http://www.climatechangenews.com/2015/03/18/should-the-green-climate-fund-back-waste-to-energy-plants/>.

56 Abi Bradford, Frontier Group; Silvia Broude, Toxics Action Center; Alexander Truelove, U.S. PIRG Education Fund, *Trash in America*, February 2018, archived at <http://web.archive.org/web/20181114164951/uspigredfund.org/sites/pirg/files/reports/US%20-%20Trash%20in%20America%20-%20Final.pdf>.

57 U.S. Environmental Protection Agency, *Source Reduction and Recycling: A Role in Preventing Global Climate Change*, no date given, archived at http://web.archive.org/web/20170223080823/archive.epa.gov/region4/rcra/mg-toolkit/web/pdf/climate_change_fact_sheet.pdf.

58 Ibid.

59 See note 56.

60 State of Maryland Executive Department, *Executive Order 01.01.2015.01: Zero Waste Plan for Maryland*, 13 January 2015, archived at <https://web.archive.org/web/20181114165347/conduitstreet.mdcounties.org/wp-content/uploads/2015/01/executive-order-01-01-2015-01-zero-waste-plan-for-maryland.pdf>.

61 Ibid.

62 Ibid.

63 Ibid.

64 See note 5.

65 U.S. Environmental Protection Agency, *Clean Energy Lead by Example Guide*, 18 June 2009, archived at https://web.archive.org/web/20181114165738/19january2017snapshot.epa.gov/sites/production/files/2015-08/documents/state_lead_by_example_guide_full_report.pdf.

66 See note 65; William Prindle et al., American Council for an Energy-Efficient Economy, *Energy Efficiency's Next Generation: Innovation at the State Level*, 1 November 2003, available at <https://aceee.org/research-report/e031>; conversion to households based on average annual energy consumption of 77.1 million Btu, from U.S. Energy Information Administration, *2015 RECS: Table CE1.1 Summary annual household site consumption and expenditures in the U.S.—totals and intensities, 2015*, May 2018, downloaded from <https://www.eia.gov/consumption/residential/data/2015/index.php?view=consumption>.

67 See note 65.

68 State of Massachusetts, *Executive Order*

Executive Order No. 484: Leading by Example - Clean Energy and Efficient Buildings, 18 April 20017, archived at <http://web.archive.org/web/20181114001321/www.mass.gov/executive-orders/no-484-leading-by-example-clean-energy-and-efficient-buildings>.

69 See note 6.

70 Rhode Island Office of Energy Resources, *Lead by Example: Electric Vehicle Charging Stations installed on Capitol Hill*, July 2018, archived at <https://web.archive.org/web/20181119175644/rienergy.blogspot.com/2018/07/lead-by-example-electric-vehicle.html>.

71 State of Rhode Island and Providence Plantations, *Executive Order 15-17 State Agencies to Lead By Example In Energy Efficiency and Clean Energy*, 8 December 2015, archived at <http://web.archive.org/web/20180901052709/http://www.governor.ri.gov/documents/orders/ExecOrder15-17.pdf>.

72 Ibid.

73 New York State Governor's Office, *Executive Order No. 88: Directing State Agencies and Authorities to Improve the Energy Efficiency of State Buildings*, 28 December 2012, archived at <http://web.archive.org/web/20171116071318/http://www.governor.ny.gov:80/news/no-88-directing-state-agencies-and-authorities-improve-energy-efficiency-state-buildings>.

74 State of Minnesota Executive Department, *Executive Order 17-12 Directing State Agencies to Conserve Energy and Water, and Reduce Waste to Save Money*, 21 November 2017, archived at https://web.archive.org/web/20181115171514/mn.gov/governor/assets/E.O.%2017-12_tcm1055-318573.pdf.

75 See note 5.

76 State of Minnesota Executive Department, *Executive Order 11-12: Providing for Job Creation through Energy Efficiency and Renewable Energy Programs for Minnesota's Public Buildings*, 8 April 2011, archived at <http://web.archive.org/web/20181114170128/www.leg.state.mn.us/archive/execorders/11-12.pdf>.

77 See note 9; Green Proving Ground Program, "Plug load control," September 2012, available at https://betterbuildingsolutioncenter.energy.gov/sites/default/files/attachments/Plug_Load_Control_508c.pdf.

