



U.S. Climate Alliance Response to the House Select Committee on the Climate Crisis Request for Information

February 4, 2020

The United States Climate Alliance¹ (Alliance) is a bipartisan coalition of 25 governors committed to upholding the goals of the Paris Agreement. Together, Alliance states represent over half the U.S. population, 40 percent of U.S. emissions, and an \$11.7 trillion economy. The Alliance appreciates the opportunity to share examples of state leadership with the committee to help inform federal climate policy.

| STATE AND FEDERAL ENGAGEMENT ON FEDERAL CLIMATE POLICY

Alliance states can serve as a valuable resource in shaping an effective legislative climate framework by sharing lessons from their long history of leading on climate, working with both parties to find bipartisan solutions that have demonstrated results, and working hand-in-hand with the federal government on implementation. In general, a few principles could guide and strengthen the relationship between the states and our federal government:

1. **Collaborate with states from the beginning to advise and formulate policy.** Ultimately, any national framework will fall to the states to implement. Too often they are included in consultations after drafts have been released as part of more general “stakeholder” consultations. Including states as part of the development of legislation from the outset ensures that future legislation builds on the lessons from state policy implementation and will streamline implementation at the state level. Top down approaches without sufficient state input can lead to frameworks that stifle state leadership or do not achieve desired results. Additionally, by including Alliance states at a minimum, but also non-Alliance states, in early discussions, legislators are more likely to craft bills founded on bipartisan solutions that increase the likelihood of adoption and implementation. Finally, by including states at the outset, they can also increase the likelihood of success by actively supporting the effort, helping to bring their constituents and representatives on board. Our states invite a dialogue with the committee to explore what an appropriate consultation mechanism could look like.
2. **Build on state successes and work with states to innovate.** States have a long history of leading on climate change whether individually or in cooperation with each other. They are also the innovators of the next generation of policy solutions. The federal government can learn from those efforts, replicating successes and addressing previous shortcoming. By replicating state efforts, especially those that have been proven effective across borders, the federal government can accelerate the transformation to a low-carbon U.S. economy and achieve emission reductions at scale.

3. **Protect states' rights to formulate and implement policy within their own borders and in coordination with other states.** States have historically had and continue to employ their right to formulate and implement policies to protect their communities, economies, and ecosystems from environmental and climate impacts. The Clean Air Act, for example, has set a 40-year precedent that allows states to choose whether to adopt federal or California clean car standards. States rights have proven increasingly important in times when federal governments rollback, weaken or do not enforce climate regulations. Any federal climate legislation should avoid pre-emption clauses or at a minimum, allow states to backstop rules if the federal government reverses course. The recent rollback of light bulb efficiency rules is a useful example – provisions in the rules allowed California and Nevada to immediately enforce the efficiency rules when the Department of Energy ceased to enforce them.
4. **Avoid penalizing leading states.** Any new or updated federal policies should take into account the progress that has already been made by leading states in decarbonizing their energy sectors and reducing state-wide GHG emissions. Specifically, any new standards or targets set– whether zero carbon power, GHG emissions, energy efficiency, or others – should take into account current state baselines, which will have benefited from a long history of action. Setting targets that require the same level of reductions or improvement from current baselines requires substantially more challenging and expensive reductions from leading states than those that have not yet tackled lower-hanging fruit. Conversely, incentives for action should not only be offered for early stage actions, which leading states have already taken utilizing their own resources. Those incentives should instead support additional effort by all states.
5. **Make equity and environmental justice a core tenet of any climate policy.** Climate change poses a significant threat to vulnerable communities with little adaptive capacity. Furthermore, disadvantaged communities are disproportionately impacted by pollution, often stemming from previous policy and planning decisions. Ensuring equity and environmental justice is a key principle of climate policy in Alliance states. As many states have done, the federal government could ensure that residents and businesses across all communities have ample opportunity to shape and comment on climate policy, direct resources from climate programs (such as cap-and-invest proceeds) to help disadvantaged communities address climate change and benefit from the transition to clean energy, and repair some of the damage to communities from previous policies.

| SECTOR-SPECIFIC POLICIES

Energy Sector

Transportation

Transportation is one of the most difficult sources of GHG emissions to tackle, but Alliance States are pushing forward ambitious innovative policies to encourage low- and zero-emissions vehicle deployment. This is despite the Trump Administration's ongoing efforts to rollback clean car standards and attack states' rights to protect their residents from vehicle pollution and increased costs at the pump. The federal government can support states in transitioning the United States transportation sector to electric and

zero-emissions vehicles. Progress has been achieved through a suite of actions, leading to best practices for national policies that include:

1. Maintaining the federal clean car standards

In July 2019, twenty-four Alliance governors issued the Nation's Clean Car Promise, which reemphasizes these states' commitment to calling for one strong, national clean car standard. In it, these governors call for a common-sense approach that protects the role of states at the negotiating table and establishes a strong, national standard that:

- Achieves continuous, meaningful annual reductions in greenhouse gas emissions and criteria pollutants while saving consumers money.
- Provides regulatory certainty and enhances the ability to invest and innovate by avoiding extended periods of litigation and instability.
- Preserves good jobs in the auto sector and keeps new vehicles affordable for more Americans.

Implementing one strong, national standard as outlined in the Nation's Clean Car Promise is in the best interest of states, automakers and consumers. It also shows the world that the United States is a leader on transportation and environmental protection.

2. Protecting California's waiver

On September 27, 2019, the Administration moved forward with its efforts by issuing a final rule attempting to revoke the waiver that allows states to set more stringent vehicle emissions standards, despite federal findings just a few years old that establish that the industry can meet, and even potentially exceed, the existing program. Thirteen states have adopted California's emissions standards, collectively making up 36 percent of the light-duty vehicle market. New Mexico and Minnesota have announced their pursuit of adopting clean car standards, helping the transition to a low-carbon transportation system.

3. Implementing a ZEV Mandate

Ten states have joined California in the Zero Emission Vehicle (ZEV) Program, which mandates automakers produce a certain percentage of ZEVs each year. Nine Alliance states are also members of a multi-state ZEV Task Force committed to supporting electric vehicle (EV) adoption, collectively aiming to put more than 3.6 million ZEVs on the road by 2025. These requirements have been critical in expanding ZEV options for consumers and growing the market for zero emission car sales. Altogether, Alliance states have more than 850,000 ZEVs on the road, accounting for just over 80 percent of all battery electric (BEVs), plug-in hybrid (PHEVs), and fuel cell vehicles (FCEVs) sold nationwide in 2018.

4. Creating Low-Carbon Fuel Standards (LCFS)

These fuel-neutral policies establish market incentives for a transition towards zero-emission vehicles and cleaner fuels across transportation and have been demonstrated to work across states. California's Low-Carbon Fuel Standard requires fuel suppliers in the state to reduce the carbon intensity of fuels by 10% by 2020 and 20% by 2030. Since the program began in 2011, 3.3 billion gallons of petroleum diesel have been displaced by cleaner alternatives.² In Oregon, their Clean Fuels Program requires a 10 percent reduction in average carbon intensity from 2015 levels by 2025 and has reduced 1.6 million tons of greenhouse gases as of January 2019.³

5. Maintaining and increasing incentives for ZEVs and charging infrastructure across light-, medium-, and heavy-duty vehicles

Altogether, Alliance states have nearly a million ZEVs on the road as of June 2019 and are actively working on expanding that number. For example, Connecticut's Hydrogen and Electric Automobile Purchase Rebate Program (CHEAPR) offers consumers up to \$5,000 for the purchase or lease of HFCVs or EVs and has provided over \$9.1 million over the last four years. Incentives are offered through a variety of policy levers, such as a tax credits, HOV lane exemption, preferential parking and rebates to build charging infrastructure. As of 2018, 13 Alliance states have installed more than 15 percent of the public Level 2 charging infrastructure necessary to support the number of plug-in electric vehicles required by 2025 to meet Paris Agreement targets. Certain incentive designs have demonstrated to be effective across the experience of state incentive programs. Tying financial incentives to a household's income or a Manufacturer Suggested Retail Price (MSRP) threshold would support the program in equitably benefiting all segments of the population and improving the incentive programs' influence and effectiveness. Additionally, having multiple complementary incentive programs, both financial and non-financial, in a combined package would help achieve greater adoption of EVs. Point-of-Sale incentives have also proven to be more effective than mail-in incentives as they reduce the cost of the vehicle during purchase. Finally, consumer education, such as a coordinated national outreach campaign, would be instrumental to help potential buyers gain awareness about incentive programs and their electric vehicle choices.

