5

The USA and Climate Policies
Patterns and Progress in Compounded Muddling

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5.1 Introduction

Americans can always be trusted to do the right thing, once all other possibilities have been exhausted.[1]

This aphorism, often misattributed to Winston Churchill, is at best a backhanded compliment that has nevertheless become popular with American politicians and political commentators alike. It recognizes some negative characteristics of both Americans and the American political system, namely, significant propensities for denial, avoidance, and piecemeal half-measures. But it captures an underlying optimism in the way Americans prefer to see themselves – as skeptical but enterprising, determined, pragmatic tinkerers who are fundamentally well-intentioned. Also embedded in it are some questionable but seldom dissected assumptions about the fundamental nature of the politics and governance problems Americans face, namely, that all problems are fixable so long as Americans eventually do the right thing. Even if accepted at face value, the aphorism becomes much less reassuring if one recognizes that some problems cannot be fixed, in any meaningful sense of 'fixed', but can only be prevented or ameliorated. Eventually coming around to doing the right thing is commendable, but only so long as it is not too late. If problems involve issues of irreversible damage or system degradation, the only truly effective action may be early efforts of avoidance or prevention. Moreover, doing the right thing seldom consists of a single isolated action, but rather of interconnected sets of poorly understood processes extending over generations, involving complicated and coordinated efforts at experimentation, learning, execution, revision, and follow-through. This is the political challenge that the climate warming problematique poses for everyone, but nowhere more so than for the United States. The aphorism offers little reason to be hopeful.

If there is any fairness or validity in its characterization of Americans and their country (and surely there is a bit),[2] it suggests that U.S. climate policy and governance will continue for some time to be characterized by denial, avoidance, half measures, and considerable experimentation. But it also tells us to expect that the U.S. climate policies and governance

[1] Although Churchill apparently never said it, the sentiments seem Churchillian. The original version, which did not single out Americans, can be found in a speech by Abba Eban at the United Nations in June 1967: 'Men and nations do act wisely when they have exhausted all the other possibilities.'

[2] A. de Tocqueville, trans. H. Reeve, *Democracy in America* (Schocken Books, 1961).

will involve tinkering that over time will make the United States incrementally more effective in reducing the rates of emission of greenhouse gases per capita, per unit of gross domestic product (GDP), and even overall. The United States will undertake a variety of programs that do not threaten powerful political actors, such as programs to mitigate the levels of greenhouse gasses already in the atmosphere. And the United States will achieve, however expensively, considerable societal and economic adaption to the physical realities of a warmer climate. The American political and economic system has a latent capacity for innovation and rapid transformation that is greater than that of most other countries, if something occurs that serves as a catalyst for action (such as a crisis posing dangers so clear and present that they are universally acknowledged). Perhaps what might be called a 'Samuel Johnson focusing circumstance'[3] will emerge before 2030 that will lead to the United States doing the right thing by overcoming both the current high levels of national political dissensus and the numerous veto points in the American policy system. Otherwise, if and when Americans ever finally come around to doing the right thing, it will certainly be well after it is too late to contribute meaningfully to stabilizing global temperature increases at or near 1.5 degrees Celsius (°C). By that standard, then, failure is probably already baked in (as is, of course, true for most other countries as well).

Stimulated by broadly foreseeable but not specifically predictable events such as catastrophe-precipitated crises, however, the United States may nevertheless become a decisive contributor to carbon stabilization at some not-too-much-higher level. If for no other reason, the United States has a substantial capacity to contribute to the kinds of scientific, technological, and economic advances that will make possible prudent and measured carbon capture and removal strategies that are inevitably going to be required for the world ever to get to net zero and then net negative carbon emissions.

With respect to national performance on greenhouse gas emissions and mitigation strategies, therefore, even if the current Biden administration continues to succeed in securing legislative approval of major portions of its climate proposals, the United States is unlikely to appear soon on any 'top 10' lists of greenhouse policy countries, although even here it may become a leader in some specific areas such as methane emissions, resource management practices, or research. The United States has always been a leader in climate research, both basic and applied, and will continue to invest, contributing disproportionately to a better scientific understanding of climate causes and effects and the development of more effective technological innovation applied to mitigation, emissions reduction, and adaptation (contributions that will notably increase the climate policy capacities of all countries).

