FEDERALISM HEDGING, ENTRENCHMENT, AND THE CLIMATE CHALLENGE

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The virtues and effects of federalism continue to generate political, judicial and scholarly ferment. While some federalism partisans champion exclusivity and separation, others praise the more common political choice to retain federal and state regulatory overlap and interaction. Much of this work, however, focuses on government learning or rule clarity, giving little or no attention to how different federalism choices can heighten or hedge risks of regulatory failure and policy reversal. These debates play out with unusual fervor and with high stakes in battles over climate change regulation. Despite broad agreement that any effective climate policy intervention must include national action, disagreement reigns regarding the retention of state authority. Prominent policymakers, industry voices, and scholars have championed a single regulator and clean authority delineation as the answer to the challenges of climate change. They characterize state climate policies as a weak or even harmful alternative, especially if overlapping or intertwined with a federal role. A global challenge like climate change does intuitively seem to be a quintessential setting for a single, comprehensive regulator, especially if addressed through market-utilizing regulation. This intuition, however, only makes sense under an idealized view of politics and regulatory efficacy. This Article introduces the concept of federalism hedging—namely retention of concurrent federal and state authority due to its benefits and especially protective effects, even in an area ideally regulated by a single national regulator— then disaggregates sometimes blurred but related strains in federalism analysis. It illuminates federalism hedging dynamics through a theoretical and historical case study of climate regulation and federalism choice. This Article argues that where effective regulation is dependent on innovations and applies in areas characterized by rapid change in regulatory design, markets, and technology, such regulatory design choices—especially regarding federalism allocations of authority—should not be based on optimistic assumptions of

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steady progress and easy implementation. Effective regulatory structures should hedge risks, with special attention to linked political and economic dynamics. Regulation that retains room for both federal and state involvement and overlap can provide room for regulatory learning and adjustment, catalyze commitment and corrective efforts, while still fostering beneficial regulatory and market entrenchment and resulting stability through a web of similarly directed regulation.

INTRODUCTION

Advocating a new body of regulation with the explicit concession of likely error and risks of regulatory derailment may seem self-defeating. Nevertheless, effective regulatory design, like effective investment strategies, must be designed for success yet anticipate unfavorable developments and error risks.[1] And in the United States, due to our constitutional structures and linked political norms, any major regulatory choice must include decisions about how to utilize the regulatory roles demarked by federalism. What roles should be allocated to or preserved for federal, state, and local actors, or perhaps a combination of them all? Climate change policy choices remain the subject of partisan and rancorous contestation, including disputes over the right federalism choice. By leavening idealized policy solutions with attention to political and legal discord and regulation-market linkages, this Article illuminates the effects and dynamics of *federalism hedging*, a largely overlooked value of federalism structures retaining concurrent and often interacting federal and state roles. Federalism hedging refers to the regulatory choice to retain overlapping, interacting, and often intertwined federal and state roles even in a setting where the apparently ideal regulatory regime would rely on exclusive federal regulation that would preempt state roles.

This Article argues that both federalism discourse and climate change policy debates have failed to analyze adequately how choices about federal and state roles can serve to hedge and even reduce risks of regulatory reversal and implementation failure. This Article's analysis of federalism hedging operates at three levels. First, it introduces federalism hedging as a theory, explaining the attributes and dynamics of federalism hedging and situating it within recent scholarly and policy debates about the values and functioning of federalism. Second, it then illuminates federalism hedging with analysis of the regulatory challenges posed by climate change and the history of climate and clean energy progress and contestation. And, third, drawing on this theoretical and historical analysis, the Article makes a normative and prescriptive claim that retaining latitude for state and federal overlap can provide an array of benefits and, especially, reduce

1. *See, e.g.*, Thomas J. Brennan & Andrew W. Lo, *Dynamic Loss Probabilities and Implications for Financial Regulation*, 31 YALE. J. ON REG. 667 (2014) (analyzing the need for "adaptive" regulation due to how risks to financial institutions' assets will vary over time and pose risk of amplifying losses); Anne Joseph O'Connell, *The Architecture of Smart Intelligence: Structuring and Overseeing Agencies in the Post-9/11 World*, 94 CAL. L. REV. 1655 (2006) (analyzing the challenge of protecting national security while maintaining democratic values and assessing linked choices of redundancy, oversight and centralization to address attendant risks).

risks of disruptive policy reversals that could, in turn, undercut linked markets and regulatory progress.

Such a hedging role is of especial importance where a body of regulation provides a crucial underpinning of a market and that market is itself essential to regulatory success. Retaining latitude for both federal and state roles also can serve in a valuable precautionary role conducive both to innovation and pragmatic adjustment in regulatory settings characterized by rapid change in business models and technology.[2]

This Article, like much federalism discourse, is actually not about what is constitutionally required. Instead, the Article builds on an increasingly robust body of scholarship analyzing how federal and state roles recognized by the Constitution should be utilized to further particular regulatory policy goals or political ends.[3] Although federalism scholars often mention the benefits of federalism "redundancy" in risk regulation and benefits of dynamic interjurisdictional learning, little of this pro-overlap and interaction federalism literature devotes attention to the regulation-business link, regulatory risks of error, implementation failures, and political reversal risks.[4] Another strain of federalism scholarship documents and analyzes

2. Sarah E. Light, *Precautionary Federalism and the Sharing Economy*, 66 EMORY L.J. 333 (2017) (discussing a case study of "sharing economy" developments and rapid innovation; identifying benefits of retaining multiple regulatory voices and not enacting preemptive law; and noting "time-bound" contingency of regulators' roles).

3. *See, e.g.*, William W. Buzbee, *Asymmetrical Regulation: Risk, Preemption, and the Floor/Ceiling Distinction*, 82 N.Y.U. L. REV. 1547 (2007) [hereinafter *Asymmetrical Regulation*] (identifying regulatory policy benefits of regulatory floors); William W. Buzbee, *Contextual Environmental Federalism*, 14 N.Y.U. ENVTL. L.J. 108 (2005) [hereinafter *Contextual Environmental Federalism*] (tracing federal and state interactions that sequentially have shaped environmental policy); Brian Galle & Mark Seidenfeld, *Administrative Law's Federalism: Preemption, Delegation, and Agencies at the Edge of Federal Power*, 57 DUKE L.J. 1933 (2008) (focusing on the implications of prevalent intersections of federalism, preemption and administrative law); Heather Gerken, *Federalism as the New Nationalism: An Overview*, 123 YALE L.J. 1889 (2014) (reviewing scholarship that identifies benefits to national aspirations and political identity due to interacting and shared federal and state turfs); Abbe R. Gluck, *Intrastatutory Federalism and Statutory Interpretation: State Implementation of Federal Law in Health Reform and Beyond*, 121 YALE L.J. 534, 541–43 (2011) (discussing centrality of statutory federalism allocations rather than constitutional lines); Gillian E. Metzger, *Administrative Law as the New Federalism*, 57 DUKE L.J. 2023, 2026–29 (2008) (analyzing how federalism choices and battles are increasingly sorted out and contested in areas shaped by administrative law).

4. A few articles regarding climate federalism identify and analyze implications of regulatory risks and are cited further below. S*ee* Alice Kaswan, *The Domestic Response to Global Climate Change: What Role for Federal, State, and Local Litigation Initiatives?*, 42 U.S.F. L. REV. 39, 67, 69 (2007); Jared Snyder & Jonathan

the logic and legality of state and local climate and clean energy initiatives undertaken without a broader national agreement.[5]

Binder, *The Changing Climate of Cooperative Federalism: The Dynamic Role of the States in a National Strategy to Combat Climate Change*, 27 J. ENVTL. L. 231, 232–33 (2009).

5. *See, e.g.*, David Adelman & Kirsten Engel, *Adaptive Environmental Federalism*, *in* PREEMPTION CHOICE: THE THEORY, LAW, AND REALITY OF FEDERALISM'S CORE QUESTION 277, 296–98 (William W. Buzbee ed., 2009) (identifying the benefits of adaptive regulation and championing non-preemptive regulation generally and through climate change case study); William L. Andreen, *Federal Climate Change Legislation and Preemption*, 3 ENVTL. & ENERGY L. & POL'Y J. 261, 268–69 (2008) (arguing in favor of federal floor preemption for climate legislation); Eric Biber, *Cultivating a Green Political Landscape: Lessons for Climate Change Policy from the Defeat of California's Proposition 23*, 66 VAND. L. REV. 399, 403 (2013) (analyzing federal climate legislation defeat and contemporaneous defeat of a bill that would have repealed California's climate regulation); Rachel Brewster, *Stepping Stone or Stumbling Block: Incrementalism and National Climate Change Legislation*, 28 YALE L. & POL'Y REV. 245, 245–50 (2010) (exploring the benefits and drawbacks of incremental climate policy); *Asymmetrical Regulation*, *supra* note 3, at 1616–19 (an article analyzing implications of choices to preempt with regulatory floors or ceilings, exploring climate regulation choices); William W. Buzbee, *State Greenhouse Gas Regulation, Federal Climate Change Legislation, and the Preemption Sword*, 1 SAN DIEGO J. CLIMATE & ENERGY L. 23, 25–26 (2009) (exploring the risks of preemption of state climate regulation authority); Ann E. Carlson, *Designing Effective Climate Policy: Cap-and-Trade and Complementary Policies*, 49 HARV. J. ON LEG. 207, 210–11 (2012) [hereinafter *Designing Effective Climate Policy*] (analyzing costs and benefits of "complementary" traditional regulatory approaches and market-based mechanisms); Ann E. Carlson, *Federalism, Preemption, and Greenhouse Gas Emissions*, 37 U.C. DAVIS L. REV. 281, 283, 285 (2003) [hereinafter *Federalism, Preemption, and Greenhouse Gas Emissions*] (discussing relationship between California climate legislation and federal law); Ann E. Carlson, *Iterative Federalism and Climate Change*, 103 NW. U. L. REV. 1097, 1100 (2009) [hereinafter *Iterative Federalism and Climate Change*] (discussing "iterative federalism" benefits of statutes that "designate[] a particular and distinct state or group of states to regulate and rel[y] on that regulatory arrangement to enhance compliance with federal standards."); Kirsten Engel, *State and Local Climate Change Initiatives: What is Motivating State and Local Governments to Address a Global Problem and What Does This Say About Federalism and Environmental Law?*, 38 URB. L. 1015, 1015–16 (2006) (exploring alleged irrationality of, and the possible justifications for, state and local measures to mitigate a global challenge); Robert L. Glicksman & Richard E. Levy, *A Collective Action Perspective on Ceiling Preemption by Federal Environmental Regulation: The Case of Global Climate Change*, 102 NW. U. L. REV. 579 (2008) (exploring why ceiling preemption of state restrictions on GHG emissions is not justified by the principal justifications for federal environmental regulation); Alice Kaswan, *A Cooperative Federalism Proposal for Climate Change Legislation: The Value of State Autonomy in a Federal System*, 85 DENV. U. L. REV. 791 (2008) (advocating cooperative federalism strategies to address climate change, including federal minimum standards and goal setting, but minimizing preemption through a waiver system to foster state-level innovation); Douglas A. Kysar & Bernadette A. Meyler, *Like a Nation State*, 55 UCLA L. REV. 1621 (2008) (discussing California's climate leadership in climate policy and unconstitutionality risks of the state's deliberately extrajurisdictional focus); Richard B. Stewart, *States and Cities as Actors in Global Climate Regulation:*

Before comprehensive federal climate legislative proposals went down to defeat in 2009 and 2010, they spurred an important but truncated debate over what roles should be retained by states if the nation enacted a climate-focused federal cap-and-trade bill.[6] Prominent scholars and stakeholders argued that because climate regulation addresses a global ill and logically must embrace market-based regulatory tools—most likely cap-and-trade-based regulation or use of pollution taxes—regulation should be structured to draw on the largest markets possible in order to facilitate the business search for cost-effective means to reduce emissions.[7] They often championed preemption of state climate roles. Final (but unsuccessful) bills, however, rejected such calls.[8] And a recent 2017 proposal by leading Republican conservatives advocated enactment of a carbon tax regime, but coupled that proposal with a call for the elimination of other similarly targeted federal or state laws.[9]

In the absence of a tailored federal climate law, states nonetheless have made climate and clean energy regulatory progress and, as litigants, prompted a series of federal regulatory actions to address climate risks under the Clean Air Act and federal energy laws. And those federal regulatory interventions, especially the Clean Power Plan (CPP) targeting existing power plants' greenhouse gas (GHG) emissions, were shaped by state experiences, sought to harness state

Unitary vs. Plural Architectures, 50 ARIZ. L. REV. 681 (2008) (acknowledging advantages in principle of a unitary approach but ultimately recommending "a plural model"); Vivian E. Thomson & Vicki Arroyo, *Upside Down Cooperative Federalism: Climate Change Policymaking and the States*, 29 VA. ENVTL. L.J. 1 (2011) (assessing political and economic circumstances influencing state-level climate change policymaking); Katherine A. Trisolini, *All Hands on Deck: Local Governments and the Potential for Bidirectional Climate Change Regulation*, 62 STAN. L. REV. 669 (2010) (exploring counterintuitive local climate efforts and how they augment national efforts); Michael P. Vandenbergh & Mark A. Cohen, *Climate Change Governance: Boundaries and Leakage*, 18 N.Y.U. ENVTL. L.J. 221 (2010) (describing mechanisms to create incentives for major developing countries to reduce emissions).