6. Reducing barriers to ZEV deployment

Expanding EV charging or hydrogen fueling corridors to reduce range anxiety is key to increasing ZEV adoption. States continue to work together to build out regional and national charging and fueling infrastructure, but have limited ability to address barriers to infrastructure build out on federal land. Specifically, federal law prohibits commercial activity at federal highway rest areas, which includes charging and fueling infrastructure. Removing limitations on commercial activity for ZEV infrastructure would allow states and companies to make necessary infrastructure investments.

7. Investing in zero-carbon mobility

Achieving deep emission reductions in the transportation sector requires more than vehicle electrification. Improving mobility and land-use planning in and beyond urban centers to reduce vehicle use, improve the efficiency of vehicle miles traveled, and make multi-modal options zero-carbon, is a key complementary strategy to ZEV deployment. And these approaches can improve quality of life and health outcomes. Federal funding currently prioritizes highways over investments in public transportation and other mobility options. This leads to more VMTs by covering 80 percent of the cost of a highway project but only 50 percent of the cost of a transit project.⁴ The federal government could increase funding to better support low- and zero-emitting transportation solutions.

States are promoting climate-friendly transportation through policies to address smart-growth, transit-oriented development, fare reductions, tele-working incentives, bike and walk infrastructure investments, and carpool incentives, among other things. California is working to adopt requirements for transportation network companies (i.e., ride-hailing services) to reduce emissions per passenger mile driven and deploy ZEVs by 2021, with targets being implemented starting in 2023 (SB 1014).⁵ Oregon's OReGO pilot program charges drivers by their vehicle miles traveled (VMT) rather than instituting a fuel tax to fund transportation infrastructure

improvements.⁶ This policy can help incentivize drivers to reduce their VMT, thus reducing transportation-related emissions. Nevada's Senate Bill 299, signed by Governor Sisolak in May 2019, enables schools to apply for utility NV Energy's Electric Vehicle Infrastructure Development incentives to fund up to 75 percent of the cost of charging infrastructure on school property or for the purchase of electric school buses.⁷ New Jersey provides technical assistance resources, tools and financial incentives to municipalities, redevelopment agencies, planners and developers to promote transit-oriented development projects.⁸

Electric Power

Alliance states have made great strides in helping to decarbonize the U.S. power system, in part by dramatically increasing non-hydro renewable energy capacity more than five-fold between 2005 and 2018. Alliance states are now home to more than 70 percent of the nation's solar capacity.⁹ In 2018, zero-carbon sources generated nearly half (48 percent) of our electricity, with 10 percent coming from non-hydro renewable sources.¹⁰ This has been accomplished through a wide range of policies that could be adopted at the national level, such as:

1. Establishing a Clean and Renewable Energy Standard

All Alliance states and Puerto Rico have a renewable energy target established by legislation or executive order. These standards mandate that utilities incorporate increasing amounts of electricity generated from renewable or other zero-carbon sources in their portfolios. Most Alliance states have a renewable portfolio standard (RPS) or clean energy standard, but they all vary by compliance mechanisms, qualifying resources, and end year. Existing targets range from 12.5 percent to 100 percent, with Governors in Hawai'i, California, Maine, Puerto Rico, New Mexico, Nevada, Washington, and New York having signed legislation committing their states to 100 percent carbon-free electricity by no later than 2050. In early 2020, Maryland Governor Larry Hogan unveiled new legislation that would establish a Clean and Renewable Energy Standard achieving 100 percent clean electricity by 2040.

2. Setting Renewable Energy Procurement Targets

Alliance states are setting procurement targets to help spur renewable energy development within their own state borders, including several Northeast states that made substantial commitments to offshore wind electricity generation ranging from 1,600 to 9,000 megawatts over the next 10-15 years. Solar procurements have also been on the rise, including in Virginia, where the Department of Environmental Quality issued permits for new solar projects expected to provide more than 200 megawatts of capacity. In North Carolina, the General Assembly passed 2017 legislation that established a competitive procurement program for renewable energy and will roughly double the state's solar capacity in four years. These investments are helping to reduce GHG emissions while also saving money for taxpayers as renewable sources are increasingly the cheaper option compared to coal and natural gas.

3. Establishing a National Energy Efficiency Resource Standard.

Twenty-one member states have energy efficiency resource standards (EERS) or goals in place, which has helped drive in-state investment and cost savings for our residents and businesses. Five Alliance states' EERS standards are among the most ambitious in the nation, with approximate annual electric savings targets of two percent or greater. These programs have saved state customers money on their energy bills. For example, Pennsylvania's energy efficiency and conservation program set targets for each of the Commonwealth's seven major

electric distribution companies of about 3.7% for 2016-2021. As a result of this program, Pennsylvania's residents have saved over 8.8 million megawatt hours of electricity usage since 2009 resulting in \$6.4 billion in savings to Pennsylvania electric customers.

4. Setting Renewable Energy and Energy Efficiency Targets for Government Operations.

State governments have been leading by example when it comes to support for renewable energy. For example, New Mexico's State Buildings Green Energy project is installing solar power at state buildings and the state government's first battery storage project for solar power. Governor Tom Wolf of Pennsylvania issued an executive order this year setting performance goals for state agencies, including a directive for agencies to offset electricity use with renewable energy procurements. In November 2019, Governor Mills' Lead by Example Executive Order committed state agencies to meeting statewide renewable energy targets through procurement and onsite projects and meeting GHG reduction targets through efficiency upgrades, EV adoption, etc.¹¹ North Carolina Governor Cooper's 2018 executive order directs state agencies to lead by example by reducing energy consumption in state-owned buildings by at least 40% by 2025 and reporting utility usage annually. As his first executive order, Connecticut Governor Ned Lamont directed executive agencies to recommit and expand the state's Lead by Example program, requiring agencies to set and achieve energy, water, waste, and GHG reduction targets.

5. Supporting Grid Modernization

Grid modernization is critical in the transition to a low carbon, resilient energy future. Alliance states are helping to advance this goal by providing a range of funding. For example, in the past year, Governor Cuomo announced up to \$30 million in support of projects to improve the resilience, flexibility, and integration of renewable energy resources onto New York's electric grid. In Washington, the State Department of Commerce is distributing over \$10 million in grants to electric grid modernization projects from the Washington Clean Energy Fund. The New Mexico Renewable Energy Transmission Authority (RETA) is performing a study to find out what the state's transmission and storage needs will be in a decarbonized electric sector.¹² States pursuing similar decarbonization efforts would likely find a national-level analysis useful for their own state-level and regional planning.

6. Supporting community solar programs

A recent study from the National Renewable Energy Laboratory found that almost half of U.S. households and businesses cannot install solar panels on their rooftops because they rent their spaces or for other reasons.¹³ Community solar programs offer an alternative, giving residents, businesses, and local governments the ability to purchase a portion of the power produced by a solar array and then receive a credit on their electricity bills. Alliance states are working to expand this option to their residents, especially in low-income communities. For example, Colorado launched the Low-Income Community Shared Solar Demonstration Project with GRID Alternatives in 2015 to develop a portfolio of projects that demonstrate varying approaches to providing low income households with affordable solar power.¹⁴ California's program is designed to reduce energy costs for households that are not currently able to benefit from existing low-income solar programs and requires that each community solar project provides solar installation training and meets specific local hiring and wage requirements.¹⁵

Even with the progress that Alliance States have made to decarbonize the U.S. power system, additional support is needed at the federal level to accelerate these efforts across the country. Potential actions include:

1. Increasing investment in storage technology development and deployment

Energy storage can help optimize the grid by reducing peak energy needs, increasing reliability integrating renewable energy, and deferring investments in transmission and distribution upgrades. However, challenges to widespread deployment still exist, such as costs and regulatory environments. To help spur deployment, the federal government can:

- a. **Increase support and resources to research and development activities.** Existing federal programs like ARPA-E and other Department of Energy programs and partnerships have already made progress.¹⁶ These programs should be fully funded so they can continue advancing energy storage technology, while also supporting complementary state efforts.
- b. **Set storage resource procurement targets.** For example, at the state level, California passed legislation (AB2514; AB 2868) requiring investor owned utilities to install 1825 MW of storage, 500MW of which must be behind the meter.
- c. **Provide robust financial incentives.** For example, California's Self-Generation Incentive Program (SGIP) will end up directing about \$1.2 billion in incentives by 2025, to help add about 3,000 megawatts of behind-the-meter batteries to the state by 2026. Improvements made to the program over time include shifting funding so that 75 percent goes to energy storage specifically; moving from a first-come, first-served awards system to a lottery that favors projects with additional GHG emission or grid-balancing benefits; and adding a declining incentive structure to reduce payouts over the life of the program.¹⁷

2. Maintaining renewable energy technology financial incentives and credits.

Existing tax credits for solar and wind technologies are set to decrease or expire soon. Extending them would help accelerate the deployment of these zero emission resources in the absence of a national climate framework.

