

Designing the New Green Deal: Where's the Sweet Spot?

by Robert Sussman

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The Donald Trump years have been painful for advocates of a forceful U.S. response to climate change. The White House has pulled out of the 2015 Paris Agreement, tried to revive coal, and moved to scuttle landmark U.S. Environmental Protection Agency (EPA) regulations for vehicles and power plants. Despite these setbacks, a heightened sense of urgency and passion has emerged following the Democratic takeover of the U.S. House of Representatives. Progressive climate policy is once again at the top of the national agenda.

This Comment examines the factors that have created a unique moment of opportunity for climate policy while underscoring the absence of a broadly accepted paradigm to guide policymakers. To provide historical context, it then steps back from the current policy scene and reviews the long and largely unsuccessful U.S. struggle to find a path forward on climate change and the lessons it offers for finding solutions that are both politically durable and effective in addressing the climate threat. Against the backdrop of recent changes in emissions and technologies, the Comment finally seeks to chart a course for post-2020 policymaking that maximizes emission reductions while acknowledging and working within political and economic realities.

I. Setting the Scene

Several factors have converged to bring climate back to center stage. Authoritative reports by the Intergovernmental Panel on Climate Change (IPCC)¹ and federal agencies² have reinforced the underlying science and underscored the potential high costs and social and economic consequences of inaction. The impacts of climate change are now palpable: they are manifested by high average temperatures, extreme weather events, melting ice packs and

glaciers, a surge in wildfires, rising oceans, and shifting patterns of rainfall and drought. As the effects of climate change become more overt, public concern has increased. A recent Yale survey showed that the number of Americans who say they are "alarmed" by climate change has doubled in five years, while the number who doubt or dismiss it has dropped to less than 20%.³

The ground is also shifting politically. Ambitious emission reduction goals have been embraced by leadership states like New York⁴ and California,⁵ and several newly elected Democratic governors have launched climate initiatives.⁶ Despite the drumbeat of skepticism from the president and his senior officials, more Republicans are willing to engage in dialogue. Establishment luminaries like James Baker and George Shultz and conservative think-tanks are coalescing around serious carbon tax proposals,⁷ and a growing number of Republican members of the U.S. Congress have recognized the seriousness of climate change even if they are far from agreeing with Democrats on the best solutions.⁸

3. YALE UNIVERSITY & GEORGE MASON UNIVERSITY, CLIMATE CHANGE IN THE AMERICAN MIND (2018), available at <http://climatecommunication.yale.edu/wp-content/uploads/2019/01/Climate-Change-American-Mind-December-2018.pdf>.

4. Jon Campbell, *President Can't Stop New York's Clean-Energy Progress*, USA TODAY, June 1, 2017, <https://www.usatoday.com/story/news/politics/2017/06/02/new-york-climate-change/3641780011/>.

5. Press Release, California Air Resources Board, Climate Pollutants Fall Below 1990 Levels for the First Time (July 11, 2018), <https://ww2.arb.ca.gov/news/climate-pollutants-fall-below-1990-levels-first-time>.

6. David Roberts, *These Governors Are Showing What Happens When You Campaign on Climate Action and Win*, Vox, Feb. 5, 2019, <https://www.vox.com/energy-and-environment/2019/1/31/18204898/climate-change-policy-governors-oregon-colorado>.

7. John Schwartz, *"A Conservative Climate Solution": Republican Group Calls for Carbon Tax*, N.Y. TIMES, Feb. 7, 2017, <https://www.nytimes.com/2017/02/07/science/a-conservative-climate-solution-republican-group-calls-for-carbon-tax.html>.

8. James Osborne, *Are Republicans Wavering on Climate Change*, HOUSTON CHRON., Feb. 22, 2019, <https://www.houstonchronicle.com/business/energy/article/Are-Republicans-wavering-on-climate-change-13635463.php>. An op-ed from three prominent House members, Reps. Fred Upton (R-Mich.), Greg Walden (R-Or.), and John Shimkus (R-Ill.), reflects this willingness to accept the need to address climate change but also underscores how Republican solutions differ from those of Democrats. Greg

1. IPCC, GLOBAL WARMING OF 1.5°C (Valérie Masson-Delmotte et al. eds., 2018), available at <https://www.ipcc.ch/sr15/>.

2. U.S. GLOBAL CHANGE RESEARCH PROGRAM, CLIMATE SCIENCE SPECIAL REPORT: FOURTH NATIONAL CLIMATE ASSESSMENT, VOLUME 1 (D.J. Wuebbles et al. eds., 2017), available at <https://science2017.globalchange.gov/>.

On Capitol Hill, several House committees are conducting hearings on climate science and policy, and Speaker Nancy Pelosi (D-Cal.) has created the Select Committee on the Climate Crisis.⁹ Early attention has focused on the Green New Deal (GND), a call to action for a massive government program to achieve zero net greenhouse gas (GHG) emissions in 10 years.¹⁰ The brainchild of new House member Alexandria Ocasio-Cortez (D-N.Y.) and grassroots groups, the GND created a media sensation, winning the endorsement of most of the aspirants for the Democratic presidential nomination¹¹ while being derided by President Trump and his followers in the House and U.S. Senate as a reckless “socialist” manifesto that would cripple the economy.¹²

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- Walden et al., *Republicans Have Better Solutions to Climate Change*, REALCLEARPOLY, Feb. 13, 2019, https://www.realclearpolicy.com/articles/2019/02/13/republicans_have_better_solutions_to_climate_change_111045.html. In the U.S. Senate, Lisa Murkowski (R-Ark.) and Joe Manchin (D-W. Va.), the chair and ranking member of the Committee on Energy and Natural Resources, published an op-ed accepting the reality of climate change and underscoring its consequences and calling for an “energy innovation” agenda to address the issue. Lisa Murkowski & Joe Manchin, *It’s Time to Act on Climate Change—Responsibly*, WASH. POST, Mar. 8, 2019, https://www.washingtonpost.com/opinions/lisa-murkowski-and-joe-manchin-its-time-to-act-on-climate-change--responsibly/2019/03/08/c4025f2-41d1-11e9-922c-64d6b7840b82_story.html?utm_term=.28bf083b1fb. Similarly, Sen. Lamar Alexander (R-Tenn.), also acknowledging the climate challenge, has proposed a “Manhattan Project” for clean energy development that would double federal research and development (R&D) spending. Emily Kopp, *Republican Proposes Green “Manhattan Project” in Lieu of Green New Deal*, Mar. 27, 2019, ROLL CALL, <https://www.rollcall.com/news/congress/republican-proposes-green-manhattan-project-in-lieu-of-green-new-deal>.
9. Anthony Adragna & Sarah Ferris, *Pelosi Announces Dems for New Climate Panel*, POLITICO, Feb. 7, 2019, <https://www.politico.com/story/2019/02/07/pelosi-climate-change-panel-1154847>. The Committee has announced that it will be conducting a series of hearings on climate change around the country and issuing a report outlining policy recommendations but will not be developing legislation. Mark K. Matthews, *New Climate Committee to Take Its Show on the Road*, CLIMATEWIRE, Mar. 29, 2019, <https://www.eenews.net/climatewire/stories/1060133291>; Nick Sobczak, *New Carbon Bill Emerges as Select Committee Convenes*, Mar. 28, 2019, GREENWIRE, <https://www.eenews.net/greenwire/stories/1060132647>.
 10. H.R. Res. 109, 116th Cong. (2019), <https://www.congress.gov/bill/116th-congress/house-resolution/109/text>.
 11. Jason Lemon, *Nearly Every Declared Democratic 2020 Candidate Supports Ocasio-Cortez’s “Green New Deal” While Trump Mocks the Proposal*, NEWSWEEK, Feb. 10, 2019, <https://www.newsweek.com/democratic-2020-candidates-support-ocasio-cortez-green-new-deal-1325775>. However, one candidate, former Colorado Gov. John Hickenlooper, criticized the GND’s “unachievable goals” and said it “sets us up for failure.” John Hickenlooper, *The Green New Deal Sets Us Up for Failure. We Need a Better Approach.*, WASH. POST, Mar 29, 2019, https://www.washingtonpost.com/opinions/2019/03/26/john-hickenlooper-green-new-deal-sets-us-up-failure-we-need-better-approach/?utm_term=.aced806956fb.
 12. Joel B. Pollak, *Donald Trump Mocks Democrats’ Embrace of “Green New Deal”: “Brilliant!”*, BREITBART, Feb. 9, 2019, <https://www.breitbart.com/politics/2019/02/09/donald-trump-mocks-democrats-embrace-of-green-new-deal-brilliant/>. In an effort to use the GND to paint Democrats into a corner, Senate Majority Leader Mitch McConnell (R-Ky.) called for a vote on the GND resolution, which was then defeated 57-0, with most Democrats voting “present” to protest the partisan motivation of the Republican leadership. Dino Grandoni & Felicia, *Senate Defeats Green New Deal, as Democrats Call Vote a “Sham,”* WASH. POST, Mar. 26, 2019, https://www.washingtonpost.com/powerpost/green-new-deal-on-track-to-senate-defeat-as-democrats-call-vote-a-sham/2019/03/26/834f3e5e-4fdd-11e9-a3f7-78b7525a8d5f_story.html?utm_term=.437441cf5708.

Despite the burst of activity, prospects for immediate action at the national level are remote. Even as mainstream Democrats cheered the GND, they hinted that it was largely an aspirational messaging vehicle rather than a practical policy blueprint.¹³ With a president who has persistently questioned climate change and a conservative majority in the Senate, the next two years are likely to produce little or no major climate legislation. As experienced Democratic lawmakers understand, the heightened activity in the House is mainly about building a base of public support for climate action and road-testing ideas and options to see which ones should shape the party platform heading into the 2020 election and beyond. If the Democrats win the White House, they will need to be ready with a fully developed and actionable climate policy agenda; building this agenda will take time and must begin now.

Compared to 2008, the policy landscape on climate change is very fluid. Comprehensive cap-and-trade legislation was the defining policy construct when President Barack Obama took office, but there has been much water under the bridge since then. After the Waxman-Markey bill to establish a national cap-and-trade program faltered,¹⁴ the Obama Administration turned to executive action under existing law. The results were promising in some areas but disappointing in others; nearly all the Obama initiatives have now been jettisoned by the Trump Administration. With a policy void at the federal level, progressive states have seized the mantle of climate leadership, but they have not moved in lockstep and their ideas may not be readily transferable to the national scene. The GND throws yet another wild card into the mix with its emphasis on large-scale government mobilization of resources to address the combined challenge of climate change and social and economic injustice.

In this dynamic environment, no single policy paradigm is now dominant. There are differing and potentially conflicting views on a set of core issues, including how ambitious our emission reduction goals should be, the role of carbon pricing and how to implement it, the

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13. For example, Sen. Amy Klobuchar (D-Minn.) described the GND as aspirational and cautioned that implementing its ambitions in legislation would be another matter, noting that “we may not have agreements on exactly how it will work and when we can get it done [a]nd . . . this is a discussion that we must have as a country.” Mark K. Matthews & Adam Aton, *“Green New Deal” Is Shrinking, and It Mystifies Activists*, CLIMATEWIRE, Feb. 21, 2019, <https://www.eenews.net/climatewire/2019/02/21/stories/1060121671>. Speaker Pelosi has also downplayed the prospect of near-term action on the GND, saying, “I salute the enthusiasm, but I can’t say we are going to take that and pass that because we have to go through the checks and balances of it with our committee chairs.” George Cahlink, *Pelosi “Can’t Say” Congress Will Pass “Green New Deal,”* E&E News PM, Feb. 27, 2019, <https://www.eenews.net/eenewspm/2019/02/27/stories/1060122589>.
 14. Formally known as the American Clean Energy and Security Act of 2009, Waxman-Markey narrowly cleared the House on June 26, 2009, by a vote of 219-212. H.R. 2454, 111th Cong. (2009), <https://www.congress.gov/bill/111th-congress/house-bill/2454>. However, it was never brought to the floor of the Senate for debate or a vote.

future of fossil fuels and nuclear power, the appropriate level of government intervention in the economy, the relationship between climate change and social justice and income inequality, and whether the best path for future progress is legislation, action under existing law, or some combination of the two. This competition of ideas is healthy, but it may sow divisions among progressives and moderates that complicate building consensus around a new climate policy framework.

A. Is Past Prologue?

As politicians and policymakers re-engage and different ideas vie for top billing, we need to be clear-eyed about the obstacles to success. Few issues have been more intractable and challenging for our political system than climate. Despite decades of debate, no set of policies has proven durable at the national level. Understanding the long and difficult history of U.S. climate policy and our many false starts and failures is critical to preparing for the next set of challenges. Battle-hardened veterans of previous struggles understand the fault lines and pitfalls in advancing the climate agenda. However, idealistic newcomers may not, and could unwittingly torpedo their own efforts. In the euphoria of the moment, it is easy to forget that the sharp reversal of progress during the Trump years is not an aberration but yet another example of the pendulum swings that have always marked U.S. climate policy.

It is tempting to attribute past failures to partisanship, denial of climate science, and the undue political influence of the fossil fuel lobby. These have all been factors, but the realities have been more complex. The climate agenda has wrestled with serious policy differences between the left and right, reflecting understandable if not always well-founded reservations about how and at what speed to decarbonize the U.S. economy. Moderates have often been caught in the middle, looking for solutions but nervous about veering too far to the left and alienating middle-of-the-road voters. At the center of the debate have been concerns about hikes in energy costs that negatively affect economic growth, jobs, and the cost of living; fear of an expansive federal bureaucracy; opposition to the government picking “winners” and “losers” among energy technologies; and anxiety that we will weaken our competitive position if the United States commits to ambitious climate goals but our major trading partners do not.

It would be a serious mistake for policymakers to ignore these concerns as they roll out new proposals. Based on advances in technology and our success in reducing emissions, there is now a stronger basis than before to argue that we can address climate change without severe economic disruption. But the strength of this case depends on whether the policies we seek to adopt are economically responsible and realistic. Proposals like the GND that are perceived as extreme, costly, and unworkable will be vulnerable to strident criticism from the right that drives away

moderate voters and may ultimately founder, much like the Waxman-Markey bill in 2009.

B. How Quickly Can We Reduce Emissions?

How quickly we can decarbonize turns on an understanding of the current U.S. GHG emission profile and the mix of opportunities and obstacles across major sectors of the economy. The good news is that technological advances have begun to reduce the U.S. carbon footprint and laid the groundwork for deeper reductions. At the same time, progress has been uneven. The greatest reductions have occurred in the electric power sector where coal plants have retired in large numbers. Emission reductions in the transportation sector have been modest and this sector now accounts for the largest share of U.S. GHG emissions. Limited progress has been made in the manufacturing, residential and commercial building, oil and gas, and agricultural sectors.

Despite the gains of renewables and the growing market share of electric vehicles (EVs), the United States is still heavily dependent on fossil fuels for electric power, transportation, and manufacturing. Largely due to the movement away from coal in the power sector, net U.S. GHG emissions in 2017 were 12.7% below 2005 levels.¹⁵ However, as a result of the strong economy, energy consumption spiked upward and emissions increased by 3.4% in 2018.¹⁶ Projections show that, under current trends, the United States will fall far short of its commitment under the Paris Agreement to a 26%-28% reduction in emissions from 2005 levels by 2025.¹⁷

C. Principles for a New Policy Framework

The current rate of emission reduction in the U.S. is clearly unacceptable if we have any hope of moderating the rise in global temperatures and avoiding the most severe impacts of climate change. The Republican approach of boosting innovation through increased funding of clean energy research and development (R&D) will not alone deliver emission reductions sufficient to significantly slow the rate of warming. Inescapably, these reductions will require strong policy drivers that go beyond the initiatives of the Obama years and include action by Congress, coupled with more forceful implementation of laws now in place.