6. For an early review of the merits of a unitary or "plural" regulatory answer, ultimately arguing for retention of latitude for state climate regulation alongside a future federal climate law, *see* Stewart, *supra* note 5, at 707.

7. *See infra* notes 111–33 and accompanying text (discussing arguments for preemptive federal climate law).

8. *See infra* notes 160–79 and accompanying text (discussing climate bills' federalism choices and final bills' rejection of a comprehensively preemptive bill).

9. *See infra* notes 114–16 and accompanying text (discussing these proposals).

regulatory capacity and creativity, and preserved state authority to do more.[10]

The role of federalism overlap and interaction as a hedge, especially in the climate regulation arena, is a subject of more than just theoretical interest. As this Article goes to press, the new administration of President Donald Trump has overtly declared plans to revisit and roll back climate progress.[11] The extent to which this new administration can do so is substantially shaped by federal, state and business climate and clean energy progress, and past statutory federalism choices.

This Article agrees that the ideal answer to a global challenge like climate change would be regulation at the largest scale possible, with minimized regulatory overlap. Nonetheless, mandating such authority allocations would be the wrong answer. The effects and political economic dynamics of federalism hedging analyzed in this Article reveal why. The value of federalism hedging links to likely regulatory implementation failures, regulatory reversal risks, and risks of unsettling linked markets. Responses to regulation will inevitably be

10. *See* Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64,662–64 (Oct. 23, 2015) (to be codified at 40 C.F.R. pt. 60) [hereinafter CPP].

11. President Trump by executive order sought to hasten such change. Exec. Order No. 13783, 82 Fed. Reg. 16,093, 16,095 (Mar. 31, 2017) (directing EPA to "suspend, revise, or rescind" the Clean Power Plan). The EPA has started down this path, withdrawing proposed rules that were the next steps in implementing the Clean Power Plan. Withdrawal of Proposed Rules: Federal Plan Requirements for Greenhouse Gas Emission from Electric Utility Generating Units Constructed on or Before January 8, 2014; Model Trading Rules; Amendments to Framework Regulations; and Clean Energy Incentive Program Design Details, 82 Fed. Reg. 16,144 (Apr. 3, 2017) (to be codified at 40 C.F.R. pt. 60). The CPP repeal proposal is quite minimal in its engagement with the CPP's extensive documentation, legal analysis, and review of clean energy trends and state level regulation built on in the CPP and which could be used to comply with the CPP. Nonetheless, Trump's EPA proposes a complete CPP repeal and does not commit to a replacement rule. *See* Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 82 Fed. Reg. 48,035 (Oct. 16, 2017) (to be codified at 40 C.F.R. pt. 60). EPA's new leader, Scott Pruitt, was focused on such policy reversals from the time of his appointment. Kevin Bogardus, *Pruitt Questions Agency's Authority to Regulate Carbon*, E&E NEWS (Feb. 20, 2017), https://www.eenews.net/stories/1060050312 [https://perma.cc/TD4G-RW6C] (reporting statements of new EPA Administrator Scott Pruitt indicating greater willingness to abandon carbon regulation than stated in confirmation hearings). Numerous other federal climate regulatory reversals are underway as of late 2017. *See* Climate Deregulation Tracker, COLUM. L. SCH., SABIN CTR. FOR CLIMATE CHANGE L., http://columbiaclimatelaw.com/resources/climate-deregulation-tracker/ [https://perma.cc/A8BN-58K4] (identifying, among other items, proposals concerning transportation planning, oil and gas mining emissions, motor vehicle emissions, and climate science advisor policy shifts).

ongoing and dynamic; whatever regulatory instruments and design are chosen will shape and change the political and market terrain, and vice versa.[12] All policy reforms are "at risk," facing post-enactment threats and a dynamic environment.[13] The challenges of climate change make such regulatory derailment risks especially likely to be persistent threats.

Federal harnessing of state roles, or at least preservation of the possibility of state regulation alongside federal regulation,[14] can be part of an effective and durable regulatory design due to three effects linked to federalism hedging: heightened stakeholder incentives to commit to the federal regime; policy diffusion dynamics; and gradual entrenchment of supportive coalitions through a process of path dependence dynamics that result in "increasing returns" and "costs of exit."[15] Relatedly, tested regulatory and market accomplishments create

12. *See* IAN AYRES & JOHN BRAITHWAITE, RESPONSIVE REGULATION: TRANSCENDING THE DEREGULATION DEBATE 3–7, 159 (Donald R. Harris et al. eds., 1992) (developing idea of "responsive regulation" shaped in light of linkages of markets and regulation); WILLIAM W. BUZBEE, FIGHTING WESTWAY: ENVIRONMENTAL LAW, CITIZEN ACTIVISM, AND THE REGULATORY WAR THAT TRANSFORMED NEW YORK CITY 31–51 (2014) (exploring how private actors and government officials engage in the "art of regulatory war," at all levels strategically interacting to pursue favored outcomes both under law and to change law); Adrian Smith et al., *Innovation Studies and Sustainability Transitions: The Allure of the Multi-Level Perspective and its Challenges*, 39 RES. POL'Y 435, 438 (2010) (noting that innovations are influenced by interacting technical, business, policy, and government process factors).

13. ERIC M. PATASHNIK, REFORMS AT RISK: WHAT HAPPENS AFTER MAJOR POLICY CHANGES ARE ENACTED 3 (2008). Patashnik's insights are applied to climate regulation in Biber, *supra* note 5, at 400–01, to explore why California's climate law survived a well-funded political attack. *See also* Richard J. Lazarus, *Super Wicked Problems and Climate Change: Restraining the Present to Liberate the Future*, 94 CORNELL L. REV. 1153, 1158–59 (2009) (describing climate change "a 'super wicked problem' that defies resolution" and citing Patashnik for reversal risks and need for "precommitment" strategies).

14. For ease of reading, I will generally refer to sub-national regulation simply as "state" regulation, but states have sometimes addressed climate change through regional agreements and local governments have taken their own additional actions.

15. For the most influential discussion of the path dependence and "increasing returns" and "costs of exit" concepts, *see* Paul Pierson, *Increasing Returns, Path Dependence, and the Study of Politics*, 94 AM. POL. SCI. REV. 251, 252 (2000). Others building on these concepts regarding climate change are few, but nuanced analysis, albeit in works with a different focus than this Article, are provided in Biber, *supra* note 5, at 400–01 (in comparing state and federal legislation fates discussing Pierson and how policy initiatives change interest group incentives); Brewster, *supra* note 5, at 251, 311 (discussing such concepts in considering the dynamics of national and international climate regulation); and Pablo del Río & Xavier Labandeira, *Barriers to the Introduction of Market-Based Instruments in Climate Policies: An Integrated Theoretical Framework*, 10 ENVTL. ECON. & POL'Y STUD. 41, 47–48 (2009) (mainly looking at how path dependence dynamics create resistance to climate regulation).

a body of experience and record that can provide a bulwark against ungrounded claims of regulatory hardship, change coalitional political dynamics, and provide a fact-based foundation for future regulation.[16]

For market actors supplying goods and services to meet a regulatory goal, a web of regulation resulting from multiple regulators, or at least potential regulators, is far more resilient and resistant to wholesale derailment than would be complete dependence on a single federal regulatory scheme. Retaining that state authority, even if just a regulatory hedging strategy, fosters overall stability, creates room for regulatory innovation, and thereby creates conditions conducive to private investment to meet regulatory goals.

Legal durability is always important, especially where the regulatory infrastructure is a critical underpinning of linked investments and markets. This is especially true in the setting of climate regulation.[17] Always underlying climate politics and linked markets is fear of all governments, citizens, and market actors that their jurisdiction will act, but others will not. Such inaction or regulatory reversals of others can disadvantage the climate-regulating jurisdiction, lay waste to investors in related businesses and markets, and leave GHG levels still on the rise.[18]

The climate and clean energy regulatory infrastructure is already built on laws and regulations benefitted by federalism hedging.[19] Concerted federal efforts to reverse course on climate change—a constant in all climate regulation battles and an even more certain

16. *See* Biber, *supra* note 5, at 401–02. *See also* discussion *infra* notes 194–232 and accompanying text (reviewing how state, regional, and federal regulatory initiatives collectively built clean energy momentum and enhanced its economic competitiveness).

17. Professor Lazarus emphasizes the importance of durability of climate legislation. *See* Lazarus, *supra* note 13, at 1157, 1159. This Article starts with this same basic assumption, but focuses on regulatory federalism and, especially, how such federalism choices and webs of regulation will influence political and economic dynamics, especially dependent markets and incentives for investments in clean energy innovations.

18. *See, e.g.*, *Massachusetts v. EPA*, 549 U.S. 497, 545–46 (2007) (Roberts, C.J., dissenting) (stating concern with futile United States regulation if China and India pollution increased). *See also* To Prohibit the Regulation of Carbon Dioxide Emissions in the United States Until China, India, and Russia Implement Similar Reductions, S. 15, 112th Cong. (1st Sess. 2011) (proposing to prohibit carbon dioxide regulation until China, India, and Russia implemented climate change policies).

19. *See Contextual Environmental Federalism*, *supra* note 3, at 112–13; William W. Buzbee, *Federalism-Facilitated Regulatory Innovation and Regression in a Time of Environmental Legislative Gridlock*, 28 GEO. ENVTL. L. REV. 451, 464–77 (2016). *See also infra* notes 180–232 and accompanying text (analyzing such federalism hedging in federal law and its influence on clean energy and pollution reduction trends and political proposals).

scenario under the Trump administration—will surely slow and might even halt federally led climate progress. The existence of federalism hedging strategies, however, will likely reduce the scale of such reversals and also set the stage for future progress.

Part I defines and introduces the dynamics and theoretical effects of federalism hedging. Part II then turns to the climate regulation case study, starting by reviewing why climate change poses a thorny regulatory challenge that is subject to ongoing contestation. Part III then turns to climate federalism choices, starting with a review of recurrent arguments in favor of preemptive federal climate regulation. It then illuminates the generative benefits of federalism hedging, tracing the development of clean energy businesses and associated regulatory innovation. State policy innovations and litigation have prompted clean energy progress at both the state and federal level, as has federal policy support. Retained latitude for state regulation has shaped the form of federal regulation plus reduced risks of regulatory reversal. Part IV then melds the climate regulatory history with federalism hedging theory to explore how retention of concurrent federal and state authority reduces regulatory failure and policy reversal risks. Such hedging predictably gives rise to coalitions favoring climate progress. After a brief foray into the merits of a carbon tax versus cap-and-trade based regulation assessed with a focus on regulatory derailment risks, the Article closes with doctrinal analysis to highlight challenges to effective statutory drafting that would harness the benefits of federalism hedging.

I. FEDERALISM HEDGING AND THE BENEFITS OF REGULATORY WEBS

Federalism's virtues have been well cataloged and much repeated, from the founding era to a wave of recent scholarship analyzing the Supreme Court's recent federalism revival.[20] This Part introduces the concept of "federalism hedging," situating it within recent years' judicial and scholarly ferment about federalism. Even in a regulatory setting where virtually all agree that regulation would ideally be devised by the largest jurisdictional unit, be it national or international, federalism hedging's virtues remain important.[21]

20. For a concise review of those development and key facets of modern federalism doctrine and related legal materials, see ROBERT L. GLICKSMAN ET AL., ENVIRONMENTAL PROTECTION: LAW AND POLICY 85–166 (7th ed. 2015) (reviewing environmental federalism). *See also supra* note 3 (citing a cross section of this literature).

21. *See* Brewster, *supra* note 5, at 256–47.