3. Addressing regulatory barriers to transmission investments.

For example, addressing issues around interstate transmission siting will enable renewable sources can be better connected with demand load centers.¹⁸

4. Supporting investments in grid resilience.

Standards, initiatives, and additional support are needed to help states increase their emergency preparedness and address grid security. For example, Nevada now requires NV Energy, the state's investor owned utility, to provide a Natural Disaster Protection Plan (NDPP) detailing how it will harden its systems against natural disasters, including wildfires. The state Public Utility Commission will then analyze those grid upgrade costs for prudence and reasonableness to determine whether it is appropriate to rate base them. While the first NDPP is not due until March 2020, potential expenditures could include vegetation management and inspection and technology additions including weather stations and fire cameras.

Industry

Across the Climate Alliance, GHG emissions from industry have fallen 12 percent between 2005 and 2017, yet this sector still contributes 12 percent of our total emissions.¹⁹ Looking forward, this sector is projected to become an even larger share of our collective emissions. Because industrial processes are so varied across subsectors (e.g., cement, steel, pulp and paper, food processing, among others) it is one of the most difficult sectors to decarbonize. Federal leadership is going to be critical in helping to modernize and decarbonize our nation's industrial sector. Potential actions include:

1. Increasing support and resources to research and development activities

The U.S. has always led the world in innovation, and it can continue doing so by supporting the development and deployment of innovative and efficient technologies that allow industries to switch to low or zero-carbon fuels, capture and store carbon emissions, and produce less waste.

2. Adopting procurement requirements

Governments can influence the businesses decisions made by suppliers looking to provide goods to public agencies by taking into account their emissions performance in procurement decisions.²⁰ For example, the **Buy Clean California Act** (Public Contract Code § 3500-3505)²¹ targets the embedded carbon emissions of certain construction materials (structural steel, carbon steel rebar, flat glass, and mineral wool board) used in public works infrastructure projects.²² Starting January 1, 2020, suppliers will be required to disclose the life cycle environmental impact of their products. The following year, the Department of General Services will publish the maximum acceptable global warming potential for eligible materials. Concrete, cement and wood were not included in the Act due to expected increase in costs.

3. Establishing incentive programs for advanced technology deployment

For example, California's Food Production Incentive Program has provided nearly \$120 million from California Climate Investments (cap and trade auction proceeds) to accelerate the adoption of advanced energy efficiency and renewable energy technologies among the food processing industry—one of CA's largest energy users.²³ These state of the art energy technologies will help food production facilities reduce their energy use, costs, and GHG emissions. The 21 projects funded to-date (as of July 2019) are projected to reduce emissions by 55,000 metric tons of CO₂e annually.²⁴

Buildings

Alliance states lead the country in instituting aggressive energy efficiency programs and policies, making up seventeen of the top twenty ranked states for energy efficiency policy by the American Council for an Energy Efficient Economy (ACEEE).²⁵ The Alliance represented nearly 70 percent of the country's new investment in utility-driven energy efficiency improvements in 2018, generating over \$4.3 billion in investment compared to roughly \$1.3 billion in non-Alliance states.²⁶ These new investments reduced the amount of electricity that households and businesses in Alliance states had to buy in 2018 by about 20 million megawatt-hours (see Figure 6).²⁷ This is equivalent to the electricity used by more than 1.7 million homes for one year,²⁸ and more than twice the amount of energy savings in non-member states.²⁹ Efficiency programs among Alliance states have put more than 1.4 million people to work, representing 60 percent of all jobs in the U.S. energy efficiency sector in 2018.³⁰ The federal government can build on

actions that Alliance States have already started to take to accelerate the transition to more efficient buildings across the country:

1. Adopting the next generation of building energy codes

For example, the California Energy Commission adopts more stringent energy performance standards for new construction as part of the triennial building standards cycle. As a result of its energy standards, the average energy bill of household in California is 21 percent lower than the national average (as of 2015).³¹ Looking forward, California has goals for all new residential construction to be net zero by 2020, and all new commercial by 2030.

New York recently developed best practice standards to advance more resilient and energy efficient buildings across the state.³² The NYStretch Energy Code-2020 was developed by NYSERDA with guidance from a 25-member advisory group comprised of public and private stakeholders as a cost-effective statewide model code to help local New York jurisdictions meet their energy and climate goals. Communities that adopt and implement NYStretch will accelerate energy cost savings, reduce emissions from buildings, improve resiliency from power disruptions, and lower utility bills for New York consumers. In fact, NYStretch is expected to provide savings of roughly 11 percent in energy costs over the model energy codes that will be the basis for the 2020 Energy Conservation Construction Code of New York State (2020 ECCC-NYS), with simple paybacks typically in the range of six to 12 years.

New Mexico hopes to adopt the IECC 2018 codes for both residential and commercial buildings soon, a significant increase from its current status using IECC 2009 for both sectors.

Programs at the Department of Energy that support building code updates and compliance in individual states through financial and technical assistance continue to be an important tool to reducing building-related emissions.

2. Adopting performance standards for existing buildings

Nine Alliance states rank among the top ten states in the United States for LEED-certified green buildings, in terms of gross square footage (GSF), GSF per capita, and number of certified projects.³³ Green buildings not only save residents in Alliance states energy and water but also create healthier environments in which to work and live. Washington offers one example of state leadership around innovative green building policy. Although LEED certification and most building codes target new buildings, building stock turnover is slow thus addressing emissions from the current building stock is key to any significant reductions in this sector. Washington's 2019 Clean Buildings Act addresses both new and existing buildings. By November 2020, the state's Department of Commerce will establish the first state-level energy performance standard for existing large commercial buildings. The largest commercial buildings will be required to meet these standards beginning in 2026; most other large commercial buildings will come into the program by 2028.³⁴ At the same time, the state's energy codes will be updated to require newly constructed buildings to move incrementally toward a 70 percent reduction in energy use by 2031.³⁵

3. Supporting deployment of high efficiency heat pumps.

Long used for cooling in warm climates, heat pumps are now one of the most popular technologies for heating in cold climates, achieving efficiencies well above 100 percent.³⁶ Because of the energy and GHG emissions savings, states are incentivizing this technology for

residential and commercial customers. For example, Efficiency Maine offers rebates for high-efficiency ductless heat pumps, with more than 30,000 heat pumps installed in Maine homes and businesses over the past five years. Governor Mills recently doubled the rebate, providing a \$1,000 rebate for the first heat pump and \$500 rebate for the second unit. Additionally, low income homeowners are eligible for a \$2,000 rebate. When fully implemented, the initiative is expected to save consumers \$30-60 million annually.³⁷

4. Adopting appliance efficiency standards nationally and ensure states are not-preempted so that they have the option of backstopping rules that are rolled back or not implemented.

