WORLD RESOURCES INSTITUTE

WORKING PAPER

NEW CLIMATE FEDERALISM: DEFINING FEDERAL, STATE, AND LOCAL ROLES IN A U.S. POLICY FRAMEWORK TO ACHIEVE DECARBONIZATION

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EXECUTIVE SUMMARY

HIGHLIGHTS

- The World Resources Institute convened thought leaders among current and former U.S. federal, state, and local government officials for a New Climate Federalism Dialogue to explore issues around the appropriate role of different levels of government in addressing climate change.
- Dialogue participants agreed that addressing the climate challenge requires ambitious federal action. This should include the establishment of national emission reduction targets that are consistent with science.
- Participants agreed, moreover, that given the urgency and scale of the challenge of climate change, all levels of government—federal, state, and local—must be part of the solution.
- As such, preemption should be rare. Instead, the U.S. Congress should, wherever possible, expressly affirm the ability of state and local governments to act and go beyond any federal requirements.
- This shared approach isn't new. In fact, the concept of federalism has been successfully applied throughout U.S. history as a means of leveraging the strengths of different levels of government.

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- There is no single "correct" approach to climate federalism. Successful climate policies will likely span the spectrum of options, including measures that are exclusively federal or exclusively subnational, and many more that include a balanced cooperative approach.

Meeting the challenge of climate change will require broad, sustained action at all levels of government: federal, state, and local. A future U.S. policy framework to achieve decarbonization by mid-century and respond to the impacts of a changing climate should reflect thoughtful consideration of the optimal roles for federal, state, and local governments as well as efficient processes to promote collaboration among them.

To explore these topics, the World Resources Institute convened thought leaders among current and former federal, state, and local government officials in a New Climate Federalism Dialogue. Over the course of two meetings in the fall of 2019 and summer of 2020, participants discussed the optimal roles for each level of government across many of the areas where action will be required to decarbonize the U.S. economy and improve resilience.

This white paper sets out the context and findings of the dialogue discussions, and proposes a working framework to delineate roles informed by the participants. The concept of federalism has been successfully applied throughout U.S. history as a means of leveraging the strengths of different levels of government to address challenges. As we demonstrate in the pages that follow, climate change is no different. Section 1 provides foundational information on the decarbonization challenge, including the pathways that have been studied to meet that challenge. Section 2 details the common arguments made in the federalism debates. Section 3 reviews the current and historical roles played by the federal, state, and local governments in environmental, energy, and resilience areas. Section 4 sets out a working framework to address federalism questions when establishing U.S. climate policy, and applies that framework to policy options for energy efficiency standards for appliances and equipment, clean electricity standards, carbon pricing programs such as cap-and-invest, zero-emission vehicle standards, transportation infrastructure policy, and flood resilience policy. Section 5 distills these observations into a series of principles that can help guide policymakers in weighing the appropriate roles for federal, state, and local governments in climate policy moving forward.

Given the magnitude of the decarbonization challenge, there is no doubt that more action will be required by all levels of government in the United States. In order to inform federal officials as they craft new policy to meet those challenges, the New Climate Federalism Dialogue asked: in what circumstances is a strong federal role desirable; when is a strong state and local role desirable; and when are shared or cooperative roles best? There was broad agreement that some policy situations will warrant a strong federal role, and some will warrant a strong state and/or local role. But the great majority of areas where action is necessary demand shared or cooperative action across multiple levels of government. Below we outline principles developed over the course of the convenings that provide guidance on how to delineate these roles in a manner that is most effective and appropriate for any particular circumstance.

Findings and principles to guide federal climate policymaking:

- Ambitious federal action is necessary to address the climate challenge. Moreover, given the urgency and scale of the challenge of climate change, all levels of government—federal, state, and local—must be part of the solution.
- Policies at every level should promote equitable and healthier outcomes for all Americans, especially disproportionately harmed communities of color and low-income communities.
- Preemption should be rare. Actions by the federal government should enable and not impede more ambitious actions by state and local government that aim to drive additional greenhouse gas emissions reductions with strategies that reflect knowledge of state-specific circumstances. Likewise, state governments should enable and not impede more ambitious action by local governments.
- The best way to achieve consistency in regulations across the country is to establish federal standards that are sufficiently ambitious to address the climate challenge, while preserving the ability of state and local governments to take more ambitious action and adopt compliance strategies that reflect local and regional conditions.

- State and local governments play a key role as "laboratories of democracy" that can help pioneer new solutions and spur market development in a manner that can help enable more ambitious federal policies over time. The federal government should learn from and engage state and local governments and replicate successful policies at the national level where appropriate.
- A strong federal role is clearly necessary and appropriate in certain areas. For example, the federal government should: establish national emission reduction targets consistent with science; engage the international community to ensure sufficient international action to meet the climate change challenge; support continued research, development and demonstration of technologies that will underpin decarbonization and position U.S. industry for leadership in the global low-carbon economy; provide funding and technical support for subnational efforts; maintain an emissions registry and require adequate and comparable emissions measurement, monitoring, reporting and verification across the economy; and take steps to decarbonize the federal government's own operations.
- A strong subnational role is clearly necessary and appropriate in other areas of action. For example, subnational governments are typically in the best position to: implement local land-use planning and zoning decisions; implement local transportation solutions (with the support of federal funding); carry out infrastructure resilience planning and implementation; and allocate funding to address climate change in an equitable manner.
- In a great majority of circumstances, a collaborative approach to energy and climate action across all levels of government will work best. Examples of programs that warrant a collaborative approach are: clean energy standards; carbon pricing programs; and zero-emission vehicle standards.
- The federal government has considerable financial and technical resources and thus should look for opportunities to act as a catalyst to drive additional state and local action in a manner that promotes equitable outcomes for all Americans.

About Participation in the New Climate Federalism Dialogue

Dialogue participants were chosen because of their experience at various levels of government working on policy, especially energy, environmental, and/or transportation policy. Participants were invited to participate as individuals, not in an official capacity. Participants did not speak for their organizations, cities, or states. While participants were offered an opportunity to comment on the draft, and every effort was made to reflect their insights and comments in the paper, this working paper is the work product of the World Resources Institute and not dialogue participants.

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1. UNDERSTANDING THE DECARBONIZATION CHALLENGE

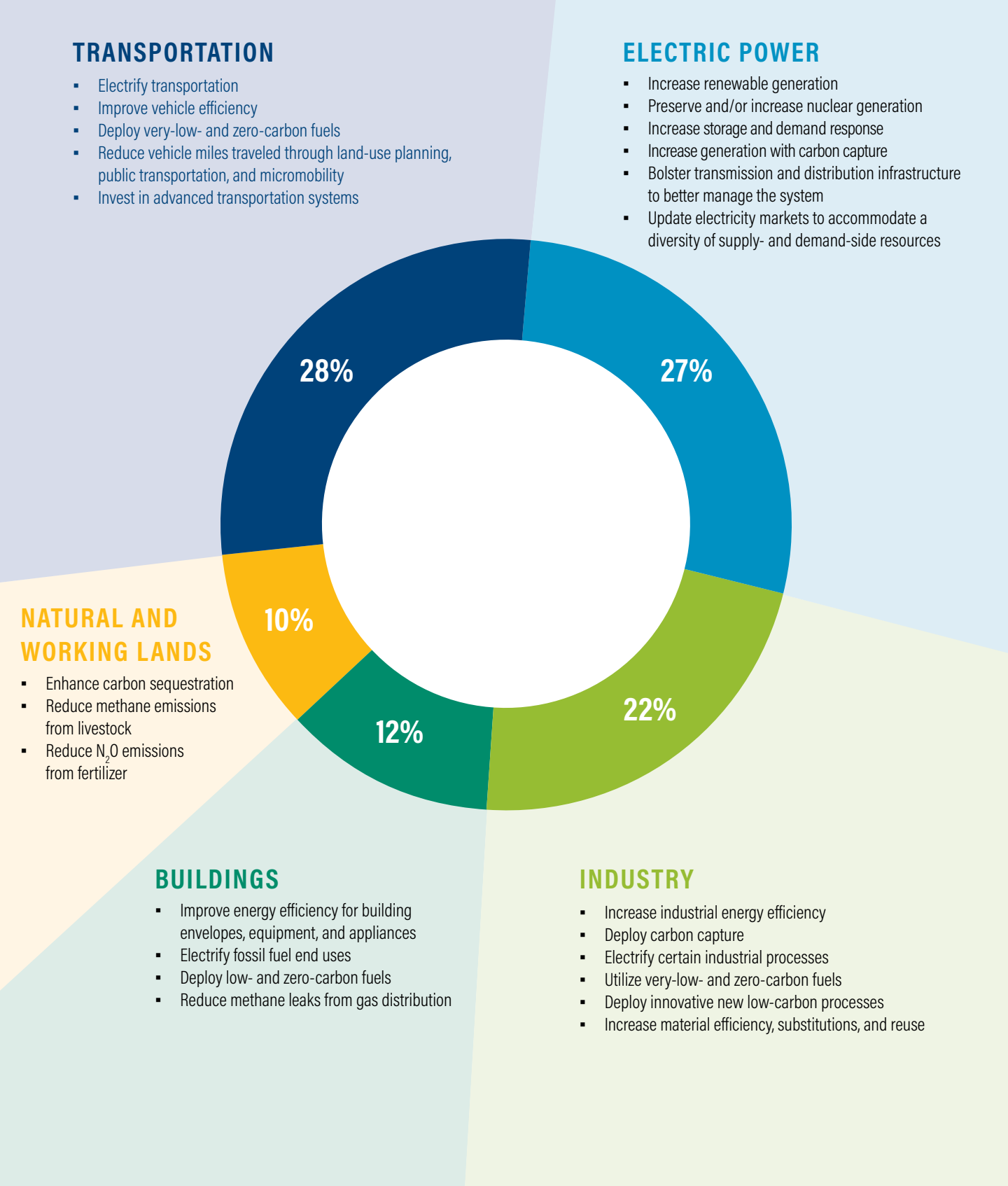
In thinking through the roles of state, local, and federal governments in addressing the climate challenge, it is useful to consider the scope of decarbonization needed to meet the goals of the Paris Agreement. The Paris Agreement established a goal of limiting the global temperature increase to "well below" 2°C (3.6°F) while striving to limit it to 1.5°C (2.7°F) (UNFCCC 2015). Achieving these goals would require largely decarbonizing the U.S. economy by mid-century.[2] A number of studies shed light on the mix of solutions that will be required in each sector to meet the decarbonization challenge. It is helpful to have a sense of what will be necessary when thinking about how to define roles for federal, state, and local governments.