78 See note 9.

79 See note 7.

80 See note 5.

81 P. S. Hu Oak Ridge National Laboratory, M. Q. Wang Argonne National Laboratory, *State Vehicle Fleets and Their Potential Acquisition of Alternative Fueled Vehicles under Epact 507*, 1996, archived at <http://web.archive.org/web/20181114170133/pdfs.semanticscholar.org/739c/9524da916ed649dcd79b46206ce6a5618c78.pdf>.

82 Coal plant equivalent calculated on 15 November 2018 using: U.S. Environmental Protection Agency, *Greenhouse Gas Equivalencies Calculator*, September 2017, available at <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>.

83 M.J. Bradley & Associates, *Electric Vehicle Cost-Benefit Analysis*, September 2017, archived at http://web.archive.org/web/20181114170134/www.nrdc.org/sites/default/files/electric-vehicle-cost-benefit-analysis_2017-09-27.pdf.

84 Alana Miller and Hye-Jin Kim, Frontier Group; Jeffrey Robinson and Matthew Casale, U.S. PIRG Education Fund, *Electric Buses: Clean Transportation for Healthier Neighborhoods and Cleaner Air*, 3 May 2018, archived at <https://web.archive.org/web/20181115194343/frontiergroup.org/sites/default/files/reports/Electric%20Buses%20-%20National%20-%20May%202018%20web.pdf>.

85 Ibid.

86 State of Colorado Office of the Governor, *Executive Order D 2015-913: Greening of State Government*, 28 October 2015, archived at http://web.archive.org/web/20170206211727/www.colorado.gov/pacific/sites/default/files/Greening%20Govt.%20E.O.%20-%20signed_1.pdf.

87 See note 71.

88 G.Eucalitto, P.Portillo, S.Gander, National Governors Association, *Governors Staying Ahead of the Transportation Innovation Curve*, July 2018, archived at <http://web.archive.org/web/20181114170140/www.nga.org/wp-content/uploads/2018/07/Transportation-Innovation-Roadmap-Final-Hi-Res-for-Posting-Online.pdf>.

89 State of Washington Office of the Governor, *Executive Order 18-01: State Efficiency and Environmental Performance*, 16 January 2018, archived at [http://web.archive.org/web/20181009001827/www.governor.wa.gov/sites/default/files/exe_order/18-01%20SEEP%20Executive%20Order%20\(tmp\).pdf](http://web.archive.org/web/20181009001827/www.governor.wa.gov/sites/default/files/exe_order/18-01%20SEEP%20Executive%20Order%20(tmp).pdf).

90 Ibid.

91 See note 4.

92 Ibid.

93 CalRecycle, *Implementing Waste Reduction*, archived on 14 November 2018 at <http://web.archive.org/web/20181114170142/www.calrecycle.ca.gov/stateagency/assistance/4rsguide/implement>.

94 U.S. Environmental Protection Agency, *Best Practices for WasteWise Participants*, archived on 16 October 2018 at <http://web.archive.org/web/20181016012034/www.epa.gov/smm/best-practices-wastewise-participants>.

95 See note 93.

96 See note 60.

97 Massachusetts Office of the Governor, *Executive Order No. 515 Establishing an Environmental Purchasing Policy*, 27 October 2009, archived at <http://web.archive.org/web/20180914033203/www.mass.gov/files/documents/2016/08/qj/eo515.pdf>.

98 See note 8.

99 U.S. Department of Energy, *Energy Codes 101: What Are They and What is DOE's Role?*, 31 May 2016, archived at <https://web.archive.org/web/20170831142851/energy.gov/eere/buildings/articles/energy-codes-101-what-are-they-and-what-doe-s-role>.

100 U.S. Department of Energy, *Building Energy Codes Program Adoption Process*, archived on 4 July 2017 at <http://web.archive.org/web/20170704060438/www.energy-codes.gov/adoption/process>.

101 Ibid.

102 See note 9.

103 Sarah Stellberg, Institute for Market Transformation, *Assessment of Energy Efficiency Achievable from Improved Compliance with U.S. Building Energy Codes: 2013 – 2030*, February 2013, archived at https://web.archive.org/web/20181127013859/www.imt.org/wp-content/uploads/2018/02/IMT_Report_Code_Compliance_Savings_Potential_FINAL_2013-5-2.pdf.

104 Lauren Urbanek, Natural Resources Defense Council, *Savings from Building Energy Codes Are a Big Deal*, 17 October 2016, archived at <https://archive.org/wayback/available?url=https://www.nrdc.org/experts/lauren-urbanek/savings-building-energy-codes-are-big-deal>.