Various comparative assessments of national climate policy performance have generally tended to focus on policies for achievement of mitigation and reduction of national emissions, either reductions in the amount or rate of net total greenhouse gas emissions, or reductions proportionate to per capita, or to per GDP. Considering net emissions, the United States has done a better job since 1990 than it is usually given credit for, and that will likely

[3] J. Boswell, *The Life of Samuel Johnson* (1791), entry for 19 September 1777: 'When a man knows he is to be hanged in a fortnight, it concentrates his mind wonderfully.'

continue going forward. But the forward path will continue to be a slow and torturous one. In the twenty-first century, neither the Bush nor the Trump administrations reversed or even significantly altered U.S. greenhouse gas emissions trends, nor did the initiatives of the Obama administration steer policy to a markedly different trajectory either (and still would not have even had all proposed policies for all those administrations been accepted by Congress and the Supreme Court). In part this is because no presidential administration has made climate policy a true priority and none has proposed radical or systemic policy changes. Climate performance continues to improve gradually in response to structural policy choices about efficiency and pollution control made decades ago. In large part it is also because in the United States much climate policy is made by subnational governments and in nongovernmental arenas that are potentially influenced by, but not controlled by, the national government. So, it is predictable that the United States will continue to achieve marginal improvements in its climate performance, but it is likely that these improvements will not be enough to contribute in a major way to stabilizing or lowering global atmospheric greenhouse gasses in the next 30 years. Again, it is a safe bet that the United States is not really going to come around to 'doing the right thing' any time soon.[4]

5.2 United States Climate Policy's Mini-Successes and Many Failures: Whys and Wherefores

Comprehension and evaluation of the climate policies of the United States is particularly challenging. United States climate governance develops and is implemented in a notably diverse cultural and social context, and it must be applicable on a trans-continental land mass with a degree of geophysical and biological variation across terrain, climate risk, and resources, as is found in few other nations. The economic system of every country affects and is affected by all climate policies, and the United States has a richly complicated economic system, with minimal central coordination and direction. The economic system is so complex in part because it is embedded within a political system that is especially fragmented and perhaps more complex than that of any other country, with most of its working institutional structures created semi-independently at different times and with varying motivations. These political structures are autonomous enough to allow them to work at cross purposes to each other, which they often do. There are the famous 'checks and balances' among the three branches of the national government, of course, but also checks and balances offered by a multitude of State and local governments and the thousands of often semi-autonomous bureaucracies and regulatory agencies. The American political system overall has never been subjected to the kinds of sweeping reorganizations and restructurings that often have occurred in other countries during or after wars or revolutions. Because the American system has a strong structural bias against policy change, with many actors empowered to veto political action, significant national policy change tends to occur mainly in periods of national near-consensus (the Great Depression; World Wars; the

[4] Many other nations will provide it company, of course – the United States is failing, but so is nearly every other country to greater and lesser degrees.

1960s). In the twenty-first century the extent of U.S. societal dissensus (polarization) has been high and has grown on political issues with significant normative dimensions including mostly environmental ones, making it a challenge to transcend ideology with pragmatism even in routine policy-making, much less for normatively charged climate policies.[5] At the national level in the United States, nothing truly big can happen without at least temporary emergence of a near-consensus that something should be done.[6]

The compound U.S. political system is poorly understood by outsiders and certainly by most Americans as well, including most public personalities and news media elites, nearly all of whom, if they think of climate policies at all, think only in terms of the formally adopted policies and initiatives of the national government. Indeed, most scholarly books and articles about U.S. climate policies, or about environmental policies more generally, share this same bias, including university textbooks. The bias extends to nearly all comparative climate policy assessments, which tend to focus mainly, or exclusively, on the actions and performance of various national governments, ignoring any independent actions of subnational governing authorities or nongovernmental actors. This is especially problematic when countries with a federal system are compared with their unitary brethren; such summary assessments often provide very incomplete and unbalanced pictures of the climate policy landscape.[7] The U.S. federal government is, of course, central to the development, adoption, and implementation of many crucially important climate policies. But in addition to the complexity created by 50 sovereign state-level governments, the United States also has what might seem to be innumerable other sovereign and semi-autonomous governing authorities (not actually innumerable because the Census Bureau counts them every five years in a formal census of governments, the most recent of which in 2017 identified more than 90,000 governmental authorities, including 38,779 general-purpose governments and 51,296 special purpose governments, all of which have a considerable degree of autonomy from the national government). Collectively these 90,000+ subnational governments employ many times more people than the single national government does.

The importance of these 90,000+ subnational governments to climate policy and governance can hardly be overstated. Just as the causes of climate warming permeate every aspect of everyday life, so each one of these 90,000+ governments has some responsibility for, and some impact on, policies affecting climate. In such a semi-anarchic system, policy is rarely made in other than partial, muddled ways, usually separately and simultaneously. Many climate policies become established as the shared efforts of multiple governments, such as between the national government and the States, or among the States and multiple local governments. But some policies, such as those dealing with land use, housing, and education, are overwhelmingly the responsibility of individual local governments. Many of these local governments are themselves internally fragmented with patterns of power

[5] W. F. Baber, R. V. Bartlett, *Consensus and Global Environmental Governance: Deliberative Democracy in Nature's Regime* (MIT Press, 2015).