The bulk of deep decarbonization literature points to a handful of core decarbonization efforts necessary for transitioning the economy, including

- decarbonizing the power supply through a mix of renewables, nuclear, fossil fuel with carbon capture, demand response, and electricity storage;
- switching to electricity and other low-carbon fuels in the transportation, industry, and building sectors;
- increasing efficiency in all sectors;
- deploying carbon capture and sequestration for emissions that are difficult to eliminate through energy efficiency and fuel switching;
- reducing emissions of non-carbon climate pollutants such as methane and hydrofluorocarbons (HFCs); and
- increasing carbon sequestration on natural and working lands and carbon dioxide removal through technological means.[1]

Figure 1 highlights sector-specific decarbonization pathways and provides a starting point to inform the discussion of optimal federal, state, and local roles in driving this transition.

Figure 1 | **U.S. GHG Emissions by Sector (2018) & Core Decarbonization Strategies**



Source: EPA 2020; WRI.

Carrying out these changes will require a major transformation of current technological, economic, and social systems. Federal, state, and local government regulations, market and consumer incentives, targeted investments, and support for research and development can act as a multipronged force to put the United States on the right path. Meanwhile, planning and investment coordination is needed across all levels of government in order to streamline action and provide greater certainty for the private sector. Furthermore, dialogue participants noted the importance of equity and environmental justice in addressing climate change (see Box 1).

Box 1 | **Equity and Climate Change**

Participants in the dialogue agreed that policies at every level should aim to promote equitable and healthier outcomes for all Americans, especially disproportionately harmed communities of color and low-income communities. Anti-discrimination laws, such as Title VI of the Civil Rights Act of 1964, prohibit discrimination on the basis of race, color, or national origin. Nonetheless, clean air programs have failed to adequately protect many of these communities. As a result, minority and low-income communities across the country suffer a disproportionate burden of air pollution and remain particularly vulnerable to climate impacts. In recognition of this, state and local policymakers are increasingly building equity into their climate and environmental programs. Below we outline several of the goals and processes for addressing equity and environmental justice in climate policy that have emerged from related state and local efforts:

- Ensure that programs do not discriminate on the basis of race, color, or national origin, as required by law
- Include frontline communities from the outset in any discussions of policy objectives and designs to ensure policies reflect community input
- Reduce the pollution burden experienced by frontline communities
- Bolster resilience in low-income, climate-vulnerable areas
- Ensure access to reliable and affordable electricity, water, housing, and transportation for every community
- Create and maintain well-paying jobs in the clean economy that are accessible to all
- Provide a fair transition for workers and communities impacted by the transition away from fossil fuels

2. FEDERALISM AND A U.S. CLIMATE POLICY FRAMEWORK

Federal, state, and local energy and environmental policies do not occur in isolation. Instead, they frequently involve the sharing of responsibility. This framework, commonly referred to as federalism, has been the bedrock of the U.S. system of government for more than two centuries. Federalism allows states to function as "laboratories of democracy" fostering innovation. Local governments are increasingly central to this innovation (Mendonca and Tyson 2018).

Debates over federalism raise questions about which level of government—federal, state, or local—is best suited to take a leading role in executing laws and policies on particular issues. Below we explore the arguments put forth by advocates of a strong federal role and those emphasizing greater state and local government control.

Arguments for a Strong Federal Role

Proponents of a strong federal role in energy and environmental policy generally rely on four central arguments:

Ensuring nationwide emissions reductions while avoiding a "race to the bottom." National standards provide a baseline of protection and mitigate concerns that states, left to their own devices, might engage in a welfare-reducing "race to the bottom" in environmental standard setting (Engel 1997). Indeed, critics of decentralization argue that state and local governments may pursue lax energy or environmental policies to attract businesses or forestall the loss of business (Konisky 2007). Differences across jurisdictions may encourage business to move to jurisdictions with less stringent regulation, leading to emissions "leakage" (Litz 2008). And, as the urgency of decarbonization increases and more stringent policy measures are adopted, the issue of leakage could become more pronounced. Proponents of federal action point to a variety of examples of uneven subnational standards. For example, even though building codes have been shown to save homeowners billions of dollars nationwide (U.S. Department of Energy n.d.), nine U.S. states don't have any residential building energy codes (Building Codes Assistance Project 2018).

Establishing a level playing field with common standards. A federal climate program would establish common standards and provide consistency for businesses affected by the policy. Most environmental statutes,

including the Clean Air Act and the Clean Water Act, set uniform pollution control standards at the national level, while leaving much of the implementation and enforcement of those standards to the states. Uniform national regulation avoids a complex patchwork of requirements, minimizes redundancies, and creates a level, competitive playing field. This can benefit industries that provide emissions reduction technologies as well as those that are required to comply with the standards (Probst and Szambelan 2009). National efficiency standards for appliances, lighting, and plumbing products (discussed later in more detail) sold between 1987 and 2035, are estimated to save U.S. consumers and businesses a total of $2.4 trillion in energy bills while also reducing emissions (deLaski and Mauer 2017). Common national standards and regulations can also address inaction by states that are unwilling to comply or constrained in their ability to act on their own.

Achieving economies of scale. Nationwide programs, whether they come in the form of a clean energy standard, a federal carbon pricing mechanism, or appliance standards, create larger markets for clean technologies and are more likely to achieve economies of scale. Increased market size can in turn help spur greater innovation by clean technology providers and help them become more cost-competitive with incumbents. A federal clean electricity standard, for instance, could almost double the overall size of the relevant market for renewable energy technologies, in comparison to the number of states currently governed by renewable portfolio standards. Increased market size could help spur greater innovation by clean electricity providers, ultimately helping them become even more cost-competitive with fossil fuel incumbents in more regions of the country.

Providing a platform for international engagement. Addressing climate change requires coordinated global action, which depends on commitment and coordination across nation states. Various international meetings and agreements, from Rio to Kyoto, Copenhagen to Paris, have been the locus of action for nation states to make commitments to addressing climate change, which they then seek to implement through national legislation and other policies (Burke-White and Barron 2018). While U.S. states and cities have come into the spotlight in recent years for their efforts to reduce greenhouse gas emissions, they are constitutionally prohibited from entering into legally binding treaties or compacts with other countries. Furthermore, only national governments are recognized as parties by the United Nations Framework Convention on Climate Change (UNFCCC), under which all international climate negotiations take place. In addition, the federal government can adopt targeted policies to ensure that domestic industries do not lose out to foreign competitors based in countries with less ambitious climate policies. For these reasons, federal leadership in international engagement is essential.[2]

Arguments for a Strong Subnational Role

By contrast, proponents of a strong subnational role in energy and environmental policy have their own rationale for allowing states and local governments to maintain some autonomy over the development of their climate change policies.

Leveraging on-the-ground knowledge and experience of subnational governments. States and local governments are more knowledgeable about their local circumstances, enabling them to develop solutions that fit their unique context and that are responsive to local equity issues. State and local governments have been acting for years in areas that are within their primary jurisdiction, including the regulation of electric utilities, building codes, land-use planning, zoning, agriculture, waste management, and more. As a result, states and localities have accumulated invaluable experience and expertise, which will be critical for the success of future federal climate programs. In addition, states are the implementers of many federal environmental statutes, such as the Clean Air Act and Clean Water Act, which set national standards for actions but empower states as frontline implementers of many programs (Litz 2008).

Fostering policy innovation and experimentation. Tapping the diversity of state and local governments fosters policy experimentation and innovation, leading to innovative ideas and practices that can spread to other states and percolate up to the federal government (Daley and Garand 2005). State and local programs allow for innovation and faster pivots, enabling the scaling up of the most effective approaches and the rapid termination of programs that do not work as intended (with fewer sunk costs due to the smaller scale and timeframe) (Jacobson 2009).