105 See note 9.

106 See note 44.

107 Information on historical spending is available in: Congressional Budget Office, *Public Spending on Transportation and Water Infrastructure, 1956 to 2014*, 2 March 2015.

108 National Conference of State Legislatures, *Transportation Governance and Finance: A 50-State Review of State Legislatures and Departments of Transportation*, May 2011, archived at http://web.archive.org/web/20171229124515/http://www.transportation-finance.org/pdf/50_State_Review_State_Legislatures_Departments_Transportation.pdf.

109 States can transfer up to 50 percent “of any apportionment to another formula program” to another (like from the NHPP, a highway program, to the STBG, a more flexible program): U.S. Federal Highway Administration, *Fixing America’s Surface Transportation Act or “FAST Act” - A Summary of Highway Provisions*, July 2016, archived at <http://web.archive.org/web/20180613213233/www.fhwa.dot.gov/fastact/summary.cfm>; see also Joe McAndrew, *Transportation For America, Falling Forward: A Guide to the Fast Act*, May 2016, archived at <http://web.archive.org/web/20160910074456/http://t4america.org:80/wp-content/uploads/2016/07/FAST-Act-Guide-2016.pdf>.

110 Dan Levine, Transportation for America, *Virginia Approves Its First Transportation Plan Based on a New System of Scoring and Prioritizing Projects*, 14 June 2016, archived at <https://web.archive.org/web/20181126203018/http://transportationforamerica.org/2016/06/14/virginia-approves-its-first-transportation-plan-based-on-a-new-system-of-scoring-and-prioritizing-projects/>.

111 See note 11.

112 Stephen Lee Davis, Transportation for America, *California Officially Dumped the Outdated “Level of Service” Metric — Your State Should Too*, 8 June 2016, archived at <http://web.archive.org/web/20181130225407/http://t4america.org/2016/06/08/california-officially-dumped-the-outdated-level-of-service-metric-your-state-should-too/>.

113 Kevin Pula et al., National Conference of State Legislatures, *On Track How States Fund and Support Public Transportation*, June 2015, archived at <http://web.archive.org/web/20160609001003/http://www.ncsl.org/Portals/1/Documents/transportation/ontrack.pdf>.

114 See note 11.

115 Indiana Department of Transportation, *Iliana Corridor*, archived on 1 December 2017 at <http://web.archive.org/web/20171201121449/http://www.in.gov/indot/projects/2495.htm>.

116 Ibid.

117 Massachusetts Department of Transportation, *MassDOT Announces Mode Shift Goal to Triple the Share of Travel in Massachusetts by Bicycling, Transit and Walking*, 9 October 2012, archived at <http://web.archive.org/web/20181119003346/http://www.massdot.state.ma.us/main/tabid/1085/ctl/detail/mid/2937/itemid/223/MassDOT-Announces-Mode-Shift-Goal-to-Triple-the-Share-of-Travel-in-Massachusetts-by-Bicycling--Transit-and-Walking-.aspx>.

118 Virginia Department of Transportation, *Smart Scale – About*, archived on 31 August 2018 at <http://web.archive.org/web/20180831165536/http://vasmartscale.org/about/default.asp>; Virginia Legislature, *2014 House Bill 2*, available at <https://lis.virginia.gov/cgi-bin/legp604.exe?141+ful+HB2ER>.

119 Shannon Baker-Branstetter, Consumer Reports Advocacy, *Nearly 9 in 10 Americans Want Automakers to Raise Fuel Efficiency*, According to Latest Consumers Union Survey, 29 June 2017, archived at https://web.archive.org/web/20181127020922/advocacy.consumerreports.org/press_release/2017-fuel-economy-survey/.

120 California Air Resources Board, *The Advanced Clean Cars Program*, archived on 27 November 2018 at https://web.archive.org/web/20181127021045/www.arb.ca.gov/msprog/acc/acc_conceptdraft.htm.