Although much federalism scholarship and jurisprudence focuses on constitutional limitations, actual decisions finding federal laws or actions to violate constitutional limitations remain rare. Still, legislation based on the Commerce Clause no longer receives a judicial rubber stamp,[22] federal law now clearly cannot just "commandeer" state actors,[23] and regulation can be unconstitutionally coercive in eliciting state cooperation through the use of conditional federal spending.[24] In the courts, federalism canons often drive arguments for more searching and even hostile judicial review.[25] Preemption decisions from recent decades are numerous, tend to be law and fact specific, and are sometimes hard to reconcile.[26] This array of federalism cases collectively creates little clear law, but in their aggregate impact teaches that congressional federalism choices—whatever they are—need to be clear to avoid uncertain future outcomes.[27]

But where federalism is at its most important, or at least most often in play, is in congressional and agency choices about how legislation and resulting bodies of regulation should allocate or preserve federal, state, and sometimes local authority. Should a federal program entice states to play a regulatory role, or should states work

22. *See* Robert A. Schapiro & William W. Buzbee, *Unidimensional Federalism: Power and Perspective in Commerce Clause Adjudication*, 88 CORNELL L. REV. 1199, 1250–52 (2003) (critiquing modern Commerce Clause jurisprudence limiting federal power with focus on implications of manipulation of the "activities" frame).

23. *New York v. United States*, 505 U.S. 144, 161 (1992) (quoting *Hodel v. Va. Surface Mining & Reclamation Ass'n*, 452 U.S. 264, 288 (1981)) (concluding that "Congress may not simply commandee[r] the legislative processes of the States").

24. *Nat'l Fed'n of Indep. Bus. v. Sebelius*, 132 S. Ct. 2566, 2604–05 (2012) (holding that the Medicaid expansion provision of the Affordable Care Act and threatened loss of conditional federal spending was "economic dragooning that leaves the States with no real option but to acquiesce in the Medicaid expansion").

25. See *infra* note 191 and accompanying text (discussing use of federalism in arguments against the Clean Power Plan); *see also* John F. Manning, *Clear Statement Rules and the Constitution*, 110 COLUM. L. REV. 399, 437–38 (2010) [hereinafter *Clear Statement Rules and the Constitution*] (criticizing use of federalism canons due to lack of "principled metric" to constrain their use); John F. Manning, *The Nondelegation Doctrine as a Canon of Avoidance*, 2000 SUP. CT. REV. 223, 224 [hereinafter *The Nondelegation Doctrine as a Canon of Avoidance*] (questioning use of the nondelegation doctrine "to disturb the apparent lines of compromise produced by the legislative process").

26. *See* THOMAS O. MCGARITY, THE PREEMPTION WAR: WHEN FEDERAL BUREAUCRACIES TRUMP LOCAL JURIES (2008) (analyzing pro-preemption arguments and policy shifts and their anti-regulatory aims); Christopher H. Schroeder, *Supreme Court Preemption Doctrine*, *in* PREEMPTION CHOICE, *supra* note 5 (reviewing preemption law doctrinal shifts and tensions).

27. *See infra* notes 326–40 and accompanying text (discussing need for clarity regarding climate federalism choices).

independently even if alongside federal initiatives, or should a federal law be preemptive? In making such choices, the Constitution seldom provides the answers, although the existence of these layers of government is, of course, a result of constitutional design.[28]

Retaining or asserting a federal role (whether exclusive or concurrent with state regulation) is often linked to economies of scale,[29] underinvestment in information without a federal role,[30] and expertise that a dedicated federal agency develops as it investigates and shares information with the whole nation.[31] It also often sets a minimum required level of safety (a floor) to avoid a regulatory race to the bottom, where jurisdictions might otherwise compete by offering regulatory laxity.[32] Where a uniform federal rule is possible, it can avoid heightened compliance costs associated with a varied "patchwork" of regulation since many businesses operate or sell across many states.[33]

Congress rarely completely preempts state regulatory authority. More often, through cooperative federalism structures, limited assertions of federal power, and savings clauses preserving state power to do more, Congress creates regulatory regimes that retain concurrent,

28. *See supra* note 3 (citing scholarship discussing federalism and allocation of regulatory roles).

29. Robert W. Hahn et al., *Federalism and Regulation*, REGULATION, Winter 2003–04, at 46, 47; *see also* Kirsten H. Engel, *State Environmental Standard-Setting: Is There a "Race" and Is it "to the Bottom"?*, 48 HASTINGS L.J. 271, 287–88 (1997) (identifying economies of scale in scientific research as a benefit of a federal regulatory role); Dave Owen, *Regional Federal Administration*, 63 UCLA L. REV. 58, 60 (2016) (in analysis of de facto regional governance, identifying benefits of federal role).

30. *See* Philip J. Weiser, Chevron*, Cooperative Federalism, and Telecommunications Reform*, 52 VAND. L. REV. 1, 32–33 (1999) (explaining cooperative federalism schemes' attributes); *see also* Jonathan H. Adler, *Jurisdictional Mismatch in Environmental Federalism*, 14 N.Y.U. ENVTL. L.J. 130, 132–33 (2005) (critiquing "matching principle").

31. Hahn et al., *supra* note 29, at 47–48; *see also* Metzger, *supra* note 3, at 2083 (arguing that policy expertise is critical to balancing federal and state regulatory roles).

32. Hahn et al., *supra* note 29, at 47; *see also* Engel, *supra* note 29, at 294 (analyzing how federal environmental law sought to prevent "a race to low environmental quality"). *But see* Richard L. Revesz, *Rehabilitating Interstate Competition: Rethinking the "Race-to-the-Bottom" Rationale for Federal Environmental Regulation*, 67 N.Y.U. L. REV. 1210 (1992) (challenging underpinnings of the "race-to-the-bottom" rationale for federal environmental standard setting).

33. *See* Engel, *supra* note 29, at 288 (arguing that federal environmental regulation "lower[s] the potential barriers to interstate trade"*)*; *see also* Philip J. Weiser, *Federal Common Law, Cooperative Federalism, and the Enforcement of the Telecom Act*, 76 N.Y.U. L. REV. 1692, 1710 (2001) (arguing for benefits of uniform national rules when "parties are not rooted in a particular state").

interacting and intertwined federal and state roles.[34] This sort of arrangement harnessing concurrent and interacting federal and state authority is an essential element of federalism hedging. It is referred to as providing "hedging" effects because, as explored through this Article, it provides an array of second-best benefits that are likely the optimal possible answer even where, as with climate change, the likely ideal arrangement would utilize a single, well crafted, preemptive and stable federal regulatory regime.

The prevalent use of overlapping and interacting roles, especially where state and local governments provide the initial implementation and enforcement role, is justified as enhancing accountability and allowing for tailoring of regulation to local conditions and priorities.[35] Latitude for state policy differences facilitates experimentation among the states as "laboratories of democracy," a virtue long ago recognized by Justice Brandeis.[36] While direct conflicts with federal law will always be preempted under the Constitution's Supremacy Clause, Congress usually leaves some room for state difference.

Most importantly, under prevailing use of "floor preemption," states can regulate a risk more aggressively than provided by federal law.[37] This can include not just more stringent regulation, but also states filling in regulatory gaps.[38] So, for example, federal law may require products or conduct to minimize risks, but states usually can ratchet performance standards down more, prohibit certain sources of risk, or adopt complementary policies that foster related improvements in performance or conditions.

The federal government also at times subsidizes and hence incentivizes states to regulate.[39] And under ubiquitous cooperative

34. *See Asymmetrical Regulation*, *supra* note 3 (exploring federalism choices, the norm of federal regulatory floors, and the differences between federalism floors and ceilings).

35. *Gregory v. Ashcroft*, 501 U.S. 452, 458 (1991) (identifying other virtues of federalism associated with separation of roles and distinct preserved state turf).

36. *New State Ice Co. v. Liebmann*, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting) (stating "[i]t is one of the happy incidents of the federal system that a single courageous state may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country").

37. *See Asymmetrical Regulation*, *supra* note 3 (analyzing implications of regulatory floors and ceilings in preemptive regimes); Glicksman & Levy, *supra* note 5 (analyzing ceiling preemption in the setting of climate regulation).

38. *See, e.g.*, Hari M. Osofsky & Hannah J. Wiseman, *Hybrid Energy Governance*, 2014 U. ILL. L. REV. 1, 18 (in analyzing concurrent federal and state roles in energy law, identifying settings where states address gaps in federal coverage).

39. *New York v. United States*, 505 U.S. 144, 167 (1992) (reviewing regulatory tools federal government can permissibly use to elicit state involvement, including conditional federal spending).

federalism structures, also often called delegated programs, states can take over implementation and enforcement of a federal program.[40] As long as they meet federal requirements, the states can choose how to achieve such goals and also, due to savings clauses and floor preemption provisions, do more without stirring up litigation. As Justice Thurgood Marshall wrote in *Union Electric*[41] regarding the Clean Air Act's key cooperative federalism provision, as long as states comply with federal law, they retain the option to regulate a business so stringently that it might go out of business.[42] In all of these settings, the federal government may be the motivator, but the innovator and first-line regulator will often be the states.

Overlapping bodies of federal and state law—whether under cooperative federalism structures or rooted in the separate authority of federal and state governments—can also deter targets of regulation from violating the law with hopes of impunity.[43] Violations and damaging conduct are more likely to be regulated, caught, and punished. Relatedly, both federal and state law usually enlist citizen enforcement to make the law real and reduce risks of unlawful behavior.[44] Cooperative federalism structures require delegated states to protect citizen participation and enforcement rights.[45]

Others identify states' interaction with each other and with the federal government as providing room for federalism-facilitated horizontal (state-to-state) and vertical (state-federal) learning. As

40. *See* Shana Campbell Jones, *Making Regional and Local TMDLs Work: The Chesapeake Bay TMDL and Lessons from the Lynnhaven River*, 38 WM. & MARY ENVTL. L. & POL'Y REV. 277, 289 (2014) (describing the cooperative federalism framework of the Clean Water Act); *see also* Jim Rossi, *The Brave New Path of Energy Federalism*, 95 TEX. L. REV. 399, 452–53 (2016) (arguing that federal energy statutes, such as the Federal Power Act, provide authority for establishment of a regulatory scheme with overlapping federal and state roles); Jessica M. Wilkins, Note, *The Validity of the Clean Power Plan's Emissions Trading Provisions*, 91 N.Y.U. L. REV. 1386, 1392 (2016) (describing the cooperative federalism framework of the Clean Air Act).

41. 427 U.S. 246 (1976).

42. *Id.* at 265 (stating the statute provides "no basis for the [federal] Administrator ever to reject a state implementation plan on the ground that it is economically or technologically infeasible").

43. ROBERT A. SCHAPIRO, POLYPHONIC FEDERALISM: TOWARD THE PROTECTION OF FUNDAMENTAL RIGHTS 124, 154 (2009) (discussing benefits of overlapping federal and state roles as "provid[ing] a redundancy that bridges the remedial gap").

44. *See, e.g.*, Clean Air Act, 42 U.S.C. § 7604 (2012) (permitting citizen suits under the Clean Air Act).

45. *See, e.g.*, *Commonwealth of Va. v. Browner*, 80 F.3d 869 (4th Cir. 1996) (upholding federal rejection of delegated state air permit program due to failure to provide adequate citizen access to judicial review of regulatory actions).

Robert Schapiro explores, the "polyphony" of regulatory voices can generate different and more informed answers than would a single voice; one regulator's involvement does not logically mean another must be displaced.[46] Uncertainty about shared or uncertain regulatory turfs can, however, lead to "regulatory commons" dynamics and create incentives for regulatory neglect.[47] Other more recent works explore the dynamics and value of uncooperative and often clashing federal and state roles, seeing benefits in such "uncooperative" and "iterative" interactions.[48]

Federalism-facilitated differences and experiments include not just the benefits of better policy and latitude for interactive and "dialectical" exchanges that can facilitate innovation, but failed policy experiments as well.[49] The price of error is far smaller when its costs fall on those affected in one state than if the error were national in scope. And each error provides lessons for improved future regulation.[50]

Perhaps because much of this federalism discourse focuses on constitutional lines or risk regulation, it sometimes pays little attention to federalism choices where regulation may provide a crucial underpinning of a market, let alone where the effectiveness of regulation is contingent on market-generated innovations.[51] Yet, as exists in the climate regulation and clean and renewable energy areas

46. SCHAPIRO, *supra* note 43, at 154 (analyzing federalism-facilitated overlapping and interacting regulatory roles as akin to "polyphony" in music).

47. William W. Buzbee, *Recognizing the Regulatory Commons: A Theory of Regulatory Gaps*, 89 IOWA L. REV. 1, 5 (2003) (identifying as regulatory commons challenges settings where multiple jurisdictions have potential regulation over an issue and analyzing resulting incentives for potential regulators to leave social ills unaddressed).

48. *See generally* Jessica Bulman-Pozen & Heather K. Gerken, *Uncooperative Federalism*, 118 YALE L.J. 1256 (2009); *see also Iterative Federalism and Climate Change*, *supra* note 5, at 1099 (observing that body of climate regulation is "the result[] of repeated, sustained, and dynamic lawmaking efforts involving both levels of government—what I term 'iterative federalism'").

