



# Climate, Energy, Justice:

## The Policy Path to a Just Transition for an Energy-Hungry America

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# Climate, Energy, Justice:

## The Policy Path to a Just Transition for an Energy-Hungry America

### Executive Summary

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The United States has 4 percent of the world's population yet produces and consumes more than 20 percent of its energy. Correspondingly, the United States emits more than 20 percent of global greenhouse gases, largely from its fossil fuel economy. The ravages of climate change are intensifying as we experience increasingly potent and more frequent storms and as western states continue to burn. Significantly, the economic, environmental, and health burdens of the nation's current energy system and the consequences of climate change fall disproportionately on low-income communities and communities of color.

The United States should and could be a key player in the global transition from a dirty energy economy to a clean energy future. Unfortunately, although states, local governments, and some private actors are playing important roles, federal leadership, both domestically and internationally, is sorely lacking. With the coming election and the prospect of a more sympathetic administration and Congress, the time is ripe for principled and pragmatic solutions to the climate crisis. With careful crafting, such solutions can grow the U.S. economy and benefit marginalized communities.

This paper, written by 19 energy and environmental law professors, all Member Scholars of the Center for Progressive Reform, describes the need for a transition to clean energy, and offers holistic policy approaches designed not simply to reduce greenhouse gases in a vacuum, but to realize a vision for an inclusive and more just clean economy.

Drawing on the unique expertise of its authors, the paper presents a series of policy recommendations, all of which are based on three core ideas. The first is that good policy requires coordination among three essential variables – energy, the environment, and the economy. There is no fundamental reason why the United States cannot enjoy a clean energy portfolio, a healthy environment, and a robust and fair economy. The second core idea, a corollary of the first, is that the transition must be just. A good transition leaves no one behind – not workers and communities whose livelihoods depended on the fossil fuel sector, not low-income communities, and not communities that have disproportionately experienced negative energy impacts. The third is that, notwithstanding significant public and private climate initiatives around the country, the nation desperately needs federal vision, policies, and resources. Policies predicated on these principles

offer the best hope for our individual and collective future, both here in the United States and around the world.

## Recommendations

Applying their expertise in energy law, environmental law, environmental justice, administrative law, and Native American law, CPR's co-authors explore the many steps that Congress and the next president should take toward a just, economically sound, and environmentally protective national climate policy, offering dozens of specific recommendations for achieving a just transition to clean energy.

The co-authors first offer a series of recommendations addressing specific sectors critical to a clean transition, including electricity, transportation, and public lands. They then provide cross-cutting recommendations relevant throughout the federal government, including climate justice, governance mechanisms, and, taking a wider view, structural insights that should inform the relationships among federal agencies, the states, and the courts.

### *Sector-Specific Recommendations*

- **Electricity Policy:** Congress should establish a federal clean energy standard, improve the Federal Energy Regulatory Commission's oversight of federal energy markets, and expand federal authority over electric transmission line siting and the exercise of eminent domain to enable better access to renewable resources.
- **Transportation Policy:** Congress and a new administration should accelerate electrification of the vehicle fleet by revoking the Trump administration's efforts to lower greenhouse gas standards and by setting higher efficiency and electric car requirements. Congress should also require new measures to ensure adequate charging and clean electricity infrastructure, and should facilitate measures to reduce driving, all while prioritizing clean transportation investments in frontline and low-income communities.
- **Public Lands Policy:** To protect public lands from increased risks posed by climate change, Congress and a new administration should ensure that federal agencies avoid or, if necessary, mitigate harms to our public lands, that they exercise their control to phase out development of nonrenewable energy resources, and that they marshal federal resources to enhance climate resiliency, preserve the biodiversity of public lands, and revise national forest planning rules to ensure forest sustainability.

### *Cross-cutting Recommendations*

- **Climate Justice:** Congress should enact just transitions legislation that provides fossil-fuel reliant communities with new and improved economic opportunities. Congress and the administration should also provide access to energy efficiency and renewable resources--as well as

support for higher energy costs--to low-income communities; prioritize climate policies that provide the most pollution-reduction co-benefits; and provide federal parameters and support to the low-income and frontline communities least able to cope with impending climate harms.

- **Governance Mechanisms:** Congress and a new administration should employ a variety of tools to achieve effective governance, including: federally funded research and development needed to lay the groundwork for private investment; a more realistic assessment of the cost of inaction (known as the “social cost of carbon”) to better inform a wide variety of regulatory actions; careful consideration of carbon pricing options; a vision and associated strategies for achieving a just transition in addition to carbon pricing; and well-funded and effective enforcement of all federal climate policies.
- **Structural Considerations:** Going beyond specific policies, Congress should enhance effective governance by optimizing the relationships among different agencies and levels of government. CPR Member Scholars offer a range of insights on the factors that should guide the allocation of authority between the federal government and the states and among agencies with related missions, recommending a careful balance between federal and state authority and a continued role for the courts.

Energy, the environment, and the economy are all parts of an interrelated whole – they are not separate and distinct areas of concern. Most importantly, the transition to a better and cleaner future must be done justly and democratically. We can no longer afford to indulge the erroneous assumption that our economy must accommodate capital-intensive, large-scale, fossil fuel energy production, distribution, and consumption without accounting for the attendant social costs. Instead, we can enjoy clean energy; we can enjoy decentralized power; we can enjoy clean air, water, and land; and we can grow our economy and protect our citizens, even the most vulnerable. These are not utopian aspirations; these are the demands of social justice, and they can be met by a democratically responsive federal government.

# Climate, Energy, Justice:

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### Introduction

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Three principles undergird the analysis and recommendations offered in this paper:

#### **Principle 1: Integrating Energy, the Environment, and the Economy**

Energy, the environment, and the economy are intrinsic parts of a whole. Virtually all energy comes from natural resources such as coal, oil, natural gas, or such renewable resources as wind, hydroelectric, and solar. In order to generate usable energy, these natural resources must be discovered, extracted or harnessed, processed, distributed, and in the case of non-renewable sources, consumed. Environmental consequences follow each stage of that process. These resources are marshalled by companies and the people they employ, who live in communities that are affected by the employment opportunities and the environmental harms they create. As some resources wax and others wane, people's fortunes wax and wane with them.

There are always trade-offs between energy, the environment, and the economy. Policies narrowly focused on only one factor – on energy but not its environmental or economic effects; or on the environment, without regard to our need for energy and the economic implications of environmental protection; or on the economy, without regard to our need for clean energy and a clean environment – could cause unnecessary harm. Fossil fuels create energy and current jobs but are destroying our environment. Wind power reduces climate harms and creates new employment opportunities but could cause bird deaths. Energy efficiency reduces the need for energy without harming the environment. With a thoughtful weighing of the tradeoffs across policy silos, we can achieve a just transition that maximizes benefits and reduces potential harms.

#### **Principle 2: The Clean Energy Transition and Social Justice**

Merging energy, the environment, and the economy is not only a matter of economic policy. It is also a matter of social justice.

Throughout the 20th century, the country's energy and environmental policies were uncoordinated, producing an energy sector that was large-scale and capital-intensive, centralized and national in scope, and dominated by pollution-heavy fossil fuels and nuclear power. Critics like

Amory Lovins warned that this paradigm was highly inefficient and threatened nuclear proliferation.

Environmental justice activists – led by Professor Robert Bullard – alerted the country to the social injustice of it all, highlighting the ways that communities of color and low-income communities have borne the disproportionate burden of our fossil fuel economy. They are more likely to live close to power plants, to the refineries that generate oil and gas, to the petrochemical facilities that produce oil-based chemicals used throughout our economy, and to the ports, highways, and railways that generate toxic vehicular pollution.

Our energy and environmental policies, in other words, have had demonstrable racial and economic consequences. A clean energy transition can not only reduce the risks of climate change – which themselves fall disproportionately on the most vulnerable – but should also prioritize the pollution burdens that have persistently affected frontline communities. Policymakers leading the transition should ensure that new energy development avoids perpetuating this trend.

A socially just transition would not only alleviate the disproportionate pollution burdens highlighted by the environmental justice movement; it would also promote economic justice. As an example, rooftop solar is a critical part of the energy transition, but it must be done right. Policies should prioritize installation on buildings in low-income areas – the locations where residents will benefit the most from lower electricity bills.

Another key aspect of the international just transition movement is facilitating a smooth transition for the fossil fuel workers who lose their jobs in the fossil fuel sector. The free market is unlikely to ensure that the individuals, communities, regions, states, and Native Americans who have relied on fossil fuel extraction and processing will seamlessly transition to the new opportunities created by a clean economy. Inclusive planning and transition resources will be necessary to ensure that these workers and their communities have a place in a better future.

Social justice and democracy are linked. The energy democracy movement favors the decentralization of energy production and distribution. In contrast to large central power stations where decisions are made at the top, a decentralized energy service, such as a microgrid, can be locally owned. Local control creates opportunities for more democratic participation and more input from consumers than is possible under our centralized fossil-fuel-based electricity model.

In short, a more decentralized and democratic energy system, one that is more responsive to the needs of the communities it serves, can find common ground with the environmental justice movement's advocacy for



environmental and economic justice. Lovins' advocacy for decentralized energy and Bullard's advocacy for social justice laid the foundation for the emerging climate justice, just transition, and energy democracy movements. All of these initiatives are intended to protect the vulnerable from environmental and economic harms while providing access to affordable and democratically controlled energy.

### **Principle 3: Federal Leadership Is Necessary for an Effective Transition**

Many cities, states, utilities, and private companies are valiantly pursuing climate action notwithstanding the lack of federal leadership and insufficient resources. The majority of U.S. states have established renewable portfolio standards. Many have also set ambitious greenhouse gas reduction targets, and even, in some cases, integrated social justice strategies. Cities have likewise set significant clean energy and carbon reduction goals and adopted efficiency standards. Indeed, several cities already obtain or generate 100 percent of the electricity consumed within their jurisdiction from green power. Many utilities around the United States have shuttered coal-fired power plants and replaced them with cleaner sources. And some large consumers of electricity – companies like Walmart and Amazon – have adopted clean energy goals and taken meaningful action toward implementing those goals.

Important as these efforts are, they are not comprehensive, and they are not holistic. Many states and cities are taking action – but many are not. Some states are instituting ambitious electric car policies, but these efforts require a national clean electricity grid and adequate charging infrastructure for the climate benefits to fully materialize. New employment opportunities are emerging, but not necessarily in the places where opportunities are disappearing.

Federal leadership – leadership that respects and builds on existing initiatives – is necessary to achieve a coherent and just transition. Recent initiatives have started to shape a path forward. The Green New Deal (GND) championed by Rep. Alexandria Ocasio-Cortez in the House and by Sen. Edward Markey in the Senate encapsulates all the above principles. The GND integrates environmental goals with social and economic reforms designed to simultaneously stem climate change and address the country's depressed economy, sustain a strong citizenry, and provide meaningful protections for workers and other disadvantaged populations.

Similarly, in June 2020, the House Select Committee on the Climate Crisis put forth an extensive [list of policy proposals](#) that integrate energy, environmental, and economic concerns, and that repeatedly emphasize the importance of addressing the needs of the most vulnerable.

Accomplishing the ambitious challenge of a clean energy transition that leaves no one behind requires insightful, creative, carefully crafted policies. In the pages that follow, CPR's co-authors offer recommendations addressing specific sectors critical to a clean transition, including electricity, transportation, and public lands, then go on to offer cross-cutting recommendations relevant throughout the federal government, addressing climate justice, governance mechanisms, and the relationships among federal agencies, the states, and the courts.

# Federal Electricity Policy and the Climate Crisis

By Alexandra B. Klass, Uma Outka, Hannah J. Wiseman

## Summary

The evolving nature of the U.S. energy market, coupled with the imperative to reduce carbon emissions as a check on climate change, has left the federal government with out-of-date and inadequate energy policies. Rather than encouraging the transition to renewable energy sources, current policies lean toward the status quo, propping up a system of electricity generation that is poisoning the planet and wasting money.

In reforming federal policies to modernize the energy sector, it is vital that lawmakers are responsive to issues of fairness and equity. For example, household energy burdens and the environmental harms of electric power generation disproportionately impact low-income people and communities of color. Energy law reform should seek to alleviate these burdens and channel benefits from the clean energy transition to areas that have been disadvantaged. We set forth the following recommendations discussed in more detail below:

**Recommendation #1:** Congress should demonstrate a national commitment to climate change mitigation and protecting communities from power plant pollution by enacting a federal clean energy standard.

**Recommendation #2:** To remove the substantial obstacles to state-supported clean energy transition posed by new regional wholesale electricity market rules, particularly in the PJM Regional Transmission Organization, Congress should direct the Federal Energy Regulatory Commission (FERC) to categorically exempt new renewable resources and existing nuclear power plants from these rules.

**Recommendation #3:** Congress should expand federal authority over the approval of new interstate electric transmission lines to support greater integration of renewable energy into the U.S. electric grid. Congress could combine this expansion of federal authority over transmission lines with greater scrutiny of FERC's practices with regard to the siting and eminent domain for interstate natural gas pipelines and other fossil fuel infrastructure within FERC's existing jurisdiction.



## Background

As a result of technological developments, government research and financial support, and federal and state clean energy policies, the U.S. electricity sector has changed significantly over the past decade. The use of coal to generate electricity nationwide has dropped precipitously as electric utilities move to cleaner and less expensive energy supplies such as natural gas, wind, and solar energy. Moreover, many of the new energy resources are not traditional, “utility-scale” power plants. Instead, “distributed” localized energy resources, such as residential and commercial rooftop solar, have exploded across the country in both rural and urban areas alongside new large-scale wind and solar plants built by electric utilities and their corporate partners. Greater energy efficiency resources, “demand response,”<sup>1</sup> and large-scale battery technologies have also altered the traditional electric grid, creating both new opportunities and new challenges for federal electricity markets, grid operators, and state and federal energy regulators.

Despite these rapid changes, significant economic, technical, and policy barriers remain, impeding the progress toward a clean energy transition that benefits all communities. Entrenched fossil fuel interests and outdated laws that favor the fossil fuel status quo make it difficult to bring about real change. For all the talk of the clean energy transition underway, the fact remains that as of 2020, 62 percent of the electricity sector and 95 percent of the transportation sector remain powered by fossil fuels.<sup>2</sup> Innovative federal clean energy policies are critical to decarbonizing the energy sector and avoiding catastrophic climate change.

*Entrenched fossil fuel interests and outdated laws that favor the fossil fuel status quo make it difficult to bring about real change. For all the talk of the clean energy transition underway, the fact remains that as of 2020, 62 percent of the electricity sector and 95 percent of the transportation sector remain powered by fossil fuels.*

This paper highlights three actions Congress can take to put in place policies that can support a clean energy transition in the electricity sector: (1) a federal clean energy standard; (2) legislation explicitly supporting state clean energy policies in the administration of regional electricity markets; and (3) greater federal authority to pave the way for new, interstate electric transmission lines needed to support the integration of large-scale renewable energy resources into the electric grid. Each of these issues is addressed in more detail below and summarized here. In proposing these federal policies, we urge lawmakers to be responsive to issues of fairness and equity. For example, household energy burdens and the environmental harms of electric power generation disproportionately impact low-income people and communities of color. Energy law reform should seek to alleviate these burdens and channel benefits from the clean energy transition to areas that have been disadvantaged.

Without a federal clean energy standard, states have taken the first step: enacting such aggressive clean energy policies as renewable portfolio standards, transforming, in many states, the way electric utilities do business by mandating that an increasing percentage of the electricity they sell to customers comes from carbon-free energy sources by a set date. Hawaii was the first state to set a 100 percent clean energy goal in 2015, and other states have since followed suit.<sup>3</sup> But these policies differ widely by state and have not been enacted in some parts of the country at all, particularly in the southeastern United States. This raises the question of whether a congressionally enacted federal clean energy standard would support a more rapid clean energy transition and benefit those states that have not already developed an ample supply of carbon-free energy within their borders.

As for regional electricity markets, electric utilities and other power providers in large swaths of the United States participate in federally regulated, interstate electricity markets within Regional Transmission Organizations (RTOs). FERC provides oversight of these markets and their rules. As a greater number of clean energy resources, such as wind, solar, and storage, increase their participation in these markets, questions arise over how to address state financial support for them within the RTO market structure. As controversy has grown over FERC orders applying to one of these markets—PJM in the northeastern United States—there is an opportunity for Congress to act. As set forth below, Congress should give additional policy guidance to FERC through legislation to ensure that outdated market rules do not stymie a clean energy transition or impose additional costs on utilities, consumers, and communities that wish to take advantage of these low-cost, clean energy resources.

With regard to the physical electric grid, interstate electric transmission lines are critical to integrating utility-scale wind and solar energy into the grid and to transporting onshore wind and solar energy from where it can be generated to population centers that are often several states away. State laws currently make it difficult for transmission line operators to obtain siting permits for interstate and intrastate electric transmission lines. In addition, state laws sometimes prevent those entities from exercising eminent domain authority for such lines. Sometimes, this is because the actor seeking to build the line is a “merchant” transmission line company rather than a public utility, and sometimes, this is because the transmission of electric energy across a state (as opposed to from or to a state) is not considered a “public need” or a “public use” under state law. In other parts of the energy sector, interstate natural gas pipelines, for example, Congress has acted to overcome roadblocks and created federal authority over portions of this infrastructure. Congress can do the same with regard to transmission lines in ways set forth below.

## Proposed Policy: A Federal Clean Energy Standard

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By Uma Outka

### Background and Context

The current patchwork of state renewable energy portfolio standards and related state clean energy laws has played a critical role in advancing clean energy resources over the last 10 to 15 years, particularly wind and solar energy. In 2020, the use of renewable energy finally exceeded coal use on the electric grid at a nationwide level.<sup>4</sup> Yet there can be no mistaking that this is the critical decade for accelerating the clean energy transition. According to the Intergovernmental Panel on Climate Change, the world needs to stabilize climate change by 2030 or face dire global consequences. In the forward to its 2019 *Special Report on Global Warming of 1.5 °C*, the panel is clear: “Without increased and urgent mitigation ambition in the coming years, leading to a sharp decline in greenhouse gas emissions by 2030, global warming will surpass 1.5°C in the following decades, leading to irreversible loss of the most fragile ecosystems, and crisis after crisis for the most vulnerable people and societies.”<sup>5</sup>

The United States remains a top global emitter of greenhouse gases (GHGs) and far exceeds the per capita electricity consumption of most other

*The United States remains a top global emitter of greenhouse gases (GHGs) and far exceeds the per capita electricity consumption of most other developed nations.*

developed nations.<sup>6</sup> Although the trajectory for renewables in the United States is promising, more rapid change is needed than inconsistent state policies alone will yield. The current regulatory landscape is a patchwork of vastly different commitments to clean energy across the states, ranging from 50 to 100 percent clean energy goals in a growing number of states often adjacent to states with no formal clean energy goal at all. In short, the clean energy transition suffers from the absence of federal guidance. The transition is underway, but too slowly. Federal stewardship is needed to accelerate the shift the world needs the United States to achieve, in good faith alongside every other nation under international commitments to ambitiously reduce GHGs.<sup>7</sup>

Now, at the start of a new and critical decade, the time is right for Congress advance a federal clean energy standard that will rapidly shift the U.S. energy sector away from fossil fuels.

A federal clean energy standard is not a new policy concept. There have been dozens of proposals in Congress for just such a measure, but none to date have garnered sufficient support to become federal law.<sup>8</sup> More now than ever before, an electricity sector based on clean energy resources is within reach. Five years ago, for example, the Deep Decarbonization

Pathways Project outlined methods for bringing GHG emissions to 80 percent below 1990 levels by 2050 through policy reforms that would electrify many end uses of energy while shifting away from fossil fuel generation of electric power.<sup>9</sup> This year, informed by the most recent IPCC warnings, a University of California Berkeley report outlines a pathway to “90 percent zero carbon electricity” by 2035, using among other things, a federal clean energy standard on an accelerated timetable.<sup>10</sup>

Importantly, a well-designed federal clean energy standard can be adopted without compromising the progress states have made or even hinder their momentum. Indeed, a federal standard should complement the most ambitious states’ work by setting a nationwide trajectory that brings the rest of the states forward. Although not every state has the same renewable resource potential as the next, regional electricity markets covering roughly 60 percent of the country have helped to compensate for these differences.<sup>11</sup> A federal standard will need complementary policies to help it accelerate clean energy development within a narrow time horizon—for example, support for communities that have depended on fossil fuel industries, and the market oversight and transmission and siting reforms discussed below. Yet it is a centerpiece policy approach that can build on and support the most effective state models, enhanced by complementary reforms.

It is important to recognize that a federal clean energy standard would do more than accelerate GHG emissions reductions needed for climate stabilization. Scaling up clean energy resources will alleviate longstanding local and regional air pollution and water pollution caused by coal-fired and natural gas power plants. This pollution has disproportionately harmed low-income people, especially in communities of color. As the power generated by these facilities is supplanted with clean energy resources, the quality of life and public health outcomes will improve for affected communities across the United States. This is why organizations like the NAACP Environmental and Climate Justice Program have focused on shutting down coal plants and other toxic facilities at the local level while working to advance renewable energy and energy efficiency policies at the state level.<sup>12</sup>

### **Recommendations**

Congress should demonstrate a national commitment to climate change mitigation and protecting communities from power plant pollution by enacting a federal clean energy standard.

Although there are a range of instrument designs that could be explored, we recommend the following guiding principles:

- The standard should require the rapid expansion of renewable energy, energy efficiency, and energy storage resources across the electric grid

for deep reductions in GHG emissions from the electricity sector. The standard should provide a timeline for transition that corresponds to current climate science.

- The standard should mandate or otherwise create strong incentives for states to prioritize low income communities and communities of color for energy efficiency and clean energy investment, through robust community engagement.
- The standard should not limit ambitious states that are innovating or cutting GHG emissions from the electricity sector at a faster pace than the standard requires.