Adopting appliance standards not preempted by the federal government have the potential to provide \$109 billion in net present value savings for consumers and businesses. Potential national cumulative electricity savings through 2035 for these standards are about 343 billion kilowatt-hours (kWh).³⁸ For comparison, that is enough electricity to power almost 31 million US households for one year.³⁹ Total potential cumulative CO2 emissions reductions through 2035 are about 192 million metric tons (MMT), with annual potential CO2 reductions in 2035 reaching 20 MMT.⁴⁰

5. Increasing financial support of highly efficient technology development and deployment.

This can include financing mechanisms like tax credits, rebates, grants, and low-interest loans. It is important that all technologies that increase the efficient use of energy, including beneficial electrification, qualify. Low income community programs should ensure that robust definitions and qualifications are used so that the number of families assisted can be maximized. States have adopted a range of programs to help bring the cost of energy efficiency investments down. For example, Connecticut's *Commercial and Industrial Property Assessed Clean Energy (C-PACE)* provides 100% upfront financing for energy upgrades to commercial, industrial, non-profit, and multi-family buildings. Loan repayment can be spread over up to 25 years. New York's *RetrofitNY* program will bring a large number of existing affordable housing units to net-zero energy use by 2025. This innovative program is encouraging more developers, owners, solutions providers, and manufacturers to help spur further progress in addressing the challenges that remain for performing net-zero energy renovations of existing building.⁴¹ Massachusetts' *Pathways to Zero Net Energy Program* awarded \$3.5 million to fund feasibility, integrated design, and construction of zero-net energy buildings. The projects included a range of locations, strategies and building types, with case studies submitted to an online database.

6. Supporting urban forestry programs to reduce building cooling needs.

Not only do urban forests reduce water runoff, beautify urban areas, and improve public health, but they reduce community energy costs as well. A USDA Forest Service report found that urban trees reduce heating and cooling energy costs for homes across the United States by more than 7 percent, saving approximately \$7.8 billion annually.⁴² However, additional support is needed to address the many challenges that urban forests face, including insects and diseases, natural catastrophic events (e.g., ice storms, wind storms, hurricanes), invasive plants, development, air pollution, impaired soil health, lack of adequate management, and other social factors.⁴³ To this end, Rhode Island's Resilient Rhody strategy includes a recommendation to support municipalities in developing urban tree inventories and implementing urban forest master plans with a goal toward mitigating increased urban heat.⁴⁴ In April 2019, Rhode Island Governor Gina Raimondo announced implementation of a grant that will empower the state to engage directly

with municipalities to develop a statewide urban tree canopy goal, support tree planting and tree care for 3 to 5 pilot communities, develop stronger relationships with nursery and landscape associations, and develop an online "decision support tool" to assist with optimizing urban tree planting for environmental and public health benefits.⁴⁵

Carbon-pricing: Deploying Market-based Solutions

Alliance states have been leaders in adopting market-based mechanisms that aim to cost effectively limit carbon pollution. States that have implemented these programs have not only achieved emission reductions but have also been able to take advantage of a wide range of economic, health, and other co-benefits. The federal program can consider establishing a market-based program that considers program design elements that have proven successful in existing and future markets in Alliance states, for example:

1. Establishing sector-specific cap-and-invest markets

For example, the Regional Greenhouse Gas Initiative (RGGI): RGGI is a cooperative effort among Northeast and Mid-Atlantic states that sets a mandatory carbon pollution cap for regional power plants and sells emission allowances through auctions generating proceeds that are reinvested in energy efficiency, renewable energy, and other consumer benefit programs. States participating in this initiative have seen their power sector emissions fall to more than 50 percent below 2005 levels, and have enjoyed \$4 billion in net economic benefits and a multitude of health benefits for their residents.⁴⁶ New Jersey rejoined the initiative in 2019 and will participate in the January 2020 auction. And two other states – Pennsylvania and Virginia – have initiated the process to become a RGGI participating state.

In December 2019, Alliance states in the Northeast and Mid-Atlantic released a draft memorandum of understanding that proposes developing regulations to establish a regional cap and invest program to reduce carbon dioxide emissions from the combustion of the fossil component of finished motor gasoline and on-road diesel fuel. Transportation sector emissions are the largest source of emissions across Alliance states, thus this bipartisan, regional program could meaningfully reduce transportation emissions and facilitate reinvestment of allowance auction proceeds in priority programs that support cleaner transportation, healthier communities, and more resilient infrastructure.⁴⁷ This program may also bring extensive socioeconomic benefits to the region. Preliminary analysis projects that over the program's first decade, it could avoid over 1,000 premature deaths and over 1,300 fewer cases of asthma annually, ultimately bringing up to \$10 billion in public health benefits across the region.⁴⁸

2. Establishing an economy-wide carbon market

In the 2018 alone, California invested \$1.4 billion of its economy-wide cap and trade proceeds, almost doubling 2017 levels of investment. To date, California's investments have helped to install efficiency measures in 110,000 homes, issue more than 207,000 rebates for zero-emissions and plug-in hybrid vehicles, preserve over 500,000 acres of land, add or expand transit options through more than 460 transit agency projects, and plant more than 50,000 trees in urban areas, all while focusing almost 60 percent of funds to benefit the state's most vulnerable populations.⁴⁹ California's carbon market is linked with Quebec's, making it the only international multi-jurisdictional carbon market in the world, and a model for future international markets.

At the same time, policy decisions made at the federal level should allow states to continue to have the ability to implement regional markets that aim to reduce GHG emissions.

Agriculture & Forestry

The United States has the potential to sequester 770 million tons of carbon dioxide equivalent per year from employing land use and management strategies, including reforestation, avoided forest conversion, and the use of cover crops.⁵⁰ The land use and forestry sector accounted for over 700 million metric tons of carbon dioxide equivalent sequestered in the United States in 2017 (11 percent of total U.S. GHG emissions).⁵¹ Despite the importance of our lands in addressing climate change, there is limited data available to help states fully quantify both current and future sequestration contributions from this sector. Working with experts and key stakeholders, the U.S. Climate Alliance is developing the data necessary to incorporate lands into statewide inventories and GHG mitigation plans. Alliance states are also taking concrete actions that will help enhance and protect this sector. States are using various vehicles to integrate NWL as a key component of their climate mitigation strategies, such as executive orders, launching stakeholder groups tasked with developing land sector action plans, revising land acquisition strategies, and implementing best practices that both enhance sequestration and achieve non-climate benefits. State actions that the federal government can help support or adopt at the national level include:

1. Supporting healthy soils practices

Improving soil health through best management practices not only increases the carbon carrying capacity but also produces increased yield and results in decreased water requirements. Maryland's Healthy Soils Program aims to increase biological activity and carbon sequestration in the state's soils by promoting practices based on emerging soil science, through incentives, research, education, technical assistance, and financial assistance for farmers.⁵² California's Healthy Soil Initiative includes funding, research and demonstration projects for producers looking to advance farm management practices that include but are not limited to: cover cropping, no-till, reduced-till, mulching, compost application, and conservation plantings. New Mexico's Healthy Soils Act (2019 HB 204) establishes a program at the New Mexico Department of Agriculture for farmers and ranchers to improve soil health, which can increase carbon sequestration in agricultural land.⁵³ The program will conduct a healthy soil assessment and education program that provides a baseline soil health assessment and training resources to farmers. It also includes a grants program that provides funding to entities through a competitive process to provide technical assistance to producers and land managers in advancing soil health principles and implementing supported methods.⁵⁴

2. Providing Incentives for Farmland Conservation Practices

Implementation of conservation practices can be expensive and farmers often operate with small margins. Providing financial incentives can help overcome these barriers. For example, Colorado's District Conservation Technician Program provides 75 percent cost share to employ technical staff for implementing conservation practices or planning on private land. Minnesota's Sustainable Agriculture Demonstration Grant Program funds innovative on-farm research and demonstrations including farm diversification using traditional and nontraditional crops and livestock, cover crops and crop rotations, conservation tillage, input reduction strategies.⁵⁵

3. Preserving farmland

Preservation of farmland helps to ensure that lands will not only continue in production, but also continue their natural carbon sequestration cycles. Many states have programs and incentives for farmland preservation including easements, tax incentives and planning. California has a comprehensive program that includes the Sustainable Agricultural Lands Conservation Program, Agricultural Land Mitigation Program and California Farmland Conservancy Program. Minnesota's Green Acres Program reduces property taxes for owners of agricultural property in areas where the market value of land is affected by development pressure, sales of recreational land, or other nonagricultural factors.⁵⁶ The Rhode Island Department of Environmental Management (DEM) provides funds to help local farmers "green" their operations and benefit from the related energy and cost savings. The new Rhode Island Farm Energy Program supports energy efficiency projects as well as helps farmers transition to renewable power. Additionally, DEM provides investment to preserve working farms and Rhode Island's growing network of local farmers from bond funding every two years.