49. Robert B. Ahdieh, *Dialectical Regulation*, 38 CONN. L. REV. 863, 879–98 (2006) (identifying benefits of dialectical regulation).

50. Light, *supra* note 2, at 360–65 (discussing benefits of precautionary federalism, including jurisdictional learning and avoiding regulatory over commitment in settings of change and innovation).

51. In an "innovation studies" analysis, Smith and co-authors note this interactive influence of regulation and business innovation. *See* Smith et al., *supra* note 12, at 439. *See also* Diane Cardwell & Julie Cresswell, *SolarCity and Other Rooftop Providers Face a Cloudier Future*, N.Y. TIMES (Feb. 10, 2016), https://nyti.ms/1XjNSWS [https://web.archive.org/web/20171208151043/https://www.nytimes.com/2016/02/11/business/energy-environment/rooftop-solar-providers-face-a-cloudier-future.html] (discussing confluence of regulatory policy shifts, energy fuel cost shifts, and evolving solar business models and resulting effects on solar companies).

analyzed below, regulation can serve in two reciprocal and bivalent roles that are facilitated through federalism hedging allocations: regulation may mitigate a risk, yet at the same time create demand for a market product or service that helps address that risk.[52] Furthermore, regulatory success and stability will often depend on market and business innovations that over time will make regulatory burdens palatable.[53] In one sense, this is no surprise: all regulation influences market activity.[54] In fact, a long-stated Chicago School view of regulation is that most regulation, even ostensibly constraining regulation, actually serves the interests of the targets of regulation.[55] This influential view, however, fails to consider how regulation often implicates both targets of regulation (the Stigler focus, focusing on barriers to entry) as well as other businesses that will seize opportunities to develop cost-effective means to meet regulatory obligations.[56]

Such businesses developing services and products to assist with regulatory compliance and improved performance can be substantially dependent on that regulation.[57] For example, businesses that sell

52. *See* Camille von Kaenel, *When Trump's Deregulation is at Odds with Industry*, E&E NEWS (Aug. 25, 2017), https://www.eenews.net/stories/1060059190 [https://perma.cc/U7FN-CPZH] (discussing businesses prepared to sell products to meet fuel economy regulatory requirements and hence concerned with regulatory instability or opposed to deregulation); *infra* notes 180-89 and accompanying text (explaining CPP design and role of business practices and state regulations in CPP design and stringency).

53. *See* Richard Revesz, *Federalism and Environmental Regulation: A Public Choice Analysis*, 115 HARV. L. REV. 553, 574 (2001) (noting that the "impetus for regulation sometimes comes from manufacturers of pollution control equipment, environmentally friendly technologies, or inputs to production processes favored by the regulatory regime").

54. Daniel L. Millimet et al., *Environmental Regulations and Economic Activity: Influence on Market Structure*, 2009 ANN. REV. RESOURCE ECON. 99 (reviewing scholarly literature on the effect of environmental regulation on market structure).

55. George J. Stigler, *The Theory of Economic Regulation*, 2 BELL J. ECON. & MGMT. SCI. 3, 3 (1971) (positing that "regulation is acquired by the industry and is designed and operated primarily for its benefit").

56. For example, anti-regulatory steps early in the Trump Administration, in particular an across-the-board regulatory "freeze," were criticized by numerous businesses and sectors that had supported such regulations and often designed their businesses in light of them. *See, e.g.*, Lorraine Woellert, *Trump's Regulation Freeze Makes Losers Out of Some U.S. Businesses*, POLITICO (Jan. 27, 2017, 5:10 AM), http://www.politico.com/story/2017/01/trump-regulation-freeze-businesses-234250 [https://perma.cc/4WKH-L67J]; von Kaenel, *supra* note 52 (same, with business concern about loss of regulatory impetus for fuel economy standards).

57. *See* Nicholas A. Ashford & Ralph P. Hall, *The Importance of Regulation-Induced Innovation for Sustainable Development,* 3 SUSTAINABILITY\ 270, 279 (2011) (exploring how "[s]tringent regulation can stimulate new entrants" into markets and

particular pollution control equipment may only have a market as a result of regulation.[58] When the 1990 Clean Air Act amendments created the acid rain cap-and-trade program, it created a new market for businesses that measured pollution and handled and monitored trades of sulfur dioxide allowances.[59] Similarly, as explored in depth below, recent growth in clean and renewable energy businesses has been shaped by a complex confluence of state and federal energy policy, the existence of government subsidies and tax incentives, clean and renewable energy mandates, and regulatory efforts to reduce GHG emissions.[60] And some business models—for example, the development of creditable carbon offsets—can be almost completely dependent on regulatory recognition.[61] Where a market, regulation, and regulatory progress are interdependent—as they long have been in utility and energy regulation and are today with climate regulation as well—then confidence in the ongoing existence of that regulation is crucial. Policy stability is essential for businesses to plan and flourish.

These shifts in stakeholder interests and the regulation-market link are critical effects of federalism hedging. Increased entrenchment of regulatory and market commitments over time creates incentives for business interests to become political coalitions that oppose regulatory

"displace dominant technologies"); William Boyd, *Public Utility and the Low-Carbon Future*, 61 UCLA L. REV. 1614, 1620 (2014) (arguing public utility regulation should be seen "less as an obstacle to markets and innovation and more as an 'instrument of the commonwealth'" that could "play an important role in the effort to secure a low-carbon future."); Millimet et al., *supra* note 54 (discussing how increased environmental regulation can both benefit and burden businesses); David B. Spence, *Naïve Energy Markets*, 92 NOTRE DAME L. REV. 973 (2017) (discussing implications of links of energy markets and regulatory design).

58. Revesz, *supra* note 53, at 574 (recounting how businesses emerged in response to the federal Superfund statute).

59. For discussions of resulting market activity, see John J. Fialka, *Breathing Easy: Clear Skies are Goal as Pollution is Turned into a Commodity*, WALL ST. J., Oct. 3, 1997 at A1 (analyzing markets reacting to 1990 Clean Air Act adoption of cap-and-trade regime); Bruce W. McClain & Heidi Hylton Meier, *The US Cap and Trade Initiative: Current Status and Potential Impact on Business*, 28 AM. J. BUS. 7, 10, 14–15 (2013) (analyzing past business responses to cap-and-trade regulation in assessing prospects of new proposals).

60. *See, e.g.*, William Boyd & Ann E. Carlson, *Accidents of Federalism: Ratemaking and Policy Innovations in Public Utility Law*, 63 UCLA L. REV. 810, 884–85 (2016) (arguing that variety of market forms, state and regional regulatory frameworks, and diverse state energy profiles and clean energy strategies have served as a sort of natural experiment).

61. William Boyd & James Salzman, *The Curious Case of Greening in Carbon Markets*, 41 ENVTL. L. 73, 77–78 (2011) (arguing that regulation has spurred the growth of carbon offset markets).

change that could unsettle their markets.[62] Federalism-facilitated preservation of concurrent and overlapping federal and state roles can be central to such shifts in interests; such shifts in stakeholder interests are one of the ways in which federalism can serve in a hedging role, reducing risks of regulatory instability and reversal.[63]

Regulatory structures that underpin markets, however, can come with a downside when returns are actually guaranteed, a downside that shapes opposition to clean energy. For example, "cost-of-service" based energy utility regulation guarantees utilities a return on large infrastructure investments due to the need for such stability.[64] Utilities predictably oppose a shift away from this arrangement.[65] Regulatory or business shifts that reduce dependence on such utility-provided energy infrastructure pose an existential threat to such utilities, as concluded in a recent industry whitepaper.[66] Relatedly, the low level of United States energy utility investment in research and development is attributed to the guaranteed returns enjoyed by incumbent monopolies facing little or no competition.[67]

Such guarantees of business viability or government choice of regulatory tools are rare. In most fields of regulation, regulatory structures utilize a complex mix of mandates and incentives such as performance standards, information elicitation, regulatory nudges via subsidies, tax policies and charges, and planning mandates.[68] In

62. *See* Dani Rodrik, *Green Industrial Policy*, 30 OXFORD REV. ECON. POL'Y 469, 470–72 (2014) (discussing how green industry policy can engender commitment and encourage progress) (*discussed in* Jonas Meckling et al., *Winning Coalitions for Climate Policy*, 349 SCI. 1170, 1170 (2015)).

63. *See* Meckling et al., *supra* note 62, at 1070–71 (observing how "green industrial policy" builds "interests and coalitions" and suggesting such coalition building should be a policy design goal). For further discussion of federalism and entrenching of regulation and business support, *see infra* notes 284-317 and accompanying text.

64. *See* Boyd & Carlson, *supra* note 60, at 827–28 (describing how the traditional "cost-of-service" model of ratemaking operates).

65. Spence, *supra* note 57, at 1010 & n.211 (citing Harvey Averch & Leland L. Johnson, *Behavior of the Firm Under Regulatory Constraints*, 52 AM. ECON. REV. 1052, 1052 (1962) and Léon Courville, *Regulation and Efficiency in the Electric Utility Industry*, 5 BELL J. ECON. & MGMT. SCI. 53 (1974) in discussion of incentives for "unnecessary capital investments" created by "cost of service" regulation).

66. PETER KIND, DISRUPTIVE CHALLENGES: FINANCIAL IMPLICATIONS AND STRATEGIC RESPONSES TO A CHANGING RETAIL ELECTRIC BUSINESS (2013).

67. *See* Felix Mormann, *Requirements for a Renewables Revolution*, 38 ECOLOGY L.Q. 903, 917–18 (2011) (discussing incentives created by such regulation and resulting minimal innovation investments).

68. For discussion of the rich array of regulatory tools, see GLICKSMAN ET AL., *supra* note 20, at 81–84, 1080–84, 1089–90 (reviewing array of regulatory strategies utilized in environmental laws); Cass R. Sunstein, *Administrative Substance*,

aggregate, these sort of mixed regulatory approaches create a web of rewards and expectations that underpin market choices and also shape responses of federal, state and local actors, but without specifying exactly what must be done.

The existence of federalism hedging and regulatory webs links to the forms of regulation utilized in such an interdependent matrix of regulation, market, and technological progress. Where regulation is fashioned in the typical form of a performance standard requiring achievement of a level of pollution, risk, or percentage of low carbon energy, rather than a rare technological and behavioral mandate, it is the results that matter; how a regulator or target of regulation meets that challenge is not dictated. Businesses have some profit-seeking incentive to find the most cost-effective means to meet those requirements.[69] But the rigor, reality, or permanence of regulation can vary. And as legal edicts underlying a market and business activity weaken or are embattled, markets will react, sometimes with abrupt downturns.[70]

1991 DUKE L.J. 607, 634–35 (discussing regulatory design choices and benefits of market-based regulation).

69. Businesses may, however, simply adopt the most readily available risk-reduction strategies. William W. Buzbee, *Preemption Hard Look Review, Regulatory Interaction, and the Quest for Stewardship and Intergenerational Equity*, 77 GEO. WASH. L. REV. 1521, 1537 (2009). Market-utilizing modes of regulation are championed as providing ongoing incentives for performance improvements. *See* Robert N. Stavins, *A Meaningful U.S. Cap-and-Trade System to Address Climate Change*, 32 HARV. ENVTL. L. REV. 293 (2008) (reviewing benefits of market-utilizing modes of regulation and suggesting such a regime for climate change regulation); Bryon Swift, *U.S. Emissions Trading: Myths, Realities, and Opportunities*, 20 NAT. RESOURCES & ENV'T, no. 1, 2005, at 3, 7 (2005). *But see* DAVID M. DRIESEN, THE ECONOMIC DYNAMICS OF ENVIRONMENTAL LAW (2003) (questioning extent to which market-based regulation will spur improved performance).

70. One extreme example is illustrated by President Trump's election. On the day following Trump's win, shares dropped across the renewable energy sector. *See* Michael Copley, *Renewables Wake Up to the Challenge of President Trump*, SNL ENERGY POWER DAILY, Nov. 10, 2016; Manikandan Raman, *Solar Stocks Red as Trump Win Turns Sector Bearish, SunPower Downgraded*, BENZINGA NEWSWIRES, Nov. 9, 2016; *Trump Win Raises Fears Over Climate Change Goals, Hits Renewable Stock*, REUTERS (Nov. 9, 2016, 10:35 AM), http://uk.reuters.com/article/usa-election-climatechange-update-1-pix/update-1-trump-win-raises-fears-over-climate-change-goals-hits-renewable-stocks-idUKL8N1DA742 [https://perma.cc/Y7LV-CBPD]; *see also Mormann, supra* note 67, at 933–35 (suggesting that a weak regulatory scheme has prevented the Regional Greenhouse Gas Initiative from being an effective cap-and-trade market). Nonetheless, such market drops do not mean market collapse; clean energy products and businesses have become increasingly competitive and remain an attractive investment. *See infra* notes 194–232 and accompanying text; s*ee also* Stanley Reed, *An Opportunity Rises Offshore*, N.Y. TIMES, Feb. 7, 2017, at B1 (analyzing promise of wind power businesses); Paul Sullivan, *Washington May Shift from Clean Energy, but*

Most existing federalism discourse, however, devotes little attention to this regulation-market link and, especially, how federalism allocations of concurrent and overlapping authority can create regulatory hedging effects, undergirding private markets that are often crucial to achieving effective responses to a regulatory challenge.[71] Retained state authority to regulate in a field, even if just latent, can serve as a federalism hedge by changing the incentives of both private actors and public officials.