121 Seven states – Delaware, Maine, Massachusetts, Oregon, New York, Rhode Island and Vermont – have adopted California’s vehicle standards through regulation. Massachusetts adopts updated emission standards through regulatory rulemaking as required by state law. Massachusetts Executive Office of Energy and Environmental Affairs, *2015 Update of the Clean Energy and Climate Plan for 2020: Federal and California Vehicle Efficiency and GHG Standards (CAFE/Pavley)*, 2015, archived at <http://web.archive.org/web/20180912102021/www.mass.gov/files/documents/2016/11/mp/federal-and-california-vehicle-efficiency-and-ghg-standards.pdf>; overview of vehicle emission standard legislation and regulation: Maryland Department of the Environment, *States Adopting California’s Clean Cars Standards*, archived on 5 November 2018 at <https://archive.org/wayback/available?url=https://mde.maryland.gov/programs/air/mobilesources/pages/states.aspx>; Oregon Department of Environmental Quality, *Notice of Proposed Rulemaking Low Emission Vehicle Rules – 2018 Update*, 31 August 2018, archived at <http://web.archive.org/web/20181114170219/www.oregon.gov/deq/Rulemaking%20Docs/levzev2018pn.pdf>.

122 See note 12.

123 Ibid.

124 See note 4.

125 Ibid.

126 Ibid.

127 Christophe McGlade and Paul Ekins, “The Geographical Distribution of Fossil Fuels Unused When Limiting Global Warming To 2°C,” *Nature*, 517, 8 January 2015.

128 Miranda Green, “Washington Gov Rejects Proposed Oil-by-Rail Train Station,” *The Hill*, 29 January 2018, available at <https://thehill.com/policy/energy-environment/371254-washington-gov-rejects-proposed-oil-by-rail-train-station>.

129 Oregon: Governor Jay Inslee, Washington Office of the Governor, *RE: Vancouver Energy Distribution Terminal EFSEC Recommendation Dated December 19, 2017*, 29 January 2018, archived at https://web.archive.org/web/20181127021743/www.governor.wa.gov/sites/default/files/documents/InsleelettertoEFSECTesoroSavage.pdf?utm_medium=email&utm_source=govdelivery; California: California Office of the Lieutenant Governor, “New Offshore Oil Can’t Be Brought Ashore” Key California Agency Tells Trump Administration, 7 February 2018, archived at http://web.archive.org/web/20181104040019/http://www.ltg.ca.gov/news.2018.02.07_OffshoreDrillingOCS.html.

130 New York Office of the Governor, *7.41 Executive Order. No. 41: Requiring Further Environmental Review of High-Volume Hydraulic Fracturing in the Marcellus Shale*, 13 December 2010, available at [https://govt.westlaw.com/nycrr/Document/Ib2187f0464611e09f330000845b8d3e?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=\(sc.Default\)](https://govt.westlaw.com/nycrr/Document/Ib2187f0464611e09f330000845b8d3e?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default)).

131 See note 13.

132 Washington Governor’s Office, *State, Governor Work to Increase Oil-By-Rail Safety*, 10 May 2017, archived at <http://web.archive.org/web/20170613055350/medium.com/wagovernor/state-governor-work-to-increase-oil-by-rail-safety-7474f2404785>.

133 See note 128.

134 See note 130.

135 New York Department of Environmental Conservation, *High-Volume Hydraulic Fracturing in NYS*, archived on 22 November 2018 at <http://web.archive.org/web/20181122123523/http://www.dec.ny.gov/energy/75370.html>.

136 See note 13.

137 See note 128.

138 Paul Hibbard et al., The Analysis Group, *The Economic Impacts of The Regional Greenhouse Gas Initiative on Nine Northeast And Mid-Atlantic States*, 17 April 2018, archived at http://web.archive.org/web/20180423011631/http://www.analysisgroup.com/uploadedfiles/content/insights/publishing/analysis_group_rggi_report_april_2018.pdf.

139 Phil McKenna, "New Jersey to Rejoin East Coast Carbon Market, Virginia May Be Next," *Inside Climate News*, 29 January 2018, archived at <http://web.archive.org/web/20180314021237/insideclimatenews.org/news/26012018/cap-and-trade-carbon-emissions-regional-greenhouse-gas-initiative-rggi-new-jersey-virginia-climate-change>.

140 See note 4.

141 West Coast Green Highway, *About*, archived on 16 August 2018 at <http://web.archive.org/web/20180816192250/http://www.westcoastgreenhighway.com/about.htm>.

142 Pacific Coast Collaborative, *Pacific North America Climate Leadership Agreement*, 1 June 2016, archived at https://web.archive.org/web/20181130234634/pacific-coastcollaborative.org/wp-content/uploads/2018/09/Pacific_North_America_Climate_Leadership_Agreement_060116_Signed.pdf.

143 New Jersey Governor's Office, *Executive Order No. 7*, 29 January 2018, archived at <http://web.archive.org/web/20180324153627/http://nj.gov:80/infobank/eo/056murphy/pdf/EO-7.pdf>.