15. U.S. EPA, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990-2017 (2019) (EPA 430-P-19-001), available at <https://www.epa.gov/sites/production/files/2019-02/documents/us-ghg-inventory-2019-main-text.pdf> [hereinafter EPA GHG INVENTORY].

16. *Preliminary U.S. Emissions Estimates for 2018*, RHODIUM GROUP, Jan. 8, 2019, <https://rhg.com/research/preliminary-us-emissions-estimates-for-2018/>. A more recent report from the International Energy Agency (IEA) concluded that U.S. energy-related carbon dioxide (CO₂) emissions increased by 3.1% in 2018. IEA, *Global Energy & CO₂ Status Report: The Latest Trends in Energy and Emissions in 2018* (2018), <https://www.iea.org/geco/> [hereinafter Global Energy & CO₂ Status Report].

17. *Id.*; see also John Larsen et al., *Taking Stock 2018*, RHODIUM GROUP, June 28, 2018, <https://rhg.com/research/taking-stock-2018/>.

Building a broad base of political support for this new policy framework will be a daunting task given long-standing divisions on climate policy and the protracted history of stalemate and inaction. Democrats will need to lead the way but draw in independent voters and some Republicans. The most sustainable approach will be one that pushes the envelope on emission reduction while shielding U.S. consumers and businesses from harmful impacts and providing for an orderly transition to clean technology at a pace that the economy can accommodate without disruption.

What guiding principles should we use to construct this new policy framework? Here are some points of departure that are fleshed out into specific policy proposals later in this Comment:

- ***Set ambitious but realistic goals based on sound economics and a feasible technology path***

Given our heavy current reliance on fossil fuels and the realistic pace at which clean technologies can be deployed, a prudent but still forward-leaning approach would be to reaffirm the Paris goal of a 26%-28% emission reduction but extend the implementation date to 2030. With a strong set of policies in place to drive reductions beyond 2030, the 2040 target could reasonably be set at 45% below 2005 levels, and a 70% reduction could be the goal for 2050.

- ***Use a mix of tools, tailoring them to different parts of the economy, and deploy them in combination to maximize positive outcomes***

While strong emission reduction goals and deadlines are essential, we should be wary of embracing a single strategy to achieve them. The complexity of the economy as well as political realities call for multiple, targeted approaches. While economywide reductions are essential, each of our emitting sectors is unique and poses distinct challenges.

- ***Focus primarily on promoting private-sector investment and innovation and not large-scale government funding of green industries***

A climate agenda heavy on large-scale government expenditures and skeptical of private-sector innovation and investment will be portrayed as fiscally irresponsible, inefficient, and wasteful. Government can best add value by accelerating advances in technology and enhancing the flow of capital to finance deployment of clean technologies at scale. Tax credits, carbon pricing mechanisms, and emission caps are all demonstrated tools for motivating private-sector innovation and investment.

- ***Use targeted government funding and financing tools where market-based incentives and regulation are ineffective***

At the same time, direct government intervention is warranted to address GHG emission sources that have historically failed to attract private-sector funding and are not amenable to carbon pricing mechanisms or direct reg-

ulation. Energy efficiency, construction of transmission lines and EV charging infrastructure, GHG-reducing agricultural practices, CCS demonstration projects, and pre-commercial R&D are all worthy areas for increased direct government funding, low-interest loans, and/or loan guarantees.

- ***Balance new authorities with action under existing laws where they are effective in reducing emissions***

A new administration should pursue executive action where the legal rationale is sound and the payoff is high, but look to legislative solutions in areas of high legal uncertainty and questionable feasibility. Experience implementing the Clean Air Act (CAA)¹⁸ during the Obama and Trump years casts doubt on its legal viability in reducing emissions in the electric power and manufacturing sectors; these sectors are best addressed legislatively. However, the CAA provides a sound legal basis for regulating vehicle GHG emissions, and should likewise be sufficient to achieve greater methane emission reductions from landfills and the oil and gas sector.

- ***Through cap-and-trade legislation, use carbon pricing to accelerate emission reductions in the electric power and manufacturing sectors***

Congress should establish an integrated national cap-and-trade program for electric power production and manufacturing sectors with significant GHG emissions. The cap for power-sector emissions should achieve a 45% reduction from 2005 levels by 2030 (well above the Clean Power Plan (CPP) target of 32%). Manufacturing emissions cannot decline as quickly, and a more modest reduction of 15% below 2005 levels by 2030 may be an appropriate target.

- ***Recognize that not all states and regions can move at the same speed, and devise a national framework that allows for differential rates of progress***

States and regions that have already reduced emissions and have strong climate policies will be better-positioned to meet national emission reduction targets than those with less capacity to decarbonize quickly and a steeper hill to climb because of their heavy reliance on fossil fuels and carbon-intensive manufacturing. Policies that moderate regional impacts and avoid perceived inequities will help win the support of elected politicians who might otherwise oppose climate policies they view as harmful to their constituents.

Table I below provides a roadmap of the legislative and administrative actions that would best implement these principles.

18. 42 U.S.C. §§7401-7671q. ELR STAT. CAA §§101-618.

Table I. NATIONAL GHG EMISSION REDUCTION GOALS

2030 – 26%-28% BELOW 2005 LEVELS
 2040 – 45% BELOW 2005 LEVELS
 2050 – 70% BELOW 2005 LEVELS

Economic Sector	Legislative Path	Action Under Existing Law
Electric Power	<ul style="list-style-type: none"> • National Cap-and-Trade Program: 45% reduction from 2005 levels by 2030 60% reduction from 2005 levels by 2040 90% reduction from 2005 levels by 2050 Allowances auctioned Trading allowed with manufacturing sector through integrated program • Continuation of federal tax credits for renewables • Continuation of tax credits and loan guarantees for carbon capture and storage (CCS) • Federal funding for transmission corridors 	
Manufacturing	<ul style="list-style-type: none"> • National Cap-and-Trade Program: 15% reduction from 2005 levels by 2030 30% reduction from 2005 levels by 2040 Allowances distributed free (no auction) Trading allowed with power sector through integrated program • Tax credits for investments in low-GHG technologies and processes • Border tariff adjustments for trade-sensitive industries 	

Table I. NATIONAL GHG EMISSION REDUCTION GOALS

2030 – 26%-28% BELOW 2005 LEVELS
 2040 – 45% BELOW 2005 LEVELS
 2050 – 70% BELOW 2005 LEVELS

Economic Sector	Legislative Path	Action Under Existing Law
<i>Residential/ Commercial Buildings</i>	<ul style="list-style-type: none"> • National efficiency standard for new construction • State block grants for building weatherization • Tax credits/low-interest loans for efficiency improvements, including conversion to electric heating and cooking • Rebates for purchases of new high-efficiency appliances • Low-interest loans for reducing gas leaks from buildings and distribution lines 	<ul style="list-style-type: none"> • Ramp up DOE review and tightening of appliance efficiency standards • Strengthen Energy Star product labeling programs
<i>Transportation</i>	<ul style="list-style-type: none"> • Expanded tax credits for zero emission vehicles (ZEVs) by eliminating manufacturer limit • Federal funding for build-out of vehicle charging infrastructure 	<ul style="list-style-type: none"> • Reinstate and strengthen Obama GHG emission and Corporate Average Fuel Economy (CAFE) Standards for light-duty vehicles under the Clean Air Act (CAA): Mandate progressive increases in stringency through 2035 Expand emission credits for ZEVs Reaffirm California waiver • Strengthen Obama GHG emission and CAFE standards for heavy-duty vehicles under the CAA • Strengthen emission standards for new and existing aircraft under the CAA
<i>HFCs</i>	<ul style="list-style-type: none"> • Senate ratification of Kigali Agreement amending Montreal Protocol to phase out hydrofluorocarbons globally • Amendments to the CAA to authorize U.S. implementation of Kigali commitments 	

Table I. NATIONAL GHG EMISSION REDUCTION GOALS

2030 – 26%-28% BELOW 2005 LEVELS
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Economic Sector	Legislative Path	Action Under Existing Law
<i>Landfills</i>		Strengthen methane emission standards under the CAA
<i>Oil and Gas Production</i>		Target 45% methane emission reduction by 2030 Reinstate and strengthen Obama methane emission standards for new and modified oil and gas wells and gathering and processing units under the CAA Promulgate emission standards for existing wells and related operations under the CAA Regulate methane leaks from oil and gas pipelines
<i>Agriculture</i>	New U.S. Department of Agriculture programs to provide loans, subsidies, and technical assistance to reduce methane and nitrous oxide emissions by encouraging more sustainable farming practices and technology	
<i>Pre-Commercial R&D</i>	Expand funding for R&D programs for breakthrough technologies for energy storage, batteries, methane leak detection and repair, CCS, and carbon sequestration	

II. Looking Back: Three Decades of False Starts

Climate change has been a national concern since the 1950s, when scientists, government officials, and members of Congress began to warn of the buildup of GHGs in the atmosphere and its potentially catastrophic consequences.¹⁹ However, policymakers have always been half-hearted and indecisive in responding to the threat. At critical points, the executive branch and Congress have wavered in their backing for domestic emission reduction policies and walked away from international commitments.

A. Bush and Clinton

George H.W. Bush proclaimed his resolve to fight climate change during the 1988 presidential campaign.²⁰ But at the Rio Summit in 1991, he refused to agree to freeze emissions at 1990 levels and nearly balked at signing the United Nations Framework Convention on Climate Change (UNFCCC), a performance that brought him condemnation from U.S. allies and almost resulted in the resignation of his EPA Administrator, William Reilly.²¹ The Clinton Administration played a leading role in the negotiation of the 1997 Kyoto Protocol,²² but the Senate overwhelmingly opposed ratification and Clinton never submitted it for a vote.²³ Despite the U.S. failure to participate, Kyoto entered into force with 192 signatories.²⁴ With the U.S. lacking any obligations under Kyoto, Clinton pursued a weak and voluntary climate action plan²⁵ and U.S. emissions rose by nearly 15% during his eight years in office.²⁶

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- 19. Waldemar Kaempffert, *Science in Review: Warmer Climate on Earth May Be Due to More Carbon Dioxide in the Air*, N.Y. TIMES, Oct. 28, 1956, <http://www.nytimes.com/packages/pdf/weekinreview/warm1956.pdf>; Benjamin Hulac, "Goodbye Washington," *Trial Records Paint "Chilling" Picture*, CLIMATEWIRE, Oct. 26, 2018, https://www.eenews.net/special_reports/juliana_v_us/stories/1060104453.
 - 20. *The White House and the Greenhouse*, N.Y. TIMES, May 9, 1989, <https://www.nytimes.com/1989/05/09/opinion/the-white-house-and-the-greenhouse.html>.
 - 21. Michael Wines, *The Earth Summit Bush and Rio; President Has an Uncomfortable New Role in Taking Hard Line at the Earth Summit*, N.Y. TIMES, June 11, 1992, <https://www.nytimes.com/1992/06/11/world/earth-summitbush-rio-president-has-uncomfortable-new-role-taking-hard-line-earth.html>.
 - 22. Bård Amundsen & Else Lie, *Why the Kyoto Agreement Failed*, RES. COUNCIL NORWAY, Dec. 15, 2010, https://www.forskningsradet.no/en/Newsarticle/Why_the_Kyoto_agreement_failed/1253963392536.
 - 23. S. Res. 98, 105th Cong. (1997), <https://nationalcenter.org/KyotoSenate.html>.
 - 24. UNFCCC, *The Kyoto Protocol—Status of Ratification*, <https://unfccc.int/process/the-kyoto-protocol/status-of-ratification> (last visited Mar. 22, 2019).
 - 25. Amy Royden, *U.S. Climate Change Policy Under President Clinton: A Look Back*, 32 GOLDEN GATE U. L. REV. 415 (2002), available at <https://digitalcommons.law.ggu.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1842&context=gkulrev>.
 - 26. GHG INVENTORY, *supra* note 15.

B. The Second Bush Presidency

George W. Bush reaffirmed the U.S. rejection of the Kyoto Protocol,²⁷ but then faced growing pressure to address climate change as authoritative IPCC reports backed by the U.S. scientific establishment solidified the linkage between fossil fuel consumption, rising GHG emissions, and increases in global temperatures.²⁸ Bush initially disputed but ultimately accepted these scientific findings.²⁹ Nonetheless, he steadfastly resisted mandatory emission controls and instituted a set of nonregulatory programs emphasizing low-carbon technology, reducing carbon intensity, and voluntary reporting of emission reductions.³⁰ Meanwhile, however, bipartisan support for cap-and-trade legislation began to build under the leadership of Sens. John McCain (R-Ariz.) and Joe Lieberman (D-Conn.),³¹ and California passed landmark legislation in 2006 establishing a statewide emission target and authorizing the use of cap-and-trade and vehicle emission limits to achieve the required reductions.³²

C. Progress Under Obama

President Obama and the congressional leadership initially tried to capture this momentum following the 2008 election. Building on earlier legislative proposals, the House Waxman-Markey bill sought to establish an economywide cap-and-trade program, premised on the successful use of emission trading for conventional pollutants under the CAA³³ and the long history of Republican support for market-based regulation.³⁴ But Congress split along

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- 27. Letter from President George W. Bush, to Senators Hagel, Helms, Craig, and Roberts (Mar. 13, 2001), <https://georgewbush-whitehouse.archives.gov/news/releases/2001/03/20010314.html>.
 - 28. IPCC, CLIMATE CHANGE 2001: SYNTHESIS REPORT. A CONTRIBUTION OF WORKING GROUPS I, II, AND III TO THE THIRD ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (R.T. Watson et al. eds., Cambridge Univ. Press 2001), available at https://www.ipcc.ch/site/assets/uploads/2018/05/SYR_TAR_full_report.pdf; NATIONAL RESEARCH COUNCIL, CLIMATE CHANGE SCIENCE: AN ANALYSIS OF SOME KEY QUESTIONS (2001), available at <https://www.nap.edu/read/10139/chapter/1>.
 - 29. By 2005, Bush was acknowledging that "[i]t's now recognized that the surface of the earth is warmer, and that an increase in greenhouse gases caused by humans is contributing to the problem." Luke Burbank, *Bush Views Shift on Climate Change*, NAT'L PUB. RADIO, Feb. 1, 2007, <https://www.npr.org/templates/story/story.php?storyId=7115660>.
 - 30. Armin Rosencranz, *U.S. Climate Change Policy Under G. W. Bush*, 32 GOLDEN GATE U. L. REV. 479 (2002), available at <https://digitalcommons.law.ggu.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1843&context=gkulrev>.
 - 31. Marianne Lavelle, *John McCain's Climate Change Legacy*, INSIDECLIMATE NEWS, Aug. 26, 2018, <https://insideclimatenews.org/news/26082018/john-mccain-climate-change-leadership-senate-cap-trade-bipartisan-liberman-republican-campaign>.
 - 32. California Air Resources Board, *Assembly Bill 32 Overview*, <https://www.arb.ca.gov/cc/ab32/ab32.htm> (last reviewed Aug. 5, 2014).
 - 33. Dallas Burtraw et al., *Economics of Pollution Trading for SO₂ and NO_x*, 30 ANN. REV. ENVT' & RESOURCES 253 (2005), available at https://www.researchgate.net/publication/24122848_Economics_of_Pollution_Trading_for_SO2_and_NOx.
 - 34. The George H.W. Bush White House strongly supported the national emissions trading program for sulfur dioxide (SO₂) in Title IV of the 1990 CAA amendments. Richard Conniff, *The Political History of Cap and Trade*, SMITHSONIAN MAG., Aug. 2009, <https://www.smithsonianmag.com/science-nature/the-political-history-of-cap-and-trade-3471121/>. The George

party lines and Waxman-Markey narrowly passed the House with limited Republican support.³⁵ Efforts to build a bipartisan coalition in the Senate then failed as party divisions hardened over health care, stimulus legislation, the auto industry bailout, and other Obama initiatives.³⁶

After abandoning congressional action, Obama turned to existing authorities to address climate change. Previous presidents had steered clear of using environmental laws on the books to reduce GHG emissions, but a unique opportunity was created by the U.S. Supreme Court's 2007 *Massachusetts v. Environmental Protection Agency* decision affirming EPA's authority to regulate GHGs under the CAA.³⁷ EPA seized this opportunity by issuing a comprehensive analysis of the science that determined that GHG emissions "endanger the public health and welfare," a precondition for invoking CAA authorities.³⁸

Leveraging this endangerment finding, the Agency then adopted standards in 2010 and 2012 progressively lowering GHG emission limits and increasing the fuel efficiency of light-duty vehicles.³⁹ These regulations received the support of the auto industry when promulgated and fared well in the courts.⁴⁰ Under the road map they established, fuel economy was projected to improve to a fleet average of 54.5 miles per gallon by 2025, preventing cumulative carbon dioxide (CO₂) emissions of six billion tons and spurring long-overdue innovation in engine technology.