With retained, shared federal and state jurisdiction over a source of risk, federal regulatory instability or reversal will not result in the collapse of interdependent markets and businesses.[72] Concurrent federal and state regulation works this way because, in the aggregate, federal and state regulation will form a web of regulatory signals that can create or undergird market demand. No single jurisdiction's regulatory reversals or instability will destroy the market or product category demand.

Furthermore, where policy signals are broad—as they are in rewarding or incentivizing renewable energy, clean energy, and pollution reduction without dictating means to such ends—then investments are unlikely to be inordinately concentrated on any single type of product or method. Policy reversals or failures at one level of government or in a few states are unlikely to unsettle all dependent markets.

As a result, both regulators and those supplying goods and services in any regulated market will become invested in that market and the linked regulatory infrastructure, increasingly incentivizing such individuals, organizations, and regulators to commit to the body of regulation.[73] Bodies of regulation undergirding such markets will become entrenched and less vulnerable to abrupt abandonment.

In contrast, if an entire market is driven by a single federal regulatory policy set by a preemptive regime, the risks of policy instability or abandonment are far greater. Indeed, as shown below from environmental law's history and linked federalism dynamics, the

Investors Shouldn't, N.Y. TIMES, Jan. 7, 2017, at B3 (discussing why clean energy investments remain attractive).

71. *Cf.* Alice Kaswan*, Decentralizing Cap-and-Trade? State Controls within a Federal Greenhouse Gas Cap-and-Trade Program*, 28 VA. ENVTL. L.J. 343, 346–47 (2010) (arguing that state autonomy in federal cap-and-trade regulatory schemes provides "a safety net for federal failure").

72. *See id.* at 355–56 (citing David E. Adelman & Kirsten H. Engel, *Adaptive Federalism: The Case Against Reallocating Environmental Regulatory Authority*, 92 MINN. L. REV. 1796, 1813–14 (2008)).

73. *See infra* 242–46 and accompanying text (analyzing state and industry support for the CPP).

mere possibility of more varied and possibly more onerous state regulation can reduce the risk of such federal policy reversal or even catalyze calls for federal regulation.[74] The rewards for fighting regulation will diminish if success leaves another layer of regulation, especially if that layer is made up of disparate state policies.

None of this discussion is meant to downplay the importance of strong, stable federal policies to articulate essential policy goals and send effective and enduring market signals where investment and innovation are needed. Nor is it advocating state regulation in lieu of federal or international regulation. Regulation at the largest scale possible will often make the best sense, especially if the law utilizes market-based regulatory tools. With a larger market, more beneficial trades will be possible. If technological innovation is needed, national regulatory incentives will hold more promise than efforts by a few states.

Instead, the point is that federalism choices need to consider not just idealized and unrealistically permanent regulation, but risks of policy instability and how such instability might not only eliminate a policy mandate, but also unsettle markets and product developments that might help to address a social ill. Retention of concurrent state authority can serve as a federalism hedge, changing the incentives of private and public actors and building supportive coalitions. Regulatory structures utilizing such a federalism hedge—the retention of potential regulatory roles for both federal and state regulators—will create incentives for and help preserve a regulatory web able to stand the vagaries of politics and regulation that accompany any area characterized by contestation, rapid change, and innovation.

The challenge of climate change and progress in combatting it and producing energy through cleaner means reveals the centrality of federalism hedging dynamics. The Article turns now to the climate challenge case study.

74. For discussion of ways state regulatory actions have triggered federal regulation, see RICHARD N.L. ANDREWS, MANAGING THE ENVIRONMENT, MANAGING OURSELVES: A HISTORY OF AMERICAN ENVIRONMENTAL POLICY 208–10 (1999) (tracing this history); *Federalism, Preemption, and Greenhouse Gas Emissions*, *supra* note 5 (same, in the climate area); J.R. DeShazo & Jody Freeman, *Timing and Form of Federal Regulation: The Case of Climate Change*, 155 U. PA. L. REV. 1499, 1500–16 (2007) (same); E. Donald Elliott et al., *Toward a Theory of Statutory Evolution: The Federalization of Environmental Law*, 1 J.L. ECON. & ORG. 313, 326–29 (1985) (exploring state regulation catalyzing federal regulation with focus mainly on the Clean Air Act).

II. THE CLIMATE REGULATION CHALLENGE AND BUSINESS NEED FOR REGULATION

The importance of federalism choices in climate regulation links directly to the difficulty in crafting any effective regulatory response to climate change. This section provides a brief review of why climate regulation is difficult to enact, sure to trigger ongoing opposition, yet remains important to foster business investment necessary for large-scale reductions in GHG emissions and related energy use.

This Article assumes that the basic nature of climate change science and its anthropogenic causes are established.[75] The most prevalent GHG, carbon dioxide, is not a readily apparent pollutant. It is invisible and a ubiquitous and essential part of the atmosphere.[76] By itself, it causes no immediate harms, although it is often emitted with more risk-creating forms of pollution, especially since almost all combustion of carbon-based fuels results in the release of GHGs.[77] Many of its most severe impacts are generally at least decades into the future and difficult to predict with any precision; climate change's particularized manifestations remain the source of probabilistic predictions.[78] And although an array of horribles are anticipated and sometimes already observed due to climate change—rising temperatures, more severe storms, glacial melt, and sea level rise being the most prevalent predictions and observations—all are the result of

75. For a succinct review of climate science and implications for climate federalism choices, see *Designing Effective Climate Policy*, *supra* note 5. For a more in-depth discussion of climate science, see GLICKSMAN, *supra* note 20, at 1172–90.

76. *See* Elke Weber & Paul Stern, *Public Understanding of Climate Change in the United States*, 66 AM. PSYCHOLOGIST 315, 317–18 (2011) (analyzing public misunderstanding of climate change).

77. *See* R. T. Watson et al., *Greenhouse Gases and Aerosols*, *in* CLIMATE CHANGE: THE IPCC SCIENTIFIC ASSESSMENT 1, 8–10 (J.T. Houghton et al. eds., 1990) (detailing the cycle of carbon in nature); *Overview of Greenhouse Gases,* U.S. ENVTL. PROTECTION AGENCY, https://www3.epa.gov/climatechange/ghgemissions/gases/co2.html [https://perma.cc/MU8Y-T53X].

78. *See, e.g.*, Michael P. Vandenbergh, *The China Problem*, 81 S. CAL. L. REV. 905, 915 (2008) (listing different projections for growth in China's emissions).

numerous contributing causes.[79] Climate skeptics can and do capitalize on the inability to trace particular harms to climate change.[80]

Nevertheless, governments may see other reasons to regulate GHG emissions or energy efficiency, especially responsiveness to citizen calls for regulation, desires for greater energy independence, or other benefits of reducing pollution that causes an array of harms in addition to climate change.[81] Still, an invisible pollutant causing uncertain dispersed harms, many expected to mostly occur in the future, add up to a recipe for indifference and inaction, whether viewed through the literature on citizen activism, political mobilization, political economic frameworks, or behavioral economics.[82]

Viewed as a collective action and political-economic challenge, effective climate change regulation faces formidable odds. Powerful and concentrated interests see climate regulation and linked clean energy shifts as a threat to their very existence. Regulation that creates incentives for energy efficiency reduces demand and thus prompts a shift away from carbon-based energy; that shift typically diverts

79. *See* NAT'L RESEARCH COUNCIL, *Causes and Consequences of Climate Change*, *in* AMERICA'S CLIMATE CHOICES 18–23 (2011) (acknowledging inability to be definitive about particular consequences of climate change); Richard Pancost & Stephan Lewandowsky, *Climate Uncertainty No Excuse for Inaction*, SCI. AM. (Oct. 17, 2014), http://www.scientificamerican.com/article/climate-uncertainty-no-excuse-for-inaction [https://perma.cc/Q7KB-B6S7] (asserting that arguments against climate change action are rooted in a misunderstanding of the science of uncertainty).

80. Prominent federal politicians have seized on single events to claim evidence of lack of climate change. *See, e.g.*, Jim DeMint, (@JimDeMint), TWITTER (Feb. 9, 2010, 9:46 AM), http://twitter.com/#!/JimDeMint/status/8863771523 [https://perma.cc/AT69-7UEN] (responding to a blizzard in Washington D.C. "It's going to keep snowing in DC until Al Gore cries 'uncle'"); Elizabeth Shogren, *Inhofe Offers Parting Shot on Global Warming*, NPR (Dec. 7, 2006, 6:00 AM), http://www.npr.org/templates/story/story.php?storyId=6591614 (quoting U.S. Senator James Inhofe referring to climate change as a "mass delusion").

81. Co-benefits of reductions in GHG emissions are many. *See* U.S. EPA, REGULATORY IMPACT ANALYSIS FOR THE CLEAN POWER PLAN FINAL RULE (2015). For discussion of other benefits of clean energy, see John C. Dernbach et al., *Making the States Full Partners in a National Climate Change Effort: A Necessary Element for Sustainable Economic Development*, 40 ENVTL. L. REP. NEWS & ANALYSIS 10597, 10602 (2010).

82. *See* Brewster, *supra* note 5, at 268–69 (arguing efficacy of national climate legislation for an international problem depends how it would "alter[] domestic politics . . . and shape[] stakeholders' interests in pursuing a comprehensive global solution); Robert Gifford, *The Dragons of Inaction: Psychological Barriers that Limit Climate Change Mitigation and Adaptation*, 66 AM. PSYCHOLOGIST 290, 290–97 (2011) (identifying psychological barriers to impede climate responses); John D. Sterman & Linda Booth Sweeney, *Understanding Public Complacency About Climate Change: Adults' Mental Models of Climate Change Violate Conservation of Matter*, 80 CLIMATIC CHANGE 213 (2007) (analyzing implications of widespread misunderstanding about climate change).

revenues from fossil fuel industries and utilities and gives rise to new competitors.[83] Unsurprisingly, threatened industries have financed climate regulatory opposition and criticisms of climate science.[84] Electrical energy utilities previously secure in their business model now face new competition, loss of guaranteed returns, and increasing regulation of their pollution.[85] In addition, at least at this time, one political party—the Republican Party—has for years been heavily invested in denying the existence of climate change, questioning its causes, and opposing particular climate regulation initiatives as ineffective or contrary to statutory authority.[86] With the election of President Trump, climate science skepticism and opposition to climate regulation are again the view of majorities ruling the executive branch and Congress.

The physical nature of climate change and linked political and economic dynamics create a quintessential example of the challenge identified by Mancur Olson: due to the costs of collective action, businesses faced with direct and large regulatory costs or benefits will tend to be advantaged over-dispersed small stakeholders, even where in aggregate those small stakeholders' interests outstrip the interests of the business groups facing regulation.[87] In the environmental and climate arena, the businesses at risk wield tremendous power and face regulatory costs now and an existential threat. In contrast, the risks of climate change (which if addressed could be viewed as the benefits of

83. *See* Biber, *supra* note 5, at 446–47 (noting that fossil fuel industries oppose clean energy regulation because "dynamic shifts in the economic and political landscape" could "pose a threat"); Robert J. Brulle, *Institutionalizing Delay: Foundation Funding and the Creation of U.S. Climate Change Counter-Movement Organizations*, 122 CLIMACTIC CHANGE 681 (2014) (tracing business funding of entities opposing climate change regulation or challenging climate science); Riley E. Dunlap & Aaron M. McCright, *Organized Climate Change Denial* 148, *in* OXFORD HANDBOOK OF CLIMATE CHANGE AND SOCIETY (John S. Dryzek et al. eds., 2011) (same).

84. *See supra* note 83.

85. *See* REGULATORY ASSISTANCE PROJECT, ELECTRICITY REGULATION IN THE US: A GUIDE 28 (2011); *see also id.* at 42–46 (describing the allowable regulated rate of return for utilities in 2011).

