

Climate Governance and Federalism in the United States

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15.1 Introduction

This chapter examines the enduring political challenges of adopting and sustaining climate policy in the American federal system. It notes the substantial carbon footprint of the United States and its ongoing struggle to secure federal-level political support for durable domestic emission reduction commitments or sustained engagement in international processes, including the Paris Agreement. The American separation-of-powers system creates numerous obstacles to either federal legislation or ratification of international agreements via treaty, both of which require legislative and executive branch assent. As a consequence, presidents frequently avoid working with Congress in favour of unilateral executive action, including reinterpretation of the federal air quality legislation to address climate concerns. These policies, however, face numerous durability challenges once a presidential term ends.

State policy adoption has been highly uneven (Bromley-Trujillo and Holman 2020; Hultman et al. 2019). Numerous jurisdictions began to adopt ambitious climate mitigation policies in the 1990s and have continually expanded the boundaries of policy innovation (Karapin 2016). This includes California, the most populous state, which has established policies in multiple sectors, maintained formidable regulatory bodies that drive implementation, and routinely prods the federal government to take added steps through either litigation or unique levers it controls (Vogel 2018). At the same time, many states do not adopt climate policies and oppose most proposed federal climate policies. This can include active resistance to compliance and multistate litigation coalitions involving elected attorneys general (Nolette 2015). In some respects, state opposition coalitions have represented an ongoing check to presidential climate policy efforts, usually involving the party opposite the president, while Congress remained gripped by prolonged inertia on climate change and other environmental issues. Texas, the

second most populous state, has been a leader in state efforts to block federal climate policy, a polar opposite to California in many respects.

Partisan divides have created enormous uncertainty and conflict in the American political system, leaving a very uneven set of federal and state policies and no clear policy path for meeting Paris reduction targets. The very issue of Paris participation became unclear given policy shifts between the Barack Obama and Donald Trump presidencies, although Joe Biden prioritized Paris re-engagement upon succeeding Trump and announced bold new emission reduction goals. In turn, there has been minimal sustained discussion of adaptation policy at either federal or state levels. Biden's 2020 election alongside narrow Democratic Party control of both Congressional chambers opened the possibility of both executive actions and legislation that could give the federal government a more far-reaching role in both mitigation and adaptation while encouraging states to consider bolder steps.

Federalism can play a compensatory role at times whereby state policy adoption and implementation can partially offset federal inertia. However, state policy has faced enduring limitations, both in terms of horizontal diffusion across regions and in vertical diffusion informing and driving federal policy. In turn, states often play an active role in undermining federal policy initiatives, particularly those launched from the executive branch. Federal capacity to build upon state models and best practices has been confounded by these enduring state divides as well as growing patterns of hyper-partisanship that deter cross-party collaboration. This has been most notable in prolonged periods of Congressional inability to address climate change or other pressing environmental issues.

15.2 Climate Change in the United States

15.2.1 Contributions to Climate Change and Its Impacts

As the second largest national contributor globally of greenhouse gas emissions (CIAT 2019), the United States' climate footprint is considerable. In 2019, the country's total greenhouse gas emissions were an estimated 6,558.3 million metric tons CO₂ eq. (EPA GHG Inventory Data Explorer). Evaluating the emissions trend since the early 1990s, total greenhouse gas emissions steadily rose through the 1990s and first part of the 2000s, reaching a high point in 2007 that was 15.6 per cent higher than 1990 levels. Following 2007, emission levels generally declined but with more fluctuation between years. In 2019, they were 1.8 per cent higher than 1990 levels, and indicators of decline in 2020 were largely attributable to the global pandemic (EPA 2021).

Carbon dioxide remains the most prominent greenhouse gas emitted, accounting for about 80 per cent of total emissions in the last decade. The main sectoral

sources of carbon dioxide are transportation and electric power generation. The electricity sector has experienced a greater decline in emissions due to increasing renewable energy production and shift from coal-fired to natural gas systems. The transportation sector, on the other hand, has remained centred on petroleum fuel and in recent years has produced more GHG emissions annually than the electricity sector (EPA 2021: ES-7).

Methane accounted for about 10 per cent of total greenhouse gas emissions in 2019 (EPA GHG Inventory Data Explorer), of which the primary sources are associated with energy production, agriculture, and livestock. Reported methane emissions have generally declined in the past few decades, decreasing by 7 per cent since 2005 and 18.1 per cent since 1990 (EPA 2021), although mounting evidence from increasingly sophisticated analyses indicates that federal estimates of these emissions routinely fall well below actual levels (Alvarez et al. 2018).