Obama's next big initiative was the 2015 Clean Power Plan (CPP), an ingenious and ambitious but controversial rule under §111(d) of the CAA to reduce emissions from existing power plants.⁴¹ Although its emission reduction goals were realistic and indeed will likely be achieved without the CPP,⁴² political opposition was greater than to the car rules and the legal case against the CPP was on a stronger footing. Conservatives argued that the CPP strayed beyond EPA's regulatory authority by dictating a shift to lower-emitting fuels for power generation, thereby encroaching on the "energy policy" prerogatives of Congress and the states.⁴³ The Supreme Court stayed the CPP by a

5-4 vote on February 9, 2016, and implementation was put on hold.⁴⁴

Obama was also able to untie the Gordian knot that had blocked the United States from participating in international climate agreements. The United States could not commit to a treaty imposing enforceable targets and timetables for emission reduction without Senate ratification, but achieving the necessary two-thirds majority was a high hurdle, as the Kyoto experience confirmed. Obama helped to engineer a shift from the Kyoto model of top-down targets and timetables to a looser framework of reciprocal but unilateral commitments that were not binding under international law. This enabled the president to sign the 2015 Paris Agreement using his executive authority without submitting it for Senate ratification.⁴⁵

In the run-up to the Paris Conference of Parties (COP), President Obama announced a goal of reducing U.S. emissions by 26%-28% below 2005 levels by 2025. This goal then became the basis for the nonbinding U.S. commitment under the Paris Agreement.⁴⁶ U.S. ambition and leadership won international praise during the COP and helped to foster collaboration on climate change between China and the United States, the world's largest GHG emitters.⁴⁷

D. Trump Rollbacks

In a sharp swing of the pendulum, however, the progress achieved under President Obama was reversed by his successor, effectively turning the clock back to 2008. President Trump has been openly contemptuous of climate change, disparaging it as a "hoax" invented by our economic competitors,⁴⁸ and has unabashedly promoted the revival of coal and expanded production of oil and gas.⁴⁹ His EPA is in the process of greatly weakening the Obama fuel economy targets and emission limits for light-

W. Bush EPA expanded trading programs for SO₂ and nitrogen oxide (NO_x) developed in the Clinton Administration and proposed a trading program for mercury. Unfortunately, these efforts did not translate into Republican support for GHG emissions trading under Waxman-Markey.

³⁵ See *supra* note 14.

³⁶ Ryan Lizza, *As the World Burns*, NEW YORKER, Oct. 11, 2010, available at <https://www.newyorker.com/magazine/2010/10/11/as-the-world-burns>.

³⁷ 549 U.S. 497, 37 ELR 20075 (2007).

³⁸ 74 Fed. Reg. 66496 (Dec. 15, 2009).

³⁹ 75 Fed. Reg. 25324 (May 7, 2010) (covering model years (MY) 2012-2016); 77 Fed. Reg. 62624 (Oct. 15, 2012) (covering MY 2017-2025).

⁴⁰ Coalition for Responsible Regulation, Inc. v. Environmental Prot. Agency, 684 F.3d 102, 42 ELR 20141 (D.C. Cir. 2012).

⁴¹ 80 Fed. Reg. 64662 (Oct. 23, 2015).

⁴² Seth Whitehead, *Analysis: U.S. Has Already Met 2025 GHG Reduction Target Thanks to Natural Gas*, ENERGY DEPTH CLIMATE, Feb. 26, 2018, <https://eidlimate.org/analysis-u-s-already-met-2025-ghg-reduction-target-thanks-natural-gas/>.

⁴³ Marlo Lewis, *States Should Just Say "No"—10 Reasons EPA's Clean Power Plan Is Unlawful*, GLOBALWARMING.ORG, Feb. 12, 2015, <http://www.globalwarming.org/2015/02/12/states-should-just-say-no-10-reasons-epas-clean-power-plan-is-unlawful/>.

⁴⁴ *West Virginia v. Environmental Prot. Agency*, 577 U.S. ___ (2016), <https://www.scotusblog.com/wp-content/uploads/2016/02/15A773-Clean-Power-Plan-stay-order.pdf>.

⁴⁵ The evolution and implications of this new framework are described in Bob Sussman, *The U.S. Finds Its Voice on Climate Change After Two Decades of Failed Diplomacy*, BROOKINGS, Nov. 24, 2015, <https://www.brookings.edu/blog/planetpolicy/2015/11/24/the-u-s-finds-its-voice-on-climate-change-after-two-decades-of-failed-diplomacy/>.

⁴⁶ Fact Sheet, The White House, U.S. Reports Its 2025 Emissions Target to the UNFCCC (Mar. 31, 2015), <https://obamawhitehouse.archives.gov/the-press-office/2015/03/31/fact-sheet-us-reports-its-2025-emissions-target-unfccc>.

⁴⁷ Joshua P. Meltzer, *U.S.-China Joint Presidential Statement on Climate Change: The Road to Paris and Beyond*, BROOKINGS, Sept. 29, 2015, <https://www.brookings.edu/blog/planetpolicy/2015/09/29/u-s-china-joint-presidential-statement-on-climate-change-the-road-to-paris-and-beyond/>.

⁴⁸ Louis Jacobson, *Yes, Donald Trump Did Call Climate Change a Chinese Hoax*, POLITICO, June 3, 2016, <https://www.politifact.com/truth-o-meter/statements/2016/jun/03/hillary-clinton/yes-donald-trump-did-call-climate-change-chinese-h/>.

⁴⁹ Ashley Parker & Coral Davenport, *Donald Trump's Energy Plan: More Fossil Fuels and Fewer Rules*, N.Y. TIMES, May 26, 2016, <https://www.nytimes.com/2016/05/27/us/politics/donald-trump-global-warming-energy-policy.html>.

duty vehicles while blocking California and other states from maintaining more stringent standards.⁵⁰

The President has urged the elimination of tax credits for EVs and warned the industry against investing too heavily in vehicle electrification.⁵¹ A skeptic of wind and solar, he has directed EPA to withdraw the CPP,⁵² and the Agency is now replacing it with a narrow rule requiring coal plants to operate more efficiently.⁵³ He has also regularly heaped scorn on the Paris Agreement, denouncing it as a “bad deal” for the United States and pulling the plug on United States participation on June 1, 2017.⁵⁴

While extreme and ill-conceived, the Trump rollbacks illustrate the chronic volatility and instability of U.S. climate policy. President Obama was resourceful in his efforts to maneuver around a gridlocked Congress and drive progress domestically and internationally using his executive authority. Yet his accomplishments proved short-lived and reversible, demonstrating the fragility of executive branch action that is not backstopped by a durable political consensus.

III. Obstacles to Durable Consensus-Based Climate Policies

What explains the decades-long failure of the U.S. political system to chart a responsible and sustainable course on climate change? Our politicians have successfully created long-lasting programs for Social Security and Medicare. Why not for climate change?

The climate debate has had more than its share of partisanship, grandstanding, and maneuvering for electoral advantage. The long campaign to discredit climate science in the face of strong and increasingly powerful evidence has been an unfortunate diversionary tactic, deployed most recently by President Trump and his senior officials.⁵⁵ Opponents of climate action have also

50. The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks, 83 Fed. Reg. 42986 (Aug. 24, 2018).
51. Umair Irfan, *Why U.S. Carmakers Are Betting on Electric Vehicles and SUVs at the Same Time*, Vox, Dec. 4, 2018, <https://www.vox.com/2018/12/4/18119858/trump-electric-vehicle-tax-credit-tariff-suv>.
52. Exec. Order No. 13783, 82 Fed. Reg. 16093 (Mar. 31, 2017), available at <https://www.whitehouse.gov/presidential-actions/presidential-executive-order-promoting-energy-independence-economic-growth/>. EPA followed up on this directive and proposed to withdraw the CPP on October 16, 2017. 82 Fed. Reg. 48035 (Oct. 16, 2017).
53. 83 Fed. Reg. 44746 (Aug. 31, 2018).
54. Remarks Announcing United States Withdrawal From the United Nations Framework Convention on Climate Change Paris Agreement, DAILY COMP. PRES. DOC. 1 (June 1, 2017), <https://www.whitehouse.gov/briefings-statements/statement-president-trump-paris-climate-accord/>.
55. For example, the president and several other officials attacked the 2018 National Climate Assessment, a multiagency report on the economic impacts of climate change, as “radical,” “not based on facts,” and based on “worst-case” scenarios, reiterating criticisms of the recent IPCC report reaching similar conclusions. Miranda Green, *Trump Officials Attack Science in Dire Climate Change Report*, HILL, Nov. 29, 2018, <https://thehill.com/policy/energy-environment/418796-trump-officials-attack-science-in-dire-climate-change-report>. Reviving an idea floated unsuccessfully by former EPA Administrator Scott Pruitt, the White House also is in the process of convening a scientific panel led by a noted climate skeptic to conduct an “adversarial” critique of leading reports on climate science. Juliet Eilperin

caricatured proposals to reduce emissions, exaggerating their costs and raising the specter of government overreach in order to play on the fears of the public. The concerted Republican effort to demonize the GND, rather than offer constructive proposals of their own, is the latest example of this strategy.⁵⁶

But politics represent only part of the story. Even apart from climate denial, the climate agenda has wrestled with serious policy differences between the left and right, reflecting understandable if not always well-founded concerns and reservations about how and at what speed to decarbonize the U.S. economy. Examining these tensions is a necessary step in bridging gaps and broadening the base of public support for action.

A. Increased Energy Costs and Lower Economic Growth

Conservatives and some moderates have persistently warned of the danger of increasing energy prices through a precipitous transition away from fossil fuels and/or a system of taxes on “dirty” energy that are passed along to consumers. This concern was a principal reason why the Kyoto Protocol met with universal rejection in the Senate in 1997. The Byrd-Hagel Resolution, approved by a 95-0 margin, declared that “the Senate strongly believes that the [Protocol] . . . could result in serious harm to the United States economy, including significant job loss, trade disadvantages, increased energy and consumer costs, or any combination thereof.”⁵⁷

The same fears were at the core of the backlash against Waxman-Markey, a bill derided by its critics as “cap and tax.”⁵⁸ An analysis by an influential conservative think-tank concluded that implementation would result in gross domestic product (GDP) losses of \$9.4 trillion between 2012 and 2035, causing “higher electric bills and gasoline prices” that would “suppress economic activity and reduce employment, especially in the manufacturing sector.”⁵⁹ More recently, in 2018, voters in liberal Washington State

et al., *White House to Set Up Panel to Counter Climate Change Consensus, Officials Say*, WASH. POST, Feb. 24, 2019, https://www.washingtonpost.com/national/health-science/white-house-to-select-federal-scientists-to-reassess-government-climate-findings-sources-say/2019/02/24/49cd0a84-37dd-11e9-af5b-b51b7ff322e9_story.html.

56. Republicans pounced on a “talking points” memo inadvertently posted on the web that included replacing air travel with high-speed rail and called for far-reaching changes in the food supply. Sen. John Barrasso’s (R-Wyo.) comments were typical: “There’s another victim of the Green New Deal, it’s ice cream . . . Say goodbye to dairy, to beef, to family farms, to ranches.” Kelsey Tamborino, *Republicans Challenge Democrats on Green New Deal*, POLITICO, Feb. 13, 2019, <https://www.politico.com/newsletters/morning-energy/2019/02/13/republicans-challenge-democrats-on-green-new-deal-392889>. In fact, the actual GND resolution introduced in the House and Senate did not include these proposals.

57. See *supra* note 23.

58. John M. Broder, *“Cap and Trade” Loses Its Standing as Energy Policy of Choice*, N.Y. TIMES, Mar. 26, 2010, <https://www.nytimes.com/2010/03/26/science/earth/26climate.html>.

59. DAVID KREUTZER, HERITAGE FOUNDATION, *THE ECONOMIC IMPACT OF WAXMAN-MARKEY* (2009), available at <https://www.heritage.org/government-regulation/report/the-economic-impact-waxman-markey>.

decisively rejected a modest carbon tax of \$15 per ton, with carveouts for export-oriented manufacturers, after its opponents warned that the tax would be passed on to consumers in the form of higher costs for energy and products.⁶⁰ Republicans have resurrected fears of spiraling energy costs and reduced economic growth in their attacks on the GND.⁶¹

The counterargument is that GHG emission reductions lower the costs to society of climate change and these substantial cost savings should be weighed against the near-term economic impacts of policies to reduce emissions.⁶² The Obama Administration's "social cost of carbon" provided a powerful tool for monetizing the future "damages" of each ton of CO₂ emitted and calculating the "present value" of these damages on a dollar-per-ton basis.⁶³ (The Trump Administration has modified but not abandoned this methodology.) EPA used the social cost of carbon to great effect in the CPP, demonstrating billions of dollars in "climate benefits" from reducing power-sector emissions.⁶⁴

As the observable effects of climate change become more severe and the price tag for floods, violent storms, and wildfires mounts, the public may be more receptive to absorbing the costs of emission reduction in return for the benefits. Still, the economic case for emission reduction must be communicated in cogent and understandable terms, and even then, many Americans may view the consequences of climate change as too theoretical and remote to justify increases in energy costs that have immediate pocketbook impacts.

The most powerful rebuttal to concerns about the cost of addressing climate change is that, as technology advances, these costs will be small and manageable. This argument did not hold water at the time of the Kyoto Protocol, when there was no plausible cost-effective alternative to coal as a power plant fuel, or even at the time Waxman-Markey collapsed in 2010, when coal still remained dominant and EVs were in their infancy.⁶⁵ Thus, the prevailing wisdom

60. David Roberts, *Washington Votes No on a Carbon Tax—Again*, Vox, Nov. 6, 2018, <https://www.vox.com/energy-and-environment/2018/9/28/17899804/washington-1631-results-carbon-fee-green-new-deal>.

61. As Senator Barrasso framed the case:

Through heavy-handed federal mandates, the far left fringe is proposing a Washington takeover of our nation's energy system. Americans would inevitably see skyrocketing electric bills, with one estimate as high as \$3,800 per year. This would be a mandate on every homeowner, forcing every building to be overhauled. The American people simply cannot afford this...

Press Release, U.S. Senate Committee on Environment and Public Works, Barrasso: Green New Deal Is a Raw Deal (Feb. 7, 2019), <https://www.epw.senate.gov/public/index.cfm/2019/2/barrasso-green-new-deal-is-a-raw-deal>.

62. Universal Ecological Fund, *The Economic Case for Climate Action in the United States*, <https://feu-us.org/case-for-climate-action-us/> (last visited Mar. 22, 2019).

63. U.S. EPA, *The Social Cost of Carbon*, https://19january2017snapshot.epa.gov/climatechange/social-cost-carbon_.html (last updated Jan. 9, 2017).