[6] A. Clark, F. Justwan, J. E. Carlisle, M. Clark, Polarization politics and hopes for a green agenda in the United States. *Environmental Politics* 2020, 29(4): 719–745.

[7] M. C. Abraham-Dukuma, M. O. Dioha, F. N. Okpaleke, N. Bogado, Improving the climate change mitigation regime of major emitting countries: the case of South Africa, China, Germany, and the United States of America. *Environmental Policy and Governance* 2022, 32(1): 43–55.

dispersal being similar to that found in the U.S. national government – with divided legislatures, executives independent of the legislatures, and considerable autonomy allocated to regulatory bodies and implementing bureaucracies. To a degree found in no other country, the U.S. judiciary (in both its local and State as well as national manifestations) plays a prominent role not only in interpreting statutory climate policies but also in determining their constitutionality (including whether state and local laws and regulations pass muster under individual state constitutions). The judiciary is also important in shaping policy through application of the precepts of common law. There are few, if any, aspects of existing or potential climate policy in the United States not subject to the various legal prohibitions, permissions, or mandates founded in millennia of judge-made common law developments – for example, of contracts, property, and tort.[8]

Beyond governmental authority, the United States has a particularly large, rich, and vital civil society and nonprofit sector that engages in the broadest possible range of activities – for example, resource management, transportation, housing, disaster recovery, migration, education – that have innumerable direct and indirect climate implications. Conservation land trusts are just one example of this kind of climate-relevant nongovernmental governance (not unique to the United States). Regional and local conservation land trusts now number in the thousands.[9] These and other environmental, church, and civic organizations and informal networks self-organize to undertake climate policy and governance beyond that which is done by governments, but also in collaboration with 90,000+ governments and often while exercising considerable discretion as agents of governments.

As such, the erratic and generally half-hearted efforts of the U.S. national government to develop climate policies over the past 35 years are indeed significant, but they constitute only one part of the picture – a big but still minority part of the picture at that. To muddy it further, adoption and implementation of some of the most notable national policies with climate impact significance were originally motivated by other concerns, and even now may not be mainly thought of as climate policies. An outstanding example is the Montreal Protocol on Substances that Deplete the Ozone Layer ('Montreal Protocol'). In the 1980s the United States was an international leader, first in banning many routine uses of ozone-depleting chemicals and then in leading negotiations that produced the initial Montreal Protocol, an agreement that no one at the time imagined to constitute climate policy at all. Nevertheless, because many ozone-depleting chemicals and substitutes for ozone-depleting chemicals are also extremely potent greenhouse gasses, the tremendous success of the Montreal Protocol as amended and implemented worldwide has had substantial impact on the reduction of greenhouse gas emissions globally (ironically, substantially much more impact than any explicitly climate-referenced international agreement!).

Likewise, aggressive U.S. air pollution policies, although not focusing on greenhouse gases per se until after 2009, have nevertheless led to substantial changes in industrial and commercial activity, residential heating, and transportation that have reduced the

[8] See Chapter 17 by Alogna, Arnould and Holzhausen in this volume.
[9] S. K. Fairfax, L. Gwin, M. A. King, L. Raymond, L. A. Watt, *Buying Nature: The Limits of Land Acquisition as a Conservation Strategy, 1780–2004* (MIT Press, 2005); R. Brewer, *Conservancy: The Land Trust Movement in America* (Dartmouth College Press, 2004).

consumption of fossil fuels (and shifted fuel use from coal and oil to cleaner-burning natural gas), which has had as a direct effect the reduced emission of the greenhouse gasses methane and nitrous oxides and as a side effect the reduced emission of carbon dioxide. After World War II, many state and local governments undertook regulation of air pollution from stationary sources, primarily residential and commercial buildings. With a focus on visual pollutants, this accelerated a shift already underway from coal to cleaner combusting fuels for heating and industry. Meanwhile research – much of it funded by the federal government – led to the nature of air pollution being better understood as involving a great deal more than the soot apparent in smoke.[10] Although air quality was already improving in many places in the United States as a consequence of economic drivers and the efforts of state and local governments, the adoption of the national Clean Air Act of 1970 established a substantial new regulatory regime aimed at protecting human health from harm caused by air pollution.[11] Henceforth a new national regulatory agency would set stringent, scientifically grounded standards for emissions, ambient air quality, and technology, and then would enforce them in collaboration with the States. Most of these standards became stricter over time, as justified by evolving scientific understanding. The result was dramatic improvements in air quality over time, even as both U.S. population and per capita GDP increased markedly over the next half-century – and with accompanying, but mostly unintended, decreases in greenhouse gas emissions.