There are numerous ways that the USA already is, or increasingly will be, affected by the effects of climate change, many of which pose threats to the country's current infrastructural, economic, and environmental systems. While the increase in temperature poses a nation-wide threat, different parts of the country are vulnerable to particular elements of climate change in different ways (US Global Change Research Program 2018). Coastal cities face the threat of sea level rise and need resilience and adaptation strategies for impacts to buildings and infrastructure. Increase in the severity and frequency of severe precipitation and weather events poses a large threat in the Midwest, while drought intensity in the Southwest is increasing (NASA 2020). The rise in intensity of severe weather events and natural disasters affects all areas of the USA, from forest fires in western states and flooding in the Midwest to hurricanes in southern states. Agricultural systems across the nation are facing changing growing conditions and regional shifts in growing seasons. Low-income groups are particularly vulnerable and disproportionately at risk from the effects of climate change. They tend to be more exposed to severe weather such as heat and cold or precipitation and drought events, and often lack resources easily accessible to respond or adapt to changing conditions or events.

15.2.2 Commitment Relating to Climate Change

The US Constitution divides responsibility for international agreements between executive and legislative branches, while denying states any formal role in these matters. It states that the president 'shall have Power, by and with the Advice and Consent of the Senate, to make Treaties, provided two thirds of the Senators present concur'. More than 1,500 treaties were approved in this manner during the first 200 years of the federation, with only twenty-one rejections, but ratification

has subsequently become far more difficult. Environmental agreements such as the Law of the Sea Convention, the Montreal Aviation Protocols, and the Kyoto Protocol, among others, have been rejected or withdrawn, reflecting the challenges of securing Senate super-majorities in a body in which every state holds a pair of seats regardless of population. The United States ratified the 1988 Montreal Protocol on Ozone Depleting Substances and approved four subsequent amendments. Congress took a major step on HFC (hydrofluorocarbons) transition through adoption of 2020 legislation that placed the United States on a timetable consistent with international phase-down goals and ratified the Kigali Amendments in 2022.

This divide between governmental branches has greatly complicated full American engagement in climate-related treaties. President George H. W. Bush signed the Earth Summit agreement but refused to sign the 1992 Convention on Biological Diversity. His successor, President Bill Clinton, signed this convention in 1993, but was unable to secure Senate ratification, along with a growing body of other international agreements (Blomquist 2002). This phenomenon repeated itself after the signing of the Kyoto Protocol, when the Clinton Administration never submitted Kyoto to the Senate for ratification given formidable opposition. In 2001, President George H. W. Bush formally withdrew the USA from the Kyoto process.

Congressional inability to ratify treaties led Obama to consider an alternative path, an executive agreement, whereby a president may articulate American support for international collaboration without Senate support for binding commitment. Both the Copenhagen Accord and Paris Agreement were negotiated by the Obama Administration with this in mind, as well as North American climate agreements with neighbouring Canada and Mexico (Ricucci 2018). The executive agreement approach needed for American involvement contributed to the Paris shift toward emphasizing volunteered and non-binding emission reduction targets, or Nationally Determined Contributions (NDC). This flexibility allowed Obama to pledge under Paris that the United States would reduce its annual GHG emissions by 26-to-28 per cent from 2005 levels by 2025, without Senate ratification or supportive legislation (Milkoreit 2019).

America's Paris NDC commitment relied heavily upon Obama executive actions – primarily electricity and transportation sector performance standards under the 1990 *Clean Air Act*, and a compilation of existing state emission reduction policies. Applicable state policies included carbon pricing (twelve states), renewable electricity standards (thirty states), energy efficiency standards (twenty-one states), and renewable fuel standards (thirteen states), among others. It also took advantage of major shifts in American electricity production from coal to natural gas produced through hydraulic fracturing. By including modest methane

emission estimates, the administration could claim significant electricity sector emission reductions.

All recent administrations have continued to attend major multilateral and transnational climate deliberations. Absence of treaty status gave Trump latitude to withdraw from Paris without Congressional consultation, although the agreement's withdrawal process meant that final departure could not occur until the very end of his term (Leggett 2019). This delay allowed the incoming Biden administration to restore American engagement in Paris upon taking office in 2021 and take an active role in the Glasgow COP meetings, although no effort was made to secure Senate ratification.

15.3 Climate Change and Federalism in the United States

15.3.1 General Practice of American Federalism

American climate policy is forged and implemented within a system that blends federalism with formal separation of powers between executive, legislative, and judicial branches at both federal and state levels. American presidents and state governors have some structural similarities, operating alongside bicameral legislative chambers and multitiered courts. Their interaction has routinely generated conflict in the formation and implementation of American climate policy, including numerous policy reversals following initial adoption.

15.3.1.1 Division of Responsibilities

At the federal level, executive power vests considerable authority over international affairs and domestic policy in an elected president. However, the chief executive is not selected through popular vote but rather an Electoral College in which each state receives the sum of its members in the Senate (two per state regardless of population) and House (based on population). Popular vote in each generally leads to a winner-take-all model whereby a victorious candidate receives all state electoral votes. A president may lose the total electoral vote nationally but win the election through victory in enough states to produce an Electoral College majority, as occurred in 2000 and 2016 with far-reaching climate policy consequences.