## Proposed Policy: Congressional Guidance to FERC in Overseeing Federal Energy Markets

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By Hannah J. Wiseman<sup>13</sup>

### Background and Context

Renewable energy infrastructure must be connected to transmission lines—often a large network of lines—in order to be economically feasible. Renewable generation is often located in very rural regions, and renewable generators need to be able to send their product long distances to populous areas called “load centers.” One historical challenge faced by renewable generators has been the difficulty of transacting with multiple transmission line operators to get their product – electricity – to consumers. Even when physical transmission lines were available, renewable generators had to contract with each transmission line operator for a rate for use of the line, often meaning that a generator sending electricity from a wind farm to distant customers had to pay numerous “pancaked” rates. The formation of regional transmission organizations (RTOs) has been critical to easing the sale of renewable generation because RTOs take over operational control of the wires from individual utilities, thus avoiding pancaked rates. RTOs also create competitive, wholesale markets for electricity that give renewable generators outlets for their electricity beyond the traditional, long-term “power purchase agreement” in which a customer commits to a purchase of electricity at a set rate or fixed, gradually increasing rate, often for a period of twenty years.

RTOs, although essential to enabling the recent expansion of renewable generation, have also stymied the addition of renewable capacity in some cases. This is most apparent in the Mid-Atlantic area, where FERC has ordered the RTO in this region, PJM, to require that most generators bidding into the competitive PJM market offer a minimum price. This “minimum offer price rule,” or MOPR, applies to capacity markets, which are markets in which generators commit to supply electricity in the future. In other words,



generators commit to build new infrastructure or otherwise have infrastructure available to supply electricity. Capacity markets are key to spurring the construction of new generation infrastructure, because without an assurance that their generation will be used and purchased, generators are often hesitant to build.

FERC's MOPR order issued to PJM in 2019 requires the RTO to set a minimum "floor" price in its capacity market.<sup>14</sup> Any generator that receives state subsidies, and that is therefore able to bid into the market at a price below this floor, has to receive case-by-case approval from PJM to bid in at this lower rate. The only exempted renewable resources are those that are already operating to meet states' existing renewable portfolio standards or had cleared a capacity auction or completed an agreement to interconnect with PJM wires prior to the date of the order.<sup>15</sup> The many new renewable resources that must be built to comply with states' more aggressive clean energy measures are subject to the rule. Additionally, existing resources that receive state subsidies, such as zero-carbon nuclear power plants, are subject to the rule and may not be able to continue operating if subject to the MOPR.<sup>16</sup> Aside from the resource-specific exemptions, the only other way for renewable and nuclear generation to avoid the rule is to apply for a "Unit-Specific Exemption," justifying a price below the floor by showing specific data about the generation unit's costs.<sup>17</sup>

*Fossil fuel generators receive hidden subsidies because, due to the lack of a federal carbon tax or other federal regulation of carbon emissions, they externalize their environmental damage, leaving everyone else on the planet to pay the cost in the form of illness and death and various forms of environmental degradation.*

FERC's MOPR order has the result of making it less likely that state-subsidized renewable and nuclear resources will "clear" the capacity auction—in other words, decreasing the chance that these generation products will be selected and paid for in the capacity auction. A similar MOPR in another RTO, ISO New England, was also approved by FERC.<sup>18</sup>

FERC's justification for the MOPR is that allowing state-subsidized generators to bid into competitive markets at lower rates undercuts competition and creates unjust and unreasonable rates. But as others have noted, fossil fuel generators receive hidden subsidies because, due to the lack of a federal carbon tax or other federal regulation of carbon emissions, they externalize their environmental damage, leaving everyone else on the planet to pay the cost in the form of illness and death and various forms of environmental degradation.<sup>19</sup> Further, the MOPR interferes substantially with states' ability under the Federal Power Act to set generation policy, and it could increase prices by entrenching old energy infrastructure that is not subject to the MOPR. One FERC Commissioner's strong dissent from the FERC MOPR order for PJM sums up the issues nicely: "From the beginning, this [FERC] proceeding has been about two things: Dramatically increasing the price of

capacity in PJM Interconnection, L.L.C. (PJM) and slowing the region's transition to a clean energy future."<sup>20</sup>

Estimates of the impacts of the PJM MOPR vary substantially, but many are bleak. First, states and individual utilities that wish to continue subsidizing renewables and avoid the MOPR problem have the option of leaving the RTO's capacity market and instead adopting a strategy called a "Fixed Resource Requirement."<sup>21</sup> The independent market monitor for PJM estimates that this could increase costs--in just one capacity auction--by several million dollars.<sup>22</sup> For states that opt to have utilities within the state remain within the PJM capacity market, analysts project that some renewable resources, such as offshore wind, would not clear the markets at all, meaning that offshore wind would still be built but would not be recognized as a resource to supply electricity needs in the future. Some analysts believe that the capacity markets--blind to the offshore wind resource as a result of its failure to clear capacity auctions--would instead fill the additional electricity need with other resources, such as fossil fuel-fired power. This would produce more electricity generation than is needed, and the generation would be dirtier.<sup>23</sup>

Numerous parties have petitioned the D.C. Circuit Court of Appeals to review the FERC MOPR order, and PJM has completed two compliance filings with FERC in an effort to follow FERC's MOPR order but avoid some of the major, costly consequences of the order.<sup>24</sup> The March 2020 compliance filing, which is most relevant to zero-carbon resources, lowers the floor prices at which solar and wind resources could bid into the capacity market, among other provisions.<sup>25</sup>

### **Recommendation**

To remove the substantial obstacles that ISO-NE and PJM MOPRs place on nuclear power and new renewable energy resources, Congress should direct FERC to categorically exempt new renewable resources and existing nuclear power plants from all MOPRs. The ability of these resources to request case-by-case exemptions from the MOPR is too onerous and will slow the rapid additions of low-carbon resources that many state policies require. Congress should also consider banning MOPRs altogether to make for "cleaner" law without an excess of complex exemptions. Indeed, some states are contemplating withdrawing from the RTO capacity markets, or even the RTO entirely, simply to avoid MOPR policies. This will make the transport of electricity into these states more cumbersome and, ultimately, more expensive for electricity users. This problem could be avoided simply by removing the MOPR impediment that is spurring a potential exodus from otherwise-important RTOs.

## Proposed Policy: Expanded Federal Authority over Electric Transmission Line Siting and Eminent Domain

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By Alexandra B. Klass

### Background and Context

Electricity transmission lines constitute critical infrastructure needed to integrate more renewable energy into the electric grid, particularly by transporting large-scale wind energy where it exists in the Midwest and Plains states to population centers several states away. Transmission lines are often controversial and sometimes meet with opposition by affected landowners and private property rights advocates. Outdated state laws provide a legal hook that enables opponents to block interstate transmission lines. This has led to fatal roadblocks for several interstate transmission projects, most notably those proposed by the merchant transmission line company Clean Line Energy Partners. Particularly for the interstate electric transmission lines required to transport wind energy from the middle, less populated parts of the country to population centers, the in-state need is often less compelling than the larger regional or national need for such lines. As a result, opponents argue that regional need or national need for renewable energy cannot justify the use of land for a project if the line will not bring significant amounts of electricity to state residents or lower the price of electricity in the state.

In addition, some states allow only “public utilities” to apply for permits. That has prevented some private merchant transmission line companies developing interstate transmission lines from obtaining required permits.

Beyond barriers posed by landowner opposition and antiquated state policy, state eminent domain authority is predicated on demonstrating that the land is being taken for a “public use.” Where the transmission lines are intended to cross a state, relaying energy from out-of-state generators to out-of-state residents, rather than providing transmission from an in-state source or to in-state residents, landowners have questioned whether there is a “public use” justifying the exercise of state eminent domain authority. State courts have in some cases invalidated the use of eminent domain authority on such grounds.

Individual landowner and community opposition to large electric transmission lines is understandable. Most transmission lines are not buried, and they thus can be aesthetically unpleasing and create environmental harm, such as habitat fragmentation, if not carefully planned. Furthermore, as with the siting of other large infrastructure, they can be placed in areas where developers face—or perceive to face—the least opposition, including areas with relatively low land values. This can result in environmental justice concerns, since the cheaper land developers favor is often home to low-

income and minority communities. Any policy that federalizes the siting of transmission lines must carefully account for the impacts of these lines and ensure that environmental justice issues are centrally considered within the siting process. Existing federal laws, if applied correctly, should help to ensure this careful consideration—particularly the National Environmental Policy Act. Additionally, there should be further federal emphasis on and support for distributed renewable resources, such as rooftop solar, that avoid the need for new, large transmission infrastructure in the first place.

In several instances in the past, Congress has acted to expand federal siting or eminent domain authority precisely to overcome state barriers similar to the ones described above. For example:

**Natural gas pipelines:** Congress created federal siting and nationwide eminent domain authority for interstate natural gas pipelines under the Natural Gas Act of 1938 (with amendments in 1947) to override state regulatory barriers to such projects. The Federal Energy Regulatory Commission (FERC) now has authority to grant a Certificate of Public Convenience and Necessity for such projects, as well as to grant nationwide eminent domain authority if the project meets economic and environmental requirements.

**Liquefied natural gas:** Congress created federal siting authority (but not eminent domain authority) for liquefied natural gas (LNG) import and export terminals in the Energy Policy Act of 2005, in response to concerns that state regulators were blocking these projects and that national energy needs would be compromised as a result.

**Cell phone towers:** In the Telecommunications Act of 1996, Congress responded to concerns over local opposition to new cell phone towers by allowing local governments to retain siting authority but creating new, federal standards for how local governments should process the applications, preempting local government prohibitions on cell phone towers, creating strict timelines for local approval, and authorizing expedited review of local decisions in federal court.

### Recommendations

- Congress should expand federal authority over the approval of new interstate electric transmission lines to support greater integration of renewable energy into the U.S. electric grid. Congress could combine this expansion of federal authority over transmission lines with greater scrutiny of FERC's practices with regard to the siting and eminent

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domain for interstate natural gas pipelines and other fossil fuel infrastructure within FERC's existing jurisdiction.

- Congress could accomplish this by granting FERC siting authority over interstate electric transmission lines, as well as authorizing FERC to approve eminent domain authority for such lines. This would be consistent with existing federal law under the Natural Gas Act that governs siting approval and eminent domain authority for natural gas pipelines.
- In the alternative, Congress could leave siting and eminent domain authority with the states but create additional procedural requirements and expedited review of permit denials in federal court as was done in the Telecommunications Act of 1996 for cell phone towers.
- Congress could amend existing provisions in the Energy Policy Act of 2005 to clarify that FERC has authority to override state denials of siting permits in certain circumstances and thus reverse federal court decisions to the contrary.<sup>26</sup>
- As part of an expansion of federal authority over transmission lines, Congress could reform the Natural Gas Act to require FERC to consider GHG emissions as part of that agency's review process for granting siting certificates and eminent domain authority for natural gas pipelines and liquefied natural gas (LNG) import and export terminals. FERC's process for approving these controversial fossil fuel projects has been subject to significant criticism for the climate change impacts of such projects as well as the interference with landowner property rights. Thus, Congress could combine expanded federal authority over clean energy projects like transmission lines with greater scrutiny of fossil fuel projects like pipelines and LNG terminals.

# Transportation Policy and the Climate Crisis

By Alexandra B. Klass, Hannah J. Wiseman, and Alice Kaswan

## Summary

Cars, trucks, and other modes of transportation are the leading cause of climate change in the United States. Two major policy changes in the transportation sector will therefore be necessary to substantially reduce U.S. carbon emissions. First, direct carbon emissions from cars, trucks, and other vehicles must be reduced through further fuel efficiency requirements and the electrification of the vehicle fleet. Second, policy tools must incentivize or mandate practices that reduce the number of vehicle miles driven each year, through better land use planning, for example. This white paper

focuses on the first set of tools—those that directly reduce carbon emissions from individual vehicles—but also briefly touches upon methods for reducing the use of cars and trucks. We also propose that investments in alternative vehicles prioritize reductions in frontline communities, so as to maximize co-pollutant reduction benefits and address longstanding racial and economic inequities in pollution exposures.



As required by the Clean Air Act, the Environmental Protection Agency (EPA) and National Highway Traffic and Safety Administration (NHTSA) had jointly implemented ambitious standards to reduce carbon emissions from vehicles, primarily by requiring more efficient vehicles<sup>27</sup> and approving California's alternative standards, which included zero-emission vehicle requirements. But recent final rules issued by the Trump Administration—the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule<sup>28</sup>—reversed much of this progress. A new Congress or administration should reinstate the previous progress. The electrification of vehicles, in turn, will require more governmental support for the purchase of electric vehicles and the installation of charging infrastructure. We explore these needed policy tools and the potential roles of the federal government, states, and local governments in implementing these tools, and we set forth the following recommendations, each discussed in more detail below. The top priorities for a more widespread and rapid transition to vehicle electrification and reduction in miles driven should include the following.

**Recommendation #1:** Congress should direct the Department of Energy (DOE), in concert with auto manufacturers and state and local governments, to plan for the optimal location of additional charging infrastructure on federal and state highways.

**Recommendation #2:** Through direct budgetary measures and competitive grant programs, Congress should fund the installation of charging infrastructure on federal and state highways and at workplaces.

**Recommendation #3:** Beyond what is already proposed in the CLEAN Future Act, Congress should direct the DOE to establish a multi-stakeholder committee to write a model state building code for the location and connection of EV charging stations near buildings and in parking lots, a model state code for the rates charged for the use of EV chargers (if any), recommended methods and rate structures for compensating customers for sales of electricity from car batteries to utilities, and a recommendation that states exempt EV chargers from the definition of “public utility.”

**Recommendation #4:** Congress should enact new legislation to expand the subsidization of electric vehicles. This legislation should include subsidization of the transition away from diesel fuels used in trucks and buses. Through this legislation, Congress should also consider converting the subsidization of electric vehicles from a tax credit to a rebate, eliminating subsidies for natural gas vehicles, and reserving a substantial percentage of rebates and other incentives for low-income consumers.

**Recommendation #5:** Congress should expand existing funding for public mass transit and land use planning that reduces vehicle miles traveled, particularly in and through frontline communities. As recommended by the Select Committee on the Climate Crisis, Congress should direct the Department of Energy to establish performance measures for Metropolitan Planning Organizations to include metrics such as enhancing urban infill, ensuring that new housing is located closer to existing transportation, and similar metrics.

**Recommendation #6:** We highlight a theme running through all of the prior recommendations: Congress should direct clean transportation investments and land use planning improvements to low-income and frontline communities.

## Background

Vehicles recently surpassed power plants as the leading contributor of carbon pollution in the United States.<sup>29</sup> Air pollution from the transportation sector is directly associated with the number of vehicles on the road, miles driven, and the efficiency (and thus emissions per mile) of vehicles.<sup>30</sup> The average annual number of miles driven by Americans continues to increase, as do the total number of registered vehicles on highways.<sup>31</sup> Americans continue to purchase cars and trucks and drive more miles due to personal preferences, land use patterns, and the lack of adequate alternative modes of transportation, among other factors.

**Health and Environmental Co-Benefits.** Beyond producing carbon emissions, transportation also emits more damaging air pollution than any other sector. In 2005, researchers from MIT and other universities comprehensively studied mature deaths from air pollution and found that cars and trucks cause 53,000 early deaths annually in the United States, as compared to 52,000 early deaths caused by power generation.<sup>32</sup> A more recent study shows 107,000 premature U.S. deaths from fine particulate air pollution, with 28 percent of those deaths caused by transportation as compared to 14 percent from electricity generation and 15 percent from agriculture.<sup>33</sup> Diesel particulate pollution from trucks, buses, ships, and rail presents particularly high health risks.

**Economic Benefits for Consumers:** Improved fuel efficiency can reduce gasoline costs, increasing the money available to U.S. consumers for non-transportation uses. Better fuel efficiency could also reduce the impact of potential oil price increases on the U.S. economy. Despite

these economic benefits, fuel-efficiency standards and financial incentives are necessary because the market does not adequately incentivize consumers to demand and auto companies to produce more fuel-efficient vehicles and EVs. Consumers frequently focus on short-term rather than long-term costs, and may undervalue the long-term cost savings associated with electric cars.<sup>34</sup>

**Job Creation Benefits:** Despite Trump administration claims that electrification will cause job losses, incentivizing the manufacture and sale of more EVs could increase jobs—indeed, perhaps double them by 2030, according to some sources.<sup>35</sup>

A critical mechanism for greening transportation is to electrify the vehicle fleet, particularly now that a declining percentage of electricity comes from carbon-intensive coal.

Successful electrification, in turn, requires enhanced charging infrastructure and use of vehicle-to-grid technologies so that electric car drivers can maximize the value of their cars. Because low-income consumers and small businesses are unlikely to be able to afford the initial investment in clean vehicles, federal support should prioritize transportation investments in frontline communities.

Reducing the number of vehicles and miles traveled by those vehicles is another important way to lower transportation sector emissions. Indeed, reductions in carbon and other pollutant emissions through vehicle efficiency measures can be offset if more people drive and drive more miles. We therefore also discuss public transportation and improved land use planning approaches in this paper.

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There are three primary ways to directly reduce carbon emissions from individual vehicles for each mile driven, including making vehicles more efficient, transforming the vehicle fleet from a gasoline-powered fleet to an electric one, and reducing how much we drive. The first strategy, increasing vehicle efficiency, has historically been a success story, and, under recent regulations, efficiency was on course to further improve. But the steady increase in average miles per gallon of the vehicle fleet was recently limited by a Trump Administration regulation. The electrification of vehicles is a more complex endeavor that requires integrating several policy approaches, as explored below. And finally, inducing Americans to stop driving, or to reduce miles driven through public transportation and metropolitan land use planning, is a critical and challenging policy approach.

## Proposed Policy: Increase Vehicle Efficiency through Improved Regulation

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By Hannah J. Wiseman

### Background and Context

The Clean Air Act requires the regulation of harmful air pollutants from cars, and under the terms of that landmark law, the EPA has established and repeatedly updated vehicle emissions standards. In 2007, the Supreme

Court, in *Massachusetts v. EPA*, held that the law applied to carbon dioxide emissions from vehicles, and required EPA to regulate carbon emissions from vehicles or justify a decision not to so regulate. In 2009, the Obama Administration proceeded to regulate vehicle carbon emissions, and, because the mechanisms for reducing carbon emissions overlap considerably with the mechanisms for increasing efficiency, ordered EPA to coordinate with the National Highway Transportation and Safety Agency's issuance of fuel efficiency standards.<sup>36</sup> These agencies collaborated to issue joint fuel efficiency and greenhouse gas (GHG) emission standards.<sup>37</sup>

*The Trump Administration recently finalized a rule that would freeze emission standards at the 2020 number, with no further improvements through 2025. As a result, efficiency standards are set to increase by just 1.5 percent annually between 2021 and 2026.*

Though harmonized to ease manufacturer compliance, these standards are important independently. The Corporate Average Fuel Economy (CAFE) standards, expressed in miles per gallon, reflected NHTSA's statutory mandate to conserve oil, while EPA's GHG emission standards reflected the Clean Air Act's statutory mandate to regulate pollutants that endanger health and welfare.

## Recommendations

Since this initial drafting of the CAFE standards, NHTSA and the EPA further strengthened these requirements, with continued improvements in vehicle efficiency through 2025.<sup>38</sup> However, the Trump Administration recently finalized a rule that would freeze emission standards at the 2020 number, with no further improvements through 2025. As a result, efficiency standards are set to increase by just 1.5 percent annually between 2021 and 2026.<sup>39</sup> A separately issued part of the rule represented a significant departure from past practice: NHTSA concluded that the Energy Policy and Conservation Act, which governs vehicle efficiency standards, preempts California's greenhouse gas emissions limits and its requirements for zero-emission vehicles.<sup>40</sup> Although the Clean Air Act generally permits California to establish more stringent standards and allows other states to follow California's lead, NHTSA and EPA have precluded California from playing that leadership role for GHG emissions.

A simple fix would be for Congress to direct the EPA and NHTSA to repeal these rules, reinstate California's ability to require zero-emission vehicles and to regulate greenhouse gas emissions from cars, and reinstate the former, more stringent, federal efficiency improvements and vehicle emissions standards rules.

## Proposed Policy: Enhance Measures to Further Electrify the Vehicle Fleet

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By Alexandra B. Klass, Alice Kaswan, and Hannah Wiseman

### Background and Context

More efficient cars emit fewer greenhouse gas emissions, but deep reductions in emissions from vehicles will not be achieved until substantial numbers of gasoline-powered vehicles are replaced with electric vehicles, which emit zero carbon when powered by zero-carbon electricity. This will require more ambitious zero-emission vehicle (ZEV) mandates as well as further subsidization of electric vehicle purchases and charging infrastructure.