64. U.S. EPA, REGULATORY IMPACT ANALYSIS FOR THE CLEAN POWER PLAN FINAL RULE (2015), https://www3.epa.gov/tmecas1/docs/ria/utilities_ria_final-clean-power-plan-existing-units_2015-08.pdf.

65. Coal accounted for 53% of total electricity production in 1997 (the year of the Kyoto Protocol) and 48% in 2008 (the year before introduction of Waxman-Markey). The current coal share is just under 30% and is expected to decline further. M.J. BRADLEY AND ASSOCIATES, LLC, *COAL-FIRED ELECTRICITY GENERATION IN THE UNITED STATES AND FUTURE OUTLOOK*

was that, since there was no way to slow the seemingly inexorable rise of emissions as GDP increased, emissions could only be reduced by shrinking economic output.

But the past decade has witnessed a dramatic shift away from coal as other generation technologies moved into the mainstream, electricity prices held steady,⁶⁶ and renewable energy jobs outpaced the loss of employment in the coal fields.⁶⁷ EVs have simultaneously demonstrated a level of performance comparable to conventional automobiles and shown staying power in the marketplace. This experience is a strong validation of climate policies that build on and accelerate changes in technology, but it also underscores that new technologies need time to mature and cannot be forced into the marketplace before they are ready for cost-effective deployment.

B. Bureaucratic Overreach

Another long-standing flashpoint has been fear of an expansive federal bureaucracy that smothers businesses with red tape and narrows consumer choice. These are not new issues in environmental policy. Intense opposition in the 1990s to vehicle inspection and maintenance programs under the CAA was a reaction to their bureaucratic intrusiveness and burdens on vehicle owners.⁶⁸ Wetlands permitting under the Clean Water Act (CWA) has similarly aroused the ire of landowners upset about infringement of their property rights.⁶⁹

In the climate arena, Waxman-Markey was criticized for its perceived complexity, intrusion into all sectors of the economy, and potential for governmental overreach.⁷⁰

66. (2017), <https://www.mjbradley.com/sites/default/files/MJBAcoalretirementissuebrief.pdf>.

67. U.S. electricity prices were stable after adjusting for inflation from 2008 to 2015, during which numerous coal plants closed. U.S. Energy Information Administration (EIA), *U.S. Average Residential Retail Electricity Price (2008-15)*, <https://www.eia.gov/todayinenergy/images/2015.03.16/main.png> (last visited Mar. 22, 2019).

68. Greg Kats, *How Many Jobs Does Clean Energy Create?*, GREENBIZ, Dec. 5, 2016, <https://www.greenbiz.com/article/how-many-jobs-does-clean-energy-create>.

69. Arnold W. Reitz Jr., *The CAA Motor Vehicle Inspection and Maintenance Program: Is It Cost Effective?*, 47 ELR 10877 (Oct. 2017), available at <https://dc.law.utah.edu/cgi/viewcontent.cgi?article=1058&context=scholarship>.

70. Nina Totenberg, *When Property Rights, Environmental Laws Collide*, NAT'L PUB. RADIO, Jan. 7, 2012, <https://www.npr.org/2012/01/07/144797552/when-property-rights-environmental-laws-collide>; 33 U.S.C. §§1251-1387, ELR STAT. FWPCA §§101-607.

71. Senator McCain, previously a cheerleader for climate legislation, panned Waxman-Markey as "an irresponsible, ill-conceived, and distorted version of a cap and trade system." Bill Chameides, *On the Climate Bill Fence: What Sen. McCain Is Thinking*, HUFFINGTON POST, Dec. 6, 2017, https://www.huffingtonpost.com/bill-chameides/on-the-climate-bill-fence_b_243933.html. He also said:

[The Waxman-Markey] 1,400-page bill is a farce. They bought every industry off—steel mills, agriculture, utilities. . . . I would not only not vote for it. I am opposed to it entirely, because it does damage to those of us who believe that we need to act in a rational fashion about climate change.

Robert Bradley, *McCain Echoes Hansen: Waxman-Markey Is a "Farce"* (*The Civil War Widens Among Climate Alarmists*), WATTS UP WITH THAT?, Aug. 3, 2009, <https://wattsupwiththat.com/2009/08/04/mccain-realization-the-waxman-markey-1400-page-bill-is-a-farce/>.

Even in California, concern about restricting consumer choice derailed Gov. Jerry Brown's proposal to reduce gasoline consumption by 50% by 2030.⁷¹ The GND has raised similar fears, with conservatives claiming (without much basis) that its proponents want to eliminate air travel and cows and radically change the food supply.⁷²

Opposition to "big government" approaches is not necessarily a sign of lack of concern about climate change or opposition to reducing emissions. Sen. Bill Cassidy (R-La.) called the GND a "nightmare" and said that "[i]t's going to raise utility rates and our taxes, eliminate jobs, and worsen global greenhouse gas emissions." However, at the same time, Senator Cassidy called for reducing GHG emissions, emphasizing that Louisiana is "the most impacted by rising sea levels," and "we need to have some sort of way to address it."⁷³

C. Picking Winners and Losers

Conservatives have also rallied around the free market mantra that the government should not be picking "winners" and "losers" among technologies but should allow all energy sources to compete on a neutral basis.⁷⁴ This is an appealing concept, but since some technologies are higher-emitting than others, an absolute level playing field is impossible. Ambitious emission reduction goals will necessarily disfavor high-carbon fuels and advantage lower-emitting energy sources. Thus, it was irresponsible to demonize President Obama for conducting a "war on coal" when his policies were not directed at banning coal per se but at reducing CO₂ emissions, a goal that necessarily required less burning of coal, the most carbon-intensive fuel source.⁷⁵

The Obama CPP was designed so that all fuel sources could be used to supply electricity, subject to overall limits on emissions. Administration officials touted this aspect of the CPP as evidence that it was technology-neutral.⁷⁶ Moving forward, the question for policymakers is whether we should try to accommodate all technologies as we reduce our carbon footprint or whether, now or in the future, only

71. Chris Megerian, *Gas Reduction Dropped From California Climate Change Bill*, L.A. TIMES, Sept. 9, 2015, <https://www.latimes.com/local/political/la-me-lngasoline-reduction-dropped-from-climate-change-bill-20150909-story.html>.

72. See *supra* note 56.

73. Geof Koss, *Natural Gas: Cassidy Sees Opening in "Green New Deal" Debate*, E&E DAILY, Feb. 15, 2019, <https://www.eenews.net/eedaily/2019/02/15/stories/1060121179>.

74. Michael Sandoval, *It's Time to Stop Picking Winners and Losers in the Energy Industry*, DAILY SIGNAL, Jan. 28, 2013, <https://www.dailysignal.com/2013/01/28/its-time-to-stop-picking-winners-and-losers-in-the-energy-industry/>.

75. Sterling Burnett, *Trump and the End of Obama's Bitter "War on Coal"*, HILL, Sept. 30, 2017, <https://thehill.com/opinion/energy-environment/353232-trump-and-the-end-of-obamas-bitter-war-on-coal>.

76. For example, EPA said that, under the CPP, "[f]ossil fuels will continue to be a critical component of America's energy future. The Clean Power Plan simply makes sure that fossil fuel-fired power plants will operate more cleanly and efficiently, while expanding the capacity for zero- and low-emitting power sources." Factsheet, U.S. EPA, Overview of the Clean Power Plan: Cutting Carbon Pollution From Power Plants (Aug. 2015), available at <https://19january2017snapshot.epa.gov/sites/production/files/2015-08/documents/fs-cpp-overview.pdf>.

the "cleanest" technologies should be allowed. California recently adopted legislation mandating zero-emission electric power by 2045, with the majority of the state's electricity coming from renewable sources and the remainder from non-emitting hydro, nuclear, and natural gas plants with carbon capture and sequestration (CCS).⁷⁷ By contrast, the CPP and approaches that put a price on carbon (such as a cap-and-trade program or carbon tax) would not prohibit any type of fuel but would rely on price signals to influence the relative mix of energy sources, preserving some space for fossil fuels albeit at a progressively higher cost that would reduce their utilization over time.

Economists would likely see such approaches as more efficient and less costly than technology-specific mandates, and energy producers would undoubtedly prefer a tapering down of fossil fuels rather than a date certain for their elimination. How much room future policy proposals provide for a mix of energy sources within an overall carbon pricing framework will be an important consideration for many in industry and their congressional allies.

D. International Competitiveness

Debates over climate policy have always been dominated by concern about U.S. international competitiveness and the fear that we will weaken our economy if we commit to ambitious climate goals but our major trading partners do not. These concerns center mainly on China, and will likely be exacerbated as tensions between the two countries over trade and national security become more acute.

The original UNFCCC assigned advanced economies primary responsibility for climate mitigation based on their historical contribution to emissions and greater financial resources. It also committed the developed world to assist poorer nations in coping with climate change.⁷⁸ This basic architecture shaped the 1997 Kyoto Protocol, under which Annex I developed countries made binding commitments to reduce emissions below 1990 levels but no obligations were placed on developing countries.⁷⁹

The absence of such obligations was the principal reason why the Protocol was rejected by Congress. The Byrd-Hagel Resolution unanimously approved by the Senate in 1997 warned that "greenhouse gas emissions of Developing Country Parties are rapidly increasing and are expected to surpass emissions of the United States and other OECD [Organisation for Economic Co-Operation and Development] countries as early as 2015." The resolution then emphasized that "the exemption for Developing Country Parties is inconsistent with the need for global action on

77. Steven Mufson, *California Law Would Make State's Electricity Grid 100 Percent Carbon Free by 2045*, WASH. POST, Sept. 13, 2018, https://www.washingtonpost.com/business/economy/california-law-would-make-states-electricity-grid-100-percent-carbon-free-by-2045/2018/09/13/34e0c430-b2c7-11e8-9a6a-565d92a3585d_story.html.

78. UNFCCC, May 9, 1992, S. TREATY DOC. NO. 102-38, 1771 U.N.T.S. 107, <https://unfccc.int/resource/docs/convkp/conveng.pdf>.

79. Kyoto Protocol to the UNFCCC, Dec. 11, 1997, 37 I.L.M. 22, <https://unfccc.int/resource/docs/convkp/kpeng.pdf>.

climate change and is environmentally flawed." The resolution took a stand against any agreement that would require the United States to lower emissions unless it "mandates new specific scheduled commitments to limit or reduce greenhouse gas emissions for Developing Country Parties within the same compliance period."⁸⁰

In the wake of Kyoto, China emerged as a leading economic power, displacing the United States in many manufacturing sectors, and its GHG emissions soared as its fossil fuel consumption rapidly increased. China became the world's top emitter in 2007,⁸¹ and by 2017, it accounted for 27% of global emissions, as compared to the U.S. share of 15%.⁸² With China's economic ascendancy, it became increasingly untenable to treat it (and India, another rising economic power) as a developing nation with no obligation to contribute to global emission reduction.

A signal achievement of the Paris Agreement—and a diplomatic coup for the Obama Administration—was to narrow the disparate treatment of Annex I nations and developing economies. Unlike under the Kyoto Protocol, both established and emerging economies made commitments to controlling emissions.⁸³ However, these commitments allowed developing world emissions to continue to increase while those of the United States and other developed nations declined. Thus, China agreed that its emissions would rise until 2030 and then peak, while the United States committed to a 26%-28% reduction below 2005 levels by 2025.⁸⁴

The differing Paris targets of the United States and China are arguably justified on the ground that the United States is by far the largest historical emitter of GHGs,⁸⁵ and China's skyrocketing emissions are a recent development that followed a century of unchecked industrial development in the West. While China's emissions greatly exceed U.S. emissions in absolute terms, China's population is much larger and the United States actually has higher emissions per capita.⁸⁶ In addition, because of China's lower standard of living and higher aspirations for growth, it arguably should have greater leeway to increase fossil fuel consumption and more time to decarbonize its economy. On this logic, with its mature economy and slower rate of growth, the United States is better-positioned to make immediate emission cuts.

China has made tangible efforts to reduce its carbon intensity. For example, it has created cap-and-trade programs and made impressive strides in developing renew-

able energy.⁸⁷ But China is continuing to build coal plants in large numbers⁸⁸ and finance their construction in other countries, and there is concern that while it may meet its Paris targets, its steeply rising emissions are a serious obstacle to moderating the buildup of carbon in the atmosphere.⁸⁹

Although China has insisted that it is committed to fighting climate change,⁹⁰ some conservatives claim it is cynically using the Paris Agreement to weaken the U.S. economy. When announcing the U.S. withdrawal from the agreement, President Trump complained that "China will be allowed to build hundreds of additional coal plants" and "can do whatever they want for 13 years," whereas the United States would assume "draconian financial and economic burdens." He charged that China and other developing countries want "to see us remain in the agreement [] so that we continue to suffer this self-inflicted major economic wound."⁹¹

These statements exaggerate the impact of the Paris Agreement on the U.S. economy and wrongly assume that the agreement gives China a free ride.⁹² At the same time, as climate activists argue that the United States should adopt more ambitious emission reduction goals, they will need to confront the narrative that China—a country that represents a serious threat to U.S. national interests—is being held to a lower standard. As in the past, domestic industries vulnerable to international competition will sound the alarm if they believe they will incur added costs to reduce emissions that enable producers in China and other countries to steal their customers. Unions representing employees in these industries will likewise warn of job losses and further offshoring of U.S. manufacturing. Politicians—including progressive Democrats—will ignore these concerns at their peril.

Even apart from the perceived economic imbalance between the two countries, the reality of rising Chinese and global emissions calls into question how deeply the United States should cut its own emissions. In 2018, global energy-related CO₂ emissions rose 1.7% to a historic high of 33.1 gigatons of CO₂.⁹³ With no sign that global emissions will

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80. See *supra* note 23.
81. John Vidal & David Adam, *China Overtakes U.S. as World's Biggest CO₂ Emitter*, GUARDIAN, June 19, 2007, <https://www.theguardian.com/environment/2007/jun/19/china.usnews>.
82. GLOBAL CARBON PROJECT, *GLOBAL CARBON BUDGET 2018* (2018), https://www.globalcarbonproject.org/carbonbudget/18/files/GCP_CarbonBudget_2018.pdf.
83. See *supra* note 45.
84. See *supra* note 45.
85. See *supra* note 82.
86. See *supra* note 82.
87. Daniel K. Gardner, *Trump Is Unwilling to Tackle Climate Change. China Must Step Up.*, N.Y. TIMES, Dec. 10, 2018, <https://www.nytimes.com/2018/12/10/opinion/china-trump-climate-change.html>.
88. *Global Energy & CO₂ Status Report*, *supra* note 16. Reflecting a trend across Asia, coal consumption increased in China by 5.3% in 2018.
89. *Id.*
90. Edward Wong, *Trump Has Called Climate Change a Chinese Hoax. Beijing Says It Is Anything But*, N.Y. TIMES, Nov. 19, 2016, <https://www.nytimes.com/2016/11/19/world/asia/china-trump-climate-change.html>.
91. Remarks Announcing United States Withdrawal From the United Nations Framework Convention on Climate Change Paris Agreement, *supra* note 54.
92. Bob Sussman, *The U.S.-China Climate Deal: Not a Free Ride for the Chinese*, BROOKINGS, Nov. 25, 2014, <https://www.brookings.edu/blog/planetpolicy/2014/11/25/the-us-china-climate-deal-not-a-free-ride-for-the-chinese/>.
93. *Global Energy & CO₂ Status Report*, *supra* note 16. According to IEA, this emissions increase "was the highest rate of growth since 2013, and 70% higher than the average increase since 2010 . . . CO₂ emissions stagnated between 2014 and 2016, even as the global economy continued to expand. . . But the dynamics changed in 2017 and 2018. Higher economic

start to decline any time soon, skeptics will plausibly argue that the buildup of CO₂ concentrations in the atmosphere and resulting rise in temperatures is unavoidable whatever the United States does.⁹⁴

This should not be an excuse to do nothing; if the world's largest economy sits on its hands, other countries will have no incentive to reduce emissions. At the same time, an effective global response to climate change would be impossible unless China and other rising economies cut their emissions more rapidly. The United States should lead by example, but should not relax the pressure on its competitors to reduce their carbon footprints at a faster pace or commit to emission reduction targets that jeopardize our competitive position in the global economy.