Legislation must pass in both Senate and House and be approved by the president to become law. The Constitution gives Congress a lead role in taxation and spending as well as broad powers to pre-empt state policy addressing cross-state commercial activity. These powers have increasingly been applied to the environmental policy arena over the course of American political history (Kincaid 2019) Congressional authority can be restricted either by unilateral presidential

powers (such as executive orders) or federal court rulings overturning legislation that violates Constitutional principles.

State governments retain authority to establish their own constitutions and parallel governance systems. Article 10 of the federal Constitution explains that ‘powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively to the people’. States maintain separate executive, legislative, and judicial branches and active processes to amend or replace their constitutions (Dinan 2018). They have been historically dominant players in areas such as education and public health. However, many areas of public policy have shifted during the past half-century from state domination to shared state and federal authority (Kincaid 2019). This includes medium-based statutes for air and water quality, which markedly expanded federal authority during active periods of Congressional output in the 1970s and 1980s (Lowry 1997).

15.3.1.2 Contentiousness

This balance of power has not dampened tensions between federal and state governments, much less local authority, which exists largely at the discretion of individual states. Both federal and state governments have experienced mounting ‘hyper-partisanship’ between Republican and Democratic parties during recent decades, often resulting in policy gridlock in cases where different parties formally share power between executive and legislative branches. Climate change has fallen into this increasingly partisan divide. Earlier state-level patterns of bipartisan engagement in the late 1990s and early 2000s have subsequently declined precipitously. As a result, exclusive Democratic Party control across state government levels has increasingly become a strong predictor of active climate policy engagement, reflected in such major states as California, New York, and Massachusetts (Bromley-Trujillo and Holman 2020). Partial or exclusive Republican Party control across state government levels has increasingly posed an obstacle to climate mitigation policies, reflected in such major states as Texas, Florida, and Ohio.

These partisan divides have been exacerbated by the geological distribution of fossil fuel resources that states can potentially tap. The realization that vast shale deposits in many American regions could be unlocked via hydraulic fracturing and horizontal drilling had a profound impact on American climate policy. The fracking boom that began in the early 2000s would by the late 2010s restore America’s standing as the world’s leading producer of oil and natural gas. More than thirty states produce such energy and many leading production states have experienced dramatic increases in employment and tax revenue linked to this expansion, often leading them to take vigorous stands opposing climate policy

threatening continued production. Most state climate policy leaders, in contrast, lack such fossil-based energy development opportunities.

15.3.2 Climate Governance in the American Federal System

15.3.2.1 Constitutional Climate Authority

Both federal and state levels possess broad constitutional powers to pursue far-reaching climate policy if they choose to do so. Multiple forms of carbon pricing, energy procurement mandates, performance standards, and other policies have been adopted in numerous states over the past quarter century, facing few federal pre-emption or other constitutional threats. The modest federal role on both national and international scales reflects political and partisan divides rather than formal constitutional impediments.

15.3.2.2 Respective Policy Development and Implementation Roles

At the federal level, Congressional gridlock is reflected in the fact that no major federal environmental legislation has been adopted in the United States since the 1990 *Clean Air Act* Amendments, approved by a predominantly Democratic Congress and signed into law by Republican President George H. W. Bush. This legislation did not expressly identify greenhouse gases as an environmental threat, instead reflecting a Congressional decision to delay in addressing climate change until later (Carlson and Burtraw 2019). No federal legislative window on climate opened sufficiently for passage during the subsequent three decades, even though considerable climate legislation was introduced into every two-year legislative session. The House did pass far-reaching climate legislation in 2009 but failed to secure Senate approval, though the 2020 elections reopened the door to renewed consideration of major climate legislation. Congress eschewed carbon pricing or regulatory standards, instead focusing on proposed expenditures and tax incentives to accelerate clean energy transition.

This Congressional inertia has shifted authority to the federal executive branch and the states, generating considerable political and legal conflict and expanding the federal court role. All presidents serving since 1990 have utilized unilateral executive powers on climate policy, filling gaps left by Congress. These ‘administrative presidency’ initiatives have included efforts to interpret or reinterpret ways to apply existing legislation to climate mitigation (Clinton, Obama, and Biden) or avoid doing so despite pressure from some states to act (George H. W. Bush and Trump).

States have divided in their responses to these federal initiatives. Some routinely fall in line and support implementation, whereas others pursue either resistance in

implementation or outright opposition via litigation in federal courts (Merriman 2019). State partisan alignment often predicts its approach in any given instance. Forty-three states elect their attorneys general on a partisan basis, and this office is frequently a platform for future career advancement to higher state or federal office. State attorneys general can individually or in partnership with colleagues from other states attempt to delay or overturn federal executive decisions via litigation. They dramatically expanded their efforts on climate change during the 2010s (Nolette 2015; Nolette and Provost 2018). State attorneys general of one party can provide core climate policy opposition to a president of the other party, particularly salient in an era where Congress remains hamstrung in adopting legislation or counter-balancing executive branch power (Thompson, Wong, and Rabe 2020).