86. *See* JANE MAYER, DARK MONEY: THE HIDDEN HISTORY OF THE BILLIONAIRES BEHIND THE RISE OF THE RADICAL RIGHT 198–225 (2016) (discussing the increasing split between the Democratic and Republican parties over climate science and regulation); Jonathan Chait, *Why are Republicans the Only Climate Science-Denying Party in the World?*, N.Y. MAG. (Sept. 27, 2015, 8:00 PM), http://nymag.com/daily/intelligencer/2015/09/whys-gop-only-science-denying-party-on-earth.html [https://perma.cc/GKQ5-E2LE].

87. MANCUR OLSON, THE LOGIC OF COLLECTIVE ACTION: PUBLIC GOODS AND THE THEORY OF GROUPS (1965); *see also* Paul G. Harris, *Collective Action on Climate Change: The Logic of Regime Failure*, 47 NAT. RESOURCES J. 195 (2007) (applying Olson to analyze climate regulation).

regulation) are dispersed and generally felt in the future by individuals and other entities who would be likely to experience (or avoid) climate-linked disruptions.[88] And risks to the environment itself are similarly likely to be given short shrift in regulatory disputes.

Structurally, the cross-border nature of GHG pollution adds a further complicating layer. A ton of carbon emitted or avoided has an equal impact everywhere; GHG levels and climate change are a global phenomenon.[89] Any level of regulation smaller than the entire world will necessarily be partial and can be undercut by the actions or inaction of other jurisdictions.[90] The pervasively shared atmosphere and uncertain regulatory responsibilities are also subject to "regulatory commons" dynamics; because no jurisdiction owns or is legally responsible for climate change or on its own ability to regulate it effectively, all jurisdictions face incentives not to act due to free rider dynamics, fears of regulatory futility, or lack of political benefit.[91]

Nonetheless, climate progress has been made. A remarkable proliferation of states, local governments, and regions now regulate GHGs and have compelled growth in reliance on clean and renewable energy. Despite claims that such sub-national action is illogical and perhaps even futile, such state and local leadership undoubtedly show that complete inaction is far from inevitable.[92] The late Nobel Prize winner, Elinor Ostrom, documented that effective 'bottom-up' climate regulation was underway, theoretically understandable, and could be effective.[93] As further discussed below, states and their innovations were critical to efforts to compel the federal government to act.

88. *See* WILLIAM NORDHAUS, THE CLIMATE CASINO: RISK, UNCERTAINTY, AND ECONOMICS FOR A WARMING WORLD 316–23 (2013) (analyzing how global warming policies are in a special kind of gridlock); *see also* Harris, *supra* note 87 ("The costs of preventing climate change are immediate, but the benefits will not be seen for many decades.").

89. Brewster, *supra* note 5, at 246–47.

90. *Id*; Buzbee, *supra* note 47, at 6–7.

91. *See* Buzbee, *supra* note 47, at 11–13, 22–36. *Cf.* Hari M. Osofsky, *Diagonal Federalism and Climate Change Implications for the Obama Administration*, 62 ALA. L. REV. 237, 280–87 (2011) (discussing "regulatory commons" concept and offering a broader "diagonal" perspective to analyze transportation climate pollution).

92. *See* Thomson & Arroyo, *supra* note 5; Kristen H. Engel & Scott R. Saleska, *Subglobal Regulation of the Global Commons: The Case of Climate Change*, 32 ECOLOGY L.Q. 183, 223–26 (2005). *See supra* notes 3–5 and accompanying text.

93. Elinor Ostrom, *A Polycentric Approach for Coping with Climate Change*, (The World Bank Dev. Econ. Office of the Senior Vice President and Chief Econ., Working Paper No. 5095, 2009). For a more succinct development of similar points, see Elinor Ostrom, *A Multi-Scale Approach to Coping with Climate Change and Other Collective Action Problems*, SOLUTIONS, Mar.–Apr. 2010, at 27–35.

The same attributes of climate change that make regulation both difficult and an uphill battle also create enduring incentives for opposition to GHG regulation. All regulation is vulnerable to derailment, but climate regulation is particularly likely to face ongoing opposition, as it has now for several decades.[94] As of 2017, climate regulation opponents now lead the federal government.[95]

This uncertain regulatory terrain and faltering climate regulation progress have long had a crucial impact on linked markets, undercutting investments in the green economy and means to combat climate change.[96] For years, when climate legislation and regulation or clean energy incentives ran into political or legal roadblocks, linked markets responded directly and adversely.[97] In one sense, this is no surprise; law always provides a crucial undergirding for property rights and markets.[98]

Nevertheless, despite the centrality of this regulation-market link, little in climate federalism scholarship illuminates how market stability and market demand for clean energy products and investments links to

94. *See supra* notes 83–86, *infra* notes 190–93 and accompanying text (tracing and analyzing climate related litigation and efforts to block or preclude climate legislation or regulation). For journalism analyzing such opposition, see Robert Brulle, *America Has Been Duped on Climate Change*, WASH. POST. (Jan. 6, 2016), https://www.washingtonpost.com/news/in-theory/wp/2016/01/06/america-has-been-lied-to-about-climate-change/ [https://perma.cc/S5DZ-N4VJ]; Jamie Corey, *Senator Whitehouse Exposes ALEC Climate Change Denial*, CTR. FOR MEDIA & DEMOCRACY'S PRWATCH (Mar. 13, 2015, 10:10 AM), http://www.prwatch.org/news/2015/03/12771/senator-whitehouse-exposes-alec-climate-change-denial [https://perma.cc/683L-M2LQ]; Brulle, *supra* note 83.

95. *See supra* note 11 (citing Trump statements and proposed climate regulation reversals).

96. *Cf.* Michael E. Porter & Claas van der Linde, *Green and Competitive: Ending the Stalemate*, 73 HARV. BUS. REV., Sept.–Oct. 1995, at 120, 120–21 (discussing neglected benefits of regulation and overestimation of regulatory costs).

97. Inho Choi, Article, *Global Climate Change and the Use of Economic Approaches: The Ideal Design Features of Domestic Greenhouse Gas Emissions Trading with an Analysis of the European Union's $C0_2$ Emissions Trading Directive and the Climate Stewardship Act*, 45 NAT. RESOURCES J. 865, 870–71 (2005) (finding uncertain market environment chills capital investments in new and cleaner energy technologies).

98. *See* Averch & Johnson, *supra* note 65, at 1052, 1065–66, 1068; Michael J. Brennan & Eduardo S. Schwartz, *Consistent Regulatory Policy Under Uncertainty*, 13 BELL J. ECON. 506, 506, 508–09 (1982); Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1089–93 (1972); R.H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 15–16, 19, 23 (1960); Oliver Wendell Holmes, *The Path of the Law*, 10 HARV. L. REV. 457, 460–61 (1897); Richard A. Posner, *Creating a Legal Framework for Economic Development*, 13 WORLD BANK RES. OBSERVER 1, 1, 3, 7–8 (1998).

the question of who should have authority to regulate climate ills.[99] This linkage is important because businesses and markets supporting efforts to reduce GHG emissions and energy use have long been substantially dependent on legally created incentives, scarcity and other legal structures that reward, punish, or price those emissions or support clean energy advances.[100] Market value and business prospects have been substantially contingent on the content and stability of such public policies.[101] But, as discussed below, regulation, markets, and technology develop in tandem and can over time dramatically change the competitiveness of business models and energy alternatives.[102]

Governmental policies influence the viability and competitiveness of clean energy and pollution-reduction methods through signals both to polluters and to businesses dedicated to reducing pollution or producing cleaner energy. Fossil-fuel businesses do not compete in anything close to a neutral or efficient market. They have long enjoyed massive favorable subsidies.[103] They also often benefit from low-cost leases.[104]

99. For two exceptions that discuss the linkage, see Kaswan, *supra* note 5; Mormann, *supra* note 67; *see also* Felix Mormann, *Clean Energy Federalism*, 67 FLA. L. REV. 1621, 1646, 1668–69 (2015) (discussing clean energy federalism and business viability and regulation link).

100. Joseph E. Aldy & Robert N. Stavins, *Using the Market to Address Climate Change: Insights from Theory & Experience*, 141 DAEDALUS 45, 48 (2012) (discussing how a carbon tax incentivizes innovation); Kira R. Fabrizio, *The Effect of Regulatory Uncertainty on Investment: Evidence from Renewable Energy Generation*, 29 J.L. ECON. & ORG. 765, 766, 768–69 (2012) (discussing how state renewable portfolio standards encourage investment and calling linked business assets "policy specific" because "their value in their next-best use is substantially lower than their value under the governing policy"); Adam B. Jaffe & Robert N. Stavins, *The Energy Paradox and the Diffusion of Conservation Technology*, 16 RESOURCE & ENERGY ECON. 91, 97, 111–19 (1994) (stating that "any policy that increased the profitability of a technology would speed its diffusion" and why there is need for "those externalities to be internalized").

101. Amy Sinden, *The Tragedy of the Commons and the Myth of a Private Property Solution*, 78 U. COLO. L. REV. 533, 571 (2007) (stating firms have no "intrinsic desire to reduce pollution levels in the absence of any government-set limits on pollution"); Thomas W. Merrill, *Explaining Market Mechanisms*, 2000 U. ILL. L. REV. 255, 290 (stating that "environmental resources are not, as a rule, under sufficient pressure to warrant the adoption of market mechanisms").

102. *See infra* notes 194–232 and accompanying text (tracing strengthening price and technological competitiveness of clean energy businesses and linked regulatory support).

103. For analysis of these subsidies supporting the fossil fuel industry, see MGMT. INFO. SERV., INC., 60 YEARS OF ENERGY INCENTIVES: ANALYSIS OF FEDERAL EXPENDITURES FOR ENERGY DEVELOPMENT 7–17 (2011); SHAKUNTALA MAKHIJANI ET AL., CASHING IN ON ALL OF THE ABOVE: U.S. FOSSIL FUEL SUBSIDIES UNDER OBAMA 4 (2014); *see also* ELIZABETH BAST ET AL., EMPTY PROMISES: G20 SUBSIDIES TO OIL, GAS AND COAL PRODUCTION 12 (2015) (cataloguing such subsidies); ALEX DOUKAS, G20

In addition, at this point, federal-level charges or other "Pigouvian" taxes for GHG pollution harms are nonexistent. Hence, under federal policy, fossil fuel extraction is encouraged through subsidies, while climate harms from fossil fuel emissions remain an externalized cost imposed on society without charge to the polluter. Post-2008 efforts to set performance standards for GHG emissions have started to impose regulatory costs, but do not directly tax or price such emissions.[105] Every policy that supports fossil fuel-linked businesses works to the disadvantage of new clean energy entrants. In addition, since the 'fracking' natural gas revolution, this abundant and cheaper form of energy has undercut demand for even lower or zero carbon forms of energy and linked technological innovation; fracking's rise has led to substantial utility and industry switching from coal to natural gas.[106]

Although solar and wind power are becoming competitive over the long-term with carbon-based energy sources,[107] utilities that supply energy may see little or no benefit in such a switch unless they control and can profit from such projects.[108]

SUBSIDIES TO OIL, GAS, AND COAL PRODUCTION: UNITED STATES 2–4 (2015) (describing top five Federal and State subsidies for the fossil fuel industry).

104. *See* Kenneth Gillingham et al., *Reforming the U.S. Coal Leasing Program*, 354 SCI. 1096, 1096–98 (2016) (comparing cost of climate damages and production across three fossil fuel industries); Jayni Foley Hein, *Oil Companies Are Drilling on Public Land for the Price of a Cup of Coffee. Here's Why That Should Change*, WASH. POST (June 16, 2015), https://www.washingtonpost.com/posteverything/wp/2015/06/16/oil-companies-are-drilling-on-public-land-for-the-price-of-a-cup-of-coffee-heres-why-that-should-change/?utm_term=.92bc5794344b [https://perma.cc/Z8JN-G825] (reporting on low cost drilling leases); ALAN KRUPNICK ET AL., PUTTING A CARBON CHARGE ON FEDERAL COAL: LEGAL AND ECONOMIC ISSUES 7, 24 (2015) (providing overview of Federal coal program). For analysis of offshore leasing arrangements, see CONG. RESEARCH SERV., THE BUREAU OF OCEAN ENERGY MANAGEMENT'S FIVE-YEAR PROGRAM FOR OFFSHORE OIL AND GAS LEASING: HISTORY AND PROPOSED PROGRAM FOR 2017-2022 at 9–13 (2016).

105. The embattled CPP was structured so both energy utilities and most states would embrace market-based regulatory strategies, but did not mandate or create markets directly. *See supra* note 5; *see also infra* notes 180–92, 222–30 (discussing CPP proposal and battles).

106. *See* Shifali Gupta, *Fracking Threatens U.S. Clean Energy Investment – Experts*, THOMSON REUTERS FOUND. (Oct. 1, 2014, 9:53 GMT), http://news.trust.org//item/20141001095359-n4eg5/ [https://perma.cc/9YV9-SUZY].