Over the same period, different motivations prompted the adoption and implementation of various national policies to improve U.S. energy efficiency. None of the efficiency policies established prior to 1990 had even the secondary purpose of reducing emissions of greenhouse gasses. Rather, they were intended to help achieve the goal of national 'energy independence' via the reduced consumption of oil in particular. After the dramatic rise in oil prices in 1973, the United States began establishing a wide variety of efficiency standards, most notably for vehicles but also for building construction and operations, long-lasting household and commercial appliances, and a variety of consumer and commercial goods such as light bulbs. Many of these kinds of efficiency standards were established by state governments as well as by nongovernmental certification associations. Energy efficiency was also driven, of course, by incentives provided by monetary savings. In the United States the net effect was an improvement in the average annual decrease in national energy intensity from 1% per year before the mid-1970s to 2% per year thereafter,[12] explaining much of the overall 2% decrease in annual greenhouse gas emissions that occurred from 1990 to 2019 in the absence of any major national effort explicitly to reduce greenhouse gas emissions.[13]

After 1990, no major new national climate relevant programs and initiatives that would require congressional authorization and presidential approval, such as a carbon or British Thermal Unit tax or a watered-down version of a Green New Deal, have been able to

[10] The word 'smog', originally a portmanteau of 'smoke' and 'fog', became scientifically understood as something hardly involving fog at all, but rather as consisting of photochemical haze resulting from the action of ultraviolet sunlight on hydrocarbons and nitrous oxides in the air.

[11] 42 USC ch. 85.

[12] These long-term trends did waver up and down during and after recessions, but were minimally affected by shifts in control of the national government from one party to another, or divided control.

[13] After 1990, and especially after 2009, efficiency policy adoption and revisions were increasingly motivated by the dual goals of energy independence and greenhouse gas emission reduction.

overcome the many veto points in the legislative process. Big policy developments or change continue to be unlikely going forward, in the absence of a crisis that has enough impact and immediacy to coalesce previously unimaginable levels of support. The exceptions are and will be the occasional programs that get folded into small and large budgetary, infrastructure, and macroeconomic stimulus packages. For example, the economic stimulus package passed in the depths of the Great Recession in 2009 allocated billions of dollars to energy efficiency, energy conservation, renewable energy, energy research, and public transportation, all of which had an impact on greenhouse gas emissions.

Thus, extending and ratcheting up of earlier policies on pollution control and energy efficiency constituted much of the national government's climate policy from 1990 to 2021.[14] These are areas for which the authorizing legislation had been adopted as long ago as the 1970s and that had delegated rulemaking and enforcement to executive agencies led by presidential appointees. Under the Obama administration (2009–2017), for example, regulatory authority delegated to the Environmental Protection Agency (EPA) under the Clean Air Act of 1970 was used to designate carbon dioxide as a pollutant and to justify the EPA's proposal of plans and rules to regulate it as such. As authorized by the Energy Policy and Conservation Act of 1975,[15] a schedule of increasingly stringent fuel-efficiency standards was enacted for motor vehicles. The Trump administration (2017–2021) attempted to reverse these and many other climate regulatory initiatives partially or completely, but in most instances the rollbacks left in place policies that were more demanding than those that had existed a decade earlier.[16]

What the history of both air pollution control and energy efficiency policy demonstrates is that: (1) the adoption of such sweeping national policies depends on the existence of a near-consensus; and (2) successful implementation (over decades) requires that such policies need to be both sufficiently concrete so that what counts as success is relatively clear and sufficiently strong to inspire a level of public support that makes a direct path to the goal both justifiable and sustainable.[17] If ever there emerges a degree of consensus in the United States that supports the adoption of far-reaching climate policy, then there will be reason to be optimistic that, over time, implementation of such a policy will be as successful as air pollution policies have been.[18]

5.3 Climate Policy and Implementation Going Forward

Joseph Biden became U.S. President having campaigned more extensively on climate as an issue and having prioritized climate action more in his early days in office than any previous

[14] M. Mildenberger, Development of climate institutions in the United States. *Environmental Politics* 2021, 30(1–2): 71–92.
[15] Pub L. 94–163, 89 Stat. 871.
[16] Many additional reversals and rollbacks were proposed but rejected by the courts because of procedural deficiencies in the way they were adopted, and many were adopted in the latter days of the administration and were duly abandoned by the incoming Biden administration before they could go into force.
[17] See Chapter 3 by Baber in this volume.
[18] And just as implementation of ratified treaties by the United States has been. The United States has a record of not ratifying many multilateral international treaties, including some environmental ones for which it took the lead in negotiations, because ratification requires a super-majority of the U.S. Senate. But, at the same time, the United States also has one of the best records of all countries in implementing treaties once it ratifies them.

president.[19] The climate policy strategy of the Biden administration (2021 to present) involved three broad types of action, each of which was undertaken fairly independently of each other:

(1) The proposal and negotiated adoption of major new legislative expenditure initiatives for infrastructure projects and programs aimed at subsidizing accelerated technology development, deployment, and diffusion.
(2) The proposal and adoption of stringent new energy efficiency standards that would phase in over a fairly short period of time and would be sufficiently demanding to greatly improve efficiency, and in some cases force the adoption of new technology such as electric automobiles and energy efficient light-emitting diode lightbulbs.
(3) The proposal and adoption of new pollution standards as justified by improvements in best-available technologies and economic feasibility and as justified by new scientific knowledge about the impacts of specific air pollutants, including carbon dioxide, on human health. Among the predictable impacts of more stringent regulation of various pollutants will be reductions in fuel consumption, shifts from fossil fuels to renewable energy sources, and shifts from dirtier (and more carbon-emitting) fossil fuels such as coal to comparatively cleaner fossil fuels such as natural gas.

After rejoining the Paris Agreement early in 2021, in November of that year the United States submitted a new Nationally Determined Contribution (NDC) document,[20] setting the United States' 2030 target for reduction of net greenhouse gas emissions at between 50% and 52% below 2005 levels. This target, however inadequate for ultimately solving the climate warming problem, is by historical standards quite an ambitious goal. The NDC declared that 'there are multiple paths to achieve this goal',[21] but undoubtedly the Biden administration hoped to achieve much of the goals through the successful enactment of two major legislative initiatives, the Infrastructure Investment and Jobs Act of 2021 and Build Back Better Act, both already being negotiated and debated by Congress.[22]

A few days after the conclusion of COP 26 in Glasgow, the President was able to sign the first of these acts – which had passed both the Senate and the House with some Republican votes in addition to overwhelming Democratic support – into law.[23] Although climate provisions were a relatively minor part of this infrastructure legislation, the Act nevertheless did provide for tens of billions of dollars of new spending on public transportation, charging stations for electric vehicles, climate change resilience improvements for roads and bridges, new clean energy transmission capacities, development of clean energy technologies, and the capping of methane-leaking orphaned gas and oil wells. According to analysis by Jenkins and colleagues,[24] the likely

[19] E. Bomberg, The 2020 US election and its climate consequences. *Environmental Politics* 2021, 20(5): 854–862.
[20] United States of America, The United States' Nationally Determined Contribution—Reducing Greenhouse Gases in the United States: A 2030 Emissions Target, 22 November 2021 (United Nations Framework Convention on Climate Change website, NDC Registry. www4.unfccc.int/sites/NDCStaging/Pages/All.aspx).
[21] Ibid. at p. 2.
[22] Introduced by Peter DeFazio (D-OR) as H.R. 3684 of 2021–2022; Introduced by John Yarmuth (D-KY) as H.R. 5376 of 2021–2022.
[23] Pub L. 117–58, 135 Stat. 429.
[24] J. D. Jenkins, E. N. Mayfield, R. Jones, et al., Summary Report: The Climate Impacts of Congressional Infrastructure and Budget Bills. REPEAT Project, Princeton, NJ. 28 February 2022. doi:10.5281/zenodo.6311986.

net greenhouse gas reduction impact of the Infrastructure Investment and Jobs Act, below what would have been achieved with the policies already in place in January 2021, will be 9% of the emission reductions needed to achieve the USA's 2030 goals.

Potentially much more significant for climate policy was the proposed Build Back Better Act, which in the version passed by the House of Representatives would have spent over $550 billion on a wide-ranging package of climate provisions, including clean energy tax credits, reform of oil and gas fees and royalties, and new spending on clean energy research and development, home and industrial energy efficiency, rail transportation, zero-emission vehicle infrastructure, zero-emission government vehicle fleets, support of state, local and nonprofit climate and pollution reduction efforts, the commercialization and deployment of new technologies, methane pollution control, climate resilience and mitigation workforce development, and support of rural energy access, efficiency, transition, and infrastructure. If the House-passed version of the Build Back Better Act had become law, Jenkins et al. estimate it would have achieved a further 82% of the emission reductions needed to achieve the 2030 goals (leaving a 9% gap still to be achieved by other means).[25]