Fostering a race to the top. Subnational governments frequently compete against each other to maintain their competitive advantage and project themselves as policy entrepreneurs in order to attract jobs, business, and

residents. Ultimately, this can help push national policy forward and/or encourage other states to join their efforts (Rabe 2004, 2008). A growing number of these states and local governments view environmental and climate change policy as contributing to their economic development goals, particularly in stimulating new technology and "home grown" businesses in areas of renewable energy and energy efficiency. Proponents point to the proliferation of clean electricity standards, with states around the country ratcheting up the percentage of clean electricity they are requiring. A growing number of states and cities have committed to 100 percent clean electricity, a level that seemed inconceivable just a few years ago.

Driving deeper emissions reductions. When working in tandem with federal actions, state and local governments can help drive even greater emissions reductions. Given the inherent challenges in achieving deep emissions reductions across the U.S. economy, the country cannot afford to leave any opportunity on the table. This argument is particularly salient during times when partisan gridlock and dysfunction stymie serious response to climate change at the federal level.

Promoting federal action. Bottom-up action by state and local governments can spur national governments to act, make new or more robust global commitments, and in some cases provide additional financial support to subnational actors (Burke-White and Barron 2018). For example, the U.S. Congress modeled the federal Superfund program after the New Jersey Spill Act of 1976, which required companies responsible for contamination to clean up hazardous waste sites, or allow the government to recoup costs for orphaned contaminated sites (Adler 2008). Elsewhere, California was the first state in the nation to adopt efficiency standards for appliances in 1976. Other states such as Massachusetts and New York soon followed suit, eventually leading to federal standards in the National Appliance Energy Conservation Act of 1987 (Schneider et al. 2009). Here again, subnational actors functioned as a test bed for alternative policy approaches, providing useful information for possible later adoption at the federal level (Goulder and Stavins 2010).

3. CURRENT AND HISTORICAL ROLES OF FEDERAL, STATE, AND LOCAL GOVERNMENTS IN RELEVANT AREAS

A review of the above arguments strongly suggests that, in practice, the choice is not a binary one—federal versus state and local governments—but, rather a matter of emphasis, coordination, and collaboration (Konisky and Woods 2018). Strong federal action will be necessary. Moreover, given the broad set of measures that will be necessary in each sector of the economy to meet the decarbonization challenge and respond to the impacts of a changing climate, each level of government will need to play significant roles. No single level of government can solve the climate challenge alone. Therefore, in determining the optimal roles for the federal, state, and local governments, it is useful to consider the current and historical roles played by each level in the areas most involved in climate change action and resilience.

While federal, state, and local governments divide responsibility, there is significant collaboration and interplay between different levels of government, as well as private and public actors. For instance, the adoption of electric vehicles (EVs) has been supported by federal tax credits as well as by various state and local incentives and tax or fee exemptions. Moving forward, any future federal program to support the deployment of zero-emission vehicles (ZEVs) will depend on state and local support for the rollout of charging infrastructure. Similarly, federal financial and technical assistance has enabled state and local entities to adopt more ambitious solar deployment programs.

The respective roles of federal, state, and local government in electricity, transportation, buildings, industry, natural and working lands, and adaptation and resilience are discussed generally below.

Electricity

Electricity must be generated, transmitted in bulk, and distributed across local distribution systems. Governments have played a significant role in each of these three areas. The respective roles of the federal, state, and local governments are briefly detailed in Table 1.

Table 1 | **Roles of Federal, State, and Local Governments in Decarbonizing Electricity**

	FEDERAL GOVERNMENT PURVIEW	STATE GOVERNMENT PURVIEW	LOCAL GOVERNMENT PURVIEW
Large-scale generation	▪ Tax policy ▪ Research and development ▪ Environmental protection—air, water, and waste ▪ Regulation of nuclear safety, hydropower licensing, and renewable leasing on federal land and in federal waters ▪ Regulation of regional electricity markets	▪ In many states, utility resource planning and cost recovery is regulated by state commissions ▪ Renewable and/or clean electricity standards ▪ Environmental protection—air, water, and waste ▪ Determine whether state participates in regional electricity markets	▪ Municipally owned utilities determine investments ▪ Renewable procurement requirements
Transmission and distribution	▪ Federal Energy Regulatory Commission jurisdiction over interstate lines ▪ Regional transmission organization planning	▪ States regulate siting and remuneration for intrastate lines ▪ Regulation of local distribution utilities and rates	▪ Municipally owned utilities determine investments
Distributed generation	▪ Federal law (PURPA) guarantees access	▪ State commissions determine practical access and compensation through policies such as net metering and community solar	▪ Facilitate installation via building readiness requirements and streamlined permitting ▪ Local financial incentives ▪ Municipal utility determines practical access and compensation

Source: Authors.

Transportation

Transportation emissions are affected by a wide range of laws, regulations, and other government actions that determine the vehicles and fuels used, investments in infrastructure and transportation systems, and the land-use patterns served by transportation. In addition to current federal standards and policies, state and local actions are playing significant and often mutually reinforcing roles in several areas of the transportation sector, such as the deployment of low- and zero-emission vehicles and infrastructure systems, including public transit. In addition, local land-use planning, permitting, and housing policies can significantly impact transportation patterns, and with them, vehicle miles traveled and greenhouse gas emissions. While most transportation regulations involve shared authority between federal, state, and local governments, aviation and international shipping are primarily regulated at the federal level.

Table 2 | **Roles of Federal, State, and Local Governments in Decarbonizing Transportation**

	FEDERAL GOVERNMENT PURVIEW	STATE GOVERNMENT PURVIEW	LOCAL GOVERNMENT PURVIEW
Vehicles (cars, trucks, buses, aircraft, etc.)	▪ Efficiency standards ▪ Vehicle emissions standards ▪ Tax credits for vehicle purchases ▪ Vehicle purchases	▪ Vehicle emissions standards for cars and trucks in states that adopt CA standards ▪ Zero-emission vehicle mandates ▪ Clean vehicle purchase rebates and/or tax credits ▪ Registration fees ▪ Vehicle purchases	▪ Policies to encourage vehicle choice—parking, taxi regulations, HOV lane access, pricing, etc. ▪ Vehicle purchases
Fuels	▪ Renewable fuel standard ▪ Environmental requirements (blending) ▪ Fuel taxes	▪ Clean fuel or low-carbon fuel standards ▪ Environmental requirements (blending) ▪ Fuel taxes	▪ Various programs to support local renewable fuel production
Infrastructure and systems	▪ Infrastructure spending (e.g., roads, bridges, mass transit, EV charging) ▪ Infrastructure siting on federal lands (e.g., EV chargers along federal interstates)	▪ Infrastructure spending—roads, bridges, mass transit, EV charging, etc. ▪ Transportation planning	▪ Infrastructure siting, permitting, and spending ▪ Transportation planning ▪ Mass transit ▪ Micro mobility policies
Land use	▪ Funding and technical assistance to promote local and regional planning	▪ Land use and zoning regulation ▪ Funding and technical assistance to promote local and regional planning ▪ Vehicle miles traveled (VMT) reduction targets ▪ Policies governing road pricing	▪ Land use and zoning regulation ▪ Congestion pricing ▪ Parking policies ▪ Transit-oriented development

Source: Authors.

Commercial and Residential Buildings

Buildings consume electricity, natural gas, and other heating fuels. Federal, state, and local policies and programs can affect the fuels, efficiency, and location and size of buildings (as well as the carbon intensity of the electricity they consume, as detailed above). State and local governments exercise significant authority over retrofitting older buildings and building new construction through energy efficiency requirements, performance standards, and incentive programs for energy use. States also wield authority over most infrastructure investment decisions that could facilitate fuel switching. To date, the federal government's role has revolved primarily around establishing energy efficiency standards for appliances, tax incentives, policies regarding federal buildings, and authority over certain infrastructure projects that influence building energy choices, such as interstate gas pipelines. The table below details the roles currently played by each level of government.

Table 3 | **Roles of Federal, State, and Local Governments in Decarbonizing Commercial and Residential Buildings**

	FEDERAL GOVERNMENT PURVIEW	STATE GOVERNMENT PURVIEW	LOCAL GOVERNMENT PURVIEW
Fuels and fuel switching	▪ *See electricity table for influence on electricity* ▪ Tax policy	▪ *See electricity table for influence on electricity* ▪ Policies to influence fuel choice in new and existing buildings ▪ Tax policy	▪ *See electricity table for influence on electricity* ▪ Purchasing and lead-by-example measures ▪ Policies to influence fuel choice in new and existing buildings
Building efficiency and flexible demand	▪ Appliance standards ▪ Research and development ▪ Supports development of building codes ▪ Tax policy ▪ FERC regulation on access to markets for demand response	▪ Appliance standards ▪ Utility regulatory policy on energy efficiency, distributed generation, and demand response ▪ Building codes ▪ Tax policy ▪ Utility smart meter programs and access to data ▪ Financing and financial incentives	▪ Building codes and enforcement ▪ Building retrofit requirements, including energy audits to identify upgrades ▪ Green building requirements ▪ Financing, financial, and regulatory incentives ▪ District heating and cooling policies
Location and size of buildings		▪ Infrastructure investments	▪ Land-use and zoning regulation ▪ Infrastructure investments

Source: Authors.

Industry

Industry is a varied and complex sector with numerous subsectors that contribute to carbon and other greenhouse gas emissions. Industry is affected by every level of government as detailed in the table below, with policies affecting on-site combustion and industrial processes, and establishing material use and efficiency programs for producers and consumers. In addition, federal, state, and local governments play important roles in the oversight of fossil fuel exploration and extraction.