4. Developing improved carbon modeling for forested ecosystems

Maintaining forest health and reducing wildfire risk is becoming more and more challenging, but limited carbon modeling exists for these areas that would help identify the areas most at risk. Improved modeling coupled with forest management practice strategies would help land managers target their limited resources to areas and practices that provided the greatest gains for reducing wildfire risk.

5. Providing financial support for re-vegetation activities

Nationally, states report a shortage of seedlings that would help re-vegetate lands post wildfire. Federal support for seed banks and seedling nurseries could help address this issue.

6. Incentivizing investments in private forests to enhance resilience and mitigation

Massachusetts has initiated the development of a Forest Resilience Program, a pilot program that incentivizes private forest owners to manage carbon benefits and climate resilience across the state through education and grants. New York State is working on a new cost-share practice program for private forest landowners aimed at overcoming severe obstacles to establishing natural regeneration in stands of maturing forests located on most of New York's 15.6 million acres of privately-owned forests. Extreme wildfires, which are becoming more frequent as the climate changes, not only reduce forest cover (and therefore sequestration capacity), but also emit large amounts of CO₂. Managing our forests to reduce the risk of extreme fire events also reduces emissions those fires produce and keeps more trees alive to continue sequestering carbon. In New Mexico, a new working group established by 2019 House Memorial 42 is studying constraints on the use of prescribed fire, including on private land, and will provide policy recommendations by June 2020.

Non-CO2 Emissions

Until recently, a growing and effective regulatory framework was in place to help reduce non-CO2 short-lived climate pollutants (SLCP) nationally. It included regulations to reduce the loss of valuable methane gas from oil and gas production and landfills, phase out the use of HFCs where climate friendly alternatives are available, improve refrigerant management to limit leaks, and develop cleaner

woodstoves to cut pollution in our neighborhoods. Many of these rules have been rescinded or delayed, leading to significant uncertainty in the regulatory landscape affecting businesses and emissions in the U.S. The USCA supports reinstatement of a strong federal framework that supports state action.

Hydrofluorocarbons (HFCs)

HFCs are potent short-lived climate pollutants, with global warming potentials hundreds to thousands of times greater than CO₂, and with a lifespan of about 15 years. HFCs are often used in commercial refrigeration, stationary and mobile air conditioning, heat pumps, foams, and aerosols. They are the fastest growing source of greenhouse gas emissions, both nationally and globally. Without further controls, HFC emissions could double in 20 years. Actions that the federal government could consider include:

1. Creating a national framework to phase-down HFC use that allows states to backstop potential future rollbacks

Under the Kigali Amendment to the Montreal Protocol, the world agreed to phase down HFC production and use and transition to climate friendly alternatives. In many cases, transitioning to new equipment with lower global warming potential (GWP) refrigerants offers energy efficiency benefits and net cost savings. Ratification is almost universally supported by U.S. industry and environmental groups, yet the United States remains one of the only countries in North America and Europe that has not ratified the Amendment. Federal rules restricting the use of HFCs—EPA’s Significant New Alternatives Policy (SNAP) program—have been partly vacated by the D.C. Court of Appeals. Alliance states support a national framework that phases down HFCs, but it is critical that any legislation or regulation avoid pre-empting state action. States often play a critical role in backstopping regulations when the federal government refuses to act, and in the case of HFCs, there has been a strong need for states to lead.

U.S. Climate Alliance states are stepping up to fill this void and protect American companies and jobs. To do this, they are adopting regulations substantially similar to each other and the federal SNAP rules to create a coordinated regulatory framework that supports industry. HFC legislation passed in Washington and Vermont. Delaware, Maryland, New Jersey and New York are in the process of regulating or legislating HFCs, and California has already passed and is now implementing regulation.

2. Improving refrigerant management practices to minimize HFC emissions from equipment in use and at the end of life

Even with limits on the sale of new equipment using HFCs, there remains a significant amount of HFC use in existing equipment. At the same time, removing refrigerants from equipment either during servicing or at retirement remains a large source of unaddressed emissions. Actions to address these sources include:

- a. Limiting the use of high- GWP refrigerants in existing equipment.** The California Cooling Act limits the use of high-GWP refrigerants in new and existing refrigeration and air conditioning equipment, when low-GWP alternatives are available.
- b. Developing a National Framework for disposal and reclaim:** Broader efforts to address leaks and proper disposal and reclaim are needed to address end-of-life venting. Without regulations and incentives in place, as well as proper training for technicians, these refrigerants are often vented into the atmosphere or added to stockpiles that are at risk for

leaks. While states can address this to some extent on a state-by-state basis, a coordinated national incentive program would help to standardize rules and increase compliance.

- c. Providing incentives:** Incentives can encourage adoption of new refrigerant technologies and transitions away from HFCs in supermarkets, homes, and commercial buildings. California is exploring statewide incentive programs. One of its utilities, the Sacramento Municipal Utility District, has developed the Pilot Natural Refrigerant Incentive Program, which provides incentives to commercial customers who use natural refrigerants (ammonia, CO₂, or a hydrocarbon) in new or retrofitted refrigeration systems.⁵⁷ These systems may offer energy efficiency benefits, as well.

Upstream oil and gas methane

The U.S. Environmental Protection Agency (EPA) estimates that about 45 percent of methane emissions in the United States from coal mining and oil and natural gas systems can be reduced nationally at low or negative cost.⁵⁸ Capturing these emissions improves mine and pipeline safety, conserves energy, and saves money. Actions that can help reduce methane emissions from new and existing oil and natural gas facilities include installing emissions monitoring requirements, replacing leak-prone pipes, and limiting methane venting and flaring, which has the added benefit of reducing black carbon emissions. Many of the commonsense solutions that reduced methane emissions from the sector have since been weakened or eliminated, such as federal requirements that oil and gas companies install technology to detect and fix methane leaks. State actions that the federal government can help support or adopt at the national level include

1. Developing Regulations to Reduce Methane in the Oil and Gas Sector

Colorado became the first state to directly regulate oil and gas methane emissions. The state requires facilities to detect and repair leaks using infrared cameras or other approved technologies. A two-year pilot project found that this action alone reduces the incidence of leaks by over 70 percent. California has subsequently developed regulations while New York is in the development phase of state regulations to enact new source performance standards and control techniques guidelines. New Mexico has announced regulations to reduce methane from oil and gas production while Pennsylvania is working to inventory methane releases from legacy wells to determine how best to mitigate emissions. Virginia has begun their rule-making process for methane loss from natural gas infrastructure and Maryland is working on rules to Minimizing Methane Emissions from Natural Gas.

2. Extending “Upstream” Requirements to all Segments of the System

Some federal rules address oil and gas methane emissions at the point of production for new and some existing sources, however, additional rules could expand coverage further to existing sources as well as transmission and distribution facilities. For example, in New Jersey, a major gas utility (PSE&G) applied new methane sensing technologies to help measure natural gas flux associated with leaks and not just the presence of leaks, and has reported successfully reducing methane emissions by 83 percent from targeted areas.

3. Capping Emissions from Natural Gas Distribution

Massachusetts imposes annually declining emission limits on gas operators to reduce methane from natural gas distribution mains and services. The caps decline from 2018-2020 to help meet the state's 2020 greenhouse gas emissions limit.⁵⁹

4. Requiring Reporting and Best Management Practices

Requiring utility companies and gas suppliers to report natural gas emission data and implement best management practices to mitigate leaks provides data to measure progress and identify additional mitigation opportunities. California requires utilities to incorporate 26 best practices for methane leak detection, quantification, and elimination.⁶⁰

5. Replacing Old, Leak-Prone Pipes

Non-cathodically protected steel, cast-iron, and wrought-iron pipes are vulnerable to methane leaks and tend to have a higher risk of leaks as they age. Massachusetts law requires replacing aged pipelines, which are the most leak-prone infrastructure.⁶¹ New York has developed incentives for gas distribution companies to encourage accelerated replacement of leak-prone pipes and has instituted negative revenue adjustments for gas utilities that do not meet their required replacement levels.