In sum, while the current moment may offer new opportunities to move the needle on climate policy and the politics may be more favorable than before, the long-standing tensions and disagreements that blocked progress in the past will not disappear. Leaders who are serious about taking action need to recognize the challenges and steer a course that achieves significant reductions but is economically and politically viable.

IV. Taking Stock of the U.S. Carbon Footprint

The starting point for a new policy framework is understanding the current U.S. GHG emission profile and the mix of opportunities and obstacles across the major sectors of the economy.

A. Overall Emission Trends

The good news is that technological advances have begun to reduce the U.S. carbon footprint and laid the groundwork for deeper reductions. These advances have been largely market-driven but have also benefitted from government policy. They provide evidence that decarbonization is within the capabilities of available and emerging technologies and achievable at an acceptable cost—a recognition that did not exist two decades ago. At the same time, cleaner technology has not advanced across the economy and different regions of the country at the same pace. While emissions have dropped, economywide reductions remain relatively modest and the outlook for further reductions

growth was not met by higher energy productivity, lower-carbon options did not scale fast enough to meet the rise in demand.”

94. Global energy-related CO₂ emissions are projected to increase by one-third between 2012 and 2040 in EIA's *International Energy Outlook 2016* reference case, largely driven by increased energy use in countries outside of the developed world. Ari Kahan, *Projected Growth in CO₂ Emissions Driven by Countries Outside the OECD*, EIA, May 16, 2016, <https://www.eia.gov/todayinenergy/detail.php?id=26252>. Under this scenario, the recent IPCC report indicates that there would be no possibility of avoiding temperature rises of 2.0°C, regardless of whether global emissions later peak and start to decline and even if the United States makes significant reductions before 2040. See *supra* note 1. The American public should understand that warming patterns will therefore continue well into the future, accompanied by intensification of the consequences of climate change that we are already experiencing.

is uncertain. Fossil fuels continue to play a dominant role throughout the economy.

U.S. GHG emissions peaked in 2007 and in 2017 were 12.7% below 2005 levels.⁹⁵ However, the pace of reductions has slowed in recent years and 2018 emissions in fact were 3.4% higher than in 2017.⁹⁶ With this recent increase, projections are that by 2025, U.S. emissions will be 12%-16% lower than in 2005, well short of the 26%-28% reduction to which the United States committed under the Paris Agreement.⁹⁷

B. Electricity Production

The electric power sector has contributed the lion's share of total U.S. emission reductions, experiencing a decline of 25% between 2005 and 2016.⁹⁸ This decline in turn resulted from a dramatic contraction of the nation's fleet of coal-fired power plants: from 2005 to 2016, coal's share of U.S. electricity production plummeted from 50% to 30%.⁹⁹ The wave of coal retirements was largely triggered by the explosive growth in U.S. natural gas production and accompanying drop in prices resulting from the widespread use of hydraulic fracturing starting in the mid-2000s.

In 2016, natural gas accounted for 32% of U.S. electricity, narrowly surpassing coal.¹⁰⁰ Because natural gas combustion emits significantly less CO₂ than coal combustion, the replacement of coal plants with natural gas generation initially translated into a significant reduction in power-sector emissions. However, if fewer additional coal plants retire, this factor would diminish in importance, and further emission reductions could be harder to achieve so long as the natural gas share of total power production stays constant. We are already seeing power-sector emissions flatten out and even increase, with 2018 levels 1.9% above 2017 emissions.¹⁰¹

The emissions decline in the power sector has also reflected the impressive growth in wind and solar, a result of technological improvements, cost reductions, federal tax credits, and a strong policy push by some states. Renewables accounted for 17% of electricity production in 2017, double their share in 2005.¹⁰² Within the renewables category, wind contributed 6.3% of total generation in 2017, solar 1.3%, and hydro 7.5%.¹⁰³

95. GHG INVENTORY, *supra* note 15.

96. *Preliminary U.S. Emissions Estimates for 2018*, *supra* note 16. See also Global Energy & CO₂ Status Report, *supra* note 16.

97. In its 2018 *Taking Stock* analysis, Rhodium projected that 2025 U.S. emissions would be 15%-19% below 2005 levels. John Larsen et al., *supra* note 17. However, the unexpectedly high 3.4% increase in 2018 requires a proportionate decrease in projected 2025 emission reductions. Moreover, while the expected retirement of more coal plants and increases in energy efficiency suggest a continued decline in emissions through 2025, this decline is not guaranteed, particularly if Trump policies remain in place.

98. *Id.*

99. See *supra* note 65.

100. See *supra* note 65.

101. See *Preliminary U.S. Emissions Estimates for 2018*, *supra* note 16.

102. See *supra* note 17.

103. EIA, *Electricity in the United States Is Produced With Diverse Energy Sources and Technologies*, <https://www.eia.gov/energyexplained/index>.

However, the build-out of renewables has progressed unevenly across the United States. Market penetration in leadership states like California, Iowa, Kansas, and Washington has been in the range of 35%-80%, but penetration in states historically dominated by coal like Indiana, Ohio, Mississippi, Missouri, and West Virginia has been 6% or less.¹⁰⁴ Factors slowing the growth of renewables nationally include the intermittency of wind and solar power sources and limited reach of transmission lines across regions.¹⁰⁵ However, energy storage breakthroughs and increases in interregional transmission lines could soon give a leg up to large solar installations and wind farms and reduce the need for backup fossil fuel generation.¹⁰⁶

California, New York, and other states have announced policies to dramatically increase renewable sources of power over the next decade.¹⁰⁷ These renewable mandates should show dramatic results if they are implemented successfully. In other parts of the United States, however, policy drivers are weaker. Because U.S. energy demand is relatively flat, further market penetration in these states may depend on whether coal plants continue to retire and renewables can dislodge recently constructed gas facilities. If gas maintains its current share of electricity production, renewables could plateau in non-leadership states and CO₂ emissions could remain close to current levels. Strong policies supporting renewables at the national level are necessary to counter these trends.

C. Transportation

The sizable drop in emissions in the power sector has not been mirrored in other sectors. The dip in transportation emissions since 2005 has been modest (less than 4%) and this sector has now replaced power plants as the largest U.S. emissions source, accounting for 28.7% of the national total in 2017.¹⁰⁸ Fuel efficiency improvements under the Obama standards have thus far resulted in modest fleetwide emissions reductions, in part because

- php?page=electricity_in_the_united_states#tab2 (last updated Apr. 20, 2018).
- 104. EIA, *Detailed State Data*, <https://www.eia.gov/electricity/data/state/> (last visited Mar. 22, 2019).
- 105. Union of Concerned Scientists, *Barriers to Renewable Energy Technologies*, <https://www.ucsusa.org/clean-energy/renewable-energy/barriers-to-renewable-energy> (last revised Dec. 20, 2017).
- 106. Scott Nyquist, *How Energy Storage Could Change Everything About Renewables*, FORTUNE, Sept. 24, 2015, <http://fortune.com/2015/09/24/future-renewable-energy-storage/>.
- 107. Gov. Andrew Cuomo in January 2019 announced a goal of 70% renewables by 2030. Erin Voegele, *New York Sets New Goals for 100% Clean Power, 70% Renewables*, BIOMASS MAG., Jan. 17, 2019, <http://biomass-magazine.com/articles/15883/new-york-sets-new-goals-for-100-clean-power-70-renewables>. California recently set a 60% renewable target for 2030. Camila Domonoske, *California Sets Goal of 100 Percent Clean Electric Power by 2045*, NAT'L PUB. RADIO, Sept. 10, 2018, <https://www.npr.org/2018/09/10/646373423/california-sets-goal-of-100-percent-renewable-electric-power-by-2045>. Colorado's new governor ran on a platform of transitioning Colorado to 100% renewable energy by 2040. Lorraine Chow, *Colorado Governor-Elect Has Most Ambitious Renewables Goal in U.S.*, ECOWATCH, Nov. 7, 2018, <https://www.ecowatch.com/colorado-governor-polis-renewable-energy-2618515156.html>.
- 108. GHG INVENTORY, *supra* note 15.

older vehicles remain a large part of the U.S. vehicle fleet, and vehicle miles traveled have nudged upward as the economy has strengthened.¹⁰⁹ The likely relaxation of the Obama standards by the Trump EPA will further slow fuel economy gains, and a lengthy legal standoff between the federal government and California could paralyze industry planning and investment. As the economy has strengthened, air travel and truck shipments have also increased, with a corresponding growth in emissions that has increased the overall carbon footprint of the transportation sector.

EVs accounted for 1.6% of U.S. vehicle sales in 2017.¹¹⁰ However, with Tesla providing a road map for the industry, large-scale production is on the horizon as major manufacturers announce significant investments in retooling their plants and prepare to roll out several all-electric models.¹¹¹ In parallel, charging infrastructure is expanding rapidly and charging time is declining.¹¹² Nonetheless, market penetration of EVs is highly uneven across the country, and some regions are lagging well behind others both in sales and creation of charging networks.¹¹³

Overall, the future rate of EV deployment is uncertain and will depend on whether EVs are competitively priced in middle market segments, how quickly driving range and battery capacity improve, and whether federal tax incentives and other policy drivers continue and possibly expand. Forecasts of EV market share in the United States range from 8%-12% by 2025, with some analysts predicting that EVs will account for 35% of new car sales by 2040.¹¹⁴

D. Manufacturing

The industrial sector is the third largest source of CO₂ emissions, contributing roughly 15% of the U.S. total in 2017.¹¹⁵ Emissions in this sector declined by 4% between 2005 and 2017,¹¹⁶ but increased significantly in 2018.¹¹⁷ Further increases are projected in the next decade,¹¹⁸ in part because of growing use of natural gas as a raw material for chemical manufacturing and other industries.

- 109. David Schaper, *Record Number of Miles Driven in U.S. Last Year*, NAT'L PUB. RADIO, Feb. 21, 2017, <https://www.npr.org/sections/thetwo-way/2017/02/21/516512439/record-number-of-miles-driven-in-u-s-last-year>.
- 110. EVAdoption, *EV Market Share*, <https://evadoption.com/ev-market-share/> (last visited Mar. 22, 2019).
- 111. Adam Vaughan, *All Volvo Cars to Be Electric or Hybrid From 2019*, GUARDIAN, July 5, 2017, <https://www.theguardian.com/business/2017/jul/05/volvo-cars-electric-hybrid-2019>.
- 112. Elisabeth Behrmann, *No One Else Built Charging Stations, So Automakers Will Do It*, BLOOMBERG, Feb. 26, 2019, <https://www.bloomberg.com/news/articles/2019-02-26/no-one-else-built-charging-stations-so-automakers-will-do-it>.
- 113. EVAdoption, *EV Market Share by State*, <https://evadoption.com/ev-market-share/ev-market-share-state/> (last visited Mar. 22, 2019).
- 114. Dan Cohan, *Electric Car Sales Predictions Are All Over the Map*, HILL, Jan. 24, 2017, <https://thehill.com/blogs/pundits-blog/transportation/315958-forecasts-for-electric-car-sales-are-all-over-map>.
- 115. GHG INVENTORY, *supra* note 15.
- 116. GHG INVENTORY, *supra* note 15.
- 117. According to Rhodium, 2018 industrial emissions were 55 million metric tons higher than in 2017. See *Preliminary U.S. Emissions Estimates for 2018*, *supra* note 16.
- 118. *See supra* note 17.

No single type of facility dominates industrial emissions. Cement, iron and steel, forest products, automobiles, petroleum refining, and chemical production are all major contributors.¹¹⁹ International competition is significant for many of these industries and raw material and energy costs impact their position in world markets.

E. Other Sectors

Beyond electric power, transportation, and manufacturing, U.S. GHG emissions come from a host of smaller but cumulatively significant sectors. Ten percent of total CO₂ emissions in 2017 were from residential and commercial buildings due to the combustion on-site of oil, diesel, and natural gas for heating and cooking.¹²⁰ These emissions had been dropping as various government programs made homes and businesses more energy-efficient, but they increased by 10% in 2018 to their highest level since 2004.¹²¹ This increase may reflect lower winter temperatures in 2018 and higher demand for cooking and heating fuel in buildings as a result of population and economic growth.¹²²

Agricultural emissions are roughly the same magnitude as building emissions and result from releases of two highly potent GHGs—methane, which is emitted by livestock and during manure management, and nitrous oxide, a byproduct of soil management.¹²³ These emissions have steadily increased since 2005 with rising agricultural production.¹²⁴ The politically influential agricultural sector is largely beyond the reach of existing regulatory programs and sensitive to government oversight of farming practices.

Methane emissions from oil and natural gas production represented 4% of all U.S. GHG emissions in 2016.¹²⁵ Regulation of oil and gas methane releases under the CAA and state laws is beginning to have an impact, but the Trump EPA is in the process of relaxing federal requirements and rising oil and gas output will increase emissions in the absence of controls. A smaller emissions source (less than 2% of the U.S. total) is use of hydrofluorocarbons (HFCs), highly potent GHGs that have replaced ozone-depleting substances in air-conditioning and refrigeration. HFC emissions increased by around 30% between 2005 and 2017.¹²⁶ The Obama Administration took significant steps domestically and internationally to phase out HFCs,¹²⁷ but the Trump White House has put these actions on hold. After initial hesitation, the producers and

users of HFCs are on a path toward replacing them with lower-emitting chemicals.¹²⁸

In sum, despite the advances of the Obama years, the United States is falling significantly short of the level of emission reductions required to meaningfully curb the rise in atmospheric levels of CO₂. The Trump rollbacks have slowed momentum and delayed emission reductions that seemed to be on track as a result of Obama policies. Restarting progress and accelerating the pace of emission reductions will require more ambitious goals and policies backstopped by new laws and executive actions.

V. Guiding Principles for a New Policy Framework

The political alignment of the U.S. government following the 2020 elections will define the range of available climate policy choices. If the 2020 elections lead to overwhelming Democratic dominance of the executive branch and Congress, there will be an opening for broad and far-reaching legislation. However, with a Democratic president but divided control of Congress, the outlook will be more challenging. Even with narrow Democratic majorities in the House and Senate and a Democrat in the White House, legislative success will be far from guaranteed. As the Waxman-Markey experience of 2010 demonstrates, moving controversial legislation over the goal line in the face of partisan opposition and with Democratic congressional seats at risk in a difficult mid-term election is a heavy lift.

Democrats need to acknowledge these political realities, and steer a course that can sustain mainstream support from the electorate while at the same time taking far-reaching steps to decarbonize the U.S. economy. This will be a difficult line to walk, and success is only possible if advocates can convincingly rebut the long-standing concerns that have historically blocked consensus on climate policy. While die-hard conservatives will be impossible to appease, moderates (including some Republicans) will be persuadable if they are reassured that that climate action will not drive up energy costs, limit consumer choice, add new bureaucracy, stifle private enterprise, or weaken U.S. competitiveness in the global economy. However, proposals like the GND that can be easily attacked on these very grounds will polarize the electorate and alienate the political center. We cannot afford yet another policymaking failure that allows GHG emissions and global temperatures to continue to rise unchecked.

What should the guiding principles and implementing measures be for a politically viable climate policy framework in a new Democratic administration? Here are some suggestions:

119. GHG INVENTORY, *supra* note 15.

120. GHG INVENTORY, *supra* note 15.

121. See *Preliminary U.S. Emissions Estimates for 2018*, *supra* note 16.

122. Some have advocated increased electrification of heating and cooking systems as a way to lower building emissions but this promising strategy has not yet been widely implemented.