One early manifestation of this conflict was a landmark 2007 Supreme Court decision, *Massachusetts v US Environmental Protection Agency*. This case was brought by attorneys general from Massachusetts and other Democratic-led states to challenge the George H. W. Bush administration's unwillingness to apply administrative presidency powers to climate change. It confirmed that states possessed legal standing to sue the federal government in federal court for inaction, affirming that the well-being of their citizens had been 'endangered' by federal failure to take measures to mitigate climate harms. This case focused on key *Clean Air Act* provisions, whereby California and allied states prodded the Bush administration to extend vehicle emission standards to cover carbon. The five-to-four court majority concurred that the federal government and its lead environmental agency, the Environmental Protection Agency (EPA), needed to take mitigation steps unless it was able to advance 'some reasonable explanation as to why it cannot or will not exercise its discretion to determine whether they do' (Thompson, Wong, and Rabe 2020, 30). This decision formally legitimized a state role in climate change, including formal legal challenges brought against alleged federal inaction. However, it did not resolve the issue of how the federal government would respond to the court challenge, with EPA offering very different responses during the Bush, Obama, Trump, and Biden presidencies.

15.3.2.3 State Inclusion within NDCs

States lack formal authority to participate in international negotiations or introduce emission reduction commitments that would be internationally accepted, even in cases of federal disengagement. However, state climate policies can be influential in two potential ways linked to American involvement in Paris. First, the Obama administration referenced them in explaining how the United States would achieve its Paris reduction commitments, noting anticipated emission impacts of various state-sponsored programmes. The Biden administration restored this approach in

the 2021 COP meetings in Glasgow. Second, the Trump administration's 2017 decision to withdraw from Paris was met with considerable outcry from state climate policy leaders, including many governors and legislators. This reaction fostered formation of the 'We're Still In' movement and launch of the US Climate Alliance, whereby governors pledged to honour their portion of previous national NDCs, either through existing commitments or additional ones they would develop. This roster of states grew initially from thirteen to twenty-four, including additions following 2018 mid-term elections and shifts toward expanded Democratic control in states such as Illinois, New Mexico, and Wisconsin.

15.4 Case Study of American Climate Governance

15.4.1 State Climate Change Action

By contrast with the federal government's prolonged inability to produce climate legislation, many states have adopted and implemented both regulatory and more market-based climate mitigation policies. Most of these policies are specific to individual states, albeit with potential to diffuse through emulation and adaptation in other jurisdictions (Grumbach 2018; Shipan and Volden 2021; Stokes 2020). Renewable electricity standards were first adopted in Iowa in 1991 and expanded to thirty states as of 2021 with seven others maintaining voluntary versions. There is also some precedent for multiple states to adopt and implement policies that can be formally linked across jurisdictional boundaries. In carbon pricing, for example, the Regional Greenhouse Gas Initiative (RGGI) features nine partnership states maintaining a regional cap-and-trade system focused on electricity sector emissions. Auction revenue is commonly allocated for state energy transition expenses (Raymond 2016). RGGI expanded in 2019–20, adding New Jersey and Virginia as formal members while North Carolina and Pennsylvania also considered joining.

States diverge widely in their willingness and capacity to develop climate policies. California leads the nation in population and ranks second in total greenhouse gases, with particularly large releases from its transportation and agricultural sectors. It has long been a national leader on environmental policy, particularly air quality issues that have proven particularly vexing, and it has long prodded other states and the federal government to take more aggressive stances (Vogel 2018). Substantial climate change engagement began in the early 1990s, and California maintains a multisector cap-and-trade programme (operated jointly with the Canadian province of Québec) that allocates auction revenues for climate mitigation and adaptation. California also implements a wide range of renewable energy, energy efficiency, and biofuels programmes, often delegating considerable administrative authority to the formidable California Air Resources Board.

In turn, Texas leads the nation in total greenhouse gas emissions and ranks second in population. It has been a laggard in many climate policy areas and energy sector emissions have surged due to massive oil and gas production expansion since 2005 linked to hydraulic-fracturing techniques, particularly in the abundant Permian Basin. State leaders have long expressed doubts about the existence of climate change and have regularly led opposition to federal executive efforts to adopt climate policy. At the same time, Texas has abundant wind resources and has experienced substantial growth in its wind energy deployment, jumping from less than 1 per cent of total state electricity generation in 2000 to nearly 20 per cent in 2019. It has also invested heavily in renewable energy transmission infrastructure through fees added to electricity bills.

State policy divergence has greatly complicated federal attempts to use executive power to develop climate policy nationally, including Obama's tenure. Alongside failure to consummate proposed cap-and-trade legislation in 2009, Obama advanced multiple administrative presidency initiatives linked to separate *Clean Air Act* provisions. All of these, including those focused on the electricity and transportation sectors, required extensive federal–state interaction and built on state model cases. They required extensive rule-making procedures set forth in federal legislation and could theoretically be adopted and implemented by EPA without Congressional input or approval (Belton and Graham 2019). Collectively, they represented cornerstones in the Obama administration's plan to achieve proposed Paris Agreement emission reductions just as they would subsequently under the Biden administration. States led by California actively inspired these efforts and actively endorsed them. States led by Texas actively opposed them, taking formal steps to reverse or undermine them.