Landfills & Waste

Landfills account for about 21 percent of U.S. Climate Alliance methane emissions, making them the third largest source after enteric fermentation and manure management. Methane capture systems and other best management practices at landfills significantly reduce methane emissions and can generate heat, renewable electricity, or fuel from landfill gas. Diverting organics from landfills avoids generating methane from decomposition and offers a valuable resource stream to produce compost or renewable energy. State actions that the federal government can help support or adopt at the national level include:

1. Incentivizing the Diversion of Organic Materials from Landfills

Eliminating or reducing the disposal of organics in landfills, and taking steps to ensure alternative, cost-effective treatment is available for diverted organics, can dramatically reduce methane emissions from landfills. Massachusetts bans commercial disposal of organic waste from businesses and institutions that dispose more than one ton of organic materials per week. Vermont has a Universal Recycling Law that contains an organics diversion mandate by 2020. California has a target to reduce organic waste disposal by 75 percent below 2014 levels by 2025. Connecticut has a municipal solid waste 60 percent diversion goal.

2. Accelerating the Development of Infrastructure to Utilize Diverted Organic Material

Connecticut has streamlined permitting requirements for certain waste facilities that use newer technologies, like anaerobic digesters, to generate renewable energy and avoid landfilling organics. California's Organics Grant Program helps expand capacity for compost or energy production from diverted organic waste streams. New York's Climate Smart Communities Projects and Municipal Recycling Programs offer cost share for municipalities to implement organics diversion infrastructure, and a grant program for large organics generators through New York's Empire State Development.

3. Creating Markets to Support Organics Diversion

Helping to build markets for clean energy or soil amendment products will support organics diversion goals. For example, California utilities share costs of pipeline interconnection to renewable sources of gas, including from landfills and anaerobic digesters, and the state's Healthy Soils Initiative promotes activities to increase soil organic matter and improve soil health.⁶² New York is supporting research to increase the use of compost in agriculture.

Agricultural Methane

Actions to improve manure management and to reduce methane from enteric fermentation have the potential to significantly reduce agricultural methane emissions across U.S. Climate Alliance states. Improving manure storage and handling, composting manure, utilizing pasture-based systems, or installing anaerobic digesters significantly reduces methane from manure management on dairy, swine, and other livestock operations. Actions that the federal government can take include:

1. Incentivizing Strategies to Reduce Methane

Several state and federal programs offer financial assistance or tax incentives for projects that help reduce agricultural methane and other emissions. When developing or implementing agriculture funding programs, methane emissions reductions can be used as a requirement or scoring criteria. California offers grants that cut methane from dairy manure through the Dairy Digester Research and Development Program⁶³ and Alternative Manure Management Program.⁶⁴ Massachusetts provides grants through the Massachusetts Clean Energy Center to conduct organics-to-energy project feasibility studies and move forward with implementation and pilot projects.⁶⁵ New York offers cost sharing for projects that improve water quality or reduce climate impacts from agriculture through the Agricultural Environmental Management Framework and Climate Resilient Farming Program

2. Improving Predictability of Revenue Streams for Renewable Gas from Dairies and Farms

Revenue from environmental markets like low carbon fuel standard programs, renewable portfolio standards, or cap-and-trade programs, provide valuable revenue streams that may be sufficient to cover the costs of dairy digester or other projects. However, credit prices can be unpredictable, making it difficult to finance projects. For example, California and Vermont offer feed-in tariffs for small bioenergy projects, and Green Mountain Power's voluntary Cow Power program offers an adder to the feed-in tariff in Vermont. North Carolina's Renewable Portfolio Standard includes a set-aside for energy from swine and poultry waste. California is also exploring a "pilot financial mechanism" for the state's Low Carbon Fuel Standard to reduce the economic uncertainty associated with the value of environmental credits for dairy-related projects producing low carbon transportation fuels.

Resilience and Adaptation

Climate change-driven severe weather events, like wildfires, drought, flooding, and sea-level rise, continue to threaten communities and businesses across the United States, costing the country \$45 billion in 2019 alone.⁶⁶ Looking ahead, the economic toll of climate change will only grow as the intensity and frequency of severe weather events increases and the value of real estate in vulnerable areas also grows. Policies need to accurately reflect infrastructure lifespan and changing risk profiles over longer

time period than just the near future or historical trends. Alliance states are prioritizing investments that will make communities, infrastructure and our economies more resilient to climate impacts. The following adjustments to existing federal policies and programs would help support state efforts:

1. Strengthening and redesigning the Stafford Act

Resources are currently included in section 406 of the Stafford Act for mitigation planning, but the Act does not allow for comprehensive change; rather, projects must stay within the original footprint. Congress could also update this program with more flexibility built in so states can move forward with proactive solutions that build resilience. Furthermore, the use of taxpayer dollars should consider the latest science, especially sea level rise projections, to ensure those investments are resilient. The repeal of the Federal Flood Risk Management Standard puts federally funded infrastructure at risk.

2. Incorporating state feedback regarding the Building Resilient Infrastructure and Communities (BRIC) Program

It is important that this program includes the positive aspects of the Hazard Mitigation Grant Program and the Pre-Disaster Mitigation Grant Program that are working well and make improvements to the proposed program as outlined in Alliance state comments. For example, Provide 10 percent State Management Costs at 100 percent federal, Include a longer pre-award period so that scoping and design activities can be accomplished & provide a State/Tribal set-aside without planning limits.

3. Reviewing the Emergency Watershed Protection program in a timely manner

The Government Accountability Office (GAO) has agreed to conduct the review requested by Senators Bennet and Romney for the Natural Resources Conservation Service's Emergency Watershed Protection Program, this review should be completed in a timely manner

4. Adopting an Ecosystem-based Adaptation approach

All federal natural resources agencies could adopt "Ecosystem-based Adaptation" to "address water insecurity and climate change adaptation by strengthening natural systems, conserving biodiversity and maintaining the goods and services that ecosystems provide for human development." This approach involves the use of biodiversity and ecosystem services to help people and communities proactively adapt to the adverse impacts of climate change.⁶⁷

5. Expanding the workforce to support growing resilience and adaptation needs

Using AmeriCorps as a labor source for a national Climate Corps would be a cost-effective option for building climate resilience expertise and supporting communities. Department of Labor (DOL) youth employment dollars could also be used to create youth employment for local climate adaptation and resilience labor needs.

6. Supporting multi-jurisdictional approaches

Where climate impacts are experienced regionally, states and municipalities work together on coordinated climate resilience and adaptation strategies. Federal funds, programs and policies are difficult to access by groups of jurisdictions. Enabling multiple jurisdictions to collectively access those resources would enable more effective regional response to climate change.

States have been at the forefront in developing programs aimed at increasing community and local government preparedness to natural disasters and sea level rise that could be replicated at the national level, such as:

1. Reducing risks for front-line communities

Nature based solutions use natural systems, mimic natural processes, or work in tandem with traditional approaches to address natural hazards like flooding, erosion, drought, and heat islands. Incorporating nature-based solutions in local planning, zoning, regulations, and built projects can help communities reduce their exposure to these impacts, resulting in reduced costs, economic enhancement, and safer, more resilient communities.⁶⁸ For example, over the span of 20 years, the Massachusetts Water Resources Authority has spent \$130M to protect 22,000 acres of watershed lands. Doing so has avoided ratepayer costs of \$250M on a filtration plant and saved \$4M in annual operation costs.

Massachusetts' Municipal Vulnerability Preparedness (MVP) Program provides support for cities and towns in Massachusetts to begin the process of planning for climate change resiliency and implementing priority projects.⁶⁹ The state awards communities with funding to complete vulnerability assessments, develop action-oriented resiliency plans and implement preparedness measures. In March 2019, the Baker-Polito Administration announced \$10 million for the MVP program, bringing the total funds committed to the program to \$17 million.