Extensive negotiations through July 2022 did not produce an agreement on a bill that could secure passage in the U.S. Senate. Negotiations dragged out and foundered mainly over tax and social spending provisions of the bill that were minimally climate relevant. Finally, agreement was reached among Democrats on a slimmer bill without many of the earlier social spending provisions, renamed the Inflation Reduction Act of 2022.[26] It passed the Senate 51:50 with all Democrats voting in favor and all Republicans voting against, and then the revised bill passed the House with again all Democrats in favor and all Republicans opposed. It was signed by President Biden on 16 August 2022. The new, more politically attractive name, was justified by provisions for prescription drug price reforms, a new corporate tax rate, a new excise tax on stock buybacks, and increased spending on tax enforcement. New spending on energy security, climate change, and drought resilience totaled $373 billion, mostly for tax credits, subsidies, and rebates. Jenkins et al. estimate that the Act will result in closing the gap between what current policy would achieve and the reduction of greenhouse gas emissions to 50% below 2005 levels, for a total reduction by 2030 of 42%.[27] This estimate was within the 31–44% range of impacts on greenhouse gas emissions estimated by other modelers.[28] The Act is also likely to have emissions reduction impacts beyond U.S. borders, perhaps by encouraging other countries to greater action but also significantly by making renewable energy technology cheaper for worldwide adoption.[29]

Although the attention of environmental activists, domestic politicians and global political leaders, and policy commentators is always overwhelmingly on legislative initiatives, significant national climate policy change always continues to happen through the vehicle of existing statutory regulatory authority. The Biden administration undertook from its

[25] Ibid. [26] Pub L. 117–169, 136 Stat. 1818.
[27] J. D. Jenkins, E. N. Mayfield, J. Farbes, et al., Preliminary Report: The Climate and Energy Impacts of the Inflation Reduction Act of 2022. REPEAT Project, Princeton, NJ, 12 August 2022.
[28] S. Osaka, Why the Climate Bill's impact might not match what many expect: models could be over- (or under-!) estimating the climate impact of the Inflation Reduction Act. *Washington Post*, 12 August 2022.
[29] S. Sengupta, What the US Climate Law means for the world. *New York Times*, 19 August 2022.

first day an extensive program of executive actions to cancel and reverse Trump regulatory initiatives and to begin the often-lengthy processes of promulgating new climate and other environmental regulations.

An August 2022 summary of Biden administration climate and air pollution regulatory actions counted 26 Trump administration policies as overturned and another 29 targeted for attention, with 25 wholly new policies added.[30] Other administrative actions taken in such categories as drilling and extraction or infrastructure and permitting are also likely to have climate impacts. Some of these regulatory changes might be expected to have fairly significant impacts over time, such as those addressing much more stringent automotive mileage standards, various efficiency standards for household appliances and lightbulbs, and the stricter regulation of methane from oil and gas wells and landfills. The Biden administration also proposed 40 new policies, including building performance standards, phasing down use of hydrofluorocarbons, a U.S. Army climate strategy, and carbon-free source standards for utilities. The administration further informally announced that it had begun working on several other regulatory policies that would likely require lengthy periods of development to ensure that the ultimate regulation would pass the certain judicial scrutiny to which it will inevitably be subjected. Prominent in this category were new regulation of greenhouse gas emissions by electric power plants, stricter regulation of mercury emissions, and new requirements for the disclosure of the financial impacts of climate warming. After passage of the Inflation Reduction Act, Biden administration officials again promised to undertake new regulatory actions on emissions from vehicle tailpipes, oil and gas wells, and power plants in order to come closer to achieving the 2030 goal of a 50% emission reduction.[31]

Neither of the Biden administration's two big legislative proposals, and none of its executive regulatory initiatives undertaken in the first year, were especially innovative or posed any special challenges for implementation. All involved policy tools that have been deployed many times over decades. The greatest risks to failure lay in the adoption stage, as most if not all are challenged in the courts on their procedural bona fides and in terms of their compliance with substantive authorizing legislation, as judged by a federal judiciary preponderantly appointed by Biden's Republican predecessors. All formally adopted regulations are potentially reversible under future presidents and congresses, but reversal is politically and administratively difficult. Previous presidents and congresses who were antagonistic to climate policies were able to prevent adoption of some new policies and often were able to slow implementation of existing regulations, but actual reversals were fairly uncommon.

Even if fully supported and embraced by future presidents and congresses, the policy initiatives of the first two years of the Biden administration will not themselves get the United States to meet its 2030 emissions target or enable it to become net-zero carbon emitting by 2050, but they are likely to have more impact than is commonly expected. The actual emissions effect is especially difficult to calculate or predict, as many pollution and

[30] J. Eilperin, B. Dennis, J. Muyskens, Tracking Biden's environmental actions. *Washington Post*, 26 May 2022.
[31] L. Friedman, J. Tankersley, After signing Climate Bill, Biden plans more actions to cut emissions. *New York Times*, 19 August 2022.

efficiency regulations can have indirect effects that end up being more significant than the expected direct effects – for example, source substitution, reduced consumption, and technological innovation all play a role, and in many instances there are interactive, synergistic, and cumulative effects that lead to the abandonment of particular technologies and the transformation of whole economic sectors (such effects are not always in the desired direction, of course, and there may also be evasion, distortion, and noncompliance effects). Many policy actions may have wholly unpredictable consequences in changing the way society and the national and international economy operates. For example, the United States has begun integrating climate issues into financial regulation,[32] which, given the status of the dollar as the primary global currency, has the potential to have wide-reaching impacts.