107. *See* INT'L. ENERGY AGENCY ET AL., PROJECTED COSTS OF GENERATING ELECTRICITY 5 (2015) (finding that the costs of renewables have declined significantly and are no longer cost outliers); Tara Patel, *Fossil Fuels Losing Cost Advantage Over Solar, Wind, IEA Says*, BLOOMBERG (Aug 31, 2015, 7:15 AM), http://www.bloomberg.com/news/articles/2015-08-31/solar-wind-power-costs-drop-as-fossil-fuels-increase-iea-says [https://perma.cc/8QKJ-73H2].

108. *See* Rebecca Smith, *Utilities' Profit Recipe: Spend More*, WALL ST. J. (Apr 20, 2015, 6:04 PM), http://www.wsj.com/articles/utilities-profit-recipe-spend-

Businesses and jurisdictions dependent on the fossil fuel sector for such reasons led the opposition to the CPP, attributing a bleak future to the CPP, while virtually ignoring the rise of fracking and dropping costs of wind and solar.[109] Despite clean energy innovations and progress, greater pollution reductions are needed to reduce GHG pollution to levels scientists say are needed to forestall the most serious of climate disruptions. Individual behavioral shifts might help, but regulatory mandates and inducements remain essential to strengthen incentives for both individual and business change.[110]

Hence, the climate challenge for the law remains, at its essence, figuring out effective means to respond to an innovation imperative in a setting where opposition is steadfast and challenging regulatory attributes remain. Climate-targeted regulation confronts a wealthy and combative opposition, plus physical and political economic features that make climate change a particularly thorny regulatory puzzle. Regulation both disadvantages and in other facets undergirds clean energy markets. Growing proof of carbon and clean energy market viability and profitability remains essential to overcoming citizen, market, and political opposition to more comprehensive regulation. Federalism choices—especially the prevailing choice to retain latitude for overlapping and interacting federal and state roles—have been and will remain central to the viability and resilience of climate and clean energy initiatives, as discussed the next Part.

III. THE CLIMATE FEDERALISM TERRAIN

Climate federalism choices are central to effective future climate regulation, especially when assessed in light of incessant and fierce opposition to climate and clean energy regulation. The federalism overlap and interaction provided by current federal and state

more-1429567463 [https://perma.cc/S5JY-U5PK]. *See* Joby Warrick, *Utilities Wage Campaign Against Rooftop Solar*, WASH. POST (Mar. 7, 2015), https://www.washingtonpost.com/national/health-science/utilities-sensing-threat-put-squeeze-on-booming-solar-roof-industry/2015/03/07/2d916f88-c1c9-11e4-ad5c-3b8ce89f1b89_story.html?utm_term=.3ccd5bcb9019 [https://perma.cc/MCG4-D2BK]; DELOITTE GLOBAL SERVS., THE FUTURE OF THE GLOBAL POWER SECTOR 20 (2015), https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Energy-and-Resources/gx-power-future-global-power-sector-report.pdf [https://perma.cc/KYR5-LXFG] (explaining distributed generation's negative impact on the current utility business model).

109. *See infra* at 180–246 and accompanying text (reviewing battles over the Clean Power Plan).

110. Vandenbergh, *supra* note 78, at 929–30; Michael P. Vandenbergh & Anne C. Steinemann, *The Carbon-Neutral Individual*, 82 N.Y.U. L. REV. 1673, 1695–96, 1702–04 (2007).

environmental and energy laws has been essential to regulatory progress already underway. That state and local progress, plus the view that more comprehensive action was needed, led to the unsuccessful 2009 and 2010 efforts by the Obama administration and congressional allies to pass a comprehensive climate cap-and-trade law. But there too federalism allocation choices and arguments for strongly preemptive legislation provoked debate.

Even without enactment of climate-tailored federal legislation, progress continued at the federal and state level under existing federal law and under state initiatives. This sequence of actions and interactions enabled by federal-state overlap and concurrent but separate initiatives—as well as their linked impacts on businesses working in the clean energy sector—is reviewed below to illuminate the dynamics of federalism hedging. The protective elements of federalism hedging are already becoming apparent in responses to the Trump Administration's overt efforts to unravel climate-focused regulations.

To launch this review of climate federalism's terrain and the generative and protective benefits of federalism hedging, the next section starts by distilling key pro-preemption arguments. Then this Part turns to the history of iterative and interactive federal and state climate and clean energy regulation, unstopping contestation, and progress. This history illuminates the dynamics and effects of federalism hedging introduced in Part I. Drawing on that history, the Article then returns in the final Part IV to federalism hedging analysis and its implications for understanding and designing future climate regulation.

A. The Climate Pro-Preemption Arguments

Despite the prevalence of non-preemptive environmental regulation, pro-preemption arguments have repeatedly been made in connection with climate regulation. During the first two years of the Obama administration, prominent scholars, policymakers, and regulatory stakeholders, generally speaking in support of federal climate legislation, argued that it should preempt state and local climate regulation.[111] Those arguments were even more emphatically made by

111. For discussion or championing of such pro-preemption arguments, see, e.g., Cary Coglianese & Jocelyn D'Ambrosio, *Policymaking Under Pressure: The Perils of Incremental Responses to Climate Change*, 40 CONN. L. REV. 1413, 1425–27 (2008) (advocating for coordinated federal overhaul of climate policy, specifically a national cap-and-trade program over "piecemeal" state experimentation); Robert N. Stavins, *Policy Instruments for Climate Change: How Can National Governments Address a Global Problem?*, 1997 U. CHI. LEGAL F. 293, 293–98, 323 [hereinafter *Policy Instruments for Climate Change*] (arguing that "[o]n the domestic level, even the

industry actors who, for a short period, appeared to condition support for climate legislation on its utilization of a cap-and-trade strategy that would preempt different or additional state approaches.[112] Many others opposed preemptive legislation. In the congressional arena, the leading (but defeated) climate bills ultimately rejected a preemptive framework, adopting language that would have retained substantial state climate regulatory authority.[113]

More recently, a 2017 proposal by prominent self-labeled "conservative" Republican financial and government leaders advocated that the Republican-controlled federal government discard its emphatic opposition to climate regulation and climate denialism.[114] They advocated a carbon tax, with proceeds to be returned to citizens under a tax-and-dividend design.[115] But that new proposal once again championed elimination of other sources of regulation, calling for the revocation of most regulations issued under the Clean Air Act and also calling for the elimination of state law burdens.[116]

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most cost-effective greenhouse policy instrument will be desirable only if the national target it seeks to achieve is part of an accepted set of international mandates"); Robert N. Stavins, *State Eyes on the Climate Policy Prize*, ENVTL. F., July–Aug. 2010, at 16, 16 [hereinafter *State Eyes on the Climate Policy Prize*] (arguing that "it makes no sense" for Congress to preserve state climate roles and stating states should "get[] out of the way"); Jonathan Baert Wiener, *Global Environmental Regulation: Instrument Choice in Legal Context*, 108 YALE L.J. 677, 686, 689 (1999) (comparing presumptions about policy instrument choice when the legal context shifts from the national to the global level); *cf.* Daniel C. Esty, *Stepping Up to the Global Environmental Challenge*, 8 FORDHAM ENVTL. L.J. 103, 104–13 (1996) (exploring why anything less than a global agreement will be inadequate, but not discussing state-federal issues).

112. *See* discussion *infra* notes 117–33, 160-79 (reviewing 2009–10 climate legislative proposals, advocacy of preemptive regulation, and supportive rationales).

113. *See* GLICKSMAN ET AL., *supra* note 20, at 1190–1211 (discussing regulatory design choices, climate federalism, the 2009–10 leading bills and federalism language).

114. The proposal was announced in a New York Times editorial. Martin S. Feldstein et al., editorial, *A Conservative Case for Climate Action*, N.Y. TIMES, Feb. 8, 2017, at A25. More details were in several website papers. JAMES A. BAKER, III ET AL., THE CONSERVATIVE CASE FOR CARBON DIVIDENDS 3 (2017), https://www.clcouncil.org/media/TheConservativeCaseforCarbonDividends.pdf [https://perma.cc/95WD-QKTG]; DAVID BAILEY & DAVID BOOKBINDER, A WINNING TRADE 1 (2017), https://www.clcouncil.org/media/A_Winning_Trade.pdf [https://perma.cc/8ZZN-GG5L].

115. BAKER, III ET AL., *supra* note 114; BAILEY & BOOKBINDER, *supra* note 114.

116. BAKER, III ET AL., *supra* note 114; at 3 (calling for "significant regulatory rollback" and specifying for elimination of most "EPA regulations" and "state tort liability for emitters."). Due to the skeletal form of this proposal, it is not clear if it literally means tort liability, which would be unusual and rarely targeted at GHG emission, or it meant to propose a broader preemption of overlapping state regulation.

The pro-preemption arguments for federal climate regulation are indeed strong, but only if one assumes a stable, perfect, and easily implemented federal regulatory regime. As explained above in introducing federalism hedging, as a matter of theory and as illustrated by the history of environmental law and climate regulation, effectively designed regulation must anticipate ongoing contestation and risks of regulatory failure, political reversal, and other regulatory inadequacies.

The pragmatic argument for a preemptive federal climate law has been linked to political necessity; a preemptive climate regulatory regime might be the price to garner industry support necessary to enact any future federal climate legislation or collectively comprehensive regulation under existing law.[117] The allure of such a unitary regulatory framework was apparent when the automobile industry in 2010 supported a single federal standard following California's concomitant willingness to surrender its usual right to require an even lower emitting car.[118] Advocates supporting the recent 2017 tax-and-dividend proposal likewise highlighted how it could eliminate other legal burdens.[119]

The main public-regarding argument for a preemptive federal climate regime focuses on regulatory effectiveness if climate regulation utilizes a cap-and-trade regime or other market-based regulation. Advocates of preemptive federal climate regulation argue that retaining state climate authority would either hinder federal goals or merely be futile acts that would raise production costs, injure the regulating jurisdiction, but not actually lock in any climate-related benefits.[120] Analysis of these claims follows.

If climate regulation were to rely primarily on a cap-and-trade market, then it is correct that ideally there would be one stable market at the largest scale possible, with one tradable currency, and ideally venues in which trades and prices would be transparent.[121] By using a market-based regulatory strategy that allowed trading, policy

Surrounding texts repeated reference to "regulations" indicates a focus on elimination of regulatory burdens. *Id.*

117. DeShazo & Freeman, *supra* note 74, at 1500–16.

118. Jody Freeman, *The Obama Administration's National Auto Policy: Lessons from the "Car Deal"*, 35 HARV. ENVTL. L. REV. 343, 344–64 (2011) (analyzing circumstances and incentives leading to state and industry consent to the stringent new auto emissions standard designed to reduce GHG emissions).

119. BAKER, III ET AL., *supra* note 114, at 1, 3.

120. Jonathan B. Wiener, *Think Globally, Act Globally: The Limits of Local Climate Policies*, 155 U. PA. L. REV. 1961, 1966–73 (2007).

121. *See* Esty, *supra* note 111, at 111–12.

effectiveness would not depend on regulatory omniscience.[122] And if the market and linked regulation rewarded the most cost-effective producers of energy or methods to reduce GHG emissions, then over time market success and environmental benefits would go together.

In addition, the pro-preemption argument goes, any partial regulation (whether state compared to national or national compared to international regulation) could lead other jurisdictions to free ride on the effective regulator's efforts.[123] Either one jurisdiction's work would benefit others, or others' regulatory laxity could result in overall pollution increases.[124] Transaction costs and confusion would also increase if conflicting and uncertain climate regulation and splintered carbon markets resulted from sub-national regulation.[125]

Legislators considering the 2009 and 2010 cap-and-trade climate bills explicitly explained their support for a federal climate law in such terms. Sponsors alluded to concerns with a "patchwork" of state requirements and "fifty different standards," both standard lines utilized by industry and the George W. Bush administration to justify strong claims of preemptive effect by an array of agencies from around 2005 until late 2009.[126] Senator Lindsey Graham stated, "I wouldn't support, you know, EPA regulation on top of congressional action, and I couldn't support 50 states coming up with their own standard."[127]

122. *See* Bradley C. Karkkainen, *Bottlenecks and Baselines: Tackling Information Deficits in Environmental Regulation*, 86 TEX. L. REV. 1409, 1413–20 (2008).

123. *See* Rodrik, *supra* note 62, at 471–72, 483, 488 (not addressing preemption issues, but explaining the jurisdictional free riding and distrust challenges); Stavins, *supra* note 69, at 358 (noting the jurisdictional action dilemma in one of several pieces exploring climate regulation design and advocating preemptive regulation).