### Recommendations

**Enhance manufacturer zero-emission vehicle mandates.** Manufacturer mandates are designed to stimulate industry innovation – to force automakers to develop emission-free technology. The Obama Administration's joint CAFE and GHG emissions standards were somewhat technology-forcing because they encouraged manufacturers to achieve the standards through some degree of vehicle electrification.<sup>41</sup> As manufacturers provide more low- and zero-emission vehicles, the average

emissions from their vehicles goes down, enabling the attainment of stringent fleet-based efficiency and emissions standards. Explicit zero-emission vehicle mandates, like those developed by California and adopted by a range of other states, have provided an even more direct technology-forcing incentive.<sup>42</sup>

The Zero-Emissions Vehicles Act of 2019 (H.R. 2764/S. 1487) offers a more ambitious approach. The proposed bill would amend the Clean Air Act to require manufacturers of passenger vehicles to deliver for sale 50 percent electric vehicles and other zero emissions vehicles by 2030 and 100 percent by 2040.<sup>43</sup> If enacted, this Act would advance transportation emission reductions more quickly than Obama-era vehicle standards. Indeed, the House Select Committee on the Climate Crisis has proposed an even more aggressive timeline, recommending that beginning in 2035, all new passenger vehicles sold should be zero-emission vehicles and that all new heavy-duty trucks should be zero-emission vehicles beginning in 2040.<sup>44</sup>

**Further subsidize electric vehicle purchases.** The existing federal tax credit for electric vehicles has been somewhat effective at incentivizing their purchase. But under current federal law, the tax credit of \$7,500 declines and phases out completely after an automaker sells 200,000 EVs. As a result, tax credits are no longer available for EV purchases from Tesla or

General Motors (which manufactures the Chevy Bolt).<sup>45</sup> Further subsidization of electric vehicle purchases will be necessary to spur a large-scale consumer switch to electric vehicles. Members of Congress have already introduced bills to do precisely that. The Driving America Forward Act (H.R. 2256/S. 1094) would provide a tax credit of up to \$7,000 with a vehicle cap of 600,000 total vehicles per automaker.<sup>46</sup> The Electric Credit Access Ready at Sale (Electric CARS) Act of 2019 (H.R. 2042/S. 993) would repeal the vehicle cap altogether and extend the \$7,500 tax credit through December 31, 2029.<sup>47</sup>

*Although tax credits can be effective in spurring new vehicle sales, a federal rebate may be even more effective. Studies have shown that EV incentive programs are most effective when the incentive is very clear to car sellers and buyers and when the benefits of the incentive accrue at or near the time of sale.*

Moreover, although tax credits can be effective in spurring new vehicle sales, a federal rebate may be even more effective. Studies have shown that EV incentive programs are most effective when the incentive is very clear to car sellers and buyers and when the benefits of the incentive accrue at or near the time of sale.<sup>48</sup> A rebate offered at the time of sale would likely inspire more consumers to purchase an EV, and it might also be a clearer instrument for automobile salespeople to understand and promote. Studies have demonstrated that car dealership sales personnel often do not understand EVs, do not have appropriate incentives to sell them, and steer customers towards non-EVs even when customers express interest in purchasing EVs.<sup>49</sup> Likewise, some vehicle retailers are even unaware of the

existing federal EV tax credits and fail to tell potential customers about these credits.

Substantial rebates are also essential if proposed mandates for electric vehicles go into effect. If by 2035 or a similar date all passenger vehicles sold must be zero-emission vehicles, this mandate will disproportionately affect lower-income new car buyers who cannot afford these more expensive vehicles. Further, these mandates – if not accompanied by adequate rebates – might push many new-car buyers to purchase used, gasoline-powered vehicles instead, thus substantially negating the intended benefits of mandating a zero-emission vehicle fleet.

In addition to passenger vehicles, further incentives are needed to spur the electrification of buses and medium- and heavy-duty trucks. California has been a leader in truck electrification, requiring truck manufacturers to increase the percentage of zero-emission trucks sold, requiring 40 to 75 percent zero-emission trucks by 2035, with the specific level and target date varying by class of truck.<sup>50</sup> As noted above, a federal House committee recommends that heavy duty trucks be fully zero-emission by 2040. Federal legislation should emulate this approach and provide funding for the purchase of electric trucks and further advancement of electric truck technology. The proposed draft CLEAN Future Act takes one step toward this needed support by creating a pilot program with federal grants that would support projects to electrify refrigerated trucks.<sup>51</sup>

Beyond trucks, deep reductions in carbon emissions from transportation will require more widespread electrification of buses. Several existing federal programs take important steps toward this effort. The Federal Transit Administration awards grants for public bus fleets, and these grants support a variety of projects, such as upgrading bus terminals. One permitted use of the funds is to assist the replacement of buses in fleets with battery-electric buses, with 2020 grants supporting these efforts in places like Davis, California, and the County of Suffolk, New York.<sup>52</sup> The proposed Green Bus Act of 2019 would require all of these funds to be used to purchase zero-emission buses as of October 1, 2029.<sup>53</sup> The DOT's Low-No Program, already in place, specifically "provides funding to State and local governmental authorities for the purchase or lease of zero-emission and low-emission transit buses."<sup>54</sup> Continued federal support for these types of projects will be essential. Current law, the Fixing America's Surface Transportation (FAST) Act, only authorized funding through FY 2020, which ended on September 30, 2020.<sup>55</sup>

With respect to school buses, under the Diesel Emissions Reduction Act of 2010 (DERA), the EPA annually issues \$15,000 or \$20,000 rebates to public and private school bus fleet owners who replace diesel buses with EPA-certified clean buses, including, among others, battery-powered buses.<sup>56</sup> The CLEAN Future Act would amend existing programs for the retrofitting of

school buses to include grants specifically for retrofitting buses to make them “low or zero emissions.”<sup>57</sup> As with other buses, continued federal funding for replacement and retrofitting of school buses will be critical.

**Expand incentives and planning for the installation of EV charging infrastructure.** Federal planning incentives for EV charging infrastructure and charging corridors are perhaps even more important than consumer vehicle purchase incentives. Studies have shown that large numbers of potential customers will not purchase an EV until they have assurances that they will be able to easily charge the EV at home, at public charging stations, at workplaces, and on highway charging corridors during long-distance travel.

**Expand the funding of charging infrastructure.** With regard to tax incentives for installing charging infrastructure, Congress enacted a tax credit for alternative fuel vehicle refueling property in 2005, extended it several times until it expired in 2017, and then revived it to extend through the end of 2020.<sup>58</sup> The credit is 30 percent of the cost of qualified property, with a \$30,000 limit for businesses at each location and a limit of \$1,000 for a taxpayer’s residential property.<sup>59</sup> Like other temporary tax credits that may or may not be extended, the efficacy of this credit is limited by uncertainty surrounding its durability. The Electric CARS Act of 2019 (S. 993/H.R. 2042) would extend the credit through 2029. If extended or made permanent, similar tax credits could support new investment in higher-voltage EV charging at homes, at workplaces, in parking lots, and at such commercial establishments as grocery stores, shopping malls, or gas stations.<sup>60</sup> However, this tax credit would not help incentivize construction on highway corridors of the Level 3 direct current fast chargers (DCFC) more suited to long-distance travel. This is because Level 3 chargers are significantly more costly than Level 2 chargers, and thus the tax credit will not significantly reduce the high, up-front infrastructure costs of this infrastructure. Congress should therefore consider a significantly larger tax credit for Level 3 chargers or create a rebate program to fund such infrastructure.

The Clean Corridors Act of 2019 (H.R. 2616/S. 674) would create a grant program for state, tribal, and local governments to install publicly accessible EV charging infrastructure along alternative fuel corridors (on national highways) designated by the federal government, states, or groups of states.<sup>61</sup> Under the proposed EV Freedom Act, the DOT and DOE would help create a network of charging infrastructure—also on national, public highways—by writing a plan for the location of the infrastructure and issuing grant for entities to install charging infrastructure in accordance with the plan.<sup>62</sup> America’s Transportation Infrastructure Act of 2019 contains nearly identical language. This Act, if enacted, would provide \$1 billion for

*Studies have shown that large numbers of potential customers will not purchase an EV until they have assurances that they will be able to easily charge the EV at home, at public charging stations, at workplaces, and on highway charging corridors during long-distance travel.*

these same activities but would not be limited to EV charging infrastructure; it would also cover hydrogen and natural gas fueling stations.<sup>63</sup> Similarly, the CLEAN Future Act would provide support for state and local government and private installation of charging stations.<sup>64</sup>

**Unify building standards and charging rate structures and enhance vehicle-to-grid capabilities.** In addition to supporting the installation of physical charging infrastructure, the federal government needs to do more to enhance the uniformity of standards for charging infrastructure technologies and installation and to incentivize the development of technology and standards that will allow EV owners to sell electricity from their batteries to electric utilities – technology called “vehicle-to-grid” technology. Further, the federal government needs to do more to support efforts to enhance the predictability, fairness, and reasonableness of the rates charged for the use of charging infrastructure.

With respect to building standards, the CLEAN Future Act proposes a model building code for electric vehicle supply equipment and vehicles.

Specifically, the draft Act directs the Secretary of Energy to propose a model building code that would include electric vehicle charging infrastructure and parking in plans for commercial and residential buildings.<sup>65</sup> The Leading Infrastructure for Tomorrow’s America Act, introduced in May 2019, includes identical language.<sup>66</sup> Congress should be more proactive in requiring the Secretary of Energy to spearhead a collaborative, multi-stakeholder effort to develop a model uniform building code, which would include specifications for electric connections; more details with respect to the types and size of spaces in which charging infrastructure should be located; specifications regarding the empty space that should be left on or near commercial buildings for the charging infrastructure and its recommended proximity to electrical outlets; and other information.

In addition to encouraging the installation of more charging infrastructure through uniform building codes, Congress should direct the DOE to form a multi-stakeholder committee to issue a model uniform code to states for ratemaking procedures associated with EV charging infrastructure. This code should address the issue of state utility commissions’ treatment of EV charging—likely with a recommendation that EV charging stations not be treated as public utilities. The code should also include recommendations for how states should regulate charging rates (if at all), and how rates could be developed to value and compensate electricity sold from car batteries to the grid through vehicle-to-grid technologies.

**Expand EV corridor planning.** As noted above, a critical component of building sufficient EV charging infrastructure is planning and funding a

*A critical component of building sufficient EV charging infrastructure is planning and funding a nationwide network of Level 3 direct current fast chargers on highway corridors for long-distance travel.*

nationwide network of Level 3 DCFC chargers on highway corridors for long-distance travel. In federal legislation, these corridors are typically called “alternative fuel corridors” or “AFCs” and federal support for these corridors has included planning for the installation of fueling stations for hydrogen, propane, and natural gas vehicles in addition to EV charging stations. For several reasons, however, this section focuses primarily on the importance of planning EV charging stations specifically. First, although hydrogen vehicles do not emit air pollution, they have faced a steep uphill battle in terms of manufacturing and deployment, and their relevance is currently marginal. As EVs continue to improve, they are likely to be the most important point of focus. Further, propane and natural gas vehicles are not zero emission vehicles. Although they *reduce* conventional air pollution in urban areas, which is exceedingly important given illnesses and premature deaths associated with this air pollution, they *increase* greenhouse gas emissions as compared to conventional gasoline-powered vehicles.<sup>67</sup> Indeed, scientists have concluded that compressed natural gas-fueled vehicles “are not a viable mitigation strategy for climate change.”<sup>68</sup> Planning for EV charging infrastructure should therefore be the highest federal priority and the focus of future legislation.

Section 1413 of the Fixing America’s Surface Transportation Act (FAST Act; P.L. 114-94) enacted in 2015 sought to address that goal by requiring the U.S. Department of Transportation to designate by 2020 national AFCs to promote alternative vehicle use, including EVs.<sup>69</sup> Since that time, the Federal Highway Administration (FHWA) has been working with industry, other federal agencies, and state and local governments, to plan AFCs, develop uniform signage, determine when highway segments are “corridor ready,” and help fund charging infrastructure within AFCs. FHWA has detailed information on the status of corridors and funding on its website.<sup>70</sup> FHWA is also helping coordinate funding from other related programs, such as Volkswagen’s “Electrify America” investments resulting from the company’s vehicle emission cheating settlement with EPA and the state of California, and the Department of Energy’s Clean Cities Coalition Network, which helps state and local governments fund EV charging infrastructure.<sup>71</sup>

Congress should continue to monitor FHWA’s progress on AFCs and should likely provide additional funding and directives to expand the AFC effort well beyond 2020.

## Proposed Policy: Reduce Vehicle Miles Traveled

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By Alice Kaswan and Hannah J. Wiseman

### Background and Context

Moving to more efficient transportation, and particularly to battery-powered transportation, is critical to climate efforts in light of the large contribution of transportation to carbon emissions. But battery-powered transportation still requires electricity, and achieving zero-carbon electricity is likely to be challenging and will take time. Reducing the number of vehicle miles driven is therefore another essential component of the effort to address climate change. This requires the expansion of mass transit and continued efforts to plan new land development in a way that reduces commuting distances.

### Recommendations

**Encourage mass transit.** To make low-carbon public transit more available to more U.S. residents, Congress should channel more funding to mass transit grants. This funding should build upon existing programs such as the Urbanized Area Formula Grants Program.<sup>72</sup> Congress should also continue to fund efforts to maintain and repair mass transit infrastructure, including, for example, the State of Good Repair Grant Program.

*Mass transit functions more effectively in higher-density communities because density helps generate sufficient ridership to enable frequent and dependable service. Conversely, it is difficult to sustain in low-density suburban and rural contexts. Facilitating housing near workplaces and near mass transit hubs would reduce vehicle miles traveled.*

Congress should also consider directing the Department of Energy to initiate a prize-based program that would encourage contributors to propose cost-efficient, effective, and broadly accessible mass transit programs for specific cities. Although existing grants, including the Urbanized Area Formula Grants Program, include funding for planning and research, a competitive prize directed specifically at mass transit planning could perhaps incentivize more innovative and effective planning. Some mass transit systems end up resulting in low ridership, in part due to subpar design. If routes and pick-up and drop-off locations are not carefully planned and researched, public transit can be overbuilt and underused.

**Encourage land use planning and local infrastructure projects that reduce the need for driving.** Land use patterns significantly affect driving patterns, with greater sprawl increasing vehicle miles traveled (VMT) and associated emissions. In addition, mass transit functions more effectively in higher-density communities because density helps generate sufficient ridership to enable frequent and dependable service. Conversely, it is difficult to sustain in low-density suburban and rural contexts. Facilitating housing near workplaces and near mass transit hubs would reduce VMT. In



addition, infill within underutilized urban areas could reduce continued sprawl. (As discussed below, however, such efforts must be carefully designed to address potential co-pollutant increases and gentrification.) Alternatives to and disincentives for vehicles, such as bicycle lanes, pedestrian-friendly streets, parking or access fees, could also reduce VMT.

Although land use planning and housing are traditionally subject to local or state control, the federal government provides substantial funding for highways and transportation, and could condition highway funding on regional planning to reduce VMT and associated emissions. The Select Committee recommended legislation requiring DOT to establish performance measures for Metropolitan Planning Organizations (which plan for and dispense highway funds) to address GHG reductions, access to transportation systems, VMT reductions, and climate resilience, as well as grant programs to support state and local efforts to meet the performance measures.<sup>73</sup> In addition, the Committee recommended that Congress require states to plan and implement transportation projects that facilitate biking and walking.<sup>74</sup>

## **Proposed Policy: Direct Clean Transportation Investments to Frontline and Low-Income Communities**

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By Alice Kaswan

### **Background and Context**

Transportation emissions disproportionately impact frontline communities, which are often located close to sources of transportation emissions, including highways, rail lines, and ports. Moreover, people in low-income communities can ill afford new, zero-emission vehicles that would improve local conditions. As a consequence, without proactive measures to channel zero-emission options such as EVs and mass transit to poorer communities, zero-emission vehicles and their air quality benefits will be more prevalent in wealthy communities, and will remain out of reach for the poorer communities that would most benefit from air pollution reductions.

Moreover, not all transportation emissions are equal: diesel emissions contain toxic particulates that pose substantial cancer risks.<sup>75</sup> Diesel emissions hit many frontline communities hard, whether located near ports, rail depots, warehouses, or emanating from agricultural or mining operations.<sup>76</sup> Addressing diesel emissions also poses a just transitions challenge: independent truckers, small farms, and small businesses with local cargo vans could find it difficult to afford new zero- or low-emission clean vans or trucks, even if the cost of operating the new vehicles is lower over time, as policymakers predict.<sup>77</sup> Similarly, lower-income communities

could find it difficult to fund new zero-emission buses – for public transit and for schools - to replace diesel buses.

Considering a clean transition more broadly, transportation emissions, which rely on individual or local purchases rather than controls on industrial facilities, raise a key social justice issue: who gets to participate in the transition to a clean economy? Carefully tailored government policies are necessary to ensure that frontline and low-income communities are part of the transition, and able to reap the opportunities and benefits associated with clean energy.

## Recommendations

**Prioritize diesel emission reductions and support the transition from diesel to zero-emission vehicles.** Given the high risks posed by diesel pollution in frontline communities, federal climate legislation should place a high priority on truck and bus electrification. As noted, California’s Advanced Clean Truck Rule, adopted in June 2020, is already pushing manufacturers to develop and supply zero-emission trucks. To increase the supply of clean trucks, the House Select Committee recommends that climate legislation require a 100 percent transition to zero emission heavy-duty vehicles by 2040,<sup>78</sup> and recommends increased federal support for research and development to spur new technologies for the largest long-haul trucks posing the most significant decarbonization challenge. To increase demand for clean trucks, the Select Committee also recommends national purchase incentives and grants for zero-emission trucks, buses, commercial vehicles, and other diesel equipment, as well as support for additional infrastructure, like charging stations.

In determining the distribution of funds to support a diesel transition, Congress should provide financial support in areas suffering from the heaviest diesel pollution, such as at ports, in areas with multiple warehouses – which function as magnets for diesel trucks – and in areas otherwise suffering from serious air pollution. The Select Committee’s recommendations repeatedly state that “EPA should prioritize grants for projects that would benefit environmental justice communities and other communities disproportionately exposed to diesel pollution.”<sup>79</sup> Similarly, the Select Committee recommends that continued support for electrifying school buses should prioritize “[s]chool districts in underserved communities and communities disproportionately exposed to air pollution.”<sup>80</sup>

**Invest in clean and affordable mass transit.** As noted, in communities with existing mass transit or sufficient density to support mass transit, we need increased investment in zero-emission mass transit. In most urban areas, frontline and low-income residents make greater use of mass transit and would benefit from diesel reductions inside buses and in their communities. Mass transit funding should require or prioritize investments that directly

serve, or would reduce pollution in, frontline communities. As noted, the Select Committee proposes at least doubling federal funding for mass transit and states that “[t]ransit projects that reduce air pollution and improve mobility in environmental justice communities and underserved rural areas should receive additional funds and consideration.” At the same time, federal legislation should direct agencies to give less priority to investments, like commuter rail lines, that risk triggering sprawl or would provide few benefits to frontline communities. Affordability is also a key issue, both to reduce regressive impacts on low-income residents and to encourage use. Federal support is likely to be necessary to enable many municipalities to keep transit costs low.

**Provide funds and structure for shared mobility options in frontline and low-income communities.** Alternatives to individual car ownership are increasing in areas where car ownership is not necessary on a daily basis, but mass transit cannot meet all needs. The specific needs are likely to vary considerably, and local communities are best situated to identify the options that would work best for them. Frontline and low-income communities without sufficient resources will need federal support to realize these options. California, for example, has adopted an incentive program for car sharing and “clean mobility options” in disadvantaged communities where residents lack accessible or sufficient public transportation.<sup>81</sup>

**Through land use measures to reduce VMT, address the needs and concerns of frontline and low-income communities.** In some areas, like California, the lack of affordable housing near workplaces has resulted in poorer residents moving farther afield to find housing, substantially increasing transportation emissions. Conversely, urban infill development designed to bring suburban residents closer could lead to gentrification in urban low-income areas. That gentrification would not only adversely impact these households but could also induce lower-income residents to move out of the city, undermining the infill development’s VMT-reducing objectives.

In addition, land use measures that reduce VMT and overall emissions could nonetheless cause localized pollution increases. Until most vehicles are zero-emission, denser development could increase urban pollution. And if transit-oriented developments are located along highways, they could expose residents to high levels of pollution typically found adjacent to major roadways.

Land use planning measures to reduce VMT will be an important part of the policy mix, but they cannot occur in a vacuum. Planners, working with affected communities, should integrate housing and public health factors to generate holistic plans for just and sustainable development. The Select

*Land use planning measures to reduce vehicle miles traveled will be an important part of the policy mix, but they cannot occur in a vacuum. Planners, working with affected communities, should integrate housing and public health factors to generate holistic plans for just and sustainable development.*

Committee specifically recommends that Congress incentivize not simply housing near transit, but the provision of affordable housing near transit, to provide greater access to opportunities and reduce the need to drive for low-income residents.<sup>82</sup> That recommendation is a start, but more comprehensive integration of affordable housing and access to work, health care, and education should be integrated into sustainable land use planning.

**Reserve consumer car rebates for low-income households.** Because individual car ownership may be less prevalent in the future, we have not prioritized incentives for individual car ownership. Some role for cars is, however, inevitable, and so such incentives should be included in federal legislation. There is some evidence that most of the benefits of federal passenger vehicle tax incentives have, however, gone to wealthy households that would likely have been able to afford the vehicles without the tax relief.<sup>83</sup> Tax incentives facilitating new and used electric car purchases by low-income households would concentrate support in the communities where such support is most necessary.<sup>84</sup> In addition, it would foster electric vehicle ownership in the communities where transitioning from fossil fuels would achieve the greatest public health benefits.

# Federal Public Lands Policy and the Climate Crisis

By Robert L. Fischman, Christine A. Klein, Daniel J. Rohlf, and Sandra B. Zellmer

## Summary

The concept of “sustainability” is embedded in numerous laws governing federal land management. With respect to the nation’s rangelands and forests, Congress directs the Bureau of Land Management (BLM) and the U.S. Forest Service to manage under principles of multiple-use sustained yield. In addition the BLM must prevent “unnecessary or undue degradation” of lands under its jurisdiction, while the U.S. Forest Service must provide for “diversity of plant and animal communities.” The dominant-use public land systems have more conservation-oriented missions. The National Park Service must manage units by such means as will leave their resources “unimpaired for the enjoyment of future generations,” while the Fish & Wildlife Service must manage wildlife refuges to maintain “the biological integrity, diversity, and environmental health of the System ... for the benefit of present and future generations.”

The Bureau of Ocean Energy Management (BOEM), an often overlooked public lands management agency, must manage the coastal zone in a manner “consistent” with approved state coastal management programs, which in turn seek to “preserve, protect, develop, and where possible, to restore or enhance, the resources of the Nation’s coastal zone for this and succeeding generations.”



Achieving the sustainability goal has become more urgent than ever due to rapidly changing climate and human-driven development patterns. In order to meet the needs of the present generation without compromising the ability of future generations to meet their needs, we propose four categories of legislative reforms to promote ecological, social, and economic sustainability on and through the nation’s public lands.

**Recommendation #1:** Enact sequential mitigation and net conservation benefit legislation requiring all federal land managers to use sequential mitigation to establish a net conservation benefit goal or, *at a minimum*, a “no net loss” of wetlands goal.

**Recommendation #2:** Phase out nonrenewable energy development on federal lands.

**Recommendation #3:** Create biodiversity resilience funds to promote restoration of biodiversity on federal and non-federal lands.