Table 4 | **Roles of Federal, State, and Local Governments in Decarbonizing Industry**

	FEDERAL GOVERNMENT PURVIEW	STATE GOVERNMENT PURVIEW	LOCAL GOVERNMENT PURVIEW
On-site combustion	▪ Environmental protection—air, water, and waste ▪ Tax policy	▪ Environmental protection—air, water, and waste ▪ Tax policy	▪ Land use and zoning ▪ Tax policy
Industrial processes	▪ Equipment standards ▪ Tax policy ▪ Procurement policies (e.g., buy clean) ▪ Low carbon performance standards ▪ Research and development	▪ Equipment standards ▪ Tax policy ▪ Procurement policies (e.g., buy clean) ▪ Low carbon performance standards ▪ Utility regulatory policy on energy efficiency and distributed generation	▪ Procurement policies (e.g., buy clean) ▪ Building codes and enforcement ▪ Recycling programs ▪ Land use and zoning ▪ Tax policy
Material use efficiency and substitution	▪ Research and development ▪ Material use efficiency and substitution policies for manufacturers (e.g., producer responsibility rules, product phaseouts, and recycled content requirements) ▪ Procurement policies ▪ Treatment of alternative materials in model codes and standards (e.g., cross-laminated timber)	▪ Modify codes and standards to allow alternative materials ▪ Material use efficiency and substitution policies for manufacturers and consumers (e.g., recycling programs) ▪ Procurement policies	▪ Material use efficiency and substitution policies for consumers (e.g., recycling programs) ▪ Procurement policies
Extractive industries	▪ Tax treatment and leasing policies for fossil fuel exploration and production, including on federal lands ▪ Environmental protection—air, water, and waste	▪ Tax treatment and leasing policies for fossil fuel exploration and production, including on state lands ▪ Environmental protection—air, water, and waste	▪ Land use and zoning

Source: Authors.

Natural and Working Lands, Including Livestock

Natural and working lands are managed for the production of food, fiber, and other environmental services. Lands can sequester vast amounts of carbon in soil, trees, and other vegetation, but can also contribute to greenhouse gas emissions (e.g., N_2O from agricultural soils, methane from rice production, or CO_2 from wildfires). Governments at all levels exert direct control over the management of publicly owned forest and grasslands and influence the management of those lands indirectly through a range of policies and programs that affect demand for those goods and development pressures. Meanwhile, private landowners mostly interact with governments through incentives and technical support, as detailed below.

Table 5 | **Roles of the Federal, State, and Local Governments in Decarbonizing Natural and Working Lands**

	FEDERAL GOVERNMENT PURVIEW	STATE GOVERNMENT PURVIEW	LOCAL GOVERNMENT PURVIEW
Forestry	▪ Management of national forests, national parks, and other federal lands ▪ Financial assistance to states, local governments, and private landowners for reforestation and forest management ▪ Technical assistance ▪ Research and development ▪ Sustainable procurement policies ▪ Tax policy	▪ Management of state-owned forested lands, including state parks ▪ Financial assistance to local governments and private landowners for reforestation and forest management ▪ Technical assistance ▪ Research and development ▪ Sustainable procurement policies ▪ Tax policy ▪ Smart growth policies	▪ Management of locally owned forest lands and tree planting programs ▪ Sustainable procurement policies ▪ Smart growth policies
Agriculture	▪ Management of federal rangelands ▪ Crop insurance ▪ Financial assistance to states to meet environmental goals (e.g., reducing nutrient pollution) ▪ Financial incentives to farmers and ranchers for best management practices (BMPs) ▪ Technical assistance ▪ Research and development ▪ Tax and trade policy	▪ Financial incentives to farmers and ranchers for best management practices (BMPs) ▪ Technical assistance ▪ Research and development ▪ Sustainable procurement policies ▪ Tax policy ▪ Smart growth policies	▪ Sustainable procurement policies ▪ Smart growth policies ▪ Municipal composting

Source: Authors.

Adaptation and Resilience

While climate change is a global phenomenon, impacts occur at the local level. Communities can reduce their vulnerability and increase their resiliency by preparing for and adapting to the effects of climate change. Given the local nature of the impacts, local and state governments have a major role to play in the implementation of effective adaptation and resilience strategies.

Table 6 | **Roles of the Federal, State, and Local Governments in Promoting Adaptation and Resilience**

	FEDERAL GOVERNMENT PURVIEW	STATE GOVERNMENT PURVIEW	LOCAL GOVERNMENT PURVIEW
Adaptation and resilience	▪ Financial assistance and incentives to advance state and local adaptation and resilience efforts ▪ Technical assistance and data support ▪ Research and development ▪ Federal flood insurance ▪ Incorporate resilience into disaster recovery and pre-disaster planning ▪ Establish model building and infrastructure codes and standards ▪ Set resilience standards for at-risk federally supported infrastructure	▪ Mapping and modeling of risk and vulnerability ▪ Financial assistance and incentives for local adaptation and resilience planning ▪ Require/incentivize localities to consider climate change impacts in local comprehensive plans ▪ Incorporate resilience in state-funded projects ▪ Direct public investment in adaptation and resilience ▪ Administer resilience grant and loan programs ▪ Policies addressing development in high-hazard areas (e.g., coastal buyback program) ▪ Building and infrastructure codes and standards	▪ Mapping and modeling of risk and vulnerability ▪ Integrate adaptation and resilience strategies into urban planning and investment ▪ Incorporate resilience in locally funded projects ▪ Direct public investment in adaptation and resilience ▪ Administer resilience grant and loan programs ▪ Building and infrastructure codes and standards ▪ Zoning to prohibit building in disaster-prone areas

Source: Authors.

4. A NEW CLIMATE FEDERALISM FRAMEWORK

As detailed above, there is already considerable activity underway to address climate change. However, given the magnitude of the challenge, more action will be required at every level of government. In particular, dialogue participants noted that adequately addressing the climate challenge demands ambitious federal action.

In order to inform federal officials as they craft new policy, the New Climate Federalism Dialogue asked these questions: in what circumstances is a heavy federal role desirable; when is a heavy state and local role desirable; and when are shared or cooperative roles best? Some policy situations will warrant a strong federal role, and some will warrant a strong state and/or local role. The great majority of areas where action is necessary, however, demand shared or cooperative action across multiple levels of government.

A climate federalism framework that allocates these roles in a manner that is responsive to the unique circumstances that surround any particular policy is most likely to be successful at tackling climate change. Below, we approach the delineation in general terms, with the aim of informing discussions on policy going forward.

Climate Policy Situations Warranting a Strong Federal Role

Evaluating when a strong federal role is appropriate

In evaluating whether a particular climate policy should provide for a strong federal role, the following questions should be considered:

- Is the federal government the only level of government that can implement the policy or action or achieve the desired result?
- Does the policy or action require large investments, significant expertise, or resources that are generally not available to most state and local governments?
- Does the need for national uniformity in the policy or action outweigh the benefits of allowing variations and experimentation at the state and local levels?
- Is there potential for a "race to the bottom" if left in whole or in part to state and local governments?

In the subsections that follow we briefly outline several examples of climate policy solutions where the answer to one or more of these questions is "yes," suggesting that a strong federal role is appropriate. We then more closely examine a case study on energy efficiency standards for appliances and equipment.

Examples of climate policy solutions warranting a strong federal role

Dialogue participants generally agreed that a strong federal role may be appropriate in a range of circumstances, including establishing national emission reduction targets that are consistent with science, international engagement, investment in innovation, providing funding and technical support for subnational efforts, emissions monitoring and reporting, and product standards like energy efficiency standards for appliances and equipment (which are discussed in more detail in the next section). Below we outline the rationale for a strong federal role in each case.

NATIONWIDE TARGETS: While many state and local governments are taking steps to reduce their greenhouse gas emissions, the level of action across the country is highly uneven. Therefore, a strong federal role is necessary to establish nationwide emission reduction targets that apply across all states to ensure reductions that are consistent with science and prevent a "race to the bottom." Dialogue participants generally agreed that achieving these targets in a timely fashion will require the adoption of federal policies and standards for key sectors. As discussed in the sections that follow, these policies could involve a strong federal role; a shared or cooperative federal, state, and local government effort; or strong state and local government roles.

INTERNATIONAL ENGAGEMENT: Climate change is a global challenge, and all or nearly all countries will need to decarbonize. Therefore, U.S. participation and leadership in international cooperation will be necessary to ensure the requisite action. Under the U.S. Constitution, the president is vested with primary authority over foreign policy, including climate negotiations, while the U.S. Senate must ratify any international treaty. States, meanwhile, are prohibited from entering into legally binding treaties or compacts with foreign governments. For these reasons, a strong national role in international climate policy is appropriate and necessary.

INVESTMENT IN INNOVATION: Programs to drive research, development, and demonstration (RD&D) of new technologies also call for a strong federal role because they require large financial investments, significant expertise, or resources that are generally not available to most state and local governments. State and local governments have much smaller revenues than the federal government. In addition, because the benefits of RD&D would inure to the entire nation, it makes sense that the federal government would make investments in it using revenue collected from taxpayers nationwide.