123. GHG INVENTORY, *supra* note 15.

124. GHG INVENTORY, *supra* note 15.

125. See *supra* note 17.

126. GHG INVENTORY, *supra* note 15.

127. Peter Powell, *Obama's Climate Action Plan Targets HFC Reduction*, News, July 29, 2013, <https://www.achrnews.com/articles/123888-obamas-climate-action-plan-targets-hfc-reduction>.

128. John Podesta, *U.S. Companies Leading to Reduce Emissions of HFC Climate Pollutants*, WHITE HOUSE BLOG, Sept. 16, 2014, <https://obamawhitehouse.archives.gov/blog/2014/09/16/us-companies-leading-reduce-emissions-hfc-climate-pollutants>.

- ***Set ambitious but realistic goals based on sound economics and a feasible technology path***

Science tells us that the magnitude and timing of GHG emissions will determine the rate at which GHG concentrations rise in the atmosphere, and in turn the anticipated temperature increases resulting from this buildup. Thus, when and how much we reduce emissions will determine our success in moderating the severity of climate impacts. This is why national emission reduction targets and timetables for achieving them are central in formulating climate policy. The Waxman-Markey legislation was built around explicit emission reduction goals,¹²⁹ as were U.S. commitments under both the 2009 Copenhagen Accord and the 2015 Paris Agreement.¹³⁰ Leadership states like California have also used emission reduction goals and deadlines to measure progress and benchmark the effectiveness of proposed emission reduction strategies.¹³¹

Limiting future temperature rises to 1.5°C above pre-industrial levels, the aspirational goal of the Paris Agreement, will require a 50% decline in global emissions from 2010 levels by 2030 and zero net emissions by 2050, according to the IPCC.¹³² It is tempting to argue that the United States should select these targets as our emission reduction goals. However, given the near-certainty that global emissions will still be increasing by 2030 and probably beyond as fossil fuel consumption rises in emerging economies, the world is on track to overshoot the 1.5°C target even with herculean efforts by the United States to cut emissions by 2030. Moreover, since U.S. emissions were only 12.7% below 2005 levels in 2017 and actually increased in 2018, a 50% reduction in 11 years would greatly outpace the speed at which cost-effective clean technologies can be deployed. It is difficult to argue convincingly that the United States should risk significant economic disruption when the growing emissions of China and India are driv-

129. The Waxman-Markey goals for U.S. emission reductions, benchmarked against 2005 levels, were a 3% cut by 2012, 17% cut by 2020, 42% cut by 2030, and more than 80% cut by 2050. Kate Sheppard, *Everything You Always Wanted to Know About the Waxman-Markey Energy/Climate Bill—In Bullet Points*, GRISt, June 4, 2009, <https://grist.org/article/2009-06-03-waxman-markey-bill-breakdown/>.

130. The Copenhagen COP was largely disappointing but helped pave the way for the Paris Agreement as a small group of major emitters entered into a last-minute political agreement to reduce emissions by 2020. Center for Climate and Energy Solutions, *COP 15 Copenhagen*, <http://www.c2es.org/content/cop-15-copenhagen/> (last visited Mar. 22, 2019). The United States committed to a 17% reduction from 2005 levels by 2020. Darren Samuelsohn & Lisa Friedman, *Obama Announces 2020 Emissions Target*, Dec. 9 Copenhagen Visit, N.Y. TIMES, Nov. 25, 2009, <https://archive.nytimes.com/www.nytimes.com/cwire/2009/11/25/25climatewire-obama-announces-2020-emissions-target-dec-9-22088.html>. Whether this goal will be met is doubtful given 2018 increases in U.S. emissions.

131. S.B. 32 enacted by the California Legislature in 2016 sets a goal of reducing emissions by 40% below 1990 levels by 2030. S.B. 32, 2015-2016 Leg., Reg. Sess. (Cal. 2016), http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB32. California had earlier set a goal of reducing emissions to 1990 levels by 2020, which required a 30% emission reduction. It achieved this goal in 2018. Christopher Weber, *California Meets Greenhouse Gas Reduction Goal Years Early*, PHYS.ORG, July 12, 2018, <https://phys.org/news/2018-07-california-greenhouse-gas-reduction-goal.html>.

132. See *supra* note 1.

ing increases in global temperatures notwithstanding any action the United States takes.

Going well beyond the aspirational IPCC target for 2030, the GND has proposed an extremely aggressive goal of zero net emissions in 10 years.¹³³ This is a significantly more ambitious target than any country or U.S. state has adopted. Achieving it would be impossible without crippling our electricity, transportation, and manufacturing sectors.¹³⁴

A more realistic goal is the U.S. Paris target of a 26%-28% reduction from 2005 levels. Reaffirming this goal after it has been repudiated by the Trump Administration would send a positive message to world leaders and demonstrate U.S. resolve.¹³⁵ The goal is also ambitious: the latest forecasts put projected 2025 emission levels 12%-16% above the Paris target and closing this gap will require significant effort. While a running start on the Paris target in 2016 might have brought it within reach, the Trump rollbacks have effectively delayed progress by four years and even blocked reductions that Obama policies had seemingly locked in. As a result, the original compliance date of 2025 is now unattainable and another five years will be required. Thus, reaffirming the Paris goal of a 26%-28% emission reduction but setting a new implementation date of 2030 would represent a forward-leaning but prudent approach.

Emission reduction goals reflecting a steadily increasing level of ambition should also be set for the out-years, preferably at 10-year intervals (i.e., for 2040, 2050, and beyond). With a strong set of policies in place to drive reductions and zero-emission technologies rapidly gaining momentum in the marketplace, the 2040 target could reasonably be set at 45% below 2005 levels and a 70% reduction could be the goal for 2050.

- ***Use a mix of tools, tailoring them to different parts of the economy, and deploy them in combination to maximize positive outcomes***

While strong emission reduction goals and deadlines are essential, we should be wary of embracing a single strategy to achieve them. The complexity of the economy as well as political realities call for multiple, targeted approaches.

133. See *supra* note 10.

134. For example, coal and natural gas account for more than 60% of electricity production at present. The GND goal would require that all coal and gas plants either be closed and replaced by renewable power or retrofitted with CCS technology that captures CO₂ and prevents its release into the atmosphere. The associated costs would be prohibitive and the massive disruption of electricity supply would risk compromising the reliability of the power grid. Similarly, not only would the auto industry need to fully convert its production to zero emission vehicles in 10 years, but all fossil fuel-burning vehicles now in use would need to be removed from service and replaced.

135. H. Res. 9, introduced in the House by the Democratic leadership, would reaffirm the U.S. commitment to the Paris agreement and direct the Administration to develop a plan to meet the U.S. Paris targets. Nick Sobczyk, *Energy and Commerce to Vote on Leadership's Paris Bill*, E&E DAILY, Apr. 2, 2019, <https://www.eenews.net/eedaily/2019/04/02/stories/1060139389>.

In hindsight, the comprehensive scope of the Waxman-Markey bill was a liability. The bill would have established a cap-and-trade regime for the entire economy, necessitating a complex set of credits, carveouts, and special requirements to address the needs of numerous sectors and political constituencies. Even though its core principles were simple and straightforward, the bill was perceived as unwieldy and overly complex, allowing opponents to argue that it created opportunities for self-dealing by Washington insiders and Wall Street speculators.¹³⁶

Moving forward, we should not repeat the mistake of pinning all our hopes on a one-size-fits-all solution, such as an economywide cap-and-trade system or carbon tax. We need emission reductions from all sectors of the economy, but different tools are required for different sectors based on their unique characteristics. For example, cap-and-trade programs are well-suited to power plants and large manufacturers, but do not work well for the much bigger universe of commercial and residential buildings, small businesses, and farms. Similarly, putting a carbon price on transportation fuels through a cap-and-trade program or carbon tax could simply increase prices at the pump without necessarily reducing gasoline consumption and transportation emissions. A better approach is to strengthen fuel efficiency and tailpipe emission standards, and in parallel provide emission credits and tax reductions for zero emission vehicles (ZEVs) and increase funding for the build-out of charging infrastructure.

Experience also shows that using multiple tools to address a particular challenge can maximize desirable outcomes. For example, federal tax credits for wind and solar have worked in combination with state renewable portfolio standards to accelerate the penetration of renewable electricity sources and lower costs to consumers.¹³⁷ Federal support for new transmission corridors to allow renewable power to be delivered over long distances would provide an additional boost. Similarly, federal tax credits for ZEVs¹³⁸ have complemented the California ZEV program¹³⁹ and

136. Justin Danhof, *Waxman-Markey Backers: Stubborn as a Mule or Greedy as a Pig?*, NAT'L CENTER FOR PUB. POL'Y RES., Sept. 1, 2009, <https://nationalcenter.org/ncppr/2009/09/01/waxman-markey-backers-stubborn-as-a-mule-or-greedy-as-a-pig-by-justin-danhof/>.

137. U.S. DEPARTMENT OF ENERGY (DOE), RESOURCES FOR STATE AND LOCAL GOVERNMENTS (2016) (DOE/EE-1509), available at https://www.energy.gov/sites/prod/files/2016/12/f34/Leveraging_Federal_Renewable_Energy_Tax_Credits_Final.pdf.

138. The federal tax credit is for \$2,500 to \$7,500 per new EV purchased for use in the United States. The size of the tax credit depends on the size of the vehicle and its battery capacity. The tax is available for each manufacturer until 200,000 qualified EVs have been sold by that manufacturer, after which the credit begins to phase out for the manufacturer's vehicles. DOE Office of Energy Efficiency and Renewable Energy, *Electric Vehicles: Tax Credits and Other Incentives*, <https://www.energy.gov/eere/electricvehicles/electric-vehicles-tax-credits-and-other-incentives> (last visited Mar. 22, 2019). Both Tesla and General Motors have reached the 200,000 vehicle limit. This limit arguably penalizes first-mover companies and will slow market acceptance of EVs. There is growing interest in Congress in removing the limit and fortifying the tax credit against attacks by President Trump. Maxine Joselow, *Democrats Look to Shield Tax Credit From Trump*, E&E DAILY, Apr. 3, 2019, <https://www.eenews.net/eedaily/stories/1060140591>.

139. Under the ZEV program, manufacturers are required to produce a minimum number of ZEVs and plug-in hybrids each year, based on the total number

fuel efficiency standards in boosting the number of EVs in the state's vehicle fleet.¹⁴⁰

California has set an example for national policy by combining different but complementary strategies—a cap-and-trade program, ambitious renewable power mandates, strong tailpipe emission standards for vehicles, a low-carbon fuel standard, incentives for ZEVs, and strong efficiency standards for buildings. As we design new strategies to reduce emissions at the national level, we should likewise look for the right mix of new and existing tools to address the problem at hand—not for a single silver bullet.

- ***Focus primarily on promoting private-sector investment and innovation and not large-scale government funding of green industries***

The GND calls for a 10-year “national, social, economic mobilization” to address climate change, building on the example of “the Federal Government-led mobilizations during World War II and the New Deal.”¹⁴¹ Although the details of this “mobilization” are not spelled out, the analogy to New Deal programs and the World War II military buildup connotes large-scale government funding of public works projects and “pump-priming” infusions of cash in critical industries. The GND is conspicuously silent on the role of private-sector innovation and capital markets in driving GHG reductions. Yet in recent years, billions of dollars of private capital have flowed into the build-out of wind and solar capacity and the commercialization of advanced vehicle technologies, with tangible benefits in decarbonizing the economy.¹⁴²

Government can best add value by accelerating advances in technology and enhancing the flow of capital to finance deployment of clean technologies at scale. Tax credits, carbon pricing mechanisms, and emission caps are all demonstrated tools for motivating private-sector innovation and investment. Direct government funding of power plant construction, clean vehicle production, or “green” manufacturing is neither an efficient use of government resources nor the best and fastest way to achieve emission reduction. Moreover, a climate agenda heavy on large-scale government expenditures and skeptical of private-sector innovation and investment will be an attractive target for conservatives, and could drive away the middle-of-the road politicians necessary to pull climate legislation across the finish line.

140. As of late 2018, more than 500,000 EVs have been sold in California, nearly one-half of the national total. Elizabeth Puckett, *Over 500,000 EVs Have Now Been Sold in California*, DRIVE, Dec. 12, 2018, <http://www.thedrive.com/news/25419/over-500000-evs-have-now-been-sold-in-california>.

141. See *supra* note 10.

142. For example, Tesla's market capitalization was \$46 billion on March 22, 2019, demonstrating the significant shareholder value it has created since it went public in 2010. YCharts, *Tesla Inc Market Cap*, https://ycharts.com/companies/TSLA/market_cap (last visited Mar. 22, 2019). The performance of the company's stock and the billions of dollars in loans and capital infusions it has received from private investors attest to Wall Street's willingness to bankroll zero-emission technologies.

The GND also combines aggressive climate goals with an ambitious social and economic justice agenda. This includes “creat[ing] millions of good, high-wage jobs,” “providing resources, training, and high-quality education” to all Americans, “directing investments to spur economic development,” “guaranteeing a job with a family-sustaining wage,” and “providing all people of the United States with . . . high-quality health care.”¹⁴³ These may be laudable objectives, but they are distinct from reducing GHG emissions. Mitigating climate change is essential to protect against long-term economic harm, but this does not mean that climate programs are an affirmative near-term remedy for wage stagnation, inadequate health care, uneven economic development, or other social and economic maladies. To link these broader goals with GHG reductions risks creating unrealistically high expectations for climate policy and compromising the effectiveness of emission reduction strategies by using them to serve a non-climate social and economic policy agenda.¹⁴⁴

- ***Use targeted government funding and financing tools where market-based incentives and regulation are ineffective***

Although government funding should not be the prime mover for reducing GHG emissions, targeted government intervention can be beneficial to address GHG emission sources that have historically failed to attract private-sector funding and are not amenable to carbon pricing mechanisms or direct regulation. While some existing programs seek to fill this gap, we must significantly increase the scale of direct government support for emissions reductions that the private sector will not finance on its own.

For example, together with strong national efficiency standards for new construction,¹⁴⁵ tax credits, block grants to states, and low-interest loans can reduce emissions from commercial and residential buildings by spurring energy-efficiency upgrades, reducing gas leaks from buildings and distribution lines, conversion of heating systems from oil and gas to electricity, and rebates to trade in old appliances for new energy-efficient models.¹⁴⁶

143. See *supra* note 10.

144. Expressing this concern, Sen. Debbie Stabenow (D-Mich.) said, “I want to keep [the GND] focused on climate and not other issues because I want action on climate change.” Nick Sobczyk et al., *Senate: Both Sides Plot Long-Haul Strategy for “Green New Deal,”* E&E DAILY, Feb. 27, 2019, <https://www.eenews.net/eedaily/2019/02/27/stories/1060122523>.

145. California has strong efficiency standards for new construction of, and additions and alterations to, residential and nonresidential buildings. California Energy Commission, *2019 Building Energy Efficiency Standards*, <https://www.energy.ca.gov/title24/2019standards/> (last visited Mar. 22, 2019). However, similar standards are lacking in many other states and at the national level.

146. The American Recovery and Reinvestment Act of 2009 (ARRA), the Obama stimulus legislation, provided substantial funding for weatherization block grants to states, appliance rebate programs, and other energy-efficiency initiatives. It also provided an expanded tax credit to homeowners who made their residences more energy-efficient. H.R. 1, 111th Cong. (2009), <https://www.congress.gov/bill/111th-congress/house-bill/1/text>. With the end of the stimulus program, these incentives for efficiency were discontinued or reduced in scope. Interest in reviving ARRA funding for energy efficiency has surfaced during recent discussions about bipartisan stimulus legislation.