**Recommendation #4:** Legislate portions of the national forest planning rules to ensure sustainability in the face of climate change.

## Proposed Policy: Sequential Mitigation and Net Conservation Benefit

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By Robert L. Fischman

### Background and Context

Federal public lands are subject to various forms of commodity, recreational, and energy development. Organic legislation establishing the framework for managing public resources typically provides a standard for determining which activities or impacts might be permissible. Even the

National Park System may authorize projects that create adverse impacts on ecosystems as long as they do not rise to the level of impairing park resources for future generations. Congress provides similar thresholds for the other major public lands systems, such as national wildlife refuges (ensure “maintenance of biological integrity, diversity, and environmental health,” and compatibility with other refuge objectives), BLM resources (“prevent unnecessary or undue degradation”), and national forests (providing for biodiversity and permitting logging where it is physically suitable for watershed conditions, restocking will occur within five years, and aquatic resources are protected).

*When enacted decades ago, use restrictions in federal public land law were major steps forward in conservation. They were written to stop agencies from repeating egregious mistakes, such as uses incompatible with wildlife protection in the refuges and clear-cutting that dumped sediment by mass wasting in the forests.*

When enacted decades ago, the restrictions in federal public land law were major steps forward in conservation. They were written to stop agencies from repeating egregious mistakes, such as uses incompatible with wildlife protection in the refuges and clear-cutting that dumped sediment by mass wasting in the forests. While they have succeeded in limiting the worst activities, they lack any requirement that people profiting from federal lands pay the full cost of the harm they cause. As a result, even projects that meet the congressionally mandated requirements individually often have adverse ecological effects cumulatively. Federal resources suffer from death-by-a-thousand blows, as incremental harms add up to continual degradation. This unfortunate shortcoming is manifest in declining biodiversity and ecological services, such as water purification, upon which Americans rely.

Sequential mitigation, which is widely practiced in national and international programs, is a strategy to arrest biodiversity and ecosystem services decline

from land degradation.<sup>85</sup> The strategy is sequential because it first seeks to avoid harms, then to minimize whatever harms cannot be avoided, and finally to mitigate whatever harms remain from ecologically impairing activity. The strategy has played an important role in the United States by reducing national net loss of wetlands through the Clean Water Act's fill permit program, and by preventing extinctions in the incidental take permit program of the Endangered Species Act. Sequential mitigation is the gold standard for both recovering biodiversity lost to development as well as ensuring that the public is compensated, in-kind, for the resources it sacrifices through permitting and other decision-making processes.

Yet, federal public land management lacks sequential mitigation requirements. And the programs that do exist are vulnerable to shifts in priorities of the executive branch. For instance, [the Obama administration attempted to require compensatory mitigation through a presidential memorandum](#), a tool that is notoriously unenforceable. Some agencies, including the [U.S. Fish & Wildlife Service, began to operationalize the mandate of the memorandum](#), but [the Trump administration succeeded in undoing those agency efforts](#).

### Recommendation

Congress should codify and expand upon the Obama memorandum. It should enact legislation requiring all federal land managers to use sequential mitigation to establish a net benefit goal or, *at a minimum*, a "no net loss" goal applicable to any impairment of the public lands, temporary or permanent, in biodiversity and ecological functions. It would supplement rather than replace the existing threshold requirements for determining which projects may proceed on federal lands.

Avoiding degradation is more likely to succeed than attempts to mitigate the impact from such degradation. When a resource's value is determined to be irreplaceable, avoidance would be the preferred goal. Instead of compensating to an even trade, the statute could require a "net conservation benefit" for all federal permits and projects. In that way, the *uncertainty* of successful minimization and mitigation itself is incorporated into the compensation demanded by the public for use of federal resources. It also creates a more accurate price signal for prospective consumers of federal public resources. Any doubts about the extent of ecological damage to be mitigated should be resolved in favor of providing a net conservation benefit.

Sequential mitigation and net conservation benefit is a strategy tested and refined over the years by existing federal programs by such agencies as the U.S. Environmental Protection Agency, the U.S. Army Corps of Engineers, and the U.S. Fish & Wildlife Service (though in its role under the Endangered Species Act, not as a federal land manager). Agencies and permittees already

have the tools to fulfill a sequential mitigation requirement of net conservation benefit. For instance, the [Fish & Wildlife Service's incidental take permit program employs such measures as](#):

- avoiding the impact on protected species and habitat through project design,
- minimizing the impact through best management practices,
- minimizing the impact by reducing or eliminating other threats, and
- mitigating (offsetting) impacts by restoration of degraded habitat, enhancement of functional habitat, preservation of habitat, creation of new habitat, and translocating or repatriating species.

It is time for Congress to end its decades-long neglect of federal land management legislation and act to stop the degradation of public resources. It should extend sequential mitigation and net conservation benefit requirements to all federal land and resource management programs under the Federal Land Policy and Management Act, the National Forest Management Act, the National Park Service Organic Act, and the National Wildlife Refuge System Administration Act.

## **Proposed Policy: Phase Out Nonrenewable Energy Development on Federal Lands**

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By Christine A. Klein

### **Background and Context**

Congress has long required that federal public lands be put to sustainable uses, benefitting both present and future generations. Despite these mandates, federal fossil fuel leasing – both onshore and offshore – has encouraged the production of climate-destabilizing forms of energy. Almost [24 percent](#) of the crude oil, natural gas, and coal produced in the United States is derived from the federal lands, and the combustion of such nonrenewable fuels under federal leases accounted for almost [24 percent](#) of carbon dioxide emissions by the United States between 2005 and 2014. To close this gap between public lands law and practice, Congress should expressly forbid new leases related to fossil fuel development and prohibit renewal of existing, nonproductive leases.

This course-correction would reduce outdated market subsidies for nonrenewable fuels that render clean energy less competitive. By some accounts, annual subsidies for fossil fuel production on federal lands total about [\\$7 billion](#), the elimination of which would more than compensate for the loss of royalties from federal leases. A [prohibition against the issuance of new leases on federal lands – coupled with the nonrenewal of existing,](#)



[nonproductive leases](#) – could lessen carbon dioxide emissions and reduce industry infrastructure investments that lock us into a fossil fuel economy.

Restricting fossil fuel production on federal lands would also contribute to climate justice. Communities of color and low-income communities suffer disproportionately from the [refining](#) of fossil fuels. According to [one study](#) by the Clean Air Task Force and the NAACP, in some states, 20 percent or more of the African American population lives within half a mile of a fossil fuel production, processing, or storage facility. Likewise, such communities suffer disproportionately from the [combustion](#) of fossil fuels by coal-fired power plants. More broadly, vulnerable communities suffer more from the impacts of [climate change](#) perpetuated by activities such as the use of fossil fuels.

*Restricting fossil fuel production on federal lands would also contribute to climate justice. Communities of color and low-income communities suffer disproportionately from the refining of fossil fuels. According to one study by the Clean Air Task Force and the NAACP, in some states, 20 percent or more of the African American population lives within half a mile of a fossil fuel production, processing, or storage facility.*

When the federal land systems were established – in some cases more than a century ago – we lacked widespread awareness of how fossil fuel use destabilizes Earth’s climate. At that time, leaving carbon-based fuels in the ground may have been unthinkable. But today, it is the continued development of such dirty fuels from another era that is becoming increasingly unthinkable. As the Fourth National Climate Assessment of 2017 acknowledges, “human activities, especially emissions of greenhouse ... gases, [are] the [dominant cause](#)” of an increase in the global average temperature of about 1.8 degrees Fahrenheit from 1901 to 2016. The federal public lands can be part of the climate change solution, rather than the problem.

## Recommendations

Prohibiting use of federal lands for fossil fuel production is not a new idea. Models for action include former Vice President Joe Biden’s [climate plan](#) (banning new oil and gas permitting on public lands and waters) and [H.R. 2242](#), Keep It in the Ground Act of 2017 (proposing prohibition on BOEM’s and the BLM’s ability to issue, renew, reinstate, or extend any nonproducing lease, or to authorize exploration or production of fossil fuels in specified areas). Congress should phase out nonrenewable energy development on federal lands and waters by adopting the following measures:

**New leases:** Prohibit all new leases for fossil fuel exploration and development on federal lands, both onshore and offshore. This could be accomplished by amendment of organic acts for the national parks, national forests, national wildlife refuges, and BLM lands, as well as amendment of the Coastal Zone Management Act and the Outer Continental Shelf Lands Act. Alternatively, this could be accomplished by the passage of a new federal lands and waters act.

**Phase out existing leases:** Prohibit federal agencies from renewing, reinstating, or extending any nonproducing leases that have not yet vested as property rights that would trigger just compensation for governmental “takings.” Explore funding sources to buy out particularly problematic existing leases.

## Proposed Policy: Create Biodiversity Resilience Funds

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By Daniel J. Rohlf

### Background and Context

Biodiversity – the variety of life on Earth, the ecosystems that sustain life, and the genetic diversity species contain – provides humans with enormously valuable services and resources, ranging from pollinating our crops to forming the genetic building blocks of new medicines and products. Adverse impacts on this natural asset not only imperil these benefits, but are the [root cause](#) of the unparalleled health and economic devastation of the current COVID-19 pandemic and the seeds of similarly devastating events in the future. Humans also share tangible and intangible connections with the other species that share this planet. These connections are evident in innumerable ways – the physical and cultural importance of other species to indigenous cultures, the joys of teaching our children about whales, lions, and elephants, and the thrill of seeing animals in the wild to name just a few.

Importantly, intact biodiversity also promotes resilience in the face of a changing climate. For example, wetlands provide vital wildlife habitat, purify and store water supplies, and serve as natural buffers against storm surges and flooding that are increasing as climate change causes increased weather extremes. Forests store vast amounts of carbon and protect watersheds and wildlife, while in an urban setting an abundant tree canopy saves energy by providing natural [cooling services to dwelling and businesses](#), improves air quality, and even [provides direct health benefits to city-dwellers](#). Moreover, the genetic code of plants and animals that thrive in extreme conditions can [help us](#) make our food supply more resilient on an increasingly unpredictable planet.

While important provisions of federal law limit adverse impacts to biodiversity, particularly on federal lands, governments and landowners often lack the resources to reverse past damage to ecosystems and wildlife, and to take action to restore these crucial systems. For example, the federal Endangered Species Act outlaws federal actions that “jeopardize” endangered species or destroy their critical habitat, but actions outlined in recovery plans to restore those same species and habitats are often stymied due to [grossly inadequate federal appropriations](#). Similarly, programs providing incentives to private property owners to protect and restore

habitat on their land – actions that would benefit society as a whole – are often nonexistent or woefully underfunded.

Even worse, current federal law includes some financial provisions that discourage or stand in the way of protecting biodiversity and adapting to climate change. For example, debt that federal power marketing agencies owe to the U.S. Treasury can discourage actions to restore biodiversity. The Bonneville Power Administration (BPA), a federal agency that markets hydroelectric power from federal dams in the Columbia River Basin, is in [financial trouble](#) in part because the agency is still paying off decades-old public debt for the cost of never-completed nuclear power plants. BPA has therefore staunchly opposed investments that it acknowledges would take a significant step toward restoring endangered salmon and steelhead runs, such as breaching the four outdated federal dams on the lower Snake River. In a similar vein, the Federal Emergency Management Agency continues to pay to [rebuild homes and buildings in flood zones many times over](#), despite the certain knowledge that climate change is increasing the frequency of flooding in precisely those areas. As a result, FEMA's beleaguered National Flood Insurance Program is currently \$25 billion in the red.

Fortunately, perhaps more than any other aspect of environmental policy today, protecting the natural areas required to maintain functional biodiversity – including providing funding for these protections – often garners bipartisan support at the federal level. In August 2020, for example, President Trump and Republican legislators highlighted a new federal law providing full annual funding for the Land and Water Conservation Fund, plus creation of the National Parks and Public Land Legacy Restoration Fund – a pot of money that will provide up to \$1.9 billion annually for five years to cover priority deferred maintenance projects in national parks, national wildlife refuges, national forests, and on land administered by the Bureau of Land Management. The new law, known as [the Great American Outdoors Act](#), was actually the culmination of many years of effort by both Democratic and Republican lawmakers, and will allow both state and federal land managers to better protect biodiversity and will provide facilities for visitors to enjoy public lands and the wildlife those lands support.

Congress should sustain the momentum of this recent bipartisan effort to protect and restore biodiversity, as well as the infrastructure to enable people to sustainably enjoy this vital resource, by creating additional legal mechanisms to fund similar efforts. Strategic investment in protecting and restoring biodiversity now will pay dividends many times over during the lifetimes of our children and grandchildren.

## Recommendations

Congress should create a new series of Biodiversity Resilience Funds to promote restoration of biodiversity on federal and non-federal lands alike. These funds should include the following:

**Biodiversity Climate Resilience Fund:** Most economists agree that putting a price on carbon emissions, in the form of a carbon tax or cap and trade scheme, is the most effective and economically efficient way to force polluters to internalize the costs of carbon pollution and reduce greenhouse gas emissions. Many jurisdictions – including a growing number of countries and the [state of California](#) – already have such schemes in place. When creating such a framework at the federal level, Congress should allocate 10 percent of the proceeds to the Biodiversity Climate Resilience Fund. The Council on Environmental Quality, using criteria established in regulations and on advice from a national Board of Advisors made up of representatives from local, state, and tribal government, as well as scientists appointed by the National Academy of Sciences, should allocate these funds for programs and projects that protect and restore biodiversity and promote climate resilience. Such programs and projects may include those carried out by federal agencies, such as funding recovery plans for endangered and threatened species, grants to state and local governments for “green infrastructure,” and funding for new and existing programs to fight climate change such as compensating farmers for changing cultivation methods to better sequester carbon.

**Federal Debt-for-Biodiversity Swaps:** Congress should use its authority to restructure federal financial instruments to foster biodiversity restoration. For example, debt-for-biodiversity swaps would allow a federal agency such as BPA to receive financial credit from the U.S. Treasury for the value of steps the agency takes to protect biodiversity. Similarly, FEMA could retire its \$25 billion debt for the National Flood Insurance Program by buying out flooded properties rather than paying to rebuild them again and again.

**Biodiversity Restoration Fund:** Congress should amend federal law to provide that the 50 percent of energy development revenues not allocated by the Great American Outdoors Act should go into the Biodiversity Restoration Fund. The Department of Interior should allocate proceeds from this fund to replace funds allocated to the Land and Water Conservation Fund lost due to our proposed ban on new offshore fossil fuel leasing that Congress should also immediately enact (see p. 5).

**Urban Tree Canopy Protection and Restoration Fund:** Congress should immediately enact a small national excise tax on timber from both public and private lands, the proceeds of which should be allocated by the Department of Housing and Urban Development to a fund providing grants to cities and municipalities to protect urban tree cover and urban wetlands.

## Proposed Policy: Legislate Portions of the National Forest Planning Rules to Ensure Sustainability

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By Sandra B. Zellmer

### Background and Context

In June 2020, Secretary of Agriculture Sonny Perdue announced a [blueprint to “modernize” the U.S. Forest Service](#). In touting the benefits of his

*The National Forest Management Act (1976) was pathbreaking legislation at the time. No longer would forests be managed as monoculture commodity crops; no longer would the extraction of minerals, oil, and gas be undertaken with no regard for ecological consequences or the needs of future generations; no longer would decisions be made behind closed doors without meaningful public input and scientific analysis.*

blueprint, Perdue said, “I’m from Georgia where we see trees as a crop, and it’s a longer term crop, but it’s a productive renewable resource, and guess what, it also has the ability to take carbon out of the air.” Perdue also remarked, “As stewards of the land it’s our moral obligation to leave it better than we found it, and ... we can do that through active management.”

Secretary Perdue appears to envision management as a streamlined, siloed exercise. He concluded his speech by promising to reduce rules that “complicate” forest management. “We want to expedite environmental reviews to support active management to protect communities, businesses, watershed and wildlife habitat.”

Expediting review is precisely the wrong way to go.

In 1976, when Congress passed the National Forest Management Act (NFMA), it embraced a number of recommendations from a blue ribbon committee of scientists that had been convened for the purpose of reforming unsustainable practices on our National Forest System lands. NFMA was pathbreaking legislation at the time. No longer would forests be managed as monoculture commodity crops; no longer would the extraction of minerals, oil, and gas be undertaken with no regard for ecological consequences or the needs of future generations; no longer would decisions be made behind closed doors without meaningful public input and scientific analysis.

NFMA includes several key provisions relevant to healthy watersheds, ecological integrity, and climate sustainability. The focus on watersheds and forest protection goes all the way back to the Organic Act of 1897, and forest management has been guided by a congressionally mandated sustainability principle since 1960. But NFMA added an essential tool for accomplishing these purposes: land and resource management plans (Forest Plans). These Forest Plans go hand in hand with environmental review under NEPA. In fact, NFMA tracks closely with NEPA, which requires federal agencies to “[u]tilize a systematic, interdisciplinary approach which will insure the integrated use of

the natural and social sciences ... in planning and in decision-making which may have an impact on man's environment," and to "[i]nitiate and utilize ecological information in the planning and development of resource-oriented projects."

With NEPA analysis lighting the way, NFMA requires the development of forest plans every 15 years or so. At present, many national forest units are undergoing revisions, providing the public with a golden opportunity to influence forest management for years, and even decades, to come.

Contrary to Secretary Perdue's visions, forests are not to be managed as "tree farms"; rather, under NFMA, forest plans permit logging only where it is physically suitable for watershed conditions, soils, and slopes. NFMA also utilizes forest planning to ensure that aquatic resources and the diversity of plant and animal communities are ensured.

As for climate, NFMA mandates the Forest Service account for the effects of climate change when assessing the status of forests, rangelands, and other renewable resources under its jurisdiction and when developing recommendations for resource management. The Forest Service's 2011 [National Roadmap for Responding to Climate Change](#) recognized that maintaining diverse, functioning forest and grasslands is critical in dealing with the variable and uncertain and impacts of climate change. "While systems are certain to change, having a greater array of ecosystems and species reduces our vulnerability to the impacts of a changing climate." According to the Roadmap:

A primary purpose for reserving Federal forest land at the turn of the 20th century was to protect watersheds. Today, roughly one out of five Americans depends on a national forest for drinking water. The quantity and quality of America's water, however, are affected by a changing climate. Rising air temperatures mean less snow, along with faster and earlier snowmelts. Greater variability in the volume and timing of precipitation means more floods and droughts. Warmer water ... alters critical fish habitat, while increased evapotranspiration leads to drier vegetation and more fire, insects, and pathogens.

The Roadmap acknowledged that forests "play an increasingly vital role in protecting the Nation's watersheds ... [as they] reduce erosion, recharge aquifers, regulate stream flows, moderate water temperatures, and protect water quality." Sustainably managed forests provide [carbon sequestration and biomass energy](#) as well.

Although NFMA includes fairly sophisticated sustainability requirements, it still leaves a great deal to political influence and agency discretion.<sup>86</sup> To cabin that discretion, the planning regulations required by NFMA § 1604(g) help solidify the statutory requirements with binding standards. The most

recent planning regulations were issued by the Obama Administration in 2012 after years of proposed revisions, many rounds of public comment, and litigation. It took more than a decade to revise the previous version of the regulations, which took effect in 1982. Proposed revisions were launched by the Clinton Administration in 1999, but they were retracted and reworked by the Bush Administration in 2005. The current regulations were revised and issued in final form in 2012.

The politicization of the planning regulations has generated a great deal of uncertainty and skepticism. Planning has fallen badly behind schedule. As of 2012, of the nation's 130 forest plans, more than [half \(68\) were past due](#) for revision. To date, only a handful of revisions have been completed under the 2012 planning rule.<sup>87</sup> From catastrophic wildfires to other forms of habitat loss, experts agree that "chronic delay hampers effective resource management."<sup>88</sup> Our National Forest System is too important to let languish. Congress should kickstart the sputtering effort to modernize forest planning.

### Recommendations

To fulfill NFMA's sustainability goal and to minimize the uncertainty and political maneuvering that takes place through changes in short-term administrative priorities, we recommend that several of the provisions of the 2012 Planning Rule be legislatively mandated. Congress should amend NFMA's planning provisions to require forest plans to include the following components:

- Include standards to maintain and restore ecosystem integrity and diversity of ecosystems and habitat types throughout the planning area, including components to maintain or restore structure, function, composition, and connectivity, taking into account conditions in the broader landscape that may influence sustainability within the plan area, as well as system drivers, including dominant processes, disturbance regimes, and stressors, such as natural succession, wildland fire, invasive species, and climate change.
- Provide ecological conditions necessary to keep common native species common, contribute to recovery of threatened and endangered species, conserve proposed and candidate species, and maintain viable populations of species of conservation concern and of focal species. Species of conservation concern "occur in the plan area and ... the best available scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area." Viable populations persist over the long term with sufficient distribution to be resilient and adaptable to stressors and likely future environments.
- Select and monitor focal species on the basis of their functional role in ecosystems in order to evaluate the status and trends of overall diversity

and to assess ecological conditions. Focal species serve keystone functions as engineers of ecological processes or in food web dynamics.

- Adapt management strategies and plans through revisions or amendments as necessary to respond to new information.
- Ensure consistency of every project and decision with the plan.
- Require meaningful analysis of environmental impacts and alternatives for plan revisions, amendments, and all other major federal actions on National Forest System lands pursuant to the [1978 CEQ regulations](#) (for example, ensure that adoption and revision of every forest plan is accompanied by an EIS). Authorize categorical exclusions only for those minor actions that are known to have insignificant environmental effects, individually and cumulatively.

In addition, with respect to the effects of climate change, Congress should spur the Forest Service to stay on top of best practices of modeling and adopting adaptation strategies. NFMA should be amended to incorporate climate-smart components of the Forest Service's 2011 [National Roadmap for Responding to Climate Change and related regulations](#):

- Forest plans must recognize that maintaining diverse, functioning forest and grasslands is critical in dealing with the variable and uncertain impacts of climate change.
- Forest plans must include requirements to monitor, assess, and manage forest resources and to apply these steps to ongoing, near term, and longer term activities and decision points in order to implement a comprehensive, science-based approach for managing forests and grasslands sustainably in an era of climate change.