FUNDING AND TECHNICAL SUPPORT FOR SUBNATIONAL EFFORTS: The federal government is a significant source of funding for state and local programs and has considerable technical expertise spread across the federal agencies. As such, it is uniquely positioned to support state and local action for climate mitigation, adaptation, and assistance around just transition and equity. This is true whether these efforts are voluntary or are required to comply with federal mandates [such as would occur under Section 111(d) of the Clean Air Act]. Subnational officials generally anticipate expanded technical and capacity support needs as the nation moves to tackle increasingly complex decarbonization challenges across the economy, particularly if it follows a model similar to that laid out in the CLEAN Future Act (see Box 2). These issues are taking on increasing salience at a time when state and local governments are experiencing severe reductions in revenue as a result of the COVID-19 crisis.

Box 2 | Summary of the CLEAN Future Act Discussion Draft

The recent discussion draft of the "CLEAN Future Act" offers an opportunity to apply the key questions and climate federalism principles set out above. The discussion draft, which was jointly released by key committee chairs in the U.S. House of Representatives, puts forth an economy-wide climate federalism framework. The discussion draft would, in part:

- establish national economy-wide emissions reduction goals for 2030, 2040, and 2050;
- require states to compile and submit economy-wide emissions inventories to the Environmental Protection Agency (EPA) that aggregate emissions from large sources that report to the EPA and other categories of emissions not captured by the national inventory (such as sinks and other sources of negative emissions);
- require states to submit successive 10-year climate plans to achieve those targets and maintain them once achieved, which must be approved by EPA;
- provide grant money to states to enable them to develop climate plans;
- allow states considerable discretion to determine how the reductions would be achieved, but would provide some federal opt-in programs dubbed "model control strategies," including cap and trade, low-carbon fuel standard, carbon removal strategy, and an energy efficiency strategy, as well as "other" unspecified federal programs;
- allow states to plan jointly in whole or in part;
- in the event that states fail to achieve the emissions reduction required in 2030, 2040, and 2050, require a revised state plan that will achieve the standard with consequences that are more severe with each successive 10-year plan; and
- provide for a "federal backstop carbon fee" set by the EPA administrator that would attempt to make up for the lack or inadequacy of state climate plans.

The proposal also provides for adoption of a federal clean electricity standard that would be designed to transition the electricity sector away from carbon-emitting generation, as well as other features. In addition, it appears to leave in place existing programs, including the federal appliance and equipment standards and federal vehicle tailpipe standards for greenhouse gases. The CLEAN proposal raises a number of federalism questions, which are discussed throughout this working paper. Note that a variant on the state plan portions of the CLEAN Future Act is outlined in the Nicholas Institute article, "Using the Old to Solve the New—Creating a Federal/State Partnership to Fight Climate Change" (Profeta 2019).

EMISSIONS MONITORING AND REPORTING: A strong federal role is also appropriate for measurement and reporting of greenhouse gas emissions because there are considerable benefits to national uniformity. Having consistent monitoring and reporting rules ensures comparability across states while simplifying administration for government agencies and emitting sources alike. Today, the federal government requires measurement and reporting of greenhouse gas emissions for all sources with annual greenhouse gas emissions of 25,000 metric tons or more. State or local regulations may be necessary in some cases in order to assess emissions from sources not covered by national emissions reporting, such as emissions from smaller emitters and carbon sinks. As a result of its ongoing work, the federal government is well positioned to support state and city inventory efforts.

Case study: energy efficiency standards for appliances and equipment

National appliance and equipment efficiency standards are a useful case study for applying these evaluation principles. Existing federal law sets a minimum national energy efficiency standard for appliances for each of more than 60 products ranging from residential refrigerators, clothes washers, and water heaters to commercial and industrial equipment like boilers, transformers, and motors. Standards are set at a level that is cost-effective for the consumer, meaning the consumer will save money on electricity or fuel bills over time that exceed any increased cost of the appliance. Once the federal government sets a nationwide standard for an appliance, states may not establish separate standards for that appliance.

Table 7 sets out possible approaches to delineating federal, state, and local governments' roles for appliance and equipment standards, including approaches that depart from the current strong federal role in this area. The current strong federal role has the advantage of preventing a "race to the bottom" while supporting a common national marketplace, which benefits manufacturers and consumers. Most individual states and localities account for just a small portion of the appliance and equipment market, and very few have the resources or expertise to set their own appliance and equipment standards.

The current system works well, so long as the Department of Energy sets strong standards for major product categories and updates them every six years in accordance with its statutory mandate. The average family saved $500 on their utility bills in 2015 due to efficiency standards for lighting, appliances, and plumbing products (deLaski and Mauer 2017). Unfortunately, as of January 2020, the Department of Energy had missed deadlines to update standards for 21 products (deLaski 2020) and had proposed rolling back standards for new lightbulbs even though it would cost consumers an extra $14 billion annually on energy bills for the next five years (NRDC 2019).

For these reasons, dialogue participants favored a strong federal role whereby standards are set at the federal level, provided that they are kept up to date. Participants agreed, however, that state governments have an important role to play when standards don't cover key product categories, are not kept up to date, or are rolled back without merit. Participants were not in favor of Option 3 in Table 7, in which the federal government left the establishment of efficiency standards to state and local governments.

Table 7 | **A Case Study: Applying Climate Federalism Principles to Energy Efficiency Standards on Appliances and Equipment**

OVERVIEW

National energy efficiency standards for appliances set minimum energy and/or water efficiency levels for more than 60 products ranging from residential refrigerators, clothes washers, and water heaters to commercial and industrial equipment like boilers, transformers, and motors. These products represent 90% of home energy use, 60% of commercial building energy use, and 30% of industrial energy use. Standards are set at a level that is cost-effective for the consumer, meaning the consumer will save enough money to cover the increased cost of the appliance.

	POSSIBLE ENERGY EFFICIENCY STANDARD APPROACHES		
	Federal Role	**State Role**	**Local Role**
OPTION #1 (current practice)	Nationwide standards implemented by the Department of Energy (DOE). Law requires DOE to review these standards every 6 years and, if found to need revision, to issue revised standards within 2 years of the review. DOE has not always met these statutory deadlines. DOE can also establish standards for new products if they present opportunities for significant energy savings. Energy Star labeling also encourages the sale of products that are substantially more efficient than the minimum efficiency standards.	With few exceptions, states are preempted from setting more efficient standards than those established at the federal level. A state may only set a stronger standard if it demonstrates "that such State regulation is needed to meet unusual and compelling State or local energy or water interests." No such waivers have been granted, but several states have enacted standards for products not covered by the national standards.	Local governments do not have the authority to set their own energy efficiency standards for appliances and equipment, though they can drive adoption of more efficient products through a combination of incentives and mandates (e.g., building codes).
OPTION #2	Nationwide standards and the Energy Star labeling program continue to be implemented.	States are permitted to implement standards for appliances and equipment already covered by a national standard so long as that standard is more stringent than federal standards. Concerns arising from existence of multiple state standards can be addressed by establishing ways to limit the number of distinct state standards.	Local governments continue to drive adoption of more efficient products through a combination of incentives and mandates.
OPTION #3	There are no federal standards. The federal government continues to support state programs through efficiency testing and labeling.	States are permitted to implement standards for all appliances and equipment. This will allow manufacturers to comply with all state standards so long as they comply with the strictest state's standard.	Local governments continue to drive adoption of more efficient products through a combination of incentives and mandates.

FEDERAL EMPHASIS ↕ SUB-NATIONAL EMPHASIS

Source: Authors.

Climate Policy Situations Warranting Strong State and/or Local Government Roles

Evaluating when strong state and/or local roles are appropriate

State and local governments are able to take local conditions into account when they design and implement policies. Given the size of the United States, as well as the variations in local economies, climate, topography, demographics, land use, and expected climate impacts, the ability to address local concerns without federal interference is sometimes of paramount importance. In deciding whether state and local governments should have broad discretion without federal mandates in a particular policy area, a number of questions arise:

- Does the policy area require close knowledge of local topography, settlement patterns, climate, or other similarly local facts that differ from the nation generally?
- Does effective administration of the policy require extensive engagement with local communities?
- Will state and local governments have sufficient resources or expertise to carry out the actions or policies with limited federal engagement?
- Can discretion be provided to state and local governments without leading to a "race to the bottom" or creating challenges for regulated parties due to differences in regulation from place to place?

In the subsections that follow we briefly outline several examples of climate policy solutions where the answers to one or more of these questions is "yes," suggesting that a strong state or local role is appropriate. We then more closely examine case studies on transportation infrastructure and flood resilience.

Examples of climate policy solutions warranting a strong state and/or local role

Land-use regulation is a classic example of a policy that can only be carried out with close knowledge of local facts that differ around the nation. The design of local communities has a profound impact on how their populations move around, and thus emissions associated with their transportation. It also has a major impact on the risk exposure those communities face as a result of climate change. In addition, decisions around how to manage growth and development can only be made with a deep understanding of the evolving needs of local communities.

The federal government can, and frequently does, influence land-use decisions. For example, the interstate highway system built after World War II fueled a massive expansion of suburbs across the country. That said, it is generally not practical for the federal government to implement local land-use policies. As a result, state and local governments generally possess a large degree of autonomy to control land use within their jurisdictions.