Government financial support can also help spur construction of long-distance transmission lines to connect remote wind farms and solar arrays with large population centers in other regions.¹⁴⁷ This is a critical enabler for a national renewable power grid that evens out fluctuations in demand, weather, and power availability across regions, and reduces the need for backup coal or gas generation. And in the agricultural sector, U.S. Department of Agriculture programs can provide loans, subsidies, and technical assistance to reduce methane and nitrous oxide emissions by encouraging more sustainable farming practices and technology, such as anaerobic digesters, biogas capture and utilization systems, and changes in animal feeds.¹⁴⁸

Another area for government financial support is CCS demonstration projects at coal and gas power plants and manufacturing facilities. These projects can establish the large-scale viability of CCS and pave the way for industry to fund the broader deployment of CCS technology.¹⁴⁹ Finally, on the model of the U.S. Department of Energy (DOE) Advanced Research Projects Agency-Energy (ARPA-E) program,¹⁵⁰ the government should fund pre-commercial R&D that would not receive private-sector investment. In all these areas, the government would not displace capital markets or private-sector innovation and investment, but pick up the slack in areas where the tools to spur private investment do not work or are inadequate.

- ***Balance new authorities with action under existing laws where they are effective in reducing emissions***

While forward movement on climate will require legislation, existing laws can address important emission sources if implemented effectively. Continuing to rely on these laws can limit the need for new authorities and make the path to legislation narrower and more manageable. To determine how best to leverage existing authorities, a new Democratic president and Congress should carefully analyze both the limitations and possibilities of the CAA and other laws in spurring further progress.¹⁵¹ This analy-

147. ARRA provided targeted funding for transmission upgrades in the West. *Id.*

148. PEW CENTER ON GLOBAL CLIMATE CHANGE, INNOVATIVE POLICY SOLUTIONS TO GLOBAL CLIMATE CHANGE (2001), available at https://www.c2es.org/site/assets/uploads/2001/10/policy_inbrief_ag.pdf.

149. ARRA provided \$3.4 billion for CCS projects and activities at DOE. The large infusion of funding was intended to help develop technologies that would allow for commercial-scale demonstration of CCS in both new and retrofitted power plants and industrial facilities by 2020. DOE prioritized large-scale demonstration projects with ARRA funding. The results were mixed. PETER FOLGER, CONGRESSIONAL RESEARCH SERVICE, RECOVERY ACT FUNDING FOR DOE CARBON CAPTURE AND SEQUESTRATION (CCS) PROJECTS (2016), available at <https://fas.org/sgp/crs/misc/R44387.pdf>. Bipartisan legislation to support CCS was recently introduced in the Senate. Press Release, U.S. Senate Committee on Environment and Public Works, Barasso: USE IT Act Is Commonsense Legislation to Turn Carbon Emissions Into Valuable Products (Feb. 27, 2019), <https://www.epw.senate.gov/public/index.cfm/press-releases-republican?ID=A746148B-4273-4010-BBDB-EDE60B374F70>.

150. DOE ARPA-E, *Home Page*, <https://arpa-e.energy.gov/> (last visited Mar. 22, 2019).

151. A draft resolution on climate policy released by Sen. Dianne Feinstein (D-Cal.) called for reinstating Obama CAA rules that have been reversed by President Trump. *Feinstein Draft Climate Resolution Seeks to Reinstate Obama GHG*

sis should be informed by the successes and failures of the Obama Administration's efforts to use existing laws, as well as the difficulty of undoing the Trump rollbacks of Obama regulations.

Two sectors for which the CAA will likely not provide effective authority to reduce emissions are electricity generation and manufacturing. The Trump EPA has dismantled the Obama CPP and reinterpreted the CAA provisions on which it is based. In theory, a new EPA leadership might reverse these decisions, reinstate the broad reading of the CAA adopted by the Obama Administration, and revive and strengthen the CPP. But this would be a complex, multi-year undertaking that would spawn further litigation. The Supreme Court, which stayed the CPP on February 9, 2016, would be the final arbiter of its legal validity and, with the addition of two conservative justices under President Trump, a ruling striking down the CPP is more likely than not. Thus, banking on a new iteration of the CPP to drive significant emission reductions in the power sector is a risky strategy that could lead to years of uncertainty and ultimately legal defeat.

Similarly, while reducing manufacturing emissions must be part of an economywide climate strategy, the CAA is a flawed vehicle to achieve this goal.¹⁵² EPA would need to set separate new and existing source performance standards under CAA §111 for GHG emissions from numerous industrial source categories. This would require an intensive examination of available emission reduction technologies for each category. While the Agency might try to use a CPP-type framework to spur basic changes in industrial processes and fuel sources, this would raise many of the same legal issues as the CPP and could be struck down by the courts. If the Agency is limited to a narrow "within the fenceline" approach, potential emission reductions may be minimal. Moreover, without trading of emission allowances across facilities and industrial sectors, §111 rules would likely have high compliance costs and limited flexibility.¹⁵³ Like the power sector, therefore, emission reductions in the manufacturing sector are best achieved legislatively.

Two other important emitting sectors—commercial and residential buildings and agriculture—are not amenable

to regulatory controls under the CAA or other laws, and legislation is likewise needed to increase funding and other incentives for lowering emissions. Another important and growing emission source—the widespread use of HFCs as refrigerants to replace ozone-depleting substances—is also difficult to address under the CAA. Recent court decisions have narrowly interpreted EPA's authority to require an HFC phaseout.¹⁵⁴ In addition, without White House support, the Senate has failed to ratify the Kigali Agreement amending the Montreal Protocol to set HFC phaseout targets and deadlines on a global basis.¹⁵⁵ Ratification of Kigali coupled with implementing CAA amendments is thus necessary to reduce HFC emissions. Given the availability of replacement chemicals and industry and congressional support for the Kigali framework, this should not be difficult to accomplish.

By contrast, reducing tailpipe CO₂ emissions and raising fuel economy standards for light- and heavy-duty vehicles may be best accomplished under existing law. The Obama Administration's biggest success was its 2010 and 2012 light-duty emission and Corporate Average Fuel Economy standards. The Trump Administration is now bent on undoing them by freezing further improvements in emissions performance and blocking California and other states from implementing stronger standards.¹⁵⁶ As this process plays out, a tangled web of competing federal and state requirements and litigation would likely confront a new Democratic president in 2020.

But while it will be messy to reverse the backward-looking Trump rules and reinstate ambitious emission reduction and fuel efficiency targets, a new president could successfully follow this path and potentially win the backing of the auto industry and states. In the course of further rulemaking, EPA could set new requirements for 2030 and beyond, providing a long-term road map for industry innovation and investment.¹⁵⁷ Since the Trump Administration has steered clear of unwinding the 2009 "endangerment finding" that provided the basis for regulating vehicle GHG emissions under *Massachusetts*, new vehicle standards under the CAA should have a sound legal basis.¹⁵⁸

EPA will also be well-positioned to use existing authorities to address methane emissions from landfills and the oil

Efforts, INSIDEDEPA.COM, Feb. 25, 2019, <https://insideepa.com/daily-news/feinstein-draft-climate-resolution-seeks-reinstate-obama-ghg-efforts>.

152. After initially indicating it might regulate refinery emissions under §111, the Obama EPA made no attempt to use CAA authorities to address industrial GHG emissions. ALLISON DONNELLY ET AL., REGULATING GREENHOUSE GAS EMISSIONS UNDER SECTION 111(D) OF THE CLEAN AIR ACT: IMPLICATIONS FOR PETROLEUM REFINERIES (Nicholas Institute for Environmental Policy Solutions, Working Paper No. NI WP 14-05, 2014), available at https://nicholasinstitute.duke.edu/sites/default/files/publications/ni_wp_14-05_final.pdf.

153. One possible path to creating a broad cap-and-trade program under the CAA would be to rely on the international pollution provisions of §115. Michael Burger et al., *Executive Summary*, in LEGAL PATHWAYS TO REDUCING GREENHOUSE GAS EMISSIONS UNDER SECTION 115 OF THE CLEAN AIR ACT (Institute for Policy Integrity et al. 2016), available at https://web.law.columbia.edu/sites/default/files/microsites/climate-change/executive_summary_-_legal_pathways_to_reducing_ghgs_under_caa_section_115.pdf. This approach would be legally untested and likely controversial but may be warranted if a legislative path is unavailable for these two sectors.

154. Mexichem Fluor, Inc. v. Environmental Prot. Agency, No. 15-1328, 47 ELR 20097 (D.C. Cir. Aug. 8, 2017).

155. Miranda Green, *Novel International Greenhouse Gas Commitment Goes Into Effect*, HILL, Jan. 3, 2019, <https://thehill.com/policy/energy-environment/423703-novel-international-greenhouse-gas-commitment-goes-into-effect>; *The Kigali Amendment to the Montreal Protocol: Another Global Commitment to Stop Climate Change*, UN ENVIRONMENT, Dec. 8, 2016, <https://www.unenvironment.org/news-and-stories/news/kigali-amendment-montreal-protocol-another-global-commitment-stop-climate>.

156. See *supra* note 50.

157. In addition to the light-duty fleet, EPA should use its CAA authority to further reduce emissions and improve efficiency for heavy-duty vehicles and aircraft.

158. Strong emission and fuel efficiency standards should be one component of a comprehensive strategy to accelerate the transition for EVs that also includes funding for charging infrastructure, strengthening of tax credits, and expansion of ZEV-type programs setting minimum production goals for EVs and a system of tradable credits for industry compliance with these goals.

and gas sector. In 2016, the Obama EPA issued methane control regulations for landfills under §111 of the CAA.¹⁵⁹ The Trump Administration has tried to relax these requirements,¹⁶⁰ but they could be reinstated and strengthened in a new administration. Using the same CAA provision, the Obama EPA issued two sets of emission standards for new and modified oil and gas production sources, explicitly addressing methane emissions in its 2016 rulemaking along with volatile organic compounds and other conventional pollutants.¹⁶¹ The Trump EPA has sought to weaken these rules and plans to remove methane as a regulated pollutant,¹⁶² thereby blocking further rulemaking to reduce emissions at thousands of existing oil and gas wells.

However, EPA's authority to impose technology-based standards for methane emissions in the oil and gas sector is well-grounded in light of *Massachusetts* and its 2009 endangerment determination. A new EPA should thus have little difficulty reversing the Trump rollbacks (if in fact they are finalized by 2020) and strengthening the scope and stringency of methane controls for the industry. These additional controls could target a reduction of 45% from 2012 levels by 2030; the Obama Administration adopted this target in 2015,¹⁶³ but the 2012 and 2016 EPA regulations fell short of achieving it. Using the CAA and other authorities, methane emission controls could also be required for oil and gas pipelines, a significant but often overlooked source of methane leaks.¹⁶⁴

Under the Energy Policy and Conservation Act of 1975 and subsequent amendments, DOE implements minimum efficiency standards for a wide range of appliances and equipment used in residential and commercial build-

159. Standards of Performance for Municipal Solid Waste Landfills, Final Rule, 81 Fed. Reg. 59332 (Aug. 29, 2016) (codified at 40 C.F.R. pt. 60, subpt. XXX); Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills, Final Rule, 81 Fed. Reg. 59276 (Aug. 29, 2016) (to be codified at 40 C.F.R. pt. 60, subpt. WWW).

160. Stay of Standards of Performance for Municipal Solid Waste Landfills and Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills, 82 Fed. Reg. 24878 (May 31, 2017).

161. Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews, Final Rule, 77 Fed. Reg. 49542 (Aug. 16, 2012) (codified at 40 C.F.R. pt. 60, subpt. OOOO); Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources, Final Rule, 81 Fed. Reg. 35824 (June 3, 2016) (codified at 40 C.F.R. pt. 60, subpts. OOOO and OOOOa).

162. An attempt to stay the oil and gas standards was blocked by the D.C. Circuit. *Clean Air Council v. Pruitt*, 862 F.3d 1, 47 ELR 20084 (D.C. Cir. 2017). However, the Trump EPA proposed modifications to the standards in late 2018. 83 Fed. Reg. 52056 (Oct. 15, 2018). The Agency also rescinded an information collection request that the Obama EPA had issued to the industry in 2016 as a first step in developing an emission performance standard for existing oil and gas sources. LINDA TSANG, CONGRESSIONAL RESEARCH SERVICE, EPA'S METHANE REGULATIONS: LEGAL OVERVIEW (2018), available at <https://fas.org/sgp/crs/misc/R44615.pdf>. It is expected that the Trump EPA will add further obstacles to regulating existing sources by proposing to modify the 2016 new source performance standard so it no longer directly regulates methane emissions.

163. Carol Davenport, *Obama Is Planning New Rules on Oil and Gas Industry's Methane Emissions*, N.Y. TIMES, Jan. 13, 2015, <https://www.nytimes.com/2015/01/14/us/politics/obama-administration-to-unveil-plans-to-cut-methane-emissions.html>.

164. Lisa Song, *Methane Leaks From Gas Pipelines Far Exceeds Official Estimates, Harvard Study Finds*, INSIDE CLIMATE NEWS, Jan. 28, 2015, <https://insideclimatenews.org/news/20150128/methane-leaks-gas-pipelines-far-exceed-official-estimates-harvard-study-finds>.

ings.¹⁶⁵ Currently, DOE efficiency standards cover more than 60 categories of products, from dishwashers to vending machines to lighting technologies. DOE estimates that its standards have cumulatively avoided 2.6 billion tons of CO₂ emissions. Under the law, DOE must review its appliance standards at least once every six years to determine whether new requirements are needed to raise the level of energy efficiency. The Obama Administration issued more than 50 standards, but the Trump DOE has missed several deadlines,¹⁶⁶ proposed additional steps in the rulemaking process,¹⁶⁷ and scaled back efficiency targets for upcoming revisions to lighting standards.¹⁶⁸ A new administration should be able to reverse course and both ramp up the pace of standards development and raise the efficiency bar for numerous appliance and equipment classes.¹⁶⁹

In sum, an adroit strategy for a new administration would be to pursue executive action where the legal rationale is sound and the payoff is high but look to legislative solutions in areas of high legal uncertainty and questionable feasibility. In many cases, legislative and administrative action can and should work together.

- ***Through cap-and-trade legislation, use carbon pricing to accelerate emission reductions in the electric power and manufacturing sectors***

The gold standard in climate policy for many economists and some policymakers is carbon pricing (i.e., the imposition of a tax or fee on producers and users of fossil fuels that makes it more expensive to emit GHGs and thereby incentivizes lower-emitting sources of energy and raw materials).¹⁷⁰ Economists justify a carbon price as necessary to address the “externality” of burning fossil fuels. Under this thinking, if fossil fuels are priced to reflect their true cost to society, the marketplace will drive producers and consumers to fuel sources with less carbon.

Carbon pricing has a role to play in driving future GHG reductions but not for all sectors or at the expense of other tools for promoting clean technologies. For example, it is not the optimum strategy for reducing transportation emissions or decarbonizing agriculture or commercial buildings. In addition, even where appropriate, carbon

165. DOE Office of Energy Efficiency and Renewable Energy, *About the Appliance and Equipment Standards Program*, <https://www.energy.gov/eere/buildings/about-appliance-and-equipment-standards-program> (last visited Mar. 22, 2019); Pub. L. No. 95-619, 92 Stat. 3206, 42 U.S.C. §§6201 et seq.

166. *Efficiency Standard Delays Pose Challenges for Appliance Makers*, BLOOMBERG ENV'T, Feb. 7, 2018, <https://news.bloombergenvironment.com/environment-and-energy/efficiency-standard-delays-pose-challenges-for-appliance-makers-corrected>.

167. Robert Walton, *DOE Proposal to Change How It Sets Efficiency Standards Creates New Hurdles, Advocates Say*, UTIL. DIVE, Feb. 19, 2019, <https://www.utilitydive.com/news/doe-proposal-to-change-how-it-sets-efficiency-standards-creates-new-hurdles/548612/>.

168. Alyssa Danigelis, *DOE Proposal Exempts Certain Light Bulbs From Efficiency Standards*, ENERGY MANAGER TODAY, Feb. 8, 2019, <https://www.energymanagertoday.com/doe-proposal-light-bulbs-0181488/>.