124. *Massachusetts v. EPA*, 549 U.S. 497, 545 (2007) (Roberts, C.J., dissenting) (arguing against standing for Massachusetts and other petitioners due to alleged lack of redressability because other large polluting nations might not similarly regulate and thereby emissions would still rise). The majority, however, measured redress by judicial relief that would compel United States regulators to comply with the law and reduce emissions. *Id.* at 515, 521.

125. *See* Stavins, *supra* note 69, at 298–99.

126. Stacy Morford, *5 AGs Urge Senate to Let States Set Higher Climate Standards*, INSIDECLIMATE NEWS (Sept. 2, 2009), https://insideclimatenews.org/news/20090902/5-ags-urge-senate-let-states-set-higher-climate-standards [https://perma.cc/Q4NN-VR4S] (reporting on debates over making federal climate legislation preemptive); David Roberts, *Kerry, Graham, and Lieberman Releases Framework for Senate Climate/Energy Bill*, GRIST (Dec. 11, 2009), http://grist.org/article/2009-12-10-kerry-graham-lieberman-release-framework-senate-climate-bill/ [https://perma.cc/PN7L-S9DQ].

127. Lisa Lerer, *Climate Bill Would Curb EPA*, POLITICO (Apr. 14, 2010, 5:16 AM), http://www.politico.com/news/stories/0410/35750.html [https://perma.cc/9LL3-B5W3].

Thus, support for a federal law was linked to the view that a multiplicity of related state laws would be too much, defeating federal regulatory goals of cost-effective regulation.

Furthermore, pro-preemption advocates argued, if regulation from any level of government dictated pollution performance standards, or through subsidies and other monetary incentives chose winners and losers, then government choices would undercut the main benefit of market-based regulation, namely harnessing market actors' search for cost-effective means to achieve goals.[128] Any regulation targeting particular sources or sectors would reduce the benefits of unfettered trading or the simplicity of incentives created by a market-based tool like a carbon tax.[129]

A further argument voiced for preemptive federal legislation is rooted in claims of futility. Because GHGs are ubiquitous and climate change effects are rooted in worldwide GHG levels, critics of state climate regulation argue that more stringent or additional state actions could end up merely imposing costs locally and benefitting others.[130] A crackdown on GHG emitters by any governmental jurisdiction short of an all-encompassing international regime could cause a 'leakage' problem, leading production to shift to less regulated environments, creating little or no net climate benefit.[131] Those higher polluting, more lax jurisdictions might even develop a rigid anti-regulatory posture due to the influx of new regulation-avoiding émigrés.[132] Price effect leakage could also occur, where law-induced forbearance would reduce demand for carbon-based energy or carbon allowances, resulting in lowered prices and then at least a modest rebounding surge in demand and consumption.[133] Under these perspectives, additional state and local

128. *See* Carlson, *supra* note 6, at 207, 210–12, 216, 221–22, 225–26, 228, 246–48; David Schoenbrod & Richard B. Stewart, *The Cap-and-Trade Bait and Switch*, WALL ST. J., Aug. 24, 2009, at A13. Carlson, *supra* note 6, at 207, 210–12, 216, 221–22, 225–26, 228, 246–48.

129. BAKER, III ET AL., *supra* note 114, at 1, 3.

130. *State Eyes on the Climate Policy Prize*, supra note 111.

131. Stavins, *supra* note 69, at 370.

132. *See* Brewster, *supra* note 5, at 287.

133. *See* Daniel A. Farber, *Carbon Leakage Versus Policy Diffusion: The Perils and Promise of Subglobal Climate Action*, 13 CHI. J. INT'L L. 359, 368–72 (2013) (describing the price effect leakage and studies questioning if rebound would be substantial); Lorna A. Greening et al., *Energy Efficiency and Consumption — the Rebound Effect — a Survey*, 28 ENERGY POL'Y 389, 390–93, 395, 397–99 (2000) (same); *see also* Jonathan S. Mazur & Eric A. Posner, *Climate Regulation and the Limits of Cost-Benefit Analysis*, 99 CAL. L. REV. 1557, 1588–91 (2011) (explaining leakage dynamics and difficulty in predicting ultimate amount of leakage); CARBON PRICING LEADERSHIP COAL., WHAT IS THE IMPACT OF CARBON PRICING ON COMPETITIVENESS? 1–2 (2016),

climate actions would burden polluters needlessly, both causing the regulating jurisdictions harm and providing little or no net climate change benefit.

These arguments both individually and collectively are powerful and have an intuitive appeal. Many of these arguments can be distilled to two linked fairly simple propositions: The larger the problem—and here it is a global phenomenon in cause and effect—the larger the needed regulator. And with market-based tools, create the largest market possible and let market incentives work their magic.

But the actual history of climate and clean energy regulation and related battles, plus the general federalism hedging theory introduced earlier, provide a powerful refutation of calls for a federal-only climate regulation answer. Before returning to application of federalism hedging theory to the climate problem and insights to be drawn from climate regulation's history, the Article now sets the stage by tracing the sequence of actions, reactions, and battles over climate and clean energy regulation in recent decades. This history reveals the generative benefits of overlap and interactions, as well as how such regulatory structures tend to facilitate sequential pragmatic adjustment and learning, can lead to business and regulatory innovation, plus reduce risks of regulatory error or policy derailment. Of perhaps greater importance, the analysis that follows illustrates how overlapping and intertwined regulatory authority changes stakeholder interests and incentives and leads to entrenchment and coalitional shifts that lessen the risk of wholesale regulatory reversal or linked market collapse.

B. Seesawing Climate Legislative and Regulatory Battles and Progress, 2008–14

Prior to 2008, the federal government did little to reduce emissions of GHGs contributing to climate change. Agencies and scientists studied the issue, but by the time science had become close to unanimous that climate change was happening and substantially influenced by human activity (so-called "anthropogenic" climate change), it was during the 2001 to 2008 administration of George W. Bush.[134] His administration resisted any climate action. Occasional tensions between agency officials and the White House emerged, such

http://pubdocs.worldbank.org/en/759561467228928508/CPLC-Competitiveness-print2.pdf [https://perma.cc/QF7U-4ZK7] (explaining leakage concerns but analyzing why amounts of leakage often are modest).

134. This history is both reviewed in *Massachusetts v. EPA*, 549 U.S. 497 (2007), and led to the petition and subsequent court challenge the ultimately resulted in *Massachusetts* to jump-start federal climate regulation. *See infra* at notes 145–58 and accompanying text (reviewing this history).

as when the Centers for Disease Control and Prevention (CDC) drafted testimony conceding climate change health impacts but then at the last moment the review of public health risks was deleted from the document.[135] But inaction reigned.

The same was not true at the state and local level. Granted latitude to enact more stringent or complementary pollution control and energy policies by federal law, states acted. As discussed in the following paragraphs, states provided or catalyzed climate progress through their own regulatory actions on the environmental and clean energy front, by challenging federal inaction in court, and later by supporting federal regulation and documenting why it was well grounded in state-tested regulatory and business practices.

Despite scholarly predictions of state inaction and laxity due to political economic incentives not to impose hardship internally or burden state industry with possibly ineffective regulation, state and local governments and then later regions embraced an array of climate change and clean and renewable energy strategies.[136] They embraced cap-and-trade programs, "renewable portfolio standards," and other strategies to reduce demand or pollution associated with the generation of electricity.[137] States have also used tax credits, deductions, and subsidies to reduce GHG emissions and achieve other co-benefits such as reduced health risks, a more stable energy supply, and a market presence in the "green" economy.[138] Furthermore, such state initiatives also provided regulators and affected industry with experience with somewhat varied regulatory and business models.[139] Energy utilities (as well as other sorts of polluters) also helped design, or at least learned to cope with, cost-effective means of meeting and profiting under such state clean energy and pollution control strictures.[140]

And even where states declined to so act, many electricity-producing utilities embraced measures to reduce demand, shift energy

135. Rick Piltz, *Censored Testimony from Centers for Disease Control: Update*, CLIMATE SCI. & POL'Y WATCH (Oct. 28, 2007), http://www.climatesciencewatch.org/2007/10/28/censored-testimony-from-centers-for-disease-control-update/ [https://perma.cc/5ZP5-LB5Z] (discussing White House edits removing discussion of anticipated public health risks of climate change).

136. *See* Engel, *supra* note 5, at 1016–20; Thomson & Arroyo, *supra* note 5, at 6, 9–10, 13–30.

137. *See* Mormann, *supra* note 67, at 906, 940, 951; Rossi, *supra* note 40, at 402, 405–06, 413–14, 424–25.

138. Rodrik, *supra* note 62, at 469, 473, 479, 486, 488 (discussing reasons governments pursue "green" industrial policies and suggesting ways to conceive of, measure, and further probabilities of success).

139. *See infra* notes 242–46 and accompanying text (discussing and citing to CPP briefs of states and industries supportive of the plan).

140. *See infra* notes 242–46 and accompanying text.

fuels, or produce cleaner energy, often due to their cost-effectiveness, reliability goals, and environmental compliance obligations. For example, even long-time opponents of solar energy like the Southern Company have come around, supporting state statutory and regulatory changes allowing substantial increases in distributed energy, primarily in the form of solar.[141] Many companies also shifted from coal to gas, often providing both environmental and economic benefits.

Experience with energy-related trading and linked regulation has also increased. Wholesale markets for demand reduction commitments have emerged and been embraced, with the Federal Energy Regulatory Commission (FERC) supporting such markets and the Supreme Court confirming such FERC authority.[142] This federal regulatory intervention built on a growing market for such bundling of demand reduction commitments that, in turn, was incentivized by state clean energy initiatives and utility responses to such changes.[143] Numerous states and regional entities managing multi-state energy markets known as Independent System Operators or Regional Transmission Operators supported FERC's effort to further facilitate and grow wholesale demand response markets that built on their experience.[144]

The second major state role in reducing GHG emission was as litigants. Faced with the federal refusal of the Bush administration EPA to regulate GHGs under the Clean Air Act, Massachusetts and other states petitioned for federal regulation of motor vehicle GHG emissions and then challenged the denial of that petition.[145] They focused upon existing authority under the Clean Air Act to force EPA to engage with the science and, due to strong evidence of "endangerment[s]" flowing from climate change, regulate under the Clean Air Act.[146]

141. *See* Cassandra Sweet, *Business News: Large U.S. Utilities Take Greener Route --- Power Firms Increase Investments in Solar, Wind Amid Incentives, Looming Federal Curbs*, WALL ST. J., May 10, 2016, at B6 (reporting and analyzing power company choices to invest more in solar and wind farms).

142. *FERC v. Elec. Pwr. Supply Ass'n*, 136 S. Ct. 760, 771, 777, 789 (2016) (upholding FERC Order 745's assertion of federal jurisdiction to support wholesale demand response markets).

143. State actions leading to FERC's actions included state inconsistency in facilitating or embracing demand side efficiency innovations. Sharon B. Jacobs, *Bypassing Federalism and the Administrative Law of Negawatts*, 100 IOWA L. REV. 885, 905 (2015); Rossi, *supra* note 40, at 452. This is another example of how federal progress can be catalyzed by state regulatory activity. *See supra* note 74.

144. *See* Rossi, *supra* note 40, at 452.

145. Lisa Heinzerling, *Climate Change in the Supreme Court*, 38 ENVTL. L. 1 (2008) (article by professor and co-counsel for the Commonwealth of Massachusetts discussing the history and strategies leading to the *Massachusetts* decision).

146. *Id.* at 10.

That ability to differ with federal leadership and even sue is a possibility distinctively associated with federalism; mere decentralized structures would have provided no similar option.[147] Furthermore, because Congress empowered a stable and sophisticated regulatory participant and litigant—namely the states—federal illegality and regulatory inertia faced a potential countervailing check in the form of the states.[148]

In *Massachusetts v. EPA*,[149] Massachusetts was found to satisfy standing and statutory hurdles in a Supreme Court opinion that rejected federal declination to regulate GHG emissions.[150] Massachusetts and other states were stated to deserve "special solicitude" in standing analysis,[151] although also found to have satisfied the "most demanding standards of the adversarial process."[152]

Hence, because the Clean Air Act retained state latitude for difference, and federalism doctrine relatedly allows such state differences in policies and goals despite the "supremacy" of federal law, Massachusetts and other states were able to sue, win, and elicit the ruling that jump-started federal regulation of GHGs due to their climate impacts.

The *Massachusetts* ruling set in motion several climate-directed EPA regulatory actions. It also was built upon in the Supreme Court's decision in *American Electric Power Co. v. Connecticut*,[153] where the Court held that federal public nuisance claims were preempted by the Clean Air Act.[154] But, in so ruling, the *American Electric Power* Court reaffirmed the heart of the