For electricity, Obama sought to revise *Clean Air Act* provisions overseeing State Implementation Plans (SIPs) for compliance with various air emissions control requirements. This involved multiyear development of the Clean Power Plan (CPP). The power sector had already registered major emission reductions due to substantial coal-to-gas transition and numerous state policies promoting renewables. The nation was already heading towards net emission reductions in the sector greater than the overall 26-to-28 per cent levels established nationally under the Paris process. The CPP was intended to ensure that it exceeded those targets, compensating for other sectors less likely to achieve such extensive reductions. Each state was given a numeric emissions reduction target set federally. Many states that had already made or planned for major reductions were given more modest reduction targets and they generally proved supportive of the CPP. Many others generally opposed the very idea of a federally mandated CPP, particularly once they received more demanding reduction targets.

For transportation, the Obama administration embraced unilateral California legislation as a driving force behind a national strategy to reduce vehicular carbon emissions. Under federal air quality legislation first adopted in 1967, California was given unique authority to seek federal waivers in cases when it wanted to set higher vehicle emission standards than federal ones. Waivers are not formally established in the federal Constitution but have emerged as an intergovernmental tool that can allow or encourage one or more states to pursue policy innovation, including the case of mobile sources where single-state innovation has prompted regional and then national policy adoption. Waivers have not, however, been widely used in other areas of climate policy. The vehicle emissions case reflected California's acute air quality issues linked to transportation and its active policy development in this area long before initial federal legislation (Vogel 2018). On more than 120 occasions since the late 1960s, California waiver requests were approved by EPA. At that point, other states are allowed, under 1977 provisions, to adopt the California standard. This so-called federalism 'bandwagon effect' regularly created momentum whereby the federal government ultimately harmonized its national standards with those of California and allied states (Carlson and Burtraw 2019). The Obama administration worked independently of Congress to embrace the California carbon waiver and merge it with separate federal fuel economy standards that pre-empted state action, thereby setting ambitious tailpipe emission reduction targets for multiple vehicle classes.

15.4.2 Adoption versus Implementation, and Policy Evolution

Implementation of these two federal attempts to use executive power through distinct federalism strategies for climate mitigation proved highly contentious, reflected in aggressive opposition from many states. In the CPP, more than a dozen Republican state attorneys general filed suit in federal court within days of final rule issuance. They claimed that the CPP represented an unconstitutional reinterpretation of air quality legislation that did not address climate. They contended that it outlined remedies linked not only to energy production but 'outside-the-fence' considerations, ultimately designed to eliminate fossil fuel use without legislation. This state opposition coalition eventually expanded to Texas and twenty-six other states, primarily jurisdictions with Republican leadership and significant production and use of fossil fuels within their boundaries. In contrast, California and seventeen other states, primarily with Democratic leadership and less-intensive carbon profiles, embraced the CPP. These states contended that CPP compliance would be highly feasible given growing renewable energy cost-competitiveness and could contribute significantly to American climate mitigation efforts.

This executive strategy drew no formal Congressional response but faced an unusual Supreme Court stay, suspending implementation until after 2016 elections. Trump's election generated an executive order launching CPPs replacement with a far more modest Affordable Clean Energy rule that was suspended by a federal court in 2021. It was generally expected to have negligible impact on reducing emissions and may have actually increased them in some states through extended coal plant operation (Keyes et al. 2019). However, it faced its own durability challenges in the Biden administration.

Trump was not as outspoken during his campaign against the vehicle emissions programme as the CPP. But his administration took rapid steps to begin the unprecedented process of reversing the waiver that California (and bandwagon states) had received, substituting a far more modest plan that precluded any state role through federal pre-emption of the process. Trump elevated his waiver opposition to a particularly intensive level upon learning that four major vehicle manufacturers pursued quiet negotiation of higher standards with California, including vulgar presidential diatribes and threats against these firms and the state. As with CPP, Trump did not entirely eliminate Obama's regulatory effort but rather reconfigured it, producing more modest emission reduction targets and more flexible implementation. This approach would make it difficult for any successor to reverse it, while constraining state influence on policy design. Nonetheless, Trump efforts were not finalized prior to Biden administration arrival, which moved to restore the earlier waiver and build upon it in advancing its own executive climate strategy.

15.4.3 Factors Facilitating or Hindering State Actions

The federal government role on climate policy has largely remained confined to the executive branch with occasional court engagement. This reflects long-standing legislative branch inability to adopt climate or environmental legislation regardless of partisan control of Congress. The cases demonstrate limits that individual presidents and administrations face in advancing far-reaching policies that can be implemented and prove durable. The federal government has not created intergovernmental revenue transfer to encourage or support state energy transition policies or invested in boosting state implementation capacity. States nonetheless retain considerable latitude to either develop their own policies or take individual or collective action to either support or oppose federal initiatives. The case studies suggest that states may be more successful at blocking initiatives that they dislike rather than fully implementing them.