169. The EPA Energy Star labeling program has been successful in encouraging industry to exceed DOE efficiency standards and is an important complement to the DOE standards program. ENERGY STAR, <https://www.energystar.gov/> (last visited Apr. 3, 2019).

170. World Bank, *Carbon Pricing Dashboard*, <https://carbonpricingdashboard.worldbank.org/what-carbon-pricing> (last visited Mar. 22, 2019).

pricing should not preempt other emission reduction measures such as regulation under the CAA, as some advocates of a carbon tax have urged.¹⁷¹

Cap-and-trade programs and a carbon tax are both forms of carbon pricing but work in different ways. Under cap and trade, an upper limit (or cap) is set on allowable emissions from an economic sector or sectors.¹⁷² Allowances (typically representing one ton of CO₂ each) are auctioned or distributed to covered entities in quantities that in the aggregate correspond to the emission cap. Each entity has a “right to emit” equal to the allowances they hold. Since current emissions will exceed outstanding allowances, entities must either reduce emissions or buy allowances from other entities that have excess allowances because of their own emission reductions. The cap can be reduced over time by lowering the number of available allowances.

A carbon tax, by contrast, does not place a limit on allowable emissions, but instead imposes a per-ton tax on producers (and perhaps users) of fossil fuels based on their emissions when burned. Advocates propose that the tax begin at a modest level (i.e., \$16 per ton) but increase by a set percentage above inflation (i.e., 4%) each year, progressively achieving greater emission reductions.¹⁷³ Under this approach, producers and consumers would get the benefit of a predictable and fixed carbon price—unlike under cap and trade, where allowance prices will fluctuate based on market forces.

On the other hand, in the absence of an emissions cap, a carbon tax does not create enforceable obligations to reduce emissions and there is no assurance that a given tax rate will translate into a specific level of emission reduction. For example, while a tax on the carbon content of crude oil may increase gasoline prices, consumers may respond by simply paying more at the pump as opposed to driving fewer miles or purchasing lower-emitting vehicles. If a carbon tax does not produce the desired level of emission reductions, recouping the excess emissions by raising the carbon tax rate retroactively may be resisted by industry and lawmakers.¹⁷⁴

This emission uncertainty is a fatal flaw in carbon tax proposals because it undermines our ability to deliver reliably on emission reduction goals and target dates. By contrast, cap and trade is designed to assure that desired emission reductions actually occur and therefore provides a high degree of emission certainty. Moreover, through

171. JAMES A. BAKER III ET AL., CLIMATE LEADERSHIP COUNCIL, THE CONSERVATIVE CASE FOR CARBON DIVIDENDS (2017), <https://www.clcouncil.org/media/2017/03/The-Conservative-Case-for-Carbon-Dividends.pdf>.

172. Environmental Defense Fund, *How Cap and Trade Works*, <https://www.edf.org/climate/how-cap-and-trade-works> (last visited Mar. 22, 2019).

173. ADELE C. MORRIS, BROOKINGS INSTITUTION, PROPOSAL 11: THE MANY BENEFITS OF A CARBON TAX (2016), available at https://www.brookings.edu/wp-content/uploads/2016/06/THP_15WaysFedBudget_Prop11.pdf.

174. According to a recent report, however, some economists are exploring the concept of an “emissions assurance mechanism” or a “tax adjustment mechanism” that would accelerate scheduled tax increases in order to spur more GHG cuts if targets are being missed. Doug Obey et al., *Carbon Tax Supporters Refining Details Amid Hazy Political Outlook*, INSIDE EPA, Mar. 21, 2019, <https://insideepa.com/weekly-focus/carbon-tax-supporters-refining-details-amid-hazy-political-outlook>.

allowance trading, the costs of emission reduction are allocated efficiently among emitting sources and incentives are created for innovation and low-cost compliance strategies. Thus, cap-and-trade programs are widely recognized to be highly cost effective.¹⁷⁵ Despite criticism of Waxman-Markey,¹⁷⁶ cap and trade has a long history of successful application to conventional pollutants under the CAA,¹⁷⁷ and a growing track record in controlling GHG emissions in California,¹⁷⁸ under the Northeast Regional Greenhouse Gas Initiative (RGGI),¹⁷⁹ and in the European Union (EU).¹⁸⁰ There is much less experience with carbon taxes, and the limited results to date have been inconclusive.¹⁸¹

The electric power sector is well-suited to cap and trade. The number of fossil fuel power plants is relatively small: the U.S. Energy Information Administration (EIA) reported 359 coal facilities and 1,080 natural gas facilities in 2017.¹⁸² Because these facilities are required to monitor their CO₂ emissions, compliance with emission limits is easy to measure and track. Power producers are intimately familiar with cap-and-trade programs for sulfur dioxide and nitrogen oxide and, in California and the Northeast, for CO₂.¹⁸³ During the development of the CPP, there was considerable dialogue over the design of allowance trading programs for CO₂, and this learning could be carried over

175. Lata Gangadharan, *Markets for Clean Air: The U.S. Acid Rain Program* by A. Denny Ellerman, Richard Schmalensee, Elizabeth M. Bailey, Paul L. Joskow, and Juan-Pablo Montero, 82 ECON. REC. 227 (2006), available at https://www.researchgate.net/publication/4990125_Markets_for_Clean_Air_The_US_Acid_Rain_Program_by_A_Denny_Ellerman_Richard_Schmalensee_Elizabeth_M_Bailey_Paul_L_Joskow_and_Juan-Pablo_Montero.

176. In contrast to Waxman-Markey, GHG cap-and-trade programs that apply to a relatively small universe of facilities and are simple in design may be easier to explain and defend.

177. DALLAS BURTRAW ET AL., ECONOMICS OF POLLUTION TRADING FOR SO₂ AND NO_x (Resources for the Future, Discussion Paper No. 05-05, 2005), available at <https://ageconsearch.umn.edu/record/10488/files/dp05005.pdf>.

178. CALIFORNIA AIR RESOURCES BOARD, OVERVIEW OF ARB EMISSIONS TRADING PROGRAM (2011), https://www.arb.ca.gov/newsrel/2011/cap_trade_overview.pdf.

179. Regional Greenhouse Gas Initiative, *Home Page*, <https://www.rggi.org/> (last visited Mar. 22, 2019).

180. European Commission, *EU Emissions Trading System (EU ETS)*, https://ec.europa.eu/clima/policies/ets_en (last visited Mar. 22, 2019).

181. A carbon tax has not yet been implemented in the United States. However, the Canadian province of British Columbia (BC) has been levying a carbon tax for several years. While the tax has widespread support and has not negatively affected the BC economy, it has failed to achieve expected levels of emission reduction. Eduardo Porter, *Does a Carbon Tax Work? Ask British Columbia*, N.Y. TIMES, Mar. 2, 2016, <https://www.nytimes.com/2016/03/02/business/does-a-carbon-tax-work-ask-british-columbia.html>. A carbon tax is poised to be implemented in other Canadian provinces in the face of widespread opposition by some provincial politicians. Ian Austen, *Justin Trudeau Is Facing a Carbon Tax Backlash. He Is Not Alone.*, N.Y. TIMES, Dec. 7, 2018, <https://www.nytimes.com/2018/12/07/world/canada/trudeau-carbon-tax.html>.

182. EIA, *Table 4.1. Count of Electric Power Industry Power Plants, by Sector, by Predominant Energy Sources Within Plant, 2007 Through 2017*, https://www.eia.gov/electricity/annual/html/epa_04_01.html (last visited Mar. 22, 2019).

183. Oregon is also now considering GHG cap-and-trade legislation. Dylan Darling, *Cap and Trade Bill, Other Environmental Legislation Still in the Works in Salem*, THE REGISTER-GUARD, Apr. 6, 2019, <https://www.registerguard.com/news/20190404/cap-and-trade-bill-other-environmental-legislation-still-in-works-in-salem>.

to a cap-and-trade program mandated by Congress.¹⁸⁴ It is projected that power-sector emissions will be 37% below 2005 levels by 2025—as compared to the CPP goal of 32% below 2005 levels by 2030—even though the CPP has never taken effect.¹⁸⁵ Thus, a more ambitious 2030 reduction goal of 45% below 2005 levels should be achievable and would increase pressure to retire coal plants and expand renewable capacity without unduly stressing the industry.¹⁸⁶ This reduction target might be increased to 60% by 2040 and 90% by 2050.

Manufacturing facilities with significant GHG emissions are also a good candidate for cap and trade. As noted above, emissions from these sectors have not declined measurably since 2005 and are projected to increase in coming years. Policymakers have devoted little attention to manufacturing emissions despite their significant contribution to the national total. Implementing an emissions cap set at some percentage—perhaps 85%—of 2005 levels by 2030 would begin to drive investment in fuel switching, energy efficiency, and emission-reducing process improvements.¹⁸⁷ Through allowance trading, manufacturers could lower the costs of these investments.¹⁸⁸ There is less experience with cap and trade for manufacturing operations than for power plants, but the California and EU trading systems have included industrial emitters and provide a starting point for designing a U.S. national program.

Congress should create a single integrated cap-and-trade system in which both power plants and industrial emitters could participate. This system would encompass roughly 40% of U.S. GHG emissions and the size of the resulting trading market would increase market efficiencies and expand opportunities for cost-effective emission reductions.

Revenues from the auctioning of CO₂ allowances are an essential feature of California and RGGI cap-and-trade programs,¹⁸⁹ and have been used both to fund effi-

184. Bob Sussman, *The Return of Cap and Trade Is Good News for U.S. Climate Policy*, BROOKINGS, Oct. 21, 2015, <https://www.brookings.edu/blog/planetpolicy/2015/10/21/the-return-of-cap-and-trade-is-good-news-for-u-s-climate-policy/>.

185. See *supra* note 17.

186. Some traditional utilities have announced ambitious GHG reduction goals that exceed this target. For example, Xcel Energy has committed to an 80% reduction by 2030 and an 100% reduction by 2050. *Building a Carbon-Free Future: Our Bold Vision for 2030 and 2050*, XCEL ENERGY, https://www.xcelenergy.com/Environment/Carbon_Reduction_Plan (last visited Apr. 3, 2019). DTE has committed to a 50% reduction by 2030 and an 80% reduction by 2040. Press Release, DTE Energy Accelerates Carbon Reduction Goals a Full Decade, Will Reduce Emissions 80 Percent by 2040, Mar. 28 2019, available at <http://newsroom.dteenergy.com/2019-03-28-DTE-Energy-accelerates-carbon-reduction-goal-a-full-decade-will-reduce-emissions-80-percent-by-2040#sthash.bRN3WDPe.dpbs>. Both of these utilities have historically been heavily dependent on coal-fired generation.

187. The reduction goal might be increased to 30% by 2040.

188. In addition, it may be desirable to take additional measures to protect manufacturers from competitive disadvantages in global trade from the increased costs of meeting GHG reduction requirements. The Waxman-Markey bill included provisions for border tariff adjustments based on differences in GHG intensity between the United States and trading partners. See *supra* note 14. Another option is to provide tax credits or low-interest loans for investments in low-carbon manufacturing processes and equipment. Emission allowances might also be distributed for free to manufacturing facilities.

189. California Climate Investments, *Home Page*, <http://www.caclimateinvestments.ca.gov/> (last visited Mar. 22, 2019); BRIAN M. JONES ET AL., M.J.

ciency and clean energy investments and provide direct benefits to taxpayers and communities. There are differing views on how best to invest the proceeds of allowance auctions,¹⁹⁰ and Congress will need to examine this issue should it decide to create a national cap-and-trade program for power plants and manufacturers.¹⁹¹ Auction revenues can offer another source of funding for emission-lowering programs that are unable to attract private-sector investment and are not amenable to direct regulation, but can also be used to allay concerns about increased energy prices by returning a “carbon dividend” to energy consumers.

- ***Recognize that not all states and regions can move at the same speed, and devise a national framework that allows for differential rates of progress***

A few states have taken leadership roles on climate, announcing ambitious emission reduction goals and pursuing strong programs to achieve these reductions. California, Massachusetts, New York, and other Northeast and Pacific Coast states fall in this category. A larger group of states, including Colorado, Illinois, Michigan, Minnesota, Pennsylvania, Virginia, and Wisconsin, aspire to climate leadership but are either just beginning to develop programs or have thus far made modest progress.

More than one-half the states, concentrated mainly in the South or Midwest, have been largely passive. These states derive a larger portion of their electric power from coal than the national average,¹⁹² lack strong targets for renewables and thus have modest amounts of wind and solar,¹⁹³ have made limited investments in efficiency,¹⁹⁴ and have not made a big push for EVs and charging infrastructure.¹⁹⁵ Some may also have a high concentration of carbon-intensive manufacturing facilities.¹⁹⁶

190. BRADLEY AND ASSOCIATES, A PIONEERING APPROACH TO CARBON MARKETS (2017), available at <https://www.mjbradley.com/sites/default/files/rggimarkets02-15-2017.pdf>.

191. Emilie Mazzacurati, *Politics of Carbon Auction Proceeds—The Battle Ahead*, FOUR TWENTY SEVEN, Dec. 17, 2013, <http://427mt.com/2013/12/17/politics-carbon-auction-proceeds-battle-ahead/>. Some advocate returning auction revenues to consumers in the form of reductions in energy bills, tax credits, or lump-sum payments. Others favor investments in low-income communities. Another option (largely but not entirely adopted by California and the RGGI states) is investing in clean energy and mass transit.

192. For example, cap-and-dividend legislation recently proposed by Congressman Don Beyer (D-Va.) and Sen. Chris Van Hollen (D-Md.) would return all auction revenues to taxpayers. Press Release, Van Hollen, Beyer Introduce Cap and Dividend Legislation, Mar. 28, 2019, available at <https://beyer.house.gov/news/documentsingle.aspx?DocumentID=1290>.

193. John Muyskens et al., *Mapping How the United States Generates Its Electricity*, WASH. POST, Mar. 28, 2017, <https://www.washingtonpost.com/graphics/national/power-plants/>.

194. See *supra* note 104.

195. GALEN L. BARBOSE ET AL., ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY, THE FUTURE OF UTILITY CUSTOMER-FUNDED ENERGY EFFICIENCY PROGRAMS IN THE UNITED STATES: PROJECTED SPENDING AND SAVINGS TO 2025 (2013), available at <http://emp.lbl.gov/sites/all/files/lbnl-5803e.pdf>.

196. See *supra* note 113.

197. Alexander E.M. Hess et al., *10 States Where Manufacturing Still Matters*, USA TODAY, Aug. 10, 2013, <https://www.usatoday.com/story/money/business/2013/08/10/10-states-where-manufacturing-still-matters/2638363/>.

Leadership states and regions will be better-positioned to meet national emission reduction targets than those with less capacity to decarbonize quickly and a steeper hill to climb. Federal programs need to recognize these differences and adjust the level of assistance they provide accordingly. This could take the form of issuing additional tradable allowances to states with a higher proportion of coal-fired power plants, directing a higher share of funding for new transmission to regions with modest wind and solar resources, or steering a greater percentage of energy efficiency grants to states and regions with historically higher levels of energy consumption. These efforts to moderate regional impacts and avoid inequities may have political payoffs by winning over elected politicians who might otherwise oppose climate policies harmful to their constituents.

VI. Conclusion

Forward movement on climate after the 2020 election presents both opportunities and challenges. The resurgence of public concern about climate change may provide an opening for significant progress but decisionmakers need to heed the lessons of past policy failures and work toward consensus on emission reduction strategies that can command broad support. With a spirit of pragmatism and an appreciation of political and economic realities, progressives and moderates can come together behind an ambitious but achievable agenda to make sustainable changes in the U.S. carbon footprint that provide a durable, long-term path for deep reductions in GHG emissions.