144 Phil Gregory, "It May Take More Than Year for New Jersey to Rejoin RGGI Climate Pact," *WHYY*, 18 April 2018, archived at <http://web.archive.org/web/20180419030131/whyy.org/articles/it-may-take-more-than-year-for-new-jersey-to-rejoin-rggi-climate-pact/>.

145 Virginia Department of Environmental Quality, *Virginia Executive Directive 11 and Proposed Virginia Carbon Dioxide Trading Rule*, 26 January 2018, archived at http://web.archive.org/web/20180612160705/www.rggi.org/sites/default/files/Uploads/Participation/2018-01-26-Meeting/VA_Presentation_2018_01_26.pdf.

146 See note 142.

147 Governors Jerry Brown, California; John Hickenlooper, Colorado; Dannel Malloy, Connecticut; John Carney, Delaware; David Ige, Hawaii; Larry Hogan, Maryland; Charlie Baker, Massachusetts; Mark Dayton, Minnesota; Phil Murphy, New Jersey; Andrew Cuomo, New York; Roy Cooper, North Carolina; Kate Brown, Oregon; Ricardo Rosselló, Puerto Rico; Gina Raimondo, Rhode Island; Phil Scott, Vermont; Ralph Northam, Virginia; and Jay Inslee, Washington.

148 United States Climate Alliance, *Alliance Principles*, archived on 27 September 2018 at <http://web.archive.org/web/20180927120338/www.usclimatealliance.org/alliance-principles/>.

149 National Governor's Association, *Governors' Powers & Authority*, accessed 2 November 2018, archived at <http://web.archive.org/web/20181102013636/www.nga.org/consulting/powers-and-authority/>.

150 U.S. Environmental Protection Agency, *An Overview of PUCs for State Environment and Energy Officials*, 20 May 2010, available at https://www.epa.gov/sites/production/files/2016-03/documents/background_paper.pdf; Michael Dworkin, David Farnsworth and Jason Rich, "The Environmental Duties of Public Utilities Commissions," *Pace Environmental Law Review*, 18(2), June 2001.

151 Julia Pyper, "Nevada PUC Approves Net Metering Rules Expected to Reboot the State's Rooftop Solar Industry," *Greentech Media*, 5 September 2017, archived at <http://web.archive.org/web/20181018012311/www.greentechmedia.com/articles/read/nevada-puc-approves-net-metering-rules-expected-to-reboot-the-rooftop-solar>.

152 Marianne Lavelle, "Massachusetts Can Legally Limit CO₂ Emissions from Power Plants, Court Rules," *Inside Climate News*, 6 September 2018, archived at <http://web.archive.org/web/20180905233424/insideclimatenews.org/news/05092018/climate-change-power-plant-carbon-emissions-law-massachusetts-state-clean-energy-transition-trump>.

153 Maggie Molina, Patrick Kiker and Seth Nowak, *The Greatest Energy Story You Haven't Heard: How Investing in Energy Efficiency Changed the US Power Sector and Gave Us a Tool to Tackle Climate Change*, American Council for an Energy-Efficient Economy, 19 August 2016, archived at <http://web.archive.org/web/20171224223511/http://aceee.org:80/research-report/u1604>.

154 California Energy Commission, *Energy Commission Adopts Standards Requiring Solar Systems for New Homes, First in Nation* (press release), 9 May 2018, archived at http://web.archive.org/web/20181018003417/www.energy.ca.gov/releases/2018_releases/2018-05-09_building_standards_adopted_nr.html.

155 California Energy Commission, *CEC 2019 Residential Energy Efficiency Standards: Key Changes*, accessed 2 November 2018, available at http://www.cbia.org/uploads/5/1/2/6/51268865/2019_cec_res_-_update_summary-052218.pdf.

156 Adam Ashton, "California Pension Fund Divests From Coal as Industry Rebounds," *The Sacramento Bee*, 7 August 2017, archived at <http://web.archive.org/web/20180913114731/www.sacbee.com/news/politics-government/the-state-worker/article165901712.html>.

157 Thomas MacMillan, "New York Governor Seeks Fossil-Fuel Divestment, But Comptroller Has Other Plans," *The Wall Street Journal*, 27 December 2017.

158 Memorandum of Understanding Between Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah and Wyoming, Regional Electric Vehicle Plan for the West, 12 October 2017, archived at http://web.archive.org/web/20180925054550/azgovernor.gov/sites/default/files/rev_west_plan_mou_10_3_17_final.pdf.