15.4.3.1 Constitutional or Devolved Authority of States

The electricity and transportation cases demonstrate the considerable latitude that states have to respond to proposed federal climate strategies that are quite

ambitious in their potential scope for emissions reductions. In the electricity case, Texas played a central role in supporting opposition through litigation challenges that ultimately wounded the CPP through a Supreme Court stay when plans were advancing towards full implementation. In the transportation case, Texas opposed California's position and backed the Trump administration's efforts to weaken the federal vehicle emissions programme. California took the opposite side on these policies, actively supporting the CPP and contending that it would blend effectively with its existing entourage of climate policies. It was the impetus behind the entire vehicle emissions programme, having secured Obama administration support not only for granting its waiver request but also elevating its state-wide policy into national policy. Despite their setbacks under the Trump administration, California and allied states worked cooperatively with the incoming Biden administration on new federal policies that built upon their early efforts.

15.4.3.2 State Capacity

The divergent paths that California and Texas have taken on climate policy is further reflected in their respective development of state administrative capacity to address this issue. California revenue under cap-and-trade reached \$2.5 billion in 2019, distributed across a wide range of state and local climate mitigation and adaptation initiatives. The California Air Resource Board retains extensive staff depth and talent, rivalling the US Environmental Protection Agency in these respects. It regularly receives broad support from California's governor and has had remarkable durability in senior leadership, making it a formidable force in every arena of state climate policy development and implementation.

Texas also maintains large state agencies with jurisdiction over air quality and energy production but has pursued major staff and budget reductions for these units in recent decades. It consistently ranks far behind California on comparative measures of capacity and commitment to environmental protection. The Texas Railroad Commission is a throwback to an early era in Texas but has continued to govern most aspects of oil and gas production and has remained highly deferential to industry preference on issues such as methane mitigation. Unlike California, Texas elected officials do not encourage state agencies to identify climate change as an express concern, and many seized upon an extended period of state-wide electricity loss in early 2021 to place the blame on freezing wind turbines rather than consider broader electricity system challenges contributing to the situation.

15.4.3.3 State Paradiplomacy Engagement

States face substantial federal constitutional constraints on international policy engagement, including treaty participation. However, California and a few other

states have tested those powers on climate change in recent decades. California governors have hosted global climate summits for two decades, routinely inviting national and sub-federal leaders for conferences and periodic signing of non-binding memoranda of understanding. Its efforts to build formal partners for its cap-and-trade programme secured four Canadian provincial partners in 2010, although only Québec has remained in alliance through implementation.

15.4.3.4 State Incentive for Taking Climate Action

States regularly frame climate policies as sources of economic development benefits and co-benefits such as improved air quality. California has long contended, for example, that its active engagement in the transportation sector offers climate benefits but also a substantial boost for next-generation vehicle technologies being developed by its universities and private firms as well as air quality benefits. Colorado and New Mexico have emerged as national leaders in methane mitigation linked to energy production, linking climate policy with methane capture for use as natural gas that can provide tax and royalty revenue.

15.4.4 State Compensatory or Pre-emptive Action

California exemplifies Martha Derthick's (2010) notion that states might take policy action to compensate for the absence of federal engagement, attempting to address their own emissions and also provide an example or model that can be emulated by other states or the federal government. In transportation, we see California's ongoing efforts to compensate for the slow pace of federal regulatory reforms on vehicle emissions, employing its unique waiver authority to force national consideration of carbon-sensitive standards.

Many other states have also attempted to play this type of role. In carbon pricing, RGGI formation and expansion reflected concern from participating states about federal disengagement as well as desire to create a model that could inform future federal policy. Much of the state work that contributes to the US Climate Alliance was intended to fill the gap left by the Trump administration withdrawal from Paris and reversal of Obama administration regulatory programmes (Hultman, et al. 2019).

15.4.5 State Attention to Local Expertise and Circumstances

American local governments, particularly medium-to-large cities, have made considerable efforts to address both climate mitigation and adaptation in recent decades (Hughes 2019). They face many formal limitations, however, lacking

independent constitutional authority and often reliant upon state interpretation of their potential taxation and regulatory powers. Nonetheless, local governments have regularly launched climate action plans that focus on areas of influence such as building standards and public transportation. Five hundred and thirty-four American cities, counties, and tribes, including some from every state, pledged fealty to Paris reduction targets. States have not, however, consistently drawn upon local expertise or unique circumstances in developing their own climate policies, reflecting a broader pattern of state–local tension in American politics. This reflects state trends in recent decades to reduce financial transfers from revenue-sharing programmes for local government as they contended with their own fiscal challenges, including the decade following the Great Recession.