Through Rhode Island's Municipal Resilience Program, municipalities can build on local hazard mitigation planning to develop initial resilience plans and prioritize projects through Community Resilience Building workshops. The Rhode Island Infrastructure Bank is funding the implementation of these plans, with municipalities required to match the Bank's funding with a 25 percent local project cost share. Funds will be distributed over two years, with up to \$1 million allocated to the first Municipal Resilience Communities in 2019 when they complete the program.⁷⁰ This year, Governor Raimondo released plans for a bond that would further fund the popular program and support the majority of the remaining Rhode Island municipalities.

Longmont, Colorado's Resilient St. Vrain project is an extensive, multi-year project to fully restore the St. Vrain Greenway following a catastrophic flooding event in September 2013 and improve the St. Vrain Creek channel to protect people, property and infrastructure from future flood risk.⁷¹ This comprehensive project was too resource intensive for one agency or program to implement alone; however increasing flexibility in grant agreements to permit layering and leveraging of different funding sources enabled the project to move forward. The project is being funded through several different sources.⁷²

2. Adopting standards and codes for the built environment

In November 2019, Governor Ralph Northam issued an executive order that creates the Virginia Flood Risk Management Standard to improve flood protection in flood prone areas across the state, further encouraging smart and resilient construction of state buildings.⁷³ It establishes a "freeboard" standard that increases protection of state-owned buildings in coastal and riverine floodplains. A first of its kind for any state, the standard incorporates science-based sea level rise projections that the National Oceanic and Atmospheric Administration has developed and adopted. The standard requires that state-owned buildings are built to certain elevation standards to protect them from flooding. The new standards will apply to all state-owned buildings authorized for construction after January 1, 2021.

Supported by the Massachusetts Emergency Management Agency (MEMA), the Division of Capital Asset Management and Maintenance (DCAMM) undertook a planning process with the goal of reducing the vulnerability of state facilities to climate change impacts.⁷⁴ The resulting Statewide Resilience Master Plan (SRMP) lays the groundwork for DCAMM to implement resilient building strategies in future projects, and to ensure service continuity for the Commonwealth's constituents. In addition, the SRMP will inform DCAMM's consideration of changes to building codes, land use policies, and other guidance documents in order to advance resilient design efforts.

New York is examining how current codes and standards can be modified or adjusted to better anticipate impacts of climate change into the future.⁷⁵

New Jersey will become the first state to require that climate change considerations, such as sea level rise, be integrated into its regulatory and permitting programs, including but not limited to, land use permitting, water supply, stormwater and wastewater permitting and planning, air quality, and solid waste and site remediation.⁷⁶

Climate Change Planning Body

Several Alliance states have established executive level climate change offices and/or multi-agency commissions that meaningfully coordinate state-wide climate change mitigation and adaptation policies and programs. There is already precedence in the federal government for similar structures, such as the White House Office of Energy and Climate Change Policy (2008-2011), established to coordinate administration policy on climate and energy, and the U.S. Global Change Research Program (USGCRP), "a Federal program [mandated by Congress](#) to coordinate Federal research and investments in understanding the forces shaping the global environment, both human and natural, and their impacts on society."

Establishing a Federal Climate Change Planning Body

The development of an executive interagency strategic climate change planning body could provide value across federal agencies working on climate change policies and initiatives. An entity such as this could develop overarching goals, objectives, and initial priorities for climate change mitigation and adaptation. Such an entity could work with all federal agencies to review existing programs, laws, policies, and regulations relevant to climate change planning. This could also include an evaluation of cross agency and cross sector collaboration and coordination. This planning phase could serve as the building blocks for putting forth a multi-agency federal plan to reduce GHG emissions across all sectors and to prepare the nation for the impacts of a changing climate. A federal strategy that strategically plans and coordinates programs, policies, and regulations across all federal agencies would help to ensure an effective collaboration and a coordinated approach to addressing climate change in the United States. A high-level interagency strategic climate change planning body could play a critical role in the development of such a strategy.

The federal government can take lessons learned from the many state-level planning bodies, for example:

In 2007, Maryland's Commission on Climate Change (MCCC) was established through Executive Order and charged with developing an action plan and firm timetable for mitigation of and adaptation to the likely consequences and impacts of climate change. As result of the success of this multi-agency planning

process, the Maryland General Assembly codified the MCCC into law in 2015 and charged the Commission with advising the Governor and General Assembly "on ways to mitigate the causes of, prepare for, and adapt to the consequences of climate change". The MCCC is chaired by Maryland Department of the Environment Secretary and consists of 26 members representing State agencies and legislature, local government, business, environmental non-profit organizations, organized labor, philanthropic interests, and the State University system.⁷⁷

Hawaii's Climate Change Mitigation and Adaptation Commission was established by the passage of Act 32 in 2017 and serves as another example of best practices in cross agency climate change coordinating and planning. The Climate Commission is comprised executive level officers and leadership from the general assembly, meets quarterly, and provides direction, facilitation, coordination, and planning among state and county agencies, federal agencies, and other partners on climate change mitigation and resiliency strategies.⁷⁸

In 2018 Governor Roy Cooper established the North Carolina Climate Change Interagency Council by executive order. The council is comprised of the governor and his cabinet secretaries. It recommends climate goals and establishes strategic plans and programs to advance climate mitigation and adaptation.

¹ <https://www.usclimatealliance.org/>

² <https://ww3.arb.ca.gov/fuels/lcfs/background/basics-notes.pdf>

³ <https://www.oregon.gov/deg/FilterDocs/cfpoverview.pdf>

⁴ <https://www.nber.org/papers/w15376>

⁵ California State Legislature, "SB-1014," 2017- 2018, https://leginfo.legislature.ca.gov/faces/billCompareClient.xhtml?bill_id=201720180SB1014_93

⁶ State of Oregon Department of Transportation, "OReGO," <http://www.myorego.org/about/>

⁷ Nevada State Legislature, "SB299," 2019, <https://www.leg.state.nv.us/App/NELIS/REL/80th2019/Bill/6531/Overview>

⁸ <http://www.njtod.org/seven-new-jersey-resources-supporting-tod/>

⁹ U.S. Climate Alliance analysis on data sourced from EIA Form 860 – U.S. Energy Information Agency, "Form EIA-860 detailed data with previous form data (EIA-860A/860B)," September 3, 2019, <https://www.eia.gov/electricity/data/eia860/>

¹⁰ U.S. Climate Alliance analysis on data sourced from EIA – U.S. Energy Information Agency, "Detailed State Data," October 22, 2019, <https://www.eia.gov/electricity/data/state/>

¹¹ https://www.maine.gov/governor/mills/sites/maine.gov/governor.mills/files/inline-files/Executive%20Order%2013_0.pdf

¹² https://www.climateaction.state.nm.us/documents/reports/NMClimateChange_2019.pdf

¹³ NREL, Shared Solar: Current Landscape, Market Potential, and the Impact of Federal Securities Regulation, <https://www.energy.gov/eere/articles/nrel-report-shows-big-potential-future-shared-solar>

¹⁴ <https://energyoffice.colorado.gov/community-solar>

¹⁵ <https://www.csd.ca.gov/Pages/Community-Solar-Pilot.aspx>

¹⁶ <https://www.energy.gov/sites/prod/files/2019/07/f64/2018-OTT-Energy-Storage-Spotlight.pdf>

¹⁷ <https://www.greentechmedia.com/articles/read/california-passes-bill-to-extend-incentives-for-behind-the-meter-batteries#gs.xbox7s>

¹⁸ <https://www.c2es.org/site/assets/uploads/2019/02/near-term-actions-final-02-2019.pdf>

¹⁹ <https://www.usclimatealliance.org/annual-report>

²⁰ <https://usqbc-la.org/programs/buy-clean-california/>

²¹https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?division=2.&chapter=3.&part=1.&lawCode=PCC&article=5.