The history of pollution regulation is one in which new programs have seldom been as costly as predicted at the time of adoption, sometimes ending up being more effective than projected. For example, in the absence of major national legislative action, greenhouse gas emissions have fallen since 2010 more than what had then been projected if proposed cap-and-trade legislation had been enacted, again because of regulatory actions regarding pollution control and energy efficiency as well as the actions of subnational governments compounded by market drivers. Emissions continued to drop over the four-year term of the Trump administration in spite of its extensive efforts to undercut and rollback pollution and efficiency policies.

It is worth noting and emphasizing again that U.S. climate policy is not made by one national government but rather by an ecosystem of 90,000+ semi-autonomous governments and uncounted private-sector organizations and networks. The national government is by far the largest actor in the U.S. system, and the one government in the U.S. system with the most actual and potential impact, but each of the other 90,000+ governments are policy consequential as well. California, for example, has an economy larger than all but four nations in the world (the United States, the People's Republic of China, Japan, and Germany) and consequently its climate policies have the potential to make more difference to global greenhouse gas emissions than those of most other countries. Because of its size, Californian policies often establish unofficial national or even international standards, as they affect imports and exports and as businesses and industry find it cheaper to comply with a single standard everywhere. With respect to air pollution from mobile sources (including carbon dioxide), California plays a special role in the U.S. regulatory regime, being the only State allowed to set vehicle emission standards higher than those set by the national government under the Clean Air Act of 1970 (other States are then allowed to adopt the stronger California standards, and some nearly always do so). California has often exercised its exceptional authority, and in the twenty-first century it has done so in advancing the most comprehensive package of climate policies of any State, such as adopting regulations in 2022 banning the sale of gasoline-powered cars by 2035 and adopting legislation allocating 44 billion U.S. dollars to climate spending. Other States have been pioneers in numerous climate-relevant policy areas as well, such as in promoting wind and solar generation and energy efficiency. For example, in August 2022 Massachusetts adopted a sweeping climate

[32] E. Flitter, There's a new cop on the banking beat: Chief Climate Risk Officer. *New York Times*, 12 September 2022.

and clean energy law focused on transportation, housing, and renewable energy.[33] Local governments continue to play active roles both as leaders and followers, particularly in the regulation of land use, new building construction, and local transportation, all of which have tremendous long-term impacts on climate emissions, mitigation, and adaptation. Many cities in the United States have adopted decarbonization plans of varying levels of ambitiousness. For example, the common council of the city of Ithaca, New York, a city of about 30,000 people, has voted to decarbonize every building in the city by 2030. The national government can encourage, nudge, and even subsidize local and state climate policies, but quite often it is State and local policy experiments that eventually are adopted elsewhere and, eventually, nationally.

This complex and rich institutional landscape certainly complicates climate policy adoption and implementation (and the critical study of it),[34] but it also has its strengths. Ultimately successful climate governance, like environmental governance in general in the conditions of the Anthropocene, must be created by those it addresses, applicable equally to all, capable of learning from (and adapting to) experience, rationally grounded, and internalized by those who adopt and experience it.[35] The very complexity of the U.S. political system leaves room for substantial realization of some of these normative principles in subnational and nongovernmental governance, to degrees that may ultimately make a positive difference in the successful institutionalization and implementation of meaningful climate governance.

5.4 Predicting United States Climate Policy: Doing the Right Thing Will Require the Right Kind of Crisis

It is a safe prediction that the United States' annual net direct emissions (ignoring emissions happening elsewhere in the processes of producing and transporting products to the United States) will continue to decline, even as both its population and the economy continue to grow for a few more decades. A tripling or quadrupling of the slow rate of emissions decline of the past 30 years, which something like the Inflation Reduction Act has the potential to accomplish, might get the United States closer to achieving its 2030 goals, but not to a level of net zero emissions by 2050, much less to the negative net emissions levels urgently needed to help stabilize the global average temperature increase at close to 1.5°C or 2.0°C. Bolder policies leading to more substantial transformations ('doing the right thing') are no more likely to emerge as a consequence of more and better science, or more education, or international diplomacy, or bigger marketing campaigns, or many kinds of catastrophic disasters, than has been the case in the last 35 years.[36]

A disaster or a pending danger does not necessarily become a policy turning point, or lead to a moment of decisive change that qualifies as a crisis, or inevitably open a policy