In the case of California, local government climate engagement has been considerable, and some dimensions of state policy involve local or regional entities. The state's far-reaching air quality efforts include considerable delegation of authority to local air quality districts for monitoring and compliance oversight. These bodies have played some role in climate policy implementation as well, and the state has also channelled significant cap-and-trade auction revenue to local governments, placing a growing emphasis in the past decade on disadvantaged communities that may lack resources to mount their own mitigation and adaptation strategies. This pattern is also evident in many of the RGGI cap-and-trade states and their evolving use of auction revenue in local communities. In many other states, localities with a strong climate interest may be well ahead of their state in commitment and capacity and so have to act unilaterally, albeit with formal limitations on their authority.

15.4.6 Horizontal and Vertical Convergence and Divergence

The divergent paths of American states over past decades on climate change can be demonstrated in part by distinguishing three distinct directions that clusters of states have pursued (Hultman et al. 2019, 19–20). 'First-mover' states routinely adopt new policies and have created a medley of policy responses over time. These represent 45 per cent of the total population but only 33 per cent of total greenhouse gases. California is a leading first-mover, joined by other states with predominant Democratic Party control and relatively limited oil and gas production capacity. 'Fast-follower' states lack a steady pattern of early adoption but often emulate leader states over time. These states represent 20 per cent of the total population and 20 per cent of total greenhouse gases. 'Slow-follower' states tend to delay or resist climate policy adoption. These states represent

35 per cent of the total population but 47 per cent of total greenhouse gases. Texas is the leading example, joined by a number of other states with predominantly Republican Party control as well as significant fossil fuel reserves and production.

Comparable categories can be used to divide the ways that states either formally oppose or support proposed federal policies through litigation. This suggests a significant divergence among subsets of states, one that may remain fairly consistent over time but can shift if partisan control changes or other factors emerge. Earlier expectations that significant first-mover efforts in the early 2000s would foster widespread ‘horizontal diffusion’ of multiple policies have largely not been realized, despite a long-standing American history of diffusion of environmental and other policy innovations over the last century (Baldwin, Carley, and Nicholson-Crotty 2019; Karch 2007; Shipan and Volden 2021). Neither have earlier projections that a critical mass of states might adopt a climate policy and then tip the federal government into adopting this policy on a national basis via ‘vertical diffusion’ (Posner 2010).

In turn, not all state climate policies endure, reflected in cases of ‘reverse diffusion’ following initial adoption. Carbon cap-and-trade was adopted in two Northeastern states in the early 2000s but spread by 2010 to twenty-three states lodged in regions of the Northeast, Midwest, and Pacific West. This was widely seen as setting the stage for additional horizontal diffusion and eventual federal vertical diffusion that would build on these experiences, but political support quickly ebbed. Thirteen states subsequently withdrew, including many in the Midwest and Mountain West, although there was a slight uptick a decade later. These reversals reflected Congressional rejection of cap-and-trade, increased oil and gas production, intensified state partisan cleavages, and shifts from Democratic to Republican control in many states (Rabe 2018).

15.4.7 Climate Governance Conflict and Cooperation

Intergovernmental patterns of conflict and cooperation have waxed and waned over the course of recent decades. In general, federal–state conflict differs significantly depending upon partisan control of the presidency and Congress at a given time (Karapin 2020; Rabe 2011). In instances where Republicans dominate the federal government, states tend to more actively pursue their own climate policy development and challenge federal pre-eminence. These can be considered periods of ‘state domination’ whereby they attempt to fill perceived gaps in federal engagement and often find themselves in conflict with federal authorities. During Democratic presidencies, however, the tables turn. State climate policy

development can slow in anticipation of new federal policies, as they did during the Obama presidency. Many Republican states entered into formal opposition to federal policy initiatives during this period, including litigation.

There is considerable opportunity for state clusters to cooperate in the American federal system, including inter-state compacts that the Constitution allows with Congressional consent (Bowman 2004). These historically have involved numerous policy areas, including water quality and energy production. No such compacts have been approved in recent decades related to climate change and two regional cap-and-trade initiatives either disappeared or withered. However, RGGI has proven a durable regional programme that has endured major adjustments in its emissions cap, implementation of an auction-and-invest system for revenue use, and membership changes (Raymond 2016).

15.4.8 Coercion, Collaboration, Competition, and Emulation in Climate Policy

The CPP represents a leading example of an executive effort to develop a federal climate strategy to operate with considerable room for single or multistate innovation. The CPP adapted the *Clean Air Act* state implementation plan process that sets federal standards but gives states considerable latitude to develop their preferred response, working either independently or collaboratively with neighbouring states. As long as the federal government was satisfied that a state had developed a credible plan, it would delegate implementation authority to the lead state agencies, much as had been done for conventional pollutants (Carlson and Burtraw 2019).