²²

file:///C:/Users/kigusky/Downloads/Buy%20Clean%20California%20Act%20FAQ%20for%20Contractors%205_8_19.pdf

²³ <https://www.energy.ca.gov/programs-and-topics/programs/food-production-program>

²⁴ https://energy.ucdavis.edu/wp-content/uploads/Keynote_Janea_Scott.pdf

²⁵ Weston Berg, Shruti Vaidyanathan, Eric Junga, Emma Cooper, Chris Perry, Grace Relf, Andrew Whitlock, Marianne DiMascio, Corri Waters, and Nadia Cortez, “The 2019 State Energy Efficiency Scorecard,” American Council for an Energy-Efficient Economy, October 2019, <https://aceee.org/sites/default/files/publications/researchreports/u1908.pdf>

²⁶ U.S. Energy Information Agency, “Annual Electric Power Industry Report, Form EIA-861 detailed data files,” October 1, 2019, <https://www.eia.gov/electricity/data/eia861/>

²⁷ Weston Berg, Shruti Vaidyanathan, Eric Junga, Emma Cooper, Chris Perry, Grace Relf, Andrew Whitlock, Marianne DiMascio, Corri Waters, and Nadia Cortez, “The 2019 State Energy Efficiency Scorecard,” American Council for an Energy-Efficient Economy, October 2019, <https://aceee.org/research-report/u1908>

²⁸ Based on EPA estimates that on average, each home consumed 11,764 kWh of delivered electricity in 2017 (EIA 2018a), See: U.S. Environmental Protection Agency, “Greenhouse Gases Equivalencies Calculator - Calculations and References,” <https://www.epa.gov/energy/greenhousegases-equivalencies-calculator-calculations-and-references>

²⁹ U.S. Energy Information Agency, “Annual Electric Power Industry Report, Form EIA-861 detailed data files,” October 1, 2019, <https://www.eia.gov/electricity/data/eia861/>

³⁰ U.S. Climate Alliance analysis of EFI/NASEO jobs data - Energy Futures Initiative and the National Association of State Energy Officials, “The 2019 U.S. Energy and Employment Report,” <https://www.usenergyjobs.org/>

³¹ https://www.energy.ca.gov/sites/default/files/2019-05/energy_efficiency.pdf

³² <https://www.nyserda.ny.gov/About/Newsroom/2019-Announcements/2019-10-10-NYSERDA-Releases-Best-Practice-Guidelines-To-Advance-More-Resilient-and-Energy-Efficient-Buildings-Statewide>

³³ Sarah Stanley, “U.S. Green Building Council Announces Annual Top 10 States for LEED Green Building in 2018,” U.S. Green Building Council, February 4, 2019, <https://www.usgbc.org/articles/us-green-building-council-announces-annual-top-10-states-leed-green-building-2018>

³⁴ State of Washington Office of Governor Jay Inslee, “Policy Brief: Washington Takes Bold Steps to Reduce Greenhouse Gas Emissions from Buildings,” May 2019, <https://www.governor.wa.gov/sites/default/files/documents/clean-buildings-policy-brief-bill-signing.pdf>

³⁵ <http://lawfilesexternal.wa.gov/biennium/2019-20/Pdf/Bill%20Reports/House/1257-S3.E%20HBR%20FBR%2019.pdf>

³⁶ <https://www.energymaine.com/heat-pumps/>

³⁷ <https://www.maine.gov/governor/mills/news/governor-mills-announces-new-rebates-maine-people-businesses-install-high-performance-heat>

³⁸ https://appliance-standards.org/sites/default/files/United%20States_v2.pdf

³⁹ <https://www.eia.gov/tools/faqs/faq.php?id=97&t=3>

⁴⁰ https://appliance-standards.org/sites/default/files/United%20States_v2.pdf

⁴¹ <https://www.nyserda.ny.gov/All-Programs/Programs/RetrofitNY/All-RetrofitNY-Articles/On-The-Path-to-Net-Zero>

⁴² <https://www.nrs.fs.fed.us/news/release/trees-reduces-building-energy-use>

⁴³ <http://climatechange.ri.gov/documents/resilientrhody18.pdf>

⁴⁴ <http://climatechange.ri.gov/documents/resilientrhody18.pdf>

⁴⁵ <https://www.ri.gov/press/view/35740>

⁴⁶ https://www.rggi.org/sites/default/files/Uploads/Press-Releases/2019_06_17_NJ_Announcement_Release.pdf

⁴⁷ <https://www.transportationandclimate.org/main-menu/tcis-regional-policy-design-process-2019>

-
- 48 https://www.transportationandclimate.org/sites/default/files/TCI%20Modeling-Results-Summary_12.17.2019.pdf
- 49 https://ww3.arb.ca.gov/cc/capandtrade/auctionproceeds/2019_cci_annual_report.pdf?_ga=2.14451895.1868598449.1553707432-2139052204.1553538057
- 50 Nature4Climate, "Welcome to the US State Mapper," <https://nature4climate.org/u-s-carbon-mapper/>
- 51 U.S. Environmental Protection Agency, "Greenhouse Gas Inventory Data Explorer," <https://cfpub.epa.gov/ghgdata/inventoryexplorer/>
- 52 https://mda.maryland.gov/resource_conservation/Pages/Soil-Health.aspx
- 53 https://www.climateaction.state.nm.us/documents/reports/NMClimateChange_2019.pdf
- 54 <https://www.nmlegis.gov/Sessions/19%20Regular/final/HB0204.pdf>
- 55 <http://www.mda.state.mn.us/sustagdemogrant>
- 56 <http://www.revenue.state.mn.us/property-values-and-assessment-practices-report>
- 57 SMUD Pilot Natural Refrigerant Incentive Program: Program Summary, Sacramento Municipal Utility District. <https://www.smud.org/-/media/Documents/Business-Solutions-and-Rebates/Refrigerant-Pilot-ProgramSummary.ashx?la=en&hash=E6C236B76B309F7FCE2039BFA36198A5A4F3564A>
- 58 EPA (2014) Global Mitigation of Non-CO2 Greenhouse Gases: 2010-2030, U.S. Environmental Protection Agency, March. <https://www.epa.gov/global-mitigation-non-co2-greenhouse-gases/global-mitigation-non-co2-ghgs-report-download-report>
- 59 310 CMR 7.73, Reducing Methane Emissions from Natural Gas Distribution Mains and Services.
- 60 Methane Leak Proceeding (R. 15-01-008). <http://www.cpuc.ca.gov/General.aspx?id=8829>
- 61 GSEPs Pursuant to 2014 Gas Leaks Act. <https://www.mass.gov/lists/gseps-pursuant-to-2014-gas-leaks-act>
- 62 California Healthy Soils Initiative. <https://www.cdfa.ca.gov/healthsoils/>
- 63 California Dairy Digester Research and Development Program. <https://www.cdfa.ca.gov/oefi/ddrdp/>
- 64 California Alternative Manure Management Program. <https://www.cdfa.ca.gov/oefi/AMMP/>
- 65 Commonwealth Organics-to-Energy program. <http://www.masscec.com/commonwealth-organics-energy-0>
- 66 National Oceanic and Atmospheric Administration National Centers for Environmental Information (NCEI), "U.S. Billion-Dollar Weather and Climate Disasters," 2020, <https://www.ncdc.noaa.gov/billions/>
- 67 https://pdf.usaid.gov/pdf_docs/PA00MXNJ.pdf
- 68 <https://www.mass.gov/files/nature-based-solutions.pdf>
- 69 <https://www.mass.gov/service-details/mvp-program-information>
- 70 <https://www.riib.org/node/493>
- 71 <https://www.longmontcolorado.gov/departments/departments-n-z/water/stormwater-drainage/resilient-st-vrain>
- 72 <https://www.longmontcolorado.gov/departments/departments-n-z/water/stormwater-drainage/resilient-st-vrain/funding-resilient-st-vrain>
- 73 <https://www.governor.virginia.gov/newsroom/all-releases/2019/november/headline-849374-en.html>
- 74 <https://www.mass.gov/service-details/statewide-resilience-master-plan-srmp>
- 75 http://ap.buffalo.edu/content/dam/ap/PDFs/NYSERDA/2019/2019-5-23_Climate%20Adaptation%20by%20Design-Overview.pdf
- 76 <https://nj.gov/infobank/eo/056murphy/pdf/EO-100.pdf>
- 77 <https://mde.maryland.gov/programs/Air/ClimateChange/MCCC/Pages/index.aspx>
- 78 <https://climate.hawaii.gov/commission/>