A strong local and state role is also appropriate in the oversight and administration of programs that involve extensive engagement with local communities, such as waste reduction and management programs, building code enforcement, energy efficiency retrofit programs, and programs designed to support low- and moderate-income and historically disadvantaged communities. Low- and moderate-income consumers often face barriers in accessing energy efficiency and renewable energy. State and local governments are uniquely positioned to address these challenges. For one, given their proximity to their communities, they can tailor policies to match their specific geographic and economic features, which enhances their effectiveness. Second, states and localities are better positioned than the federal government to work with a diverse group of local stakeholders, including environmental organizations, environmental justice advocates, labor unions, business, and other community organizations, in designing and implementing equitable climate policies.

These cases are hardly unique. In the subsections that follow we take a closer look at the case for a strong state and/or local role for transportation infrastructure policy and flood resilience planning.

Case study: transportation infrastructure policy

Infrastructure investments are central to any strategy to decarbonize the transportation sector. State and local governments are most knowledgeable about the transportation investment needs of their communities. Indeed, state and local governments maintain the most roadway mileage across the country and operate most of the nation's public transit systems. Furthermore, they exercise authority over land-use and infrastructure development decisions, which in concert with transportation decisions determine how a community grows. As such, a strong state and local role is appropriate.

This is generally the model followed to date. Since the late 1980s, three quarters of all transportation infrastructure funding has come from state and local governments. However, the federal government play a valuable role, funding federal highway projects and providing cost-sharing for many other important projects. The vast majority of federal transportation infrastructure dollars goes directly to states, with federal funding for local governments comprising a much smaller share. While there are some guidelines on how that money can be spent, state governments generally have discretion over which projects are prioritized. However, the majority of federal transportation funds are distributed via formulas and rely on outdated transportation metrics that promote the construction of new infrastructure that caters to private cars. Collectively, these pose a challenge to decarbonizing the transportation sector since the current framework provides no incentives to state and local governments to reduce carbon emissions, improve access and connectivity, and lower traffic fatalities.

One way to reduce transportation emissions is to invest more infrastructure dollars in projects that contribute to a low-carbon and resilient future. Table 8 provides options for increasing climate-friendly investments with different roles for federal, state, and local governments. In general, dialogue participants did not think a strong federal role was appropriate in this instance as it disempowered those most closely engaged with the transportation investment needs of their communities (represented in Option 1 in Table 8). Instead, they thought that a strong state and local role was necessary to ensure that infrastructure was built in a manner that was responsive to a community's needs. However, participants noted that many local governments face state-level constraints to realizing their ambitions. In addition, some state governments face state constitutional constraints to allocating funding toward desired projects. For these reasons, some participants felt that it was appropriate to provide federal guidance and incentives to ensure that funding is spent in a manner that is consistent with the nation's decarbonization goals.

Table 8 | A Case Study: Applying Climate Federalism Principles to an Infrastructure Plan for Reducing Transportation Sector Emissions

OVERVIEW

State and local governments account for more than three-quarters of all U.S. transportation infrastructure spending. Most federal infrastructure funding flows to the states, which then allocate funds between state and local priorities. A smaller portion of federal funds is directly allocated to local governments through a variety of programs. Government spending on transportation has prioritized building new roads and widening highways over maintenance and transit projects. In general, transportation funding priorities are not based on outcome measures and targets for making the transportation system more resilient to impacts of climate change and/or promoting decarbonization of transportation. This table outlines options for allocating roles if the federal government were to make a significant commitment to decarbonizing transportation.

	POSSIBLE TRANSPORTATION INFRASTRUCTURE INVESTMENT APPROACHES		
	Federal Role	**State Role**	**Local Role**
OPTION #1	The federal government develops and finances priority transportation infrastructure projects that reflect an understanding of the climate risk and vulnerability and include resilience measures.	States can finance their own priority projects and can advise federal decision-making.	Local governments can finance their own priority projects and can advise federal decision-making.
OPTION #2	The federal government provides flexibility to state and local governments in the use of federal infrastructure funds so long as they adopt and meet targets for reducing transportation sector emissions and improving resilience.	To meet federal conditions, states require local governments to take steps to reduce transportation sector emissions, increase access, and/or improve resilience.	Local governments could have greater financial resources to address transportation needs if they take steps to reduce transportation emissions, increase access, and/or improve resilience.
OPTION #3	The federal government increases direct allocations to local governments for climate-related projects and/or requires states to allocate a higher portion of awarded federal funds to projects that are responsive to local mitigation or resilience priorities. The federal government encourages projects that meet multiple resilience, access, and decarbonization goals.	States make it easier for local governments to raise taxes for infrastructure, enabling local leaders to effectively compete for federal and state programs that require matching funds.	Local governments have greater influence over how federal infrastructure funds are spent on climate-related projects.

FEDERAL EMPHASIS ↕ SUB-NATIONAL EMPHASIS

Source: Authors.

Case study: flood resilience policy

Flooding is the costliest extreme weather impact in the United States. Since 2000, flood-related disasters have caused $845 billion in damage to homes, businesses, and other infrastructure (Lightbody et al. 2019). Considering that flood risk reduction measures return $6 for every $1 invested, smarter planning that properly accounts for flood risks means less of a drain on local, state, and federal resources alike (Lightbody et al. 2019).

Flood resilience planning is a useful example of a policy situation that warrants a strong state and/or local government role as it requires close knowledge of local topography, settlement patterns, climate, or other similarly local facts that differ from the nation generally. In addition, states and, to a large extent, localities are key decision-makers for administering policies that affect flood risk. They have significant discretion in land-use and development decisions that determine communities' vulnerability to floods and their preparedness for dealing with the impacts. They also have the authority to enforce stricter building standards that can protect lives and property. Furthermore, resilience planning can be leveraged to address existing structural inequities and disparities, and achieve equitable adaptation outcomes. Dialogue participants noted that climate hazards, including floods, disproportionately affect low-income and minority communities, that they have fewer resources to recover, and that such events exacerbate inequality.

While the successful planning and execution of flood resilience efforts largely relies on states and local governments, the federal government can play an important role in enhancing the nation's resilience to floods. The federal government can require or provide incentives for states and communities to better prepare their communities and mitigate human and monetary costs. In addition, several dialogue participants noted that the federal government should make reforms to the National Flood Insurance Program (see Box 3).

Table 9 provides options for delineating federal, state, and local governments' roles in a flood resilience policy going forward. Two of the three options emphasize the locus of flood resilience efforts at the subnational level, with the federal government supporting state and local efforts either through mandatory requirements or incentives. Option 1 reserves planning and implementation authority for the federal government. Dialogue participants generally preferred Option 2, wherein state and local governments are required to incorporate flood mitigation into their planning efforts, but where those efforts are conducted by state and local governments themselves.

Box 3 | The National Flood Insurance Program

The National Flood Insurance Program (NFIP) is a critical tool for helping homeowners and businesses recover from catastrophic flooding. And yet this federal program, as it currently exists, is not keeping up with the climate change reality. It acts as a perverse incentive, encouraging people to build homes and businesses in flood-prone areas, while significantly downplaying the nature of the risk. Additionally, the program has been deemed to be at "high risk," with $20.5 billion of debt as of September 2018 (U.S. Government Accountability Office 2019). Critics have noted that it will be difficult to address flood resilience unless the program is reformed in a manner that reduces homeowners' and businesses' exposure to chronic flooding, puts the program on the path to solvency, and provides some form of assistance to low- to moderate-income NFIP policyholders.

Table 9 | **A Case Study: Applying Climate Federalism Principles to Flood Resilience Planning**

OVERVIEW

Since 2000, flood-related disasters have caused $845 billion in damage to homes, businesses, and other infrastructure. Currently most federal funds and assistance for resilience efforts are only made available after a natural disaster, highlighting the need for a more proactive approach to disaster preparedness. The most effective flood resilience efforts are undertaken at the local level, with help from the federal and state governments promoting and investing in resilience and factoring it into risk management decisions and land-use planning.

	POSSIBLE FLOOD RESILIENCE PLANNING APPROACHES		
	Federal Role	**State Role**	**Local Role**
OPTION #1	The federal government is **responsible** for developing and implementing flood resilience plans for communities that incorporate the impacts of climate change.	States provide an advisory role only.	Local governments provide an advisory role only.
OPTION #2 (preferred)	The federal government **requires** state governments to conduct flood resilience planning efforts that incorporate the impacts of climate change. The federal government provides guidance and financial and technical assistance.	States **incorporate** the impacts of climate change in state-level flood resilience planning. States establish **requirements** for local planning efforts and provide financial and technical assistance.	Local governments are **required** to adopt flood resilience plans that incorporate the impacts of climate change.
OPTION #3	The federal government provides funding and technical support to encourage **voluntary** state and local flood resilience planning efforts that incorporate the impacts of climate change.	States **may** incorporate the impacts of climate change in state-level planning. States **incentivize** localities to incorporate the impacts of climate change in flood resilience planning and provide financial and technical assistance.	Localities **may** incorporate the impacts of climate change in local flood resilience planning.

FEDERAL EMPHASIS ↕ **SUB-NATIONAL EMPHASIS**

Source: Authors.