Multistate *collaboration* offered one alternative for states to work together, likely through creation of cap-and-trade systems comparable to RGGI. This would draw on prior RGGI lessons and considerable state experience operating an emissions trading system for sulphur dioxide, offering a flexible path to minimize compliance costs for regulated parties and states. Federal officials outlined this option in early briefings around the nation with state officials. There was also an option of *competition* whereby each state would design its own strategy, using cap-and-trade or other performance-based compliance options. Under this model, each state would receive its emissions reduction target but select its preferred option and thereby try to out-compete neighbours in containing compliance costs. Finally, there was considerable expectation that either collaborative or competitive strategies would ultimately foster policy *emulation*, as states learned from their experiences over time given their divergent approaches, ultimately adapting and refining their state implementation plans.

In the end, none of these aspirations were achieved, given the aggressive state political opposition that emerged, leading to the 2016 court-mandated implementation freeze and followed by a federal executive transition that eviscerated the programme. The Obama administration launched the CPP with the implicit assumption that the president would be succeeded by a supportive Democrat committed to seeing it into full implementation. Opposition states played a pivotal role in CPP downfall, alleging that it represented federal *coercion* of federal legislation designed solely to reduce conventional air contaminants, although the federal courts and national election results dealt the death blows. The Biden administration faced the challenge of revisiting *Clean Air Act* application to electricity sector carbon emissions once it became clear in 2021 that Congress opposed a federal clean electricity standard despite its widespread state use.

15.4.9 Policy Divergence or Convergence and Dynamics of Conflict and Cooperation

Full implementation of existing and emerging state policy commitments as portions of a federal strategy may move the United States within striking distance of initial Paris reduction targets despite federal policy disengagement. However, state-led action alone would not enable the nation to approach Biden era emission reduction proposals for 2030. Innumerable effectiveness, equity, and efficiency questions continue to emerge in examining the American emissions trajectory and likely future course, barring a major shift towards emboldened federal policy. These equity challenges include the general absence of a consistent carbon pricing strategy or a sustained funding source for energy transition as well as enormous differences in the costs of electricity and energy in various states and regions. The state-driven American experience demonstrates that climate policies can serve to reduce emissions but only in an uneven matter that exacerbates broader American political and economic challenges (Kettl 2020). These factors have served to accentuate concerns in the United States over climate and energy justice, particularly for communities that have long faced substantial environmental threats and lack resources to address them.

15.5 Conclusion

This chapter demonstrates the challenge of adopting and implementing an effective and durable strategy to address climate change in a political system that combines federalism with formal separation of powers at both federal and state levels. The past quarter-century has demonstrated considerable capacity for single-state

innovation, consistent with the ‘laboratory of federalism’ hypothesis. This is reflected in a range of state policy initiatives and varying degrees of horizontal diffusion for particular policy tools, including renewable portfolio standards and cap-and-trade. However, vertical policy diffusion has largely failed to emerge from these state efforts. In turn, state engagement has been and remains highly uneven, concentrated most heavily in states lodged along oceanic coasts that tend towards Democratic Party control of state government and have few fossil-fuel resources. State policy adoption tends to be most active during periods when the Republican Party controls the presidency. Some states remain unable to either launch or sustain initial policy commitments.

Deep divides between states and regions have profoundly complicated efforts to develop federal climate policy strategies either through legislation or executive channels. Veto points include the Senate and the ability of states from the political party opposite the president to pursue litigation and other strategies to undermine federal policy proposals. Consensus on climate mitigation strategies across regions, branches of government, and political parties remained elusive and climate adaptation was rarely addressed through policy. The dramatic expansion of oil and gas production linked to fracking technology has only emboldened pro-fossil fuel interests at the state and federal levels and deters serious examination of federal climate policy options.

Courts have played a generally supportive role in climate policy development, including the historic *Massachusetts* case that legitimized state standing to call for federal action. But their roles do not extend to policy adoption or forcing any particular policy action. In the end, decades of Congressional disengagement from most areas of environmental policy have posed a fundamental challenge that must be surmounted before any far-reaching federal climate policy strategy becomes politically feasible. In 2020, the growing possibilities of a national election favourable to climate policy interests, particularly within the Democratic Party, unleashed a wide range of proposals that began to outline a possible shift in the future Congressional role. Early steps by the incoming Biden administration in 2021 emphasized unilateral executive action while also moving towards possible legislative steps that might prove viable while his Democratic Party retained narrow control of both chambers of Congress.

American federal experience to date underscores its profound challenges in adopting and sustaining climate policy on a national scale and building on the considerable body of innovation that has been pursued within some individual state laboratories. States have partially offset federal inertia by attempting to reduce emissions within their boundaries through innovative policies. But many remain hostile or indifferent to climate policy, particularly those with substantial

fossil fuel reserves, and they often lead opposition to new federal policy proposals considered by Congress as possible legislation or advanced by unilateral executive actions. In turn, the climate change policy era has coincided with mounting hyper-partisanship at both levels of government, further discouraging broader state policy development or federal policy adoption through legislation. The American federal system thus features some capacity for states to play a compensatory role when the federal government cannot engage, but this is inconsistent across states and has proven insufficient to foster politically feasible and durable policy on a national basis in recent decades.

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