# Climate Justice and the Climate Crisis

By Shalanda H. Baker, Alice Kaswan, Sarah Krakoff, and Hannah J. Wiseman

## Summary

Climate change has disproportionate negative impacts on Black, Indigenous, people of color (BIPOC) and low-income populations throughout the United States. Pre-existing structural inequalities in housing, health care, infrastructure, and access to capital make these communities doubly vulnerable. First, BIPOC and low-income communities suffer more from the effects of climate change. Many studies and reports document that negative effects from increased temperatures, rising sea levels, prolonged drought cycles, and more intense storms and heat waves track racial and class divides. Second, BIPOC and low-income communities are more vulnerable to the economic disruption caused by the rapid transition to zero-carbon sources of energy.



Federal leadership can have a significant impact on how climate mitigation and adaptation policies affect BIPOC and low-income communities. On the mitigation side, first, the federal government should adopt a robust strategy to ensure that the transition to zero-carbon energy sources protects workers and local economies that have been dependent on fossil fuels. Second, the federal government should adopt policies to address longstanding issues of unequal access to energy and electricity. Third, the federal government should use the energy transition as an opportunity to reduce both carbon and the pollutants undermining public health in frontline communities. With regard to adaptation, the federal government should channel funding and resources directly to frontline and vulnerable communities.

**Recommendation #1:** Congress and the president should address the negative impacts of the rapid shift to a zero-carbon economy on formerly fossil fuel-dependent communities by enacting Just Transition legislation. The legislation should prioritize BIPOC and low-income communities, and include funding for planning processes, worker and community support, and data collection.

**Recommendation #2:** Congress and the president should enact legislation that prioritizes distributed clean energy investments in BIPOC and environmental justice communities, lowers the energy burden on BIPOC and low-income communities, and increases opportunities for ownership of clean energy assets in frontline communities.

**Recommendation #3:** Congress and the president should adopt climate mitigation policies that simultaneously reduce other forms of pollution (co-pollutants) that adversely impact BIPOC and low-income communities.

**Recommendation #4:** Congress and the president should provide federal support and establish climate adaptation parameters to achieve adaptation justice for BIPOC and low-income communities.

## Proposed Policy: Federal Just Transitions Legislation and Policies

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By Sarah Krakoff and Hannah J. Wiseman

### Background

To prevent further dangerous effects from climate change, the economy must rapidly transition away from carbon-based sources of energy and consumer goods. The largest source of U.S. carbon emissions is the transportation sector, representing 36 percent of emissions.<sup>89</sup> Electrification of a substantial portion of the vehicle fleet will therefore be

a necessary component of U.S. climate policy. Close behind the transportation sector, at 35 percent of U.S. emissions is power generation, requiring a move away from fossil fuel-fired power plants toward renewable sources of energy and greater energy efficiency.

These changes will have major benefits, including job creation, pollution reduction, the formation of more durable and sustainable industries, and the ability to create opportunities for groups that have previously been underrepresented in economic growth. But if inadequately addressed through public policy, the transition will also produce costs in the form of job losses, fewer revenue dollars for governments and communities previously dependent on fossil fuels, and a measure of social and economic disruption. These

changes will disproportionately affect BIPOC and low-income communities; indeed, examples of economic disruption are already evident in formerly fossil-fuel dependent communities across the country, including in the Navajo Nation, the Powder River Basin (including the Crow Indian Tribe), and in West Virginia.

### Recommendations

**Federal Just Transitions Legislation.** The federal government should adopt legislation that provides funding, resources, and data collection for communities and individuals most vulnerable to the transition away from

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fossil fuels. The legislation should prioritize resources for BIPOC and low-income communities that historically have borne the brunt of negative impacts from fossil fuel extraction, production, and distribution. A federal Just Transitions policy could be modeled in part after the Base Realignment and Closure process, which establishes a commission to set priorities for base closures and provides community involvement and access to transition funding.<sup>90</sup>

**Funding for Community Vision and Planning Processes.** Just Transitions legislation should include grants to communities heavily impacted by and dependent on fossil-fuel development to allow them to engage in planning processes to determine their economic futures. Community planning has already been used to good effect in some former coal-dependent communities, but federal funding and leadership are necessary to match the scale of the transition ahead.<sup>91</sup>

**Funding for Community Economic Growth, Services, and Infrastructure.** Just Transitions legislation should include grants that support the initiatives identified in communities' vision and planning processes, including seed funding for start-ups and similar initiatives geared toward economic innovation and reinvention; money for critical investment in new infrastructure and repair of existing infrastructure; and support for essential community services such as public health offices, schools, and fire and emergency services during the transition away from fossil fuels.

**Funding for Individual Workers Losing Jobs.** Workers who lose jobs due to the decline of fossil fuel development and distribution will need various forms of support. For those near retirement, pension and health care support will be required. Workers who remain in the labor force will need unemployment compensation, job retraining, health care, and relocation support. In one example of this type of policy tool, New Mexico's Energy Transition Act creates a Displaced Workers Assistance Fund, which provides financial support for job retraining and the costs of participating in apprenticeship programs, among other provisions.<sup>92</sup> Alberta, Canada's Coal and Electricity Transition Tuition Voucher provides workers with up to CA\$12,000 for post-secondary education.<sup>93</sup> In North Rhine-Westphalia, Germany—a region previously largely dependent on coal mining—Germany built a large university campus to help train workers and stimulate new economic development.<sup>94</sup> Federal lawmakers should draw on these and other examples in designing worker support programs in Just Transitions legislation.

**Data collection and dissemination.** Decisionmakers will need information about which individuals, groups, and communities are harmed and benefited by the transition, and the nature and degree of the harms and benefits. They will also require data on the stakeholders most in need of benefits that will flow from the transition—including those who have

historically experienced disproportionate burdens such as pollution from power plants or underrepresentation or inadequate pay in the workforce. Data collection should not be used as an excuse to delay the deployment of essential policy tools, but should be an expeditious front-end and continuing process to identify and prioritize workers and communities eligible for Just Transitions funding and support. Congress should fund and help coordinate this data collection effort, ensuring that communities, states, and non-governmental groups that participate in this effort use similar metrics and share results through a centralized, uniform database or similar platform.

## **Proposed Policy: Federal Support for Energy Justice**

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By Shalanda H. Baker

### **Background**

BIPOC communities disproportionately bear the twin burdens of environmental injustice and energy insecurity. People of color are more likely to live near fossil-fuel generation, and BIPOC households are also more likely than white households to experience high energy burdens and energy insecurity. Although state and federal incentives have increased the penetration of rooftop solar around the country, recent studies show that communities of color have been left out of the solar energy transition. Even when controlling for income and home ownership, communities of color are less likely to have distributed solar energy than white communities.<sup>95</sup> If utility electricity prices increase, communities of color would therefore be more likely to bear the cost. Federal policies should aim to address the environmental and energy burdens facing BIPOC communities, while also closing the gaps in clean energy access across racial groups.

### **Recommendations**

**Prioritize local clean energy investments in BIPOC communities and environmental justice communities.** Distributed energy should form a cornerstone of the energy transition. Energy efficiency and distributed clean energy generation in the form of rooftop solar or community-owned solar can reduce the need to rely on harmful fossil-fuel generation and offer economic benefits that reduce energy burden and increase energy security. Federally supported distributed energy legislation should remedy the racial disparities in rooftop solar adoption by providing targeted funding to support solar investments in communities of color as well as frontline environmental justice communities. Legislation should offer incentives for solar developers to deploy rooftop solar projects in the target communities, and offer a pathway for target communities to own distributed energy. Federal funding should also support the identification and retrofitting of

energy-inefficient housing, and construction of new state-of-the-art housing and infrastructure in BIPOC and low-income communities.

**Decrease energy burden in BIPOC communities and low-income communities.** Energy burden can dictate whether a family eats or keeps the lights on. Separate studies by the Energy Information Administration and the American Council for an Energy-Efficient Economy reveal that low-

*In addition to investing in energy efficiency and distributed solar to reduce utility bills, federal energy policy should reduce the risk of excessive energy burdens by setting a ceiling on the percentage low-income communities must pay. The cap would free up household income that could help with wealth creation in BIPOC communities as well as local community investment.*

income and BIPOC communities in the United States suffer from extraordinary energy insecurity and energy burden.<sup>96</sup> These communities routinely pay more than the recommended 6 percent of overall household income to meet energy needs, and their expenditures are often double or even three-and-a-half times higher than the median national energy burden of 3.1 percent.<sup>97</sup> In the face of high energy burden, the same communities face difficult choices as they struggle to meet basic household needs. In addition to investing in energy efficiency and distributed solar to reduce utility bills, federal energy policy should reduce the risk of excessive energy burdens by setting a ceiling on the percentage low-income communities must pay. The cap would free up household income that could help with wealth creation in BIPOC communities as well as local community investment.

**Accelerate opportunities for ownership of local clean energy assets in BIPOC communities and communities of color.** Renewable energy development provides a critical pathway for deep decarbonization, but research shows that deployment of large-scale clean energy can have disproportionate social and environmental impacts on BIPOC communities, replicating the inequities of fossil-fuel based development.<sup>98</sup> Renewable energy deployment must incorporate community economic participation as well as political participation. These levels of participation will offer economic benefits to frontline communities and enhance overall community buy-in of renewable projects. Federal energy policy should require utility-scale renewable energy developers to include communities as co-beneficiaries of large renewable projects and include incentives for communities to develop community-owned utility-scale clean energy projects. Community benefits should include a requirement for equity (economic) participation in large-scale project development. This will enhance the overall economic benefits for low-income, frontline, and BIPOC communities.

## Proposed Policy: Adopt Climate Policies that Provide Co-Pollutant Benefits

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By Alice Kaswan

### Background

The inequalities in policing highlighted by the Black Lives Matter movement are only one among many inequalities experienced by BIPOC communities across the country. Decades of evidence demonstrates that environmental harms, including air pollution, are disproportionately located in frontline and vulnerable communities, a consequence of our history of segregation, zoning laws, and political and economic exclusion.<sup>99</sup>

While greenhouse gases themselves do not have significant localized impacts, most emission sources emit locally harmful co-pollutants alongside greenhouse gases. Congress's first priority among a range of climate options should be strategies that achieve the most benefits, including public health benefits. Similarly, Congress should avoid or de-prioritize strategies with negative public health consequences.

### Recommendations

**Use carbon pricing as a backstop and revenue-generator, not as a first-order strategy.** Many BIPOC communities have raised significant concerns about carbon pricing strategies. In addition to skepticism about their

efficacy in sparking fundamental change, community activists argue that, because market mechanisms leave emissions decisions to industry, individual facilities and companies can maintain or increase emissions, so long as they are willing to pay. Consequently, pricing mechanisms could perpetuate or worsen pollution in frontline communities, depriving them of the public health co-benefits they would have obtained if these facilities had decreased their GHG emissions.

At the same time, carbon pricing has certain virtues. The cap in a cap-and-trade program or the tax rate in a carbon tax can provide a steady emission reduction incentive—and backstop—if more direct policies have gaps and are implemented too slowly. Moreover, by requiring polluters to pay, carbon pricing programs create a revenue stream that can help finance an equitable clean energy transition.

The backbone of U.S. climate strategies should be a vision for a clean and equitable transition coupled with intentionally designed climate strategies that maximize public health and welfare benefits. Carbon pricing should complement more direct strategies rather than the other way

*Community activists argue that, because market mechanisms leave emissions decisions to industry, individual facilities and companies can maintain or increase emissions, so long as they are willing to pay. Consequently, pricing mechanisms could perpetuate or worsen pollution in frontline communities, depriving them of the public health co-benefits they would have obtained if these facilities had decreased their GHG emissions.*

around. Direct requirements and programs to reduce industrial and mobile source emissions could reduce pollution hot spots and reduce emissions broadly. If carbon pricing is implemented in addition to, rather than instead of, more targeted pollution-reducing strategies, carbon pricing will not undermine opportunities to improve public health.

**Prioritize reductions in industries causing the most pollution.** Congress should direct relevant federal and state agencies to design climate strategies that address the longstanding public health threats experienced in frontline communities. For industry, policymakers could prioritize achieving greenhouse gas reductions from the industries with the highest co-pollutant intensity, that is, those that generate the most pollution per unit of carbon. Policymakers could also prioritize greenhouse gas and associated co-pollutant reductions from the industries causing the greatest public health risks due to their location in dense and vulnerable population centers. For example, in California and elsewhere, refineries are disproportionately located in low-income communities of color. Federal requirements that states develop climate strategies to reduce industry emissions where they would reap the greatest co-pollutant benefits could accomplish this goal. To avoid undue disruption and potential cross-border emissions leakage, the affected industries may require support, either directly or in the form of border adjustments.

**Avoid climate strategies that could cause more pollution.** Policymakers should give a lower priority to carbon reduction strategies that increase harmful co-pollutants. For example, although biofuels are considered lower-carbon than fossil fuels because plant material absorbs carbon prior to combustion (creating a neutral carbon cycle), burning biofuels can create harmful co-pollutants. Locating biofuel facilities in or near frontline communities, where they would contribute to greater pollution for residents, would intensify their adverse impacts. In addition, carbon capture and sequestration (CCS) mechanisms, which capture carbon from fossil fuel combustion and then transport the carbon for long-term storage, could, according to some studies, increase co-pollutant air and water emissions, in part because CCS is itself energy-intensive.<sup>100</sup>

**Eliminate or substantially reduce diesel pollution.** Because diesel emissions present particularly significant climate and public health threats, policymakers should prioritize research and controls to eliminate them.<sup>101</sup> Diesel emissions generate “black carbon,” essentially particulate matter that exacerbates global warming by absorbing heat, whether airborne or deposited. In addition, diesel particulates present high risks to public health. In a 1998 study, California’s health assessment agency estimated that diesel exhaust causes 70 percent of cancer risk from air toxics in the state.<sup>102</sup> Children riding diesel school buses, and frontline communities living close to ports, highways, and warehouse districts are likely to experience disproportionate exposure to diesel pollution.

Requiring manufacturers to sell zero-emission trucks and equipment would spur technological innovation and the supply of zero-emission options. Requiring owners of bus and truck fleets, shipyards, and farms to utilize zero emission trucks and equipment would spur demand. Funds for research and development, as well as subsidies for manufacturers and equipment purchasers, may be necessary to avoid excessive disruption in these sectors.

**Target transportation improvements to frontline communities.**

Emissions from passenger vehicles, trucks, and buses are a major source of both carbon and traditional pollutants. Targeting transportation resources to frontline communities is the only way to spread the benefits of transit, sustainable development, and zero-emission vehicles to communities and individuals that would otherwise be unable to afford them. Because many of these communities suffer from disproportionate levels of air pollution, targeting public transportation and zero-emission resources in these communities would also provide out-sized public health benefits.

## **Proposed Policy: Provide Federal Support and Adaptation Parameters to Achieve Adaptation Justice**

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By Alice Kaswan

### **Background and Context**

Climate change is already here, causing more frequent and intense floods, fires, extreme heat, and other impacts. As much as we work to reduce emissions, we will simultaneously have to adapt to the changes human-induced climate change has already wrought. Adaptation will not be the same for everyone.<sup>103</sup> Vulnerability to climate change is strongly correlated with race, class, age, and other demographic factors. Three variables shape the full experience: physical exposure, sensitivity to harm, and the capacity to cope. Low-income populations and people of color face particular challenges under all of these factors.

Although the wealthy may disproportionately face particular risks, like coastal erosion affecting beach houses, for example, socioeconomically challenged communities are likely to face greater physical exposure in many contexts, including living on lower-valued land at risk of flooding or in a dense urban setting subject to the heat-island effect, as well as working in exposed occupations like agriculture and construction. Socioeconomic factors can also affect sensitivity to harm, which is determined by underlying health conditions (themselves shaped by access to healthy food and health care), housing conditions, access to air conditioning and the money to pay for it, and the like. Lastly, the capacity to cope in the long-term is critical, a factor shaped by savings, home insurance, access to government benefits, and geographic mobility.



For indigenous populations, including Alaska Natives and Tribes throughout the continental United States, climate change impacts present existential threats to entire cultures. Native American identity and culture are uniquely tied to place, and as climate change eats away at the land, whether through coastal flooding or unsustainable drought, community life and cultural integrity are threatened. Tribal governments are also at risk, and adaptation planning must include respect for tribal sovereignty and self-determination.

Climate change will also cause hidden and indirect impacts. Analysts estimate that, by 2100, as many as 13 million people could be directly impacted by sea-level rise alone, and could, potentially, migrate in response.<sup>104</sup> In the long-term, as people migrate away from areas most

impacted by climate change (in the United States and elsewhere), “receiving communities” will accommodate in-migration. Communities that might not perceive current climate risks need to be prepared for future impacts on housing availability and affordability, increased infrastructure needs, and all of the other consequences, positive and potentially negative, of an expanding population.

Effective adaptation will require advance planning rather than reactive and piecemeal decision-making.

Opportunities for meaningful participation, including people who have been historically marginalized, will be critical.

*Effective adaptation will require advance planning rather than reactive and piecemeal decision-making. Opportunities for meaningful participation, including people who have been historically marginalized, will be critical.*

Although most adaptation decisions will be made at the state and local levels where impacts are immediately experienced, federal law can nonetheless play a significant role. Federal funding will be essential to help state and local governments prepare and respond. And as the federal government provides funding, it can establish planning parameters and conditions that help achieve adaptation justice.

## Recommendations

**Continue to fund federal research on climate impacts, with explicit attention to impacts on the nation’s most vulnerable populations.** In addition to considering those directly impacted, the federal government should begin research on potential migration pathways and potential impacts on receiving communities, with explicit attention to the most vulnerable migrants and receiving communities.

**Maintain a federal adaptation clearinghouse for addressing climate risks, and, within that clearinghouse, highlight strategies for addressing risks to the most vulnerable populations.** In addition, the federal government should adopt an affirmative program to disseminate information to states, local governments, and non-profit organizations and help support their implementation efforts.

**Require local adaptation planning, integrated with state and local hazard mitigation planning.** The planning requirements should:

- Explicitly require assessment of demographics and particular vulnerabilities in differing populations, including such factors as access to air-conditioning, transportation options, need for shelter in the event of evacuation, and other factors relevant to local climate risks.
- Require development of a participation plan that includes mechanisms to ensure the meaningful engagement of frontline communities in light of local demographics and communication modes, including interpretation and outreach through non-governmental entities.

**Establish parameters for how communities facing climate risks choose among their three central response options:** (1) protection from climate impacts (e.g., flood gates; new water supply sources); (2) increased resiliency (e.g., housing code updates, like elevation requirements); and (3) retreat. Retreat may be the only option for areas at great risk, but other options are possible in some contexts. Parameters include:

**For Native American Tribes and indigenous communities, robust consultation and free, prior, informed consent before any decision to retreat.** Where retreat is the only option, allow for tribally driven decisions about relocation sites and provide support for maintaining tribal self-governance throughout the process.

- To the degree the federal government provides funding for “managed retreat,” including buy-outs to help those who are most in harm’s way, federal funding should include parameters that reduce the potential for buy-out abuse.
- Where there are alternatives to retreat, the federal government should require a showing that buy-out decisions are not driven solely by land value (disadvantaging poorer neighborhoods) and that buy-outs of low-income and of-color communities are justified by unacceptable risk and not being used as indirect exclusionary tools.

**Prioritize federal adaptation funding for Tribes, communities and households with the greatest need, including both sending and receiving communities.** For example, hazard mitigation funding should go to lower-income communities and households, and funding to support affordable housing should be provided to receiving communities.

## Conclusion

Climate change is affecting communities throughout the nation right now. Fires raging in the west and storms repeatedly battering the gulf coast are 2020's climate tragedies. Others are in motion or soon to come, including long-term drought, rising sea levels, and extreme heat events. The energy

transition is also already under way, though it is not happening as rapidly as it must. Federal lawmakers should seize on this pivotal moment to address climate change and also redress longstanding inequality and injustice for BIPOC and low-income communities. Just transitions legislation, energy justice legislation, and policies for mitigation and adaptation that prioritize frontline and vulnerable communities would go a long way toward ensuring that the climate crisis does not become a deeply unequal humanitarian crisis.

## Governance Mechanisms and the Climate Crisis

By Daniel Farber, Victor Flatt, Alice Kaswan, Joel A. Mintz, and Joseph Tomain

### Summary

Congress and federal agencies implementing climate legislation will face a wide range of policy choices as they seek the best set of strategies to reduce emissions. No single strategy alone will solve the crisis. Congress should consider climate-related governance mechanisms that cut across existing regulatory programs, develop climate-specific regulations, and strengthen basic agency functions. In this paper, Center for Progressive Reform (CPR) Member Scholars offer their expertise on a few key mechanisms.

**Recommendation 1: Research and Development.** To build technological capacity to achieve decarbonization, robust federal funding for research and development is essential. While the private sector continues research and investment in alternative energy and efficiency technologies, federal support will enable continued innovation in promising options that remain too speculative for private investment.

**Recommendation 2: Social Cost of Carbon.** On the regulatory side, Congress faces a plethora of choices. A scientifically defensible financial estimate of climate impacts, the “social cost of carbon” is key to integrating potential climate impacts into regulatory decisions across the federal government. The social cost of carbon could also provide a reference point if Congress decides to establish a carbon tax or other pricing mechanism.

**Recommendation 3: Carbon Pricing Options.** The role of carbon pricing in federal climate legislation is itself a critical question. We present several factors that are critical to the choice between two common carbon pricing mechanisms: a carbon tax, like those seen in recent congressional bills, and cap-and-trade, the form adopted by a number of states.

**Recommendation 4: The Limited Role of Carbon Pricing.** Although a carbon price has a role to play, Congress should develop a more comprehensive and visionary decarbonization strategy that includes but is not limited to carbon pricing.

**Recommendation 5: Strong Enforcement Mechanisms.** Climate mitigation strategies will only work if they are effectively implemented and enforced. Congress should ensure that EPA’s enforcement resources and substantive enforcement policies will lead to widespread compliance and real progress on the path to decarbonization.