Climate Policy Situations Warranting Shared Roles

Evaluating when cooperative federalism is appropriate

Notwithstanding the cases discussed above where a strong federal or subnational role is called for, most policy areas call for shared responsibility among federal, state, and local governments. A cooperative approach can allow policymakers to capture the opportunities offered by federal action while also allowing state and local governments to bring their comparative advantages to the effort. Notably, this is how most energy, environmental, and transportation policies have been implemented historically. A cooperative or shared policy may be appropriate if the answer was "yes" to one or more questions for strong federal and strong state and/or local roles. In addition, the following questions should be considered:

- Can the federal government ensure a level playing field while also leaving substantial discretion in the design or implementation of the policy to address state-specific or local concerns on the ground?
- Would providing discretion to state and/or local governments enhance the benefits of the policy without leading to a "race to the bottom" or creating problematic differences in regulation from state to state?
- Does the policy take advantage of current areas of state or local expertise, or speak to an area of extensive state or local engagement?
- Can the federal government provide program infrastructure and/or guidance to capture economies of scale?

Because this framework leverages the considerable strengths of federal, state, and local actors, it represents the largest category of activities. In the sections that follow we examine several case studies where the answer to these questions suggests that shared roles may be appropriate. This includes cases studies on clean electricity standards, cap-and-invest programs, and zero-emission vehicle standards.

Case study: clean electricity standards

In recent years, a federal clean electricity standard (CES) has received attention in the U.S. Congress as a policy with the potential to decarbonize the electricity sector in an efficient manner. A CES would require retail suppliers of electricity to supply an increasing percentage of electricity from clean sources over time, eventually reaching a level that would ensure decarbonization of the electricity sector. Electricity generators could earn clean energy credits by generating electricity at an emissions rate that is cleaner than a benchmark rate and credits could be used by retail suppliers to meet the CES requirements.

In many ways, a CES is an example of cooperative federalism because its successful administration would require collaborative efforts by federal and state regulators. The federal government would establish a nationwide standard that all retail suppliers have to meet; states would continue to regulate retail suppliers economically and, therefore, have a direct role in how retail suppliers meet the federal CES. In states with vertically integrated electric utilities and traditional economic regulation, for example, states would continue to oversee utility planning. Under a CES, utility planning would include developing or procuring sufficient clean generation and/or clean energy credits to meet the standard.

In addition, the CES can be designed in a manner that reinforces models of cooperative federalism. In such a scenario, the federal CES would be designed to allow states to have parallel clean electricity standards that go beyond the federal standard and/or require a specific mix of clean electricity sources reflecting the state's policy priorities. For example, while a federal CES might be technology neutral, a state could favor renewables, nuclear, or fossil with carbon capture technology. In this way, the federal government would establish the nationwide goal of increasing amounts of clean electricity over time, but the states would remain in the position of regulating the retail suppliers and could influence the mix of resources—a true collaborative model. Such an approach could be warranted here as the federal CES would ensure a level playing field. Meanwhile, the

flexibility provided to the states would allow them to address state-specific or local concerns without leading to a "race to the bottom."

Table 10 sets out a range of possible approaches to a federal CES, including a strong federal approach that would preempt states from having their own portfolio standards and a strong state role approach that would only require that electricity be decarbonized over time and let states decide how to design state-level programs to achieve that goal. Dialogue participants favored a cooperative approach, such as those outlined in Options 2 and 3, that establishes a federal program but leaves states to influence how retail suppliers meet, or exceed, the federal standard.

Table 10 | **A Case Study: Applying Climate Federalism Principles to a National Clean Electricity Standard**

OVERVIEW

A clean electricity standard (CES) would require all retail electricity suppliers (utilities) to provide a steadily increasing share of low-carbon electricity to customers. Over time, the percentage of a utility's portfolio that must be low-carbon will increase, driving a progressively cleaner electricity system. To comply with a CES, utilities can purchase lower-carbon electricity directly from generators or clean electricity credits. Under a fuel neutral CES, all types of generation would be eligible to earn credits based on their emissions rate relative to the benchmark rate, including nuclear, renewables, fossil generation with carbon capture, and other types of generation. A CES could be designed to gradually reduce emissions until the electricity sector is largely decarbonized.

	POSSIBLE CLEAN ELECTRICITY STANDARD APPROACHES		
	Federal Role	**State Role**	**Local Role**
OPTION #1	Nationwide standard implemented by a federal agency, including reporting and compliance by retail electricity suppliers nationwide.	State portfolio standards are expressly preempted in favor of a national CES.	Municipal utilities would be subject to federal CES, not state standards. Local clean energy procurement would not reduce national emissions unless the federal standard became nonbinding.
OPTION #2	Nationwide standard implemented by a federal agency, including reporting and compliance by retail electricity suppliers nationwide.	States may opt out of federal standard so long as state CES will achieve equal or greater decarbonization. States choose which resources earn credit.	National and state programs preserve the ability of local governments to drive additional emissions reductions.
OPTION #3	Nationwide decarbonization timetable that all states must meet through state-designed standards.	States implement a state CES, renewable portfolio standard (RPS), or carbon pricing program that is no less ambitious than the federal timetable, and can choose which resources earn credit.	Municipal utilities implement a state CES. Local governments retain the ability to drive additional emissions reductions.

FEDERAL EMPHASIS ↕ **SUB-NATIONAL EMPHASIS**

Note: In any of these approaches, states, and in a few cases local governments, would maintain their role as economic regulators of electric utilities, setting consumer rates that incorporate the costs of CES compliance.

Source: Authors.

Case study: cap-and-invest programs

Under a federal emissions cap-and-invest program, a declining emissions limit would be imposed on key emitting sectors, such as electricity, transportation fuels, heating fuels, and industry.[3] Rather than mandate that each regulated entity meet a specific level of reductions, the program creates a flexible market-based mechanism that allows each entity to determine its own optimal level of emissions reductions while ensuring that aggregate emissions decline in the prescribed manner. It does so by creating emissions allowances for each allowed ton of emissions. Regulated entities can buy, sell, and trade those allowances so long as they have enough to cover their emissions at the end of each control period. Cap-and-invest programs typically generate revenue from the sale of some or all of the allowances, and invest those proceeds in projects that advance the program objectives. This can include supporting investment in cost-saving measures like energy efficiency improvements, or addressing challenges families or businesses face during the transition to a low-carbon economy (e.g., through utility bill rate relief, addressing revenue shortages in communities where fossil generation is retired, worker training programs, etc.).

A growing number of states already operate cap-and-invest programs. Eleven states currently participate in the Regional Greenhouse Gas Initiative (RGGI), a cap-and-invest program for the power sector, and one more, Pennsylvania, has announced plans to join. Many of those states, along with Washington, DC, are also participating in the Transportation Climate Initiative, which aims to establish a cap-and-invest program for transportation fuels. In addition, California runs a multi-sector cap-and-invest program. As outlined in Table 11, a federal program could impact these programs in different ways depending on the federalism construct employed.

Options 2 and 3 consider broad frameworks for cooperative federalism where state and local government action can enhance the benefits of the policy without leading to a "race to the bottom." In these scenarios, the federal government could provide technical support to state and local governments, as well as program infrastructure such as an emissions and allowance tracking system to promote successful outcomes.

Whether or not their states were participating in one or more of the existing regional programs, most dialogue participants agreed that states should retain the ability to set more ambitious targets than the federal program.[4] In addition, most participants agreed that states should have control over the allocation of some portion of the allowances or revenue raised as it would allow them to address state-specific or local concerns on the ground, including programs to address equity and environmental justice. For this reason, local officials also expressed a strong interest in having a seat at the table in the allocation of funds given their central role in addressing local needs. This preferred option appears as Option 2 in Table 11.

Market-based programs in general, including cap-and-invest programs, have been criticized by some community organizations because they do not ensure emissions reductions in particular locations, including in areas that have suffered from environmental injustice. Parallel programs can be implemented to address this concern, such as the community air protection programs implemented by California under Assembly Bill (AB) 617. In some cases, states have leveraged revenue generated from market-based programs to address these issues. For example, in its implementation of RGGI, the Commonwealth of Virginia chose to allocate 50 percent of the allowance revenue to low-income energy efficiency in communities to ensure that the program benefits are targeted.

Note that questions and opportunities similar to those articulated also arise around the allocation of state, local, and federal roles in the context of other federal carbon pricing programs, such as a carbon tax.

Table 11 | **A Case Study: Applying Climate Federalism Principles to a National Cap-and-Invest Program**

OVERVIEW

A federal emissions cap-and-invest program covering electricity, transportation fuels, heating fuels, and key industry sectors would impose a declining emissions cap through 2050 to achieve national decarbonization targets for those sectors. Allowances are auctioned with revenue to be invested in sectors covered by the program.

	POSSIBLE CAP-AND-INVEST PROGRAM APPROACHES		
	Federal Role	**State Role**	**Local Role**
OPTION #1	Nationwide program implemented by a federal agency, including reporting and compliance by covered sources nationwide. (EPA administered similar program for acid rain/sulfur dioxide).	State programs are expressly preempted in favor of a uniform national cap-and-invest program. Existing state programs are phased out. States have a limited role in investment of auction proceeds in their states. States can implement local air protection programs.	Local governments have no role in determining how auction proceeds are invested.
OPTION #2	Nationwide program implemented by a federal agency, including reporting and compliance by covered sources nationwide. (EPA administered similar program for acid rain/sulfur dioxide).	States participate in the federal program but can set more ambitious targets and have control over allocation of some portion of the allowances or revenue raised. States can implement local air protection programs.	Local governments are the recipient of a share of the auction proceeds for use in programs to benefit the public and contribute to emissions reductions.
OPTION #3	Nationwide decarbonization timetable that all states must meet through state-designed cap-and-invest programs. Federal government provides optional model rule and optional program infrastructure.	States implement state cap-and-invest program that is no less ambitious than a federal timetable. States can implement local air protection programs.	Local governments are the recipient of a share of revenue for use in programs to benefit the public and contribute to emissions reductions. Certain local programs could drive additional reductions through retirement of allowances, similar to the treatment of voluntary renewable purchases in RGGI and the California cap-and-trade program.