[33] A. Chiu, Massachusetts just passed a massive climate and clean energy bill. *Washington Post*, 11 August 2022.
[34] L. Stokes, *Short Circuiting Policy: Interest Groups and the Battle over Clean Energy and Climate Policy in the American States* (Oxford University Press, 2020).
[35] W. F. Baber, R. V. Bartlett. *Democratic Norms of Earth System Governance: Deliberative Politics in the Anthropocene* (Cambridge University Press, 2021).
[36] S. Park, The politics of 21st century environmental disaster. *Environmental Politics* 2022, 31(1): 1–7.

window.[37] 'We need crises big enough to terrify us, but not ones so grave that they destroy our ability to change.'[38] A climate event or story will not terrify Americans unless it unambiguously has an immediate impact on them, and 'them' has to include the large swath of Americans inclined to deny the reality and severity of climate warming and human causation of it, and it must also include the even larger portion of Americans currently unwilling to accept substantial changes in their way of life in order to markedly reduce emissions. What is needed is the right kind of crisis. Something that dramatically kills millions of people somewhere else, such as Kim Stanley Robinson imagines in his novel *The Ministry for the Future*,[39] would not create a crisis in the United States any more than the daily deaths of tens of thousands around the world already does. Probably neither would a catastrophe in a global commons, such as dying oceans. Even disasters profoundly affecting many Americans might not precipitate a policy crisis if the impacts are not immediate, the causes are not obvious, and the burdens are not borne primarily by those inclined to resist policy change. So, for example, the continuing rise of ocean levels, increased frequency and severity of storms, extinction of charismatic species, and the further dispersion of pathogens are unlikely to lead to policy crisis. The crisis that might precipitate doing the right thing probably has to be something that equally or disproportionately affects the middle and southern parts of the United States – those regions most resistant to doing anything about climate emissions. Possibilities include killer heatwaves or even more intense and widespread droughts and wildfires in climate policy-resistant regions of the country, events that already are much more likely than even experts imagined only five years ago. When disasters of such enormity do occur, they will transform both the physical and political landscapes in ways that will make doing the right thing much more likely, albeit too late to prevent some very bad consequences.

This is the glimmer of hope in a bleak and dismal picture. But if a crisis in the next few years should result in the United States committing to sweeping climate policy action, there is reason for guarded optimism that future policy will be implemented effectively and quickly. Implementation will be less problematic in the United States than would be the case in many other places. The United States can be expected to draw on its latent but substantial capacity for innovation, experimentation, flexibility, decentralization, self-organization, and rapid transformation.[40] After all, underlying the aphorism that Americans will do the right thing after trying everything else is Americans' not entirely inaccurate perception of themselves as enterprising, determined, pragmatic, and well-intentioned, all characteristics that can serve the cause of transformative policy implementation once a near-consensus is reached that makes policy adoption – and predictable successful implementation – actually possible.

5.5 Conclusion

In the face of its international reputation for intransigence and foot-dragging on climate warming policy, combined with its deserved reputation for profligate fossil fuel

[37] J. W. Kingdon, *Agendas, Alternatives, and Public Policies*, updated edition (Pearson, 2010).
[38] I. Bremmer, *The Power of Crisis* (Simon and Schuster, 2022). [39] Published by Orbit, 2020.
[40] C. F. Sabel, D. G. Victor, *Fixing the Climate: Strategies for an Uncertain World* (Princeton University Press, 2022).

consumption, the United States has actually reduced its greenhouse gas emissions since 1990. Unlike most other rich countries, for the United States both population and GDP growth has been substantial over those three decades, so the decline in emissions per capita and per unit of GDP has been marked. Continued compounded muddling, consisting of stricter national administrative regulation of energy efficiency and pollution control, new State and local government initiatives, further nongovernmental governance developments, and market-driven economic responses, are together likely to support extending the current trends of reduced energy intensity and reduced greenhouse gas emissions over the next few decades, perhaps even to accelerate it. These trends are partly a consequence of continuing implementation of general policy commitments to energy efficiency and pollution control that the United States made decades ago. There is every reason to believe that the United States will be equally effective in implementing any new bold commitment to stopping climate warming, should it ever make that commitment as a nation. But a United States commitment to doing the right thing – whether conceived as doing what it would take to achieve the level of zero net emissions by 2050, or to accomplish the even more draconian reductions needed to soon halt global temperature rise – is unlikely in the absence of something that causes coalescence of a new normative political landscape in the United States. That something will have to be clear and present enough, and impactful enough, in enough of the right places on enough of the right people, to create the conditions for a normative consensus to emerge that can last long enough to support establishment and institutionalization (initial implementation) of bold, painful, system-transformative climate policies. It is worth remembering that even this much would only be a step toward achieving sustainable ecological governance in the conditions of the Anthropocene.[41]

[41] Baber and Bartlett. *Democratic Norms of Earth System Governance*.