## Proposed Policy: Federal Funding for Clean Energy Research & Development

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By Joseph Tomain

### Background

Clean energy research and development (R&D) is consistent with past government investments such as the Manhattan Project, Project Apollo and, now, finding a COVID-19 vaccine. At the same time, it also has distinct characteristics. Clean energy research does not have a specific target. There is no silver bullet that will help us transition from a dirty fossil fuel energy economy to a clean one. Instead, clean energy R&D requires a full-scale partnership between the federal government and the private sector, with each sector playing a specific role in furtherance of one goal – the marketing and commercialization of new technologies.

R&D investments occur along a continuum from basic science and technology through marketing and commercialization. At the basic science and technology stage, government is heavily, and most often exclusively, involved because the private sector does not want to take on the financial risk of failure. Similarly, government finances the demonstration projects needed to take a concept off the drawing boards and into the world. After demonstration, private sector corporations take over the marketing and commercialization of new technologies, and they reap the financial rewards.

Most R&D is performed by the Department of Energy, which oversees its own R&D programs, as well as 17 national laboratories that are dispersed throughout the United States. Historically, most of the research conducted by these laboratories was for defense purposes. Today, defense is still the primary focus for many of these labs; however, energy innovation is attracting increased government funding.

The key DOE R&D arm is the Advanced Research Projects Agency – Energy (ARPA-E), which, since its inception, has provided approximately \$2.3 billion in R&D funding for more than 800 potentially transformational energy technology projects. ARPA-E has funded small businesses, universities, large corporations, and federal research and development centers, as well as nonprofit organizations.

ARPA-E operates two significant initiatives. Energy Innovation Hubs bring together top scientists and engineers from the academy, industry, and government to overcome known barriers to technological innovation and to reduce the time from laboratory innovation to technological development then to commercialization. By way of example, the Joint Center for Energy Storage Research (JCESR) is dedicated to improving energy storage with the goal of having 25 percent of all electricity consumed in the United States

generated by solar and wind by 2025. The United States also operates 46 Energy Frontier Research Centers (EFRCs) that consist of partnerships among universities, national laboratories, nonprofit organizations, and for-profit firms. EFRCs have successfully funded research on solar panels, lithium batteries, LED lighting, wind turbines, smart grid technologies, appliances, transportation, carbon capture, and innovative nuclear energy technologies.<sup>105</sup>

The private sector is eager for clean energy investments. Despite the COVID crisis, global investment in clean energy for the first half of 2020 increased 5 percent, continuing a years-long trend. These investments are paying off. Renewable energy is producing more electric power than coal-fired power plants in 2020;<sup>106</sup> the private sector is investing in nuclear fusion;<sup>107</sup> solar and wind dominates new generation;<sup>108</sup> and as renewable stocks outperform fossil fuels, financial advisors are recommending buy orders for renewables.<sup>109</sup>

*Renewable energy is producing more electric power than coal-fired power plants in 2020; the private sector is investing in nuclear fusion; solar and wind dominates new generation; and as renewable stocks outperform fossil fuels, financial advisors are recommending buy orders for renewables.*

Despite private involvement in clean energy, additional federal R&D investments are needed to lay the groundwork for subsequent private development. More research is needed across many clean energy options, including local and utility-scale solar, on-shore and off-shore wind, the smart grid, electric vehicles and their charging infrastructure, nuclear fusion, energy storage, large- and small-scale battery configurations, artificial intelligence, small modular nuclear units, bioenergy, and new materials. Research is needed not only on individual options, but on the synergies among energy technologies. Investments in the smart grid could, for example, synchronize with investments in artificial intelligence, electric vehicles, recharging stations, and affordable and lighter weight batteries.

### **Recommendation**

Congress should continue to provide robust R&D funding. Government and private investors acknowledge the importance of clean energy and the reality of the transition. The Trump administration is notorious for its antipathy toward science and has proffered budget proposals to zero out ARPA-E. It is notable that Congress has resisted these budget proposals. Looking forward, Congress and future administrations should continue, if not increase, their support for ARPA-E.

## Proposed Policy: Reevaluate the Social Cost of Carbon

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By Daniel Farber

### Background

For the past 40 years, cost-benefit analysis has played a critical role in the process of issuing regulations. To be valid, that analysis must take climate change into account. Doing so requires estimating the social cost of carbon – the harm done by the emission of a single ton of carbon dioxide or the equivalent amount of another greenhouse gas such as methane.

Estimates of the social cost of carbon are important for other reasons. They can benchmark the right level for a carbon tax or the price level in a carbon trading system. The social cost of carbon can also provide a way of communicating to policymakers and the public the benefits of cutting carbon emissions.

In response to a federal court ruling requiring agencies to take in account the social cost of carbon, the Obama administration assembled an interagency working group to provide an estimate for use by all government agencies. The estimate was based on three leading economic models and was subjected to careful peer review. The resulting estimate was used throughout the government under Obama and also won recognition from state and foreign governments for its credibility. The Obama administration's estimate was upheld by a federal appeals court.<sup>110</sup>

President Trump rescinded this estimate. He ordered agencies to produce their own estimates and emphasized that they should follow normal guidelines that discourage inclusion of costs to foreign countries. The Bureau of Land Management (BLM) and the EPA have since adopted the same estimates, which are around 85 percent below the Obama administration's estimates. The Obama administration estimated that a ton of carbon emitted in 2020 caused \$42 in damage, whereas the Trump administration's estimate was \$7. The difference is largely due to ignoring all harm U.S. emissions cause outside of our own borders, but the use of a higher discount rate (lowering the weight placed on future harm) was also significant. These changes were made without peer review.

In a recent ruling, a federal district court found the Trump administration's analysis to be "riddled with flaws."<sup>111</sup> As the court pointed out, BLM had simply ignored studies by economists supporting global damages and showing that estimates limited to individual regions such as the United States are unreliable. The court also pointed out that BLM had ignored the impacts of climate change on Americans living abroad and on U.S. trade. Thus, the administration had failed to give a reasoned argument for changing direction.

## Recommendations

Cost-benefit analysis has its critics, including a number of CPR Member Scholars. This is not the place to reprise that debate. As long as the government continues to use cost-benefit analysis, however, it should certainly include full consideration of the environmental benefits of regulation. We advocate no more than using the best available methods for doing so.

**In the short term, restore the Obama administration's estimate of the social cost of carbon.** The Trump administration's estimate rests on a flimsy scientific basis. It has chosen to ignore recommendations by the National Academies of Sciences<sup>112</sup> for improving estimates of the social cost of carbon. The Government Accountability Office (GAO) has warned that without paying heed to the NAS recommendations and current economics research, government estimates may be scientifically flawed.<sup>113</sup> The GAO also found that the economic models that the Trump administration used "were not premised or calibrated to provide estimates of the social cost of carbon based on domestic damages."

Given the significant questions about the integrity of the science behind the Trump administration's estimates, the Obama administration's estimates should be reinstated across all agencies as an immediate interim measure.

**In the longer-term, update the social cost of carbon estimate.** To prevent future backsliding, key requirements for the social cost of carbon should be enacted into law by Congress and incorporated into binding regulations by agencies like EPA. New rules for determining the social cost of carbon should adopt a precautionary approach, incorporating the four principles listed below.

- **Principle 1:** Because climate change requires a global response, the social cost of carbon should be based on global impacts, not merely impacts within the boundaries of the United States.

The Trump administration was wrong to limit the analysis to climate impacts within the United States. American interests are intertwined with the state of the rest of the world, a fact that was obvious even before the global pandemic. Moreover, limiting future climate impacts within the United States will require global cooperation. We cannot expect other nations to cooperate with us if we give their interests zero weight in our own climate policies.

- **Principle 2:** To give appropriate weight to the interests of future generations, a low discount rate should be used in determining the social cost of carbon.



The incredibly long-lasting effects of carbon emissions will dramatically impact future generations. Using a high discount rate essentially ignores much of the devastation our actions will cause. When the Obama administration estimated the social cost of carbon associated with a range of potential discount rates, it came to only \$12 per ton with a 5 percent discount rate, but increased by a factor of five with a 2.5 percent discount rate because lower discount rate gives much more weight to long-term harms.<sup>114</sup> At the Obama administration's preferred 3 percent discount rate, the social cost of carbon estimate is three-and-a-half times as high as with the 5 percent level. In contrast, the Trump administration estimated the social cost of carbon using a 3 percent rate and a 7 percent rate, reducing the social cost of carbon to \$1 per ton at the higher rate.

- **Principle 3:** Because of uncertainties about the future extent of climate change and impacts on human society, the social cost of carbon should give substantial weight to the risk of catastrophic outcomes.

*Sound policy also requires giving weight to the very real possibility that climate change may be worse than expected. Scientists are confident of the reality of climate change and have made progress in estimating its future severity, but the possibility of much worse outcomes cannot be excluded.*

Sound policy also requires giving weight to the very real possibility that climate change may be worse than expected. Scientists are confident of the reality of climate change and have made progress in estimating its future severity, but the possibility of much worse outcomes cannot be excluded. Such outcomes would have disastrous effects on society, and the social cost of carbon should take that risk into account.

- **Principle 4:** The process for determining the social cost of carbon should involve peer review and use the best available economic modeling and data.

Admittedly, any estimate of the social cost of carbon will be imprecise. But we can at least make our best effort to take climate impacts into account by requiring experts to review the analysis and by employing high-quality data and methods. The Trump administration has failed to observe these obvious requirements. We should ensure that the same mistakes are not made by future administrations.

## Proposed Policy: Parameters for Choosing and Designing a Carbon Pricing Mechanism

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By Victor Flatt

### Background

According to the World Bank's 2018 carbon pricing report, more than 70 jurisdictions around the world, including China, have some form of national-level direct carbon pricing, usually applying to all greenhouse gases (GHGs), with non-carbon GHGs converted into their carbon equivalents. Economists are virtually unanimous in their claims that carbon pricing is an efficient and important strategy for reducing greenhouse gas emissions. California already has an economy-wide carbon price (through a cap and trade system), the northeastern states have a cap and trade program applicable to the electricity sector, and other jurisdictions around the world with carbon pricing programs are planning on strengthening them by applying border adjustment taxes (BAT) on products which come from countries without similar mechanisms. All of this suggests that the United States will be under pressure to pursue some kind of federal carbon pricing mechanism in the near future.

Policymakers can choose among many possible mechanisms for reducing greenhouse gases. Although not the only possible or even a preferred strategy, implementation of a direct carbon pricing strategy can complement and work in tandem with other policy solutions. (Alice Kaswan discusses the importance of non-pricing measures in her contribution to this paper.)

One common type of carbon pricing is a direct Pigouvian tax on greenhouse gas emissions, usually imposed on major polluters and, potentially, on upstream sources of carbon, like oil and gas distributors. The other common pricing system is cap and trade, wherein the government sets a long-term target and then establishes decreasing emissions caps and auctions off or otherwise distributes emission allowances. Polluters can buy, trade, and sell their emissions allowances, so long as they hold sufficient allowances to cover their actual emissions. A cap and trade program's carbon price is generated by the allowances' market price.

Carbon taxes and greenhouse gas cap and trade schemes can be set up to be roughly equivalent in terms of impact on emissions and money raised from the tax or sale of emissions rights. The choice between a carbon tax and a cap and trade system depends on many factors. Both can be used to generate revenue, and both can be used to curb emissions.

## Recommendations

In designing a program and choosing between a carbon tax and cap-and-trade, Congress should address the following factors:

**Any federal carbon pricing system needs to be understandable and not too complex.** Attempting to achieve multiple policy goals by controlling emissions distributions, developing complex offset provisions, and creating nuanced allowance allocation or tax rate provisions could increase complexity.

**Congress must address the tradeoff between certainty in carbon prices and certainty in achieving emissions reductions.** Because taxes provide a transparent and, presumably, stable price, they provide the regulated sector with more certainty with respect to price of emissions. The more stable price also allows government to better predict likely revenue. However, taxes do not control overall emissions, leading to uncertainty in emissions levels.

In contrast, by setting a clear cap, presumably descending over time, a well-designed cap and trade system would provide more certainty as to emissions reductions. However, emissions prices will depend on demand, and so prices could be quite uncertain.

**The pricing scheme should be politically feasible.** Though taxes were a dirty word the last time the United States took up the attempt to craft a greenhouse gas reduction law, taxes may be more politically feasible in the current political environment, particularly given the need for more federal revenue.

**Any pricing scheme should establish long-term parameters to increase predictability for business and to avoid future attempts for stakeholders to seek out individualized benefits that don't benefit the program as a whole.** Thus, the cap in a cap and trade system should be designed to decline on a predicted path of at least 20 years. Under a carbon tax, the increasing tax should be specified for at least 20 years.

**A new federal pricing scheme should account for existing domestic and international programs.** That might suggest cap and trade over a carbon tax, as most of the existing programs in the rest of the world are in the form of cap and trade. Any two cap and trade systems can be linked with the agreement of the sovereigns, but there may also be accounting mechanisms that would allow a federal carbon tax to be compatible with existing global cap and trade programs. This might work by converting taxes paid into carbon dioxide equivalents based on a market price in a cap and trade system. However, this also increases complexity.

Undoubtedly, the politics and optics of cap-and-trade and a carbon tax will also play a role in the choice between the two. Nonetheless, depending

upon design, cap-and-trade and a carbon tax could achieve equivalent greenhouse gas reductions. Whichever option Congress or the next administration chooses, they can amplify or ameliorate the advantages and disadvantages of these mechanisms by careful attention to the foregoing parameters.

## Proposed Policy: Carbon Pricing Should Not Supplant Visionary Strategies for Transitioning to a Clean Energy Economy

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By Alice Kaswan

### Background

Congressional proposals, state initiatives, and environmental advocacy groups have recently featured carbon taxes, possibly with a dividend back to consumers, as an efficient greenhouse gas reduction strategy that would achieve climate goals at the lowest cost. Meanwhile, several states, including those participating in the Regional Greenhouse Gas Initiative and California, have already adopted some form of a cap-and-trade program, which sets an overall cap on emissions and then allows regulated entities to buy and sell allowances to cover their emissions. (In his contribution to this paper, Victor Flatt provides a sense of the parameters that could affect policymakers' choice between a tax or cap-and-trade program.) A key question is: Considering the wide array of available climate mitigation strategies, what role should carbon pricing, in any form, play?

*Although some form of carbon pricing is necessary to encourage reductions and create revenue, federal climate legislation should provide a more visionary roadmap for accomplishing a clean energy transition, with a carbon price complementing that vision.*

### Recommendation

Although some form of carbon pricing is necessary to encourage reductions and create revenue, federal climate legislation should provide a more visionary roadmap for accomplishing a clean energy transition, with a carbon price complementing that vision.

A carbon price relies on private actors to make carbon reduction decisions based on a price signal. This leads to fragmented and uncoordinated actions. Given the scale of our decarbonization challenge and its implications for our energy infrastructure, institutional structures for energy development and deployment, transportation, manufacturing, buildings, land use, and more, we need a coordinated strategy to accomplish a coherent, effective, and just transition.

In addition, by relying on the piecemeal and short-term decisions of private actors to achieve reductions, a carbon price alone fails to provide a larger

vision for a clean economy. A clean economy could take a variety of forms, all of which have important societal, environmental, and legal implications. Will we encourage decentralized electricity or maintain our centralized structure? How will we develop the transmission infrastructure needed to move renewable energy to population centers? When and how should we deploy alternatives to fossil fuels in the transportation sector? Who will benefit and who will be harmed? Will control shift from current owners to new entrepreneurs? What will this mean for our existing regulatory frameworks at the federal and state levels? Federal climate legislation should grapple with these central questions and, as appropriate, provide a framework for states to engage in thoughtful and inclusive planning.

The lack of vision associated with a carbon price could also impede its political viability. Although industry might be attracted to what they perceive as a less expensive approach, a carbon price focuses on the cost side, not the benefit side, of a clean energy transition. A more comprehensive set of climate change strategies shows what can be achieved and how citizens, workers, industry, and agriculture can transition to a more sustainable future. Recent efforts to adopt carbon pricing in Washington State and Oregon failed,<sup>115</sup> while more substantive and visionary policies have been enacted in states across the country, including Washington State, New York, New Mexico, Maine, Colorado, Virginia, North Carolina, and more.<sup>116</sup>

Comprehensive strategies, at the federal, state, and local level, will also allow policymakers to identify measures that maximize overall benefits, including but not limited to greenhouse gas reduction benefits, and reduce potential costs. For example, strategies that simultaneously reduce co-pollutants in polluted areas will increase benefits, while strategies that might increase co-pollutants in polluted areas, like some combustion of some biofuels, might impose environmental and public health costs. Planning can control for these effects; a carbon price would not.

A carbon price also has implications for our democracy. By deferring to private sector decisions, carbon prices preclude democratic deliberation. Although a carbon price should be a part of any climate mitigation strategy, it should complement a more engaged and systematic reckoning with the future.

## **Proposed Policy: Effective EPA Enforcement**

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By Joel A. Mintz

### **Background**

Without industry compliance, federal climate legislation will fail. Vigorous, fair, and even-handed EPA enforcement will be a critical element in assuring

such compliance. It is also needed to redress the unfair burdens that climate change places on low-wealth communities, including many communities of color. Unfortunately, over the past three-and-a-half years, EPA's enforcement capability has been significantly diminished. To reinvigorate the agency's flagging enforcement efforts and allow it to effectively enforce climate change legislation, climate legislation should ensure that the agency has adequate financial and staff resources and is armed with substantive provisions that will give it the tools it needs to make sure that everyone is following the laws on the books.

## Recommendations

### *Resources: Enforcement Funding and Recruitment*

**Increase EPA's budget appropriations to enable full staffing.** Due to budget cuts, low staff morale, and the retirement of a large cohort of "baby boomers," EPA's staff declined by 12.2 percent between

December 2016 and December 2019 – a loss of 1,993 full-time equivalent positions – with experienced senior staff overrepresented in those losses. The workforce of the agency's Office of Enforcement and Compliance Assurance (OECA) was especially hard-hit, declining by 15.7 percent during the first 20 months of the Trump administration. A need to enforce new greenhouse gas emission limitations will substantially increase the strain on EPA's already undersized, overburdened career enforcement staff. It is imperative that future federal climate change legislation include significant increases in EPA's budget so the agency can increase its enforcement staff to needed levels.

*A need to enforce new greenhouse gas emission limitations will substantially increase the strain on EPA's already undersized, overburdened career enforcement staff. It is imperative that future federal climate change legislation include significant increases in EPA's budget so the agency can increase its enforcement staff to needed levels.*

Establish (and fund) an EPA program focused on recruiting and training the enhanced, skillful, and nimble professional staff that will be needed to enforce limits on greenhouse gas emissions. Environmental enforcement is a far more complex and sophisticated activity than may be evident at first blush. Therefore, to rebuild the agency, Congress must press EPA to recruit an outstanding new cohort of enforcement staffers and train them well for their critically important work.

### *Substantive Enforcement Provisions*

**Include strong and effective enforcement provisions.** Enforcement provisions in existing environmental statutes vary in their effectiveness. Future climate change legislation should include enforcement sections modeled on the most robust regulatory enforcement mechanisms currently in effect.

**Require EPA to resume meaningful oversight of state and environmental agency enforcement programs and provide grants to improve state enforcement programs.** Under most federal environmental programs, states play a critical role in permitting and enforcement, and federal climate legislation will presumably continue this pattern. Regrettably, many states lack the resources, expertise, and/or political will to enforce environmental standards adequately. Federal funding and oversight are essential but have dramatically decreased during the last few years. Congress should significantly increase funding for State and Tribal Assistance Grants. In addition, Congress should direct EPA to resume a diligent, effective oversight role of state enforcement efforts.

**Expressly allow and encourage both EPA and the U.S. Department of Justice to use Supplemental Environmental Projects (SEPs) in settling federal enforcement actions against entities that violate greenhouse gas emission limits.** When agencies settle an enforcement case with a violator, they not only impose penalties, but often include Supplemental Environmental Projects that provide a tangible environmental or health benefit to the public and have a direct connection to the polluter's violations. Although the Trump administration's Department of Justice actively discouraged their use, SEPs have a long and proven record of environmental success. In the climate context, they could be used to encourage non-complying emitters of greenhouse gases to plant trees, preserve lakes and wetlands, and set aside tracts of land to serve as greenhouse gas "sinks."

**Include an effective citizen suit provision in any new climate change legislation.** Citizen suits and/or citizen petitions are a feature of almost every major federal environmental statute. They are an important safeguard against lax federal and state enforcement and have been used successfully to force governmental compliance with rulemaking deadlines and to redress non-compliance by industrial and municipal pollution sources. A new federal climate change statute should expressly allow citizens to bring suit for past violations and allow an award of attorneys' fees to prevailing or partially prevailing citizen plaintiffs. Congress should also avoid including diligent prosecution provisions that open the door to "sweetheart deals" between polluters and state and federal agencies that effectively forestall citizen suits.

# Structural Considerations for Climate Governance

By William W. Buzbee, Alejandro E. Camacho, Robert L. Glicksman, Alice Kaswan, Dave Owen, and Karen Sokol

## Summary

Analysis of the success or failure of regulatory programs often focuses on their substantive merits or the procedures that govern their implementation. But the fate of a regulatory program may be driven as much by structural considerations as by its substantive or procedural aspects. Policymakers in the United States have long focused largely on one structural aspect of regulation – federalism. Congress’s allocations of authority between the federal and state governments – often referred to as the cooperative federalism features of environmental regulation – have worked reasonably well in some contexts. In others, however, legislators’ failure to attend to a wider range of structural dimensions has led to allocations of government authority that are less likely to achieve statutory objectives and promote effective, fair, and accountable government.