FEDERAL EMPHASIS ↕ **SUB-NATIONAL EMPHASIS**

Source: Authors.

Case study: zero-emission vehicle standards

A zero-emission vehicle (ZEV) mandate can help decarbonize the transportation sector by requiring manufacturers to sell ZEVs, like electric cars, as a certain percentage of new vehicles. There is currently no federal ZEV mandate.

Under the Clean Air Act, California was given the authority to adopt vehicle emission standards that are more stringent than federal standards if granted a waiver by the EPA. Using that authority, California established ZEV standards that complement the tailpipe standards. Other states may opt into those standards but are not permitted to adopt their own unique standards. Eleven states have elected to do so. In September 2019, the Trump administration revoked California's waiver for its ZEV program (as well as its tailpipe GHG emission standards) (EPA and NHTSA 2019). Twenty-three states have filed suit to challenge this action. As a result, the future of state ZEV programs is uncertain (*State of California v. Andrew Wheeler* 2019).

Local governments do not have the authority to set emission standards for vehicle sales. However, successful deployment of ZEVs depends on a cooperative federalism model as it can only succeed if state and local governments support the buildout of appropriate charging infrastructure. Furthermore, state and local governments can help the federal program succeed by encouraging ZEV adoption through incentives and mandates, such as emissions-free zones.

Table 12 provides an overview of potential options for balancing state, local, and federal authority around electric vehicles. Dialogue participants overwhelmingly favored Option 2. This option largely carries forward the framework that existed until the Trump administration

Table 12 | **A Case Study: Applying Climate Federalism Principles to a Zero-Emission Vehicle Program**

OVERVIEW

A ZEV mandate requires that manufacturers sell ZEVs as a certain percentage of new vehicles. Partial ZEV credit could be offered for the sale of plug-in hybrid cars that have emissions when not operating under electric power. This case study focuses on passenger vehicles, although a ZEV mandate could also be applied to trucks, buses, and other commercial vehicles.

	POSSIBLE ZERO-EMISSION VEHICLE (ZEV) PROGRAM APPROACHES		
	Federal Role	**State Role**	**Local Role**
OPTION #1	Nationwide ZEV mandate that requires each manufacturer to sell a minimum percentage of ZEVs or turn in credits from another manufacturer that has exceeded the minimum percentage.	The federal ZEV mandate would replace existing state ZEV mandates. States could offer additional purchase incentives and could seek to encourage ZEVs in other ways, such as authorizing utilities to rate base approved EV charging infrastructure.	Successful deployment of ZEVs depends on local governments to support build out of appropriate infrastructure through direct investment and requirements on new developments. Local governments could encourage ZEV adoption through local mandates and incentives, including HOV lane access, preferential parking, and emissions-free zones.
OPTION #2 (preferred)	Nationwide ZEV mandate implemented.	States may adopt ZEV mandates that go beyond the federal floor. States can promote ZEVs through purchase incentives and other measures.	Same as option #1
OPTION #3	No nationwide standards. Increased funding provided to support state and local buildout of infrastructure to support ZEVs.	States alone impose ZEV mandates, in a coordinated (as presently) or uncoordinated fashion. States can promote ZEVs through purchase incentives and other measures.	Same as option #1

FEDERAL EMPHASIS ↕ SUB-NATIONAL EMPHASIS

Source: Authors.

revoked California's waiver, but complements it with a federal ZEV program that serves as a national minimum, which states can exceed if they choose.[5] Implemented in this way, state flexibility can enhance the benefits of the policy without leading to a "race to the bottom."

5. CONCLUSION: PRINCIPLES FOR A NEW CLIMATE FEDERALISM

The magnitude of the climate challenge demands thoughtful consideration of the roles each level of government should play across the many areas where action is needed. As the discussion of specific policies in the previous section suggests, however, there is no single federalism framework that will optimize the response in every instance. Indeed, in some areas federal resources cannot easily be matched at the subnational level, suggesting a strong federal role is the way to go. In other areas, the importance of local knowledge and expertise makes it difficult to imagine the federal government taking the primary implementation role. In most circumstances, though, a collaborative approach involving significant roles at the federal and subnational levels is optimal. It will be important for federal policymakers to ask the right questions, work closely with states with strong existing climate programs, and apply sound principles in the development of U.S. policies going forward. The New Climate Federalism Dialogue offers the principles below to help guide federal decision-makers.

- Ambitious federal action is necessary to address the climate challenge. Moreover, given the urgency and scale of the challenge of climate change, all levels of government—federal, state, and local— must be part of the solution.
- Policies at every level should promote equitable and healthier outcomes for all Americans, especially disproportionately harmed communities of color and low-income communities.
- Preemption should be rare. Actions by the federal government should enable and not impede more ambitious actions by state and local governments that aim to drive additional greenhouse gas emissions reductions with strategies that reflect knowledge of state-specific circumstances. Likewise, state governments should enable and not impede more ambitious action by local governments.
- The best way to achieve consistency in regulations across the country is to establish federal standards that are sufficiently ambitious to address the climate challenge, while preserving the ability of state and local governments to take more ambitious action and adopt compliance strategies that reflect local and regional conditions.
- State and local governments play a key role as "laboratories of democracy" that can help pioneer new solutions and spur market development in a manner that can help enable more ambitious federal policies over time. The federal government should learn from and engage state and local governments and replicate successful policies at the national level where appropriate.
- A strong federal role is clearly necessary and appropriate in certain areas. For example, the federal government should: establish national emission reduction targets that are consistent with science; engage the international community to ensure sufficient international action to meet the climate change challenge; support continued research, development and demonstration of technologies that will underpin decarbonization and position U.S. industry for leadership in the global low-carbon economy; provide funding and technical support for subnational efforts; maintain an emissions registry and require adequate and comparable emissions measurement, monitoring, reporting and verification across the economy; and take steps to decarbonize the federal government's own operations.
- A strong subnational role is clearly necessary and appropriate in other areas of action. For example, subnational governments are typically in the best position to: implement local land-use planning and zoning decisions; implement local transportation

solutions (with the support of federal funding); carry out infrastructure resilience planning and implementation; and allocate funding to address climate change in an equitable manner.

- In the great majority of circumstances, a collaborative approach to energy and climate action across all levels of government will work best. Examples of programs that warrant a collaborative approach are: clean energy standards; carbon pricing programs; and zero-emission vehicle standards.
- The federal government has considerable financial and technical resources and thus should look for opportunities to act as a catalyst to drive additional state and local action in a manner that promotes equitable outcomes for all Americans.

ENDNOTES

1. Two prominent examples include the *United States Mid-Century Strategy for Deep Decarbonization* and *350 PPM Pathways for the United States* reports (White House 2016; Haley et al. 2019).
2. We note that memoranda of understanding between states and governments outside the United States are commonplace and allow for reciprocity in, among other things, emissions trading markets such as the Western Climate Initiative. See http://www.wci-inc.org/index.php.
3. A cap-and-invest program is a cap-and-trade program where the emissions allowances are sold to generate revenue that can be invested.
4. This could be done in a number of ways, such as by allowing states to reduce the number of allowances they distribute, or by requiring regulated entities to submit more than one allowance for each ton of emissions (Bianco and Litz 2009).
5. There are a variety of approaches for allowing states to go beyond the federal minimum. One option is to allow states that go beyond the federal minimum to require manufacturers to submit additional ZEV credits to the state for compliance at a ratio that is proportional to their in-state sales. Those credits would then be retired from the system, preventing their use for compliance with the national standard.

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ABOUT WRI

World Resources Institute is a global research organization that turns big ideas into action at the nexus of environment, economic opportunity, and human well-being.

Our Challenge
Natural resources are at the foundation of economic opportunity and human well-being. But today, we are depleting Earth's resources at rates that are not sustainable, endangering economies and people's lives. People depend on clean water, fertile land, healthy forests, and a stable climate. Livable cities and clean energy are essential for a sustainable planet. We must address these urgent, global challenges this decade.

Our Vision
We envision an equitable and prosperous planet driven by the wise management of natural resources. We aspire to create a world where the actions of government, business, and communities combine to eliminate poverty and sustain the natural environment for all people.

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COUNT IT
We start with data. We conduct independent research and draw on the latest technology to develop new insights and recommendations. Our rigorous analysis identifies risks, unveils opportunities, and informs smart strategies. We focus our efforts on influential and emerging economies where the future of sustainability will be determined.

CHANGE IT
We use our research to influence government policies, business strategies, and civil society action. We test projects with communities, companies, and government agencies to build a strong evidence base. Then, we work with partners to deliver change on the ground that alleviates poverty and strengthens society. We hold ourselves accountable to ensure our outcomes will be bold and enduring.

SCALE IT
We don't think small. Once tested, we work with partners to adopt and expand our efforts regionally and globally. We engage with decision-makers to carry out our ideas and elevate our impact. We measure success through government and business actions that improve people's lives and sustain a healthy environment.

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