Congress has the opportunity to avoid similar mistakes in crafting a new regulatory regime to address the core threats from the climate crisis. By recognizing and differentiating among three dimensions of regulatory

authority, and by carefully tailoring allocations of authority to perform different government

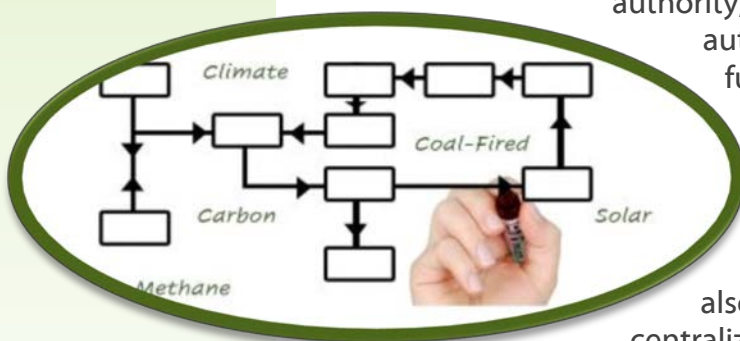
functions, Congress can adopt regulatory programs that reflect a careful balance of the policy values implicated in climate change governance. Congress should consider not only the tradeoffs of assigning authority to either states or the federal government, but also the tradeoffs of (1) varying the level of

centralization by governmental function; (2)

configurations that assign overlapping federal *and* state roles for particular government functions, as well as overlapping roles for various federal agencies; and (3) altering the amount and type of coordination between federal and state authorities (and among federal agencies).

Based on the expanded array of structural choices that these dimensional and functional allocation choices present, we make the following recommendations for legislation to address climate change:

**Recommendation 1:** Congress should consider the differential risks raised by climate change mitigation, adaptation, and geoengineering in structuring governance.





- For *adaptation*, the combination of mostly localized harms and benefits suggests (1) a primarily decentralized infrastructure for most governmental functions, (2) limited overlapping authority (with federal primacy) of key functions, such as standard setting to exploit redundancy while minimizing inefficiencies, and (3) inter-jurisdictional coordination to help manage cross-jurisdictional effects.
- For *mitigation*, the combination of global or local environmental benefits and localized harms apt to result point generally to (1) centralized standard setting, supplemented by state and local authority; (2) overlapping state and federal authority for functions for which safety net advantages are important; and (3) independent authority for functions such as standard setting and enforcement, but coordinated mechanisms for functions such as research funding and information dissemination to promote efficiency.
- For *geoengineering*, the catastrophic global harms that may result from unilateral deployment by an actor spurred by local environmental or economic benefits generally suggests (1) centralized control of research and deployment, (2) overlapping authority to create a safety net to guard against imprudent deployment, and (3) international coordination to minimize deployment by solitary institutions.

**Recommendation 2:** The experience in U.S. environmental law over the past fifty years suggests that:

- Combining federal primacy over certain governmental functions (like financing, information dissemination, and standard setting) with state primacy over others (like planning, implementation, and enforcement) helps leverage the advantages of centralized and decentralized authority.
- Overlapping authority is a good fit for functions that risk under-regulation or regulatory capture, such as standard-setting or enforcement, while more distinct authority for functions such as information generation and information dissemination is useful in achieving economies of scale and avoiding wasteful duplication.
- Congress should rely on different types of intergovernmental coordination when it seeks to pool regulator expertise, harmonize regulation, or reduce the risk of a regulatory race to the bottom, but also provide independent authority for functions such as standard setting to promote intergovernmental competition or avoid the risk of regulator groupthink.

**Recommendation 3:** Congress should restore California’s authority to establish emissions controls on greenhouse gas emissions that are more stringent than those established by EPA, as well as other states’ authority to adopt California’s standards. It should do so by reversing the agency rule preempting California’s authority to set GHG standards and by reversing

EPA's revocation in 2019 of California's waiver authority or by lightening California's burden of justifying future waivers, or both. Such action would avoid needlessly sacrificing the advantages of decentralized, overlapping, and independent regulatory authority and preserve a powerful weapon in the fight against climate change and deadly air pollution.

**Recommendation 4:** Congress should establish a strong federal role in climate mitigation where appropriate, including establishing national greenhouse gas reduction goals, a national carbon pricing system, and mobile source emission control requirements. The federal government should also invest in research and development, as well as provide financial resources to state and local governments for planning and implementation of mitigation and adaptation measures.

**Recommendation 5:** Congress should establish strong federal parameters shaping state and local action to ensure that state and local governments are meeting their respective responsibilities to contribute to nationwide decarbonization.

**Recommendation 6:** Within these federal parameters, states should retain a significant role in planning and developing regulatory requirements in the areas of electricity, building standards, transportation, and adaptation actions.

**Recommendation 7:** Legislation addressing the climate crisis should not immunize the fossil fuel industry from accountability in state tort law. Instead, it should explicitly preserve state common-law suits seeking redress for climate/COVID harms to ensure that state law continues to serve its traditional and vital role of protecting the environment and public health.

## Background

Structural deficiencies may occur if policymakers fail to appreciate the full array of choices they have in allocating authority both between and within levels of government.<sup>117</sup>

First, federalism issues relate to one dimension of decision-making authority – how centralized or decentralized the authority to regulate is. But, although deciding how to allocate authority along that dimension is important, as the federalism aspects of environmental regulation demonstrate, the centralization-decentralization dimension is only one of three dimensions along which authority may be allocated. Allocations of authority also can be arrayed on a spectrum from overlapping to distinct, and from highly coordinated to independent.

Positioning authority at a particular point along each dimension allows policymakers to promote important policy values.

- Decentralized authority, for example, has the capacity to leverage local knowledge and expertise, tailor regulation to local conditions, and foster regulatory experimentation. Centralized authority, on the other hand, may take advantage of economies of scale, foster uniformity, and address collective action problems, like competitive fears or the “free-rider” problem, more effectively.
- Overlapping authority can reduce risks of under-regulation and agency capture, but distinct authority may minimize compliance or administrative costs, as well as limit risks of conflicting regulation or overregulation.
- Coordinated authority has the capacity to reduce duplicative inefficiencies and inconsistencies and to promote accountability by combating drift, shirking, and free riding by regulators. Independent authority, in contrast, can avoid transaction costs of coordination, combat groupthink that can squelch innovation, and foster beneficial competition among multiple regulators.

*Policymakers often do not consider the benefits of differentiating regulatory authority based on the different government functions that regulation entails, such as funding, research, information distribution, information analysis, planning, standard setting, implementation, permitting, inspection and compliance monitoring, and enforce.*

Because the poles of each dimension promote different and potentially conflicting values, policymakers have to prioritize the goals of their regulatory programs in order to make appropriate structural choices. A decentralized configuration that aims to promote experimentation, for instance, may require sacrificing transaction cost efficiency that a centralized regime is capable of achieving. Situating authority along one dimension, however, may help offset disadvantages that result from situating authority along a different one. For example, coordination can be a useful means of avoiding the risk of inaction by regulators with overlapping authority. To best

promote statutory objectives, policymakers should consider holistically the interactions among all three dimensions.

Second, policymakers often do not consider the benefits of differentiating regulatory authority based on the different government functions that regulation entails, such as funding, research, information distribution, information analysis, planning, standard setting, implementation, permitting, inspection and compliance monitoring, and enforcement. An allocation of authority that makes sense for the financing of a regulatory program, for example, may be ill-suited to functions such as permitting or enforcement. Differentiating allocations along one or more dimension according to function may be the best way to accommodate the conflicting values that may result from policymakers’ dimensional choices.

Policymakers routinely conflate these dimensions and fail to differentiate among governmental functions, resulting in mismatches between the

problems that allocations of authority were designed to address and the solutions chosen to address them. The recommendations provided here urge more careful consideration of the tradeoffs of allocating authority to address climate change at different points along each of the three dimensions. They also reflect the conclusion that allocations should differ based on the function being exercised, rather than choosing a single allocation for all functions within a single subject area.

## **Proposed Policy: Allocating Authority for Three Different Aspects of Climate Change Regulation**

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By Alejandro E. Camacho and Robert L. Glicksman

### **Background and Context**

Although allocation decisions inevitably will be context specific, climate change adaptation, mitigation, and geoengineering implicate disparate tradeoffs that generally suggest different structural configurations.

### **Adaptation**

Strategies for managing the effects of climate tend to be deployed locally and often involve particularly acute local benefits and harms.

- In light of the diversity of and uncertainty accompanying most localized climate effects, a primarily decentralized infrastructure would likely be appropriate for most governmental functions, with limited centralization of certain functions such as funding and information dissemination for which economies of scale, uniformity, and/or transboundary cost internalization are especially salient.
- Limited overlapping authority (with federal primacy) of key functions such as standard setting may best exploit redundancy while minimizing inefficiencies.
- Certain types of inter-jurisdictional coordination will help manage cross-jurisdictional effects.

### **Mitigation**

Strategies to limit greenhouse gas emissions provide environmental benefits that may be either global or local in scale, but the economic harms caused by such regulation tend to be localized. Accordingly:

- The need for a national contribution to the global effort to curtail emissions, as well as the risk of state inaction due to collective action problems, suggests a robust role for centralized standard setting. Federal standard-setting should, however, be supplemented by state authority to promote experimentation and diversity.

- Overlapping state and federal authority for various functions is appropriate to accrue safety net advantages and reduce capture risks, especially absent a binding baseline international regime.
- Relatively independent authority for functions such as standard setting, permitting, and enforcement could foster a “race to the top” among regulators and combat agency groupthink.
- Coordination mechanisms for functions such as research funding and information dissemination could promote economies of scale and eliminate wasteful duplication of effort.
- Coordinated implementation of cross-jurisdiction cap-and-trade regimes could generate cost-efficient emission reductions.

### Geoengineering

It is possible that even a single actor might deploy large-scale strategies to alter the global climate, spurred by the promise of local environmental and/or economic benefits. That action could, however, pose global environmental risks.

- Risks of unilateral deployment of untried, irreversible, and catastrophic technologies suggests:
  - Centralized control of research and deployment to minimize cross-jurisdiction harms
  - Leveraging the redundancy benefits of overlapping authority, and
  - International coordination to minimize deployment by solitary institutions.
- On the other hand, independent, decentralized governance of research and analysis of possible technologies may better promote diverse research on risks and opportunities.

### Recommendations

In structuring governance over climate change mitigation, adaptation, and geoengineering activities:

- Congress should consider the tradeoffs of assigning authority to either states or the federal government.
- It should consider varying the level of centralization by governmental function.
- It should explore configurations that assign overlapping federal *and* state roles for particular government functions, as well as overlapping roles for various federal agencies.
- It should alter the amount and type of coordination between federal and state authorities (and among federal agencies).

## Proposed Policy: A Better Approach to Factoring Federalism Considerations into Regulatory Strategies

By Alejandro E. Camacho and Robert L. Glicksman

Controversies over the appropriate allocations of policymaking authority between the federal and state governments are almost as old as the Republic, as the Supreme Court pointed out in a 1992 decision involving the distribution of authority over radioactive waste disposal.<sup>118</sup> Yet, the disputes never seem fully resolved. Certainly that is true of environmental regulation.

The federal pollution control statutes exemplify the neglected potential for well-informed structural choices. Congress built the core environmental statutes on a foundation of cooperative federalism. It established the overarching policies, such as the Clean Air Act's goals of improving and protecting the nation's air quality to avoid public health risks. But Congress shared the responsibility of implementing those policies between the states and the federal government, acting primarily through the U.S. Environmental Protection Agency (EPA).

The cooperative federalism model has worked reasonably well, resulting in enhanced public health and natural resource protection. It is a relatively rare instance of Congress intentionally varying the allocation of authority along one of the three dimensions – the extent of centralization of authority – by regulatory function or task. In some cases, Congress created centralized authority by charging one entity with the sole responsibility for carrying out a particular function or task, such as EPA's exclusive authority to adopt national ambient air quality standards under the Clean Air Act. In other cases, the Act creates decentralized authority through shared regulatory authority between the two sovereigns, such as by preserving state authority to adopt more stringent emission control standards for stationary sources than EPA has enacted. Such cooperative federalism can help leverage advantages of centralized federal governance (such as expertise and superior ability to address cross-jurisdictional externalities), as well as those of state governance (such as local knowledge).

However, as detailed below, neither policymakers nor scholars seem to appreciate that cooperative federalism also implicates key tradeoffs associated with the other two dimensions of authority.

### The Overlapping-Distinct Dimension

As stated on page 2 above, situating authority at different points along the overlap-distinctness dimension for each regulatory function results in different tradeoffs of the values that regulation is designed to serve. The

*Neither policymakers nor scholars seem to appreciate that cooperative federalism also implicates key tradeoffs associated with the other two dimensions of authority.*

failure to appreciate the consequences of alternative structural options often leads to missed opportunities to promote regulatory goals more effectively, efficiently, or equitably. The Trump administration, for instance, has heavily focused on reducing overlapping authority because of perceived administrative waste. To be sure, having two regulators do the same thing may raise administrative costs. But one should not reflexively assume that having two authorities involved in a program necessarily means duplication of tasks. Assigning one government control over one function and another government authority over a completely different one leads to little duplication of activity.

Even in cases where more than one authority has the same role, observers routinely fail to account for the significant *advantages* of overlapping authority. This includes, for example, the safety net provided in case one level of government is unable or unwilling to act. Many observers simply ignore these advantages, but they have proven to be key to the success of cooperative federalism laws.

### **The Coordinated-Independent Dimension**

Similarly, many policymakers have failed to appreciate that, designed properly, the extent and type of coordination between the federal and state governments can help mitigate any costs raised by overlap. Congress can combine limited state and federal overlap with clear coordination mechanisms between these governments. In so doing, it can achieve many of the safety net advantages of overlapping authority while minimizing the costs of duplication.

As is true for the other dimensions, creating coordinated or independent authority presents a different mix of advantages and disadvantages. Legislators and other structuring regulatory programs should consider these tradeoffs in designing governance regimes, including establishing a different mix of coordination and independence for different regulatory functions. Finally, even if the tradeoffs favor coordination, policymakers should recognize that it is possible to vary the extent of coordination (as well as tradeoffs of doing so).

### **Recommendations**

The experience in U.S. environmental law over the past 50 years suggests that in adopting climate legislation:

- Congress should establish federal primacy over governmental functions (like financing, information dissemination, and standard setting) for which economies of scale, uniformity, or the need to abate interjurisdictional harms are important. At the same time, it should vest the states with primacy over other functions (like planning, implementation and enforcement) that would benefit from local

expertise, diversity of approach and experimentation, and greater public accessibility. This combination would help leverage the advantages of centralized and decentralized authority.

- Overlapping authority is a good fit for functions that risk under-regulation or regulatory capture, such as standard-setting or enforcement. This approach is reflected in the provisions in virtually all of the federal pollution control laws that preserve state authority to adopt regulatory standards (and impose common law remedies) that are more stringent than federal standards, and in the retention of federal authority to enforce state-imposed obligations under some of these laws. More distinct authority for functions, such as information generation and information dissemination, is useful in achieving economies of scale, avoiding wasteful duplication and lowering the risk of inaction and lack of accountability stemming from the regulatory commons that shared authority may create.
- Congress should rely on different types of intergovernmental coordination (such as coordination that is more or less frequent, hierarchical, or formal) when it seeks to pool regulator expertise, avoid inefficient duplication of effort, harmonize regulation, or reduce the risk of a regulatory race to the bottom. Independent authority, however, may be a good choice for functions, such as information analysis, standard setting, and enforcement, to minimize administrative costs, promote intergovernmental competition, or avoid the risk of regulator groupthink.

## **Proposed Policy: Overlapping Authority to Limit Greenhouse Gas Emissions from Motor Vehicles**

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By Alejandro E. Camacho and Robert L. Glicksman

### **Background and Context**

For five decades, California and the federal government have worked in tandem in an innovative exercise in federalism aimed at achieving cleaner air. California has played an important role in controlling greenhouse gas emissions (GHGs) that contribute to climate change, particularly from motor vehicles. But now, contrary to law and in a massive departure from longstanding practice, Donald Trump has pulled the rug out from under California's feet by divesting it of its longstanding authority to adopt auto emission controls for greenhouse gases that are more stringent than the U.S. Environmental Protection Agency's.<sup>119</sup> That action, if not overturned in pending judicial challenges, will neuter California's innovative leadership by disabling an important tool for combatting climate change.



Because of the severity of California's pollution problems and the state's early environmental leadership, the Clean Air Act specifically allows the state to apply for a waiver of the prohibition on state auto emission standards more stringent than the federal government's. California has sought waivers more than a hundred times, and with one short-lived exception, EPA has granted every request – precisely as the law anticipated.

*Contrary to law and in a massive departure from longstanding practice, Donald Trump has pulled the rug out from under California's feet by divesting it of its longstanding authority to adopt auto emission controls for greenhouse gases that are more stringent than the U.S. Environmental Protection Agency's.*

Once EPA grants a waiver, any other state may follow California's ambitious lead by adopting its standards. Essentially, then, the Clean Air Act provides all states with two options: the federal standard or the more stringent California option.

The result is that more than a dozen states follow California's more stringent standards, which is why many cars sold outside the state bear a sticker that says the car has met California's standards. The auto industry has long since adjusted to these dual standards, not wanting to ignore such a huge market for its products.

But the Trump administration deviated sharply from established bipartisan practice by revoking previously approved waivers for California, purportedly to achieve nationally uniform emission controls and eliminate "duplicative" regulation. The second part of its devastating one-two punch was to weaken federal standards adopted during the Obama administration that had required fuel efficiency improvements that would reduce GHG auto emissions.<sup>120</sup>

To be sure, centralization may promote uniformity, and reducing overlapping authority may modestly decrease some administrative costs. However, in addition to being of questionable legality,<sup>121</sup> EPA's revocation completely ignored the most important advantages of the prior system, as well as the significant downsides of revoking the waiver. These include:

- The allocation of standard-setting authority to California embodies a productive balancing of the different dimensions of regulatory authority: from centralized to decentralized, overlapping to distinct, and coordinated to independent.
- The Clean Air Act's bifurcated standard-setting authority for auto emissions fosters the experimentation advantages of decentralization. But by allowing only two sets of standards – EPA's and California's – it also tempers the risk of many conflicting standards and overregulation.
- Similarly, by requiring that EPA approve California's waiver requests, the law requires some coordination, fostering pooling of expertise and resources. But it also cultivates innovation by ensuring each regulator's independence. That allocation has allowed California to engage in innovative regulation. In fact, several large automakers recently agreed

to conform to the state's ambitious GHG controls, notwithstanding EPA's effort to eliminate them.<sup>122</sup>

- Finally, the waiver repeal ignores how the law's modest overlap in authority creates a safety net and guards against undue industry control of regulatory agencies that is all too apparent under the Trump administration. Weighing these different tradeoffs is key to designing effective governance, but EPA completely misses all of them.

California's innovation and leadership should be fostered, not squelched. Retaining the state's authority to adopt more stringent GHG auto emission standards is a critical vehicle for doing so. Congress should reverse revocation of the existing GHG waiver, and along the way, lighten the state's burden of proving eligibility for future waivers, or even eliminate EPA's veto authority altogether.

Either approach would foster regulatory experimentation and provide a check on inaction or inadequate regulation by EPA. Moreover, these changes would not forfeit the significant benefits typically associated with coordinated regulatory authority (such as EPA's authority to review state standards). Though coordination can reduce the risk that states will adopt ever-weaker standards to attract business or otherwise fail to protect public health, neither is a concern here. California has consistently adopted more stringent controls than EPA.

### **Recommendation**

- EPA's revocation promises to wreak havoc with the Clean Air Act's careful balancing of the tradeoffs associated with alternative regulatory allocations. Congress should restore California's emission control authority – by reversing EPA's revocation of California's waiver authority, lightening California's burden of justifying future waivers, or both. Doing so would avoid needlessly sacrificing the advantages of decentralized, overlapping, and independent regulatory authority, and preserve a powerful weapon in the fight against climate change and deadly air pollution.

## **Proposed Policy: States' Role in Federal Climate Legislation**

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By Alice Kaswan, William W. Buzbee, and Dave Owen

### **Background and Context**

Decisive federal climate action is essential. At the same time, however, federal climate legislation would not be built from a blank slate. Many states already have greenhouse gas reduction targets, action plans to meet those targets, related clean air programs, and substantial roles in the electricity sector. Congress should embrace an effective, strong federal role while

affirmatively creating an integrated federal/state partnership, as well as preserving and protecting additional state and local efforts, thereby gaining the benefits of both centralized and decentralized authority.

### ***The Value of Creating Affirmative State Roles within a Federal Structure***

A strong state role within federal law is not unusual. Many federal environmental laws embody a “cooperative federalism” approach that carefully structures federal, state, and local roles to create a cohesive whole that draws on the strengths of each jurisdictional level. This approach creates several key advantages.

*First*, federal-state collaborations can lead to better-informed climate change responses. States could build on existing state climate action plans and learn from each other’s efforts. A strong state role in these areas is justified by the states’ expertise in their diverse geographic, economic, and social history and needs, and their historic diversity of efforts. And states may identify areas of effective regulation overlooked by federal legislation and regulation.

*Second*, states can tailor their federal law implementation efforts to their unique circumstances and goals. For example, allowing state planning will enable states to develop integrated plans that achieve state-specific objectives, like enhancing public health by integrating GHG and co-pollutant emission reduction strategies, creating economic opportunities, and facilitating just transitions for communities and workers impacted by the demise of fossil fuels and other shifts in the nation’s economy.

*Third*, federal-state collaborations can make climate responses more politically feasible and durable. States are more likely to support federal legislation if it includes some degree of state control. Preserving state and local roles will also enable greater bottom-up participation in conceiving our clean energy transition.

### ***The Importance of Preserving Existing State Authority***

Most federal environmental laws preserve existing state authority through “savings” clauses that allow states to choose to do more than required by federal regulation. As the federal government assumes a more prominent legal role in addressing climate change, Congress should, similarly, preserve state authority. Outright preemption of state roles should be the exception, not the norm. Federal environmental laws have almost uniformly included savings clauses, which allow overlapping state authority, because of the risk of federal regulatory ineffectiveness and backpedaling. Preserving state authority to do more has been crucial to maintaining national progress in meeting climate and other regulatory goals, and to test and establish

*Federal-state collaborations can make climate responses more politically feasible and durable. States are more likely to support federal legislation if it includes some degree of state control. Preserving state and local roles will also enable greater bottom-up participation in conceiving our clean energy transition.*

effective additional strategies. If federal climate regulatory zeal, once established, were to wane, or should federal measures turn out to be too lax to achieve needed climate progress, savings clauses preserving state authority would allow states to make up for the federal lapse.

## Recommendations

- Establish a strong federal role where appropriate, including establishing national greenhouse gas reduction goals, establishing a national carbon pricing system and facilitating linkages among state, federal, and international markets, developing mobile source emission requirements, and investing in research and development.
- Provide strong federal parameters to shape state and local action to ensure that state and local governments are meeting their respective responsibilities to contribute to nationwide decarbonization goals.
- Establish and fund federal programs to facilitate state and regional climate action. Through ongoing collaboration between the federal government's national and regional offices, and state (and sometimes local) regulators, the federal government should:
  - Continue research on climate change impacts and disseminate it to state and local governments;
  - Create clearinghouses for information about effective state, federal, and global strategies and practices to mitigate and adapt to climate change and provide technical support to help states and local governments implement them;
  - Create incentives for state and local cooperative climate regulation efforts; and
  - Provide financial resources to state and local governments for planning and implementation of mitigation and adaptation measures.
- Within these federal parameters, allow states to play a significant and sometimes leadership role in planning and developing requirements in the following contexts:
  - *Electricity:* States have historically controlled electricity generation sources, land use decisionmaking and siting choices, and the majority of states have established renewable portfolio standards and energy efficiency standards. Potentially under an overarching federal Renewable Energy Standard, states, alone or in combination with states sharing the same electricity grid, could determine the mix of sources and efficiency measures most suitable for the state or region. In addition to determining sources, states could address the relative centralization or decentralization of sources and control, as well as realigning state utility regulatory policies to reflect the changing nature of the electricity sector. Careful coordination with authority

exercised by the federal Department of Energy and the Federal Energy Regulatory Commission will be necessary.

- *Buildings*: Although the federal government should require all states to adopt building efficiency codes, states could tailor their approach to local weather conditions and their mix of new versus existing housing, and accommodate other local and regional concerns, including social welfare and historic preservation goals.
- *Transportation*: Because land use patterns affect transportation emissions, state and local governments should be tasked with developing planning and zoning parameters and, as appropriate, developing transit systems or other measures and incentives to reduce vehicle miles travelled. As discussed more fully in the section on California's automobile standards, federal climate law should reinstate California's ability to establish a second option for GHG emission standards.
- *Adaptation*: Given the highly localized nature of some climate impacts, states are well positioned to develop tailored adaptation plans, with federal planning and implementation support. In addition, any state and local use of federal spending on projects involving infrastructure and building should be required to include climate adaptation assessment and prudent adjustment of plans.
- Through savings clauses, federal climate legislation should explicitly preserve state and local government authority so they can impose additional state and local pollution reduction measures and pursue additional clean energy goals, whether to reduce GHG emissions; to meet other state and local environmental, safety, welfare, and health goals; or to achieve these goals through multi-pollutant reduction strategies.
- Federal climate legislation should set regulatory floors that do not let states set standards lower than federal requirements, but should, in most instances, not preempt complementary state and local climate, clean energy, pollution control, and land use authority. Where legislation does include a preemption provision (like the partial preemption of mobile source standards), the preemption provision should make clear that preemption will be found only upon a fact-based, adjudicated determination of an actual, substantial conflict between such state and local efforts and federal requirements. Any federal preemption provisions should explicitly state that state and local government choices that merely seek additional reductions in emissions or embrace cleaner energy requirements or goals than federally required are not preempted unless such measures are proven to be directly in conflict and compliance with both is impossible.

## Conclusion

Federal leadership, control, and resources are warranted to address the emerging climate crisis. Nonetheless, federal climate legislation should craft a careful partnership with state and local entities. Such a federalism balance would set necessary goals and encourage cooperative state and local efforts while also preserving space for additional state and local regulatory efforts. Through such a climate federalism balance, the nation is likely to achieve a more effective transition that meshes with a diversity of state concerns and needs, increasing the benefits and decreasing the costs of a clean energy transition.

## Proposed Policy: The Role of State Tort Law in Climate Protections

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By Karen Sokol

### Background and Context

Since the summer of 2017, numerous states, cities, counties, and one fishing industry association have filed tort suits in state courts against ExxonMobil, Chevron, BP, Shell, and other major fossil fuel companies, in an effort to hold them accountable for contributing to the climate crisis and then misleading the public about it.<sup>123</sup> The plaintiffs seek compensation for myriad region-specific climate harms – including current and future damages to infrastructure, land and other natural resources, and the public’s health, property, and livelihoods – caused by sea-level rise, drought, wildfires, ocean acidification, storms of record-breaking severity, and other climate-driven environmental disruptions. The most recent case as of this writing, filed by Minnesota Attorney General Keith Ellison in June 2020, highlights the disproportionate impacts of the climate crisis on Black, Indigenous, and brown communities.<sup>124</sup>

In their public relations messaging, the industry and its trade associations condemn the suits and call for legislation providing them with immunity. The U.S. Chamber of Commerce has called for such legislation at the state level,<sup>125</sup> and the National Association of Manufacturers created an advocacy arm with the sole mission of attacking the state suits that will likely do so as well.<sup>126</sup> Given that several suits are poised to begin discovery proceedings in state courts, a process that could lead to further revelations of corporate deception and other malfeasance, the industry can be expected to push for immunity at the federal level as well. Indeed, the industry has already pushed for sweeping immunity in the COVID-19 relief packages that Congress has been considering.<sup>127</sup> In light of this, the industry will almost certainly call for such immunity in any federal climate legislation. Federal

and state legislators should resist such efforts as they craft vital climate legislation.

It is beyond question that, like COVID-19 relief legislation, climate legislation is urgently needed. But, as summarized below, by its very nature, legislation – no matter how robust its protections and how well-crafted its provisions – will never obviate the need for state tort law to serve the unique, complementary role in forging corporate accountability and environmental and public health protections that it has long served in the U.S. legal system.

State tort law has always been an important legal mechanism in this country for holding private actors responsible for unreasonable misconduct and for providing compensation to those harmed by that misconduct. It became particularly important in the mid-20th century, as corporate actors amassed greater economic and political power while also gaining significant control over public perceptions as a result of their sophisticated – and often deceptive – marketing campaigns. In the 1960s, in response to widespread harms caused by businesses' reliance on misleading marketing strategies to unsafe products, state courts began drawing on existing state tort law principles to provide relief to the injured, as well as accountability to the public at large. That function was and remains all the more important because corporate influence had by then begun to wield significant influence over the regulatory system, leaving public protections inadequate in important ways. Thus, state courts served as a legal venue for those seeking redress for harms caused by the wrongdoing of various industries, including the tobacco, gun, chemical, food production, and fossil fuel industries. In addition to providing much-needed compensation to the injured, these tort suits have induced industries to operate more safely, avoiding future harms.

The current wave of climate suits that states, cities, and counties all over the country have filed against fossil fuel industry defendants may prove to be the most important mass tort suits yet. Even before discovery, the plaintiffs have extensive documentation that the defendants have (1) known for decades that they were contributing to the climate crisis and its devastating consequences, and (2) responded to that knowledge with a concerted disinformation campaign about the climate crisis and its connection to fossil-fuel product use and an acceleration of their business to further entrench societal dependence on fossil fuels. This is the sort of corporate malfeasance that state tort law has been addressing for decades.

Such state venues are particularly essential now, when the Trump administration is systematically suppressing climate science and its implications across agencies, including the EPA, the Department of the Interior, the Department of Agriculture, and the State Department. The administration's systematic suppression of climate science is part of the way it supports its efforts to dismantle the climate protections that were in place

and to justify its refusal to provide the much more extensive protections that are necessary<sup>128</sup> while accelerating approval and construction of pipelines and increasing drilling on federal lands and offshore.<sup>129</sup>

Ensuring that these state claims are preserved in federal climate legislation will greatly strengthen the national response to the climate crisis and complement legislative action to reduce emissions and adapt to the climate crisis. More specifically, the ability to bring a state tort action will remain essential even after climate legislation is adopted for at least three reasons:

- Federal regulation of greenhouse gases is unlikely to compensate current and future victims of the climate crisis, and state tort law can provide some measure of relief;
- The civil discovery process can provide essential information on both the climate crisis and the fossil fuel industry's longstanding attempts to hold onto their profits in ways that intensified climate disruption; and
- In the event that federal targets end up weak or if, as is currently the case, implementation ceases or falters, state tort law can provide a vital safety net.

### **Recommendations**

- Legislation addressing the climate or any other crisis should not include provisions immunizing the fossil fuel industry from accountability in state tort law.
- As climate harms multiply, legislation should instead explicitly preserve state common-law suits seeking redress for climate or COVID harms to ensure that state law is allowed to continue to serve its traditional and vital role protecting the environment and public health. Instead, such legislation should include language explicitly preserving lawsuits.



## About the Center for Progressive Reform

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Founded in 2002, the nonprofit Center for Progressive Reform connects a nationwide network of scholars with policymakers and allied public interest advocates. CPR pursues a vision of legal and regulatory policies that put health, safety, and environmental protection before private interests and corporate profit. With rigorous analysis, strategic engagement in public interest campaigns, and a commitment to social welfare, CPR supports thoughtful government action, ready public access to the courts, enhanced public participation, and freer access to information.

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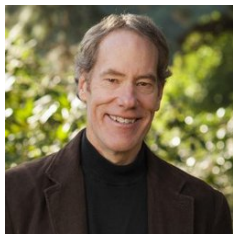
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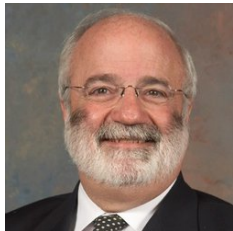
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## Endnotes

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<sup>1</sup> Demand response is the practice of paying electricity users to cut back on their electricity use at times of peak demand, which lowers wholesale energy prices for everyone and reduces the need to build excess electricity generation capacity. See, e.g., *FERC v. Electric Power Supply Ass'n*, 136 S. Ct. 760. (2016) (upholding Federal Energy Regulatory Commission rule promoting and regulating demand response).

<sup>2</sup> *Electricity in the United States is Produced with Diverse Energy Sources and Technologies*, U.S. ENERGY INFO. ADMIN., <https://www.eia.gov/energyexplained/electricity/electricity-in-the-us.php> (explaining that the largest sources of U.S. electricity generation in 2018 were natural gas at 35 percent and coal at 27 percent); *Energy Use for Transportation*, U.S. ENERGY INFO. ADMIN., <https://www.eia.gov/energyexplained/use-of-energy/transportation.php> (“In 2018, petroleum products accounted for about 92 percent of the total U.S. transportation sector energy use. . . . Natural gas accounted for about 3 percent.”).

<sup>3</sup> NC Clean Energy Tech. Ctr./DSIRE, *Renewable & Clean Energy Standards* (June 2019), <http://ncsolarcen-prod.s3.amazonaws.com/wp-content/uploads/2019/07/RPS-CES-June2019.pdf>; Alexandra B. Klass, *Eminent Domain Law as Climate Policy*, 2020 WIS. L. REV. 49 (2020) (discussing state clean energy statutes enacted in 2012 and 2020).

<sup>4</sup> Energy Info. Admin., *U.S. Renewable Energy Consumption Surpasses Coal for the First Time in Over 130 Years* (May 28, 2020), at: <https://www.eia.gov/todayinenergy/detail.php?id=43895>.

<sup>5</sup> Intergovernmental Panel on Climate Change, *Special Report on Global Warming of 1.5°C* vi (2019), available at: [https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15\\_Full\\_Report\\_Low\\_Res.pdf](https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_Low_Res.pdf)

<sup>6</sup> Energy Info. Admin., *Global Electricity Consumption Continues to Rise Faster than Population (2000-2017)* (June 15, 2020), at <https://www.eia.gov/todayinenergy/detail.php?id=44095>.

<sup>7</sup> The United States is a Party to the United Nations Framework Convention on Climate Change, which, as implemented under the Paris Agreement, requires Parties to make Nationally Determined Contributions to climate mitigation through domestic policies with “highest possible ambition”, consistent with “common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.” Paris Agreement, FCCC/CP/2015/10/Add.1, available at: [https://unfccc.int/files/essential\\_background/convention/application/pdf/english\\_paris\\_agreement.pdf](https://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf) (last visited June. 2020). In November 2019, the Trump Administration notified the UN Secretary-General of the intent to withdraw the United States from the Paris Agreement, but the withdrawal is not effective until November 2020.

<sup>8</sup> These proposals have been advanced for many years—dozens already tried and failed by 2010, see, e.g., Lincoln L. Davies, *Power Forward: The Argument for a National RPS*, 42 CONN. L. REV. 1339, 1364-65 (2010), with new proposals as recent as last year when Senator Tim Kaine proposed the Clean Energy Act of 2019 (116<sup>th</sup> Cong. 1<sup>st</sup> Sess.), <https://smithsenate.app.box.com/s/pnq9j3rmxdxIk7nigu58710b8xrlcmk5>.

<sup>9</sup> Deep Decarbonization Pathways Project, *Policy Implications of Deep Decarbonization in the United States 8* (US 2050 Vol. 2 Policy Report) (2015), at: [http://deepdecarbonization.org/wp-content/uploads/2015/11/US\\_Deep\\_Decarbonization\\_Policy\\_Report.pdf](http://deepdecarbonization.org/wp-content/uploads/2015/11/US_Deep_Decarbonization_Policy_Report.pdf).

<sup>10</sup> Goldman School of Public Policy, Univ. of Ca. Berkeley, *The 2035 Report: Plummeting Solar, Wind, and Battery Costs Can Accelerate Our Clean Energy Future* (June 2020), available at: <https://www.2035report.com> See Sonia Aggarwal & Mike O’Boyle, *Policy Summary for Congress* (June 2020) (recommending for “55 percent by 2025, 75 percent by 2030, 90 percent by 2035, and 100 percent by 2045”), at: <https://www.2035report.com/downloads/>.

<sup>11</sup> For example, in the Southwest Power Pool, the regional transmission organization with a footprint extending from the northern plains states and Canadian border to Oklahoma, was

able to set a new record of 72 percent of hourly electricity demand served by wind generation in April 2020 thanks to its ability to dispatch on a regional basis. Energy Info. Admin, *The Central United States Set Several Wind Power Records this Spring* (June 12, 2020). SPP met 29 percent of electricity demand with wind in 2019. *Id.*

<sup>12</sup> NAACP, Environmental and Climate Justice Program Goals, at: <https://www.naacp.org/environmental-climate-justice-about/>.

<sup>13</sup> Many thanks to Professor Dan Walters of Penn State Law—University Park for comments on this section. All errors and opinions in this section are mine.

<sup>14</sup> FERC Order E-1, Dec. 19, 2019, <https://cms.ferc.gov/sites/default/files/whats-new/comm-meet/2019/121919/E-1.pdf>.

<sup>15</sup> *Id.* at 10.

<sup>16</sup> Exelon in Illinois has threatened to stop operating its two nuclear plants in the state if it does not receive further subsidization from the state, in part because its plants likely will not be able to “compete in PJM’s capacity market” under the MOPR, and Illinois has not adopted the Fixed Resource Requirement approach that Exelon would prefer. Jeff St. John, *Exelon Threatens to Close 2 Nuclear Plants as Battle Over State Subsidies Looms*, Green Tech Media, Aug. 28, 2020, <https://www.greentechmedia.com/articles/read/exelon-threatens-to-close-two-nuclear-plants-as-battle-over-state-subsidies-looms>.

<sup>17</sup> FERC Order E-1, *supra* note 14, at 11.

<sup>18</sup> 162 FERC ¶ 61,205, Mar. 9, 2019, <https://www.ferc.gov/CalendarFiles/20180309230225-ER18-619-000.pdf>. ISO New England’s approach appears superior to PJM’s problematic MOPR, however. For example, ISO New England has a MOPR alternative auction through which subsidized and non-subsidized generation resources can essentially trade capacity obligations. David Boyd, *States have Options in the New MOPR World*, UtilityDive, Aug. 21, 2020, <https://www.utilitydive.com/news/states-have-options-in-the-new-mopr-world/583187/>.

<sup>19</sup> Danny Cullenward & Shelley Welton, *The Quiet Undoing: How Regional Electricity Market Reforms Threaten State Clean Energy Goals*, YALE J. ON REG. BULL., Nov. 8, 2019, <https://www.yalejreg.com/bulletin/the-quiet-undoing-how-regional-electricity-market-reforms-threaten-state-clean-energy-goals/>.

<sup>20</sup> FERC Order E-1, Glick, Commissioner, dissenting, <https://www.ferc.gov/media/statements-speeches/glick/2020/04-16-20-glick-E-4.pdf>.

<sup>21</sup> Robert Walton, *New Jersey Looks to Exit PJM Capacity Market, Worried MOPR Will Impede 100% Carbon Free Goals*, UtilityDive, Mar. 31, 2020, <https://www.utilitydive.com/news/new-jersey-looks-to-exit-pjm-capacity-market-worried-the-mopr-will-impede/575160/> (describing New Jersey’s consideration of the Fixed Resource Requirement, among other potential options).

<sup>22</sup> The Independent Market Monitor for PJM, Potential Impacts of the Creation of New Jersey FRRs (May 13, 2020), [http://www.monitoringanalytics.com/reports/Reports/2020/IMM\\_Potential\\_Impacts\\_of\\_the\\_Creation\\_of\\_New\\_Jersey\\_FRRS\\_20200513.pdf](http://www.monitoringanalytics.com/reports/Reports/2020/IMM_Potential_Impacts_of_the_Creation_of_New_Jersey_FRRS_20200513.pdf).

<sup>23</sup> Heather Richards & Arianna Skibell, *FERC Order Could Bar Offshore Wind from U.S. Power Market*, E&E NEWS: ENERGYWIRE (May 13, 2020), <https://www.eenews.net/stories/1063120381>.

<sup>24</sup> See, e.g., Catherine Morehouse, *Broad Array of Groups Sue FERC Over PJM MOPR Decision as Chatterjee Rejects Cost, Renewable Concerns*, UtilityDive, Apr. 27, 2020, <https://www.utilitydive.com/news/broad-array-of-groups-sue-ferc-over-pjm-mopr-decision-as-chatterjee-rejects/576478/>.

<sup>25</sup> Compliance Filing Concerning the Minimum Offer Price Rule, Request for Waiver of RPM Auction Deadlines, and Request for an Extended Comment Period of at Least 35 Days (Mar. 18, 2020), <https://pjm.com/directory/etariff/FercDockets/4443/20200318-er18-1314-003.pdf>; Catherine Morehouse, *PJM MOPR Compliance Plan Allays Renewable Sector Concerns*

of *Being Shut Out of Capacity Auctions*, UtilityDive, Mar. 19, 2020, <https://www.utilitydive.com/news/pjm-files-mopr-compliance-plan-with-ferc-allaying-renewable-sector-concern/574448/> (describing the order).

<sup>26</sup> See *Piedmont Env'tl. Council v. FERC*, 558 F.3d 304 (4th Cir. 2009); *California Wilderness Coal. v. U.S. Dep't of Energy*, 631 F.3d 1072 (9th Cir. 2011).

<sup>27</sup> 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, 77 Fed. Reg. 62624 (2012).

<sup>28</sup> See *The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program*, 84 Fed. Reg. 51,310 (Sept. 27, 2019) (final rule preempting California authority to control vehicular greenhouse gas emissions and revoking waiver for California's greenhouse gas standards and zero-emission vehicle program); *The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Vehicles*, Final Rule, 85 Fed. Reg. 24174 (2020), <https://www.govinfo.gov/content/pkg/FR-2020-04-30/pdf/2020-06967.pdf> (final rule rolling back vehicular greenhouse gas emission standards).

<sup>29</sup> U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2018 ES-7*, <https://www.epa.gov/sites/production/files/2020-04/documents/us-ghg-inventory-2020-main-text.pdf>.

<sup>30</sup> Bureau of Transportation Statistics, *Number of U.S. Aircraft, Vehicles, Vessels, and Other Conveyances*, <https://www.bts.gov/content/number-us-aircraft-vehicles-vessels-and-other-conveyances>.

<sup>31</sup> AAA Foundation for Traffic Safety, *American Driving Survey, 2014-2017* (Feb. 2019), [https://aaafoundation.org/wp-content/uploads/2019/02/18-0783\\_AAFTS-ADS-Brief\\_r8.pdf](https://aaafoundation.org/wp-content/uploads/2019/02/18-0783_AAFTS-ADS-Brief_r8.pdf); U.S. Dept. of Transportation, Bureau of Transportation Statistics, *U.S. Vehicle-Miles*, <https://www.bts.gov/content/us-vehicle-miles>.

<sup>32</sup> Fabio Caiazzo et al., *Air Pollution and Early Deaths in the United States: Quantifying the Impacts of Major Sectors in 2005*. 79 *Atmospheric Environment* 198 (2013).

<sup>33</sup> Andrew L. Goodkind et al., *Fine-Scale Damage Estimates of Particulate Matter Air Pollution Reveal Opportunities for Location-Specific Mitigation of Emissions*, 18 *Proc. Natl. Acad. Sci.* 8775 (2019).

<sup>34</sup> William Pizer, *The Economics of Improving Fuel Economy*, Resources (Fall 2006), <https://www.resourcesmag.org/archives/the-economics-of-improving-fuel-economy/>.

<sup>35</sup> The European Association of Electrical Contractors, *Powering a New Value Chain in the Automotive Sector: The Job Potential of Transport Electrification* 13, [https://download.dalicloud.com/fis/download/66a8abe211271fa0ec3e2b07/c572c686-f52f-4c0d-88fc-51f9061126c5/Powering\\_a\\_new\\_value\\_chain\\_in\\_the\\_automotive\\_sector\\_-\\_the\\_job\\_potential\\_of\\_transport\\_electrification.pdf](https://download.dalicloud.com/fis/download/66a8abe211271fa0ec3e2b07/c572c686-f52f-4c0d-88fc-51f9061126c5/Powering_a_new_value_chain_in_the_automotive_sector_-_the_job_potential_of_transport_electrification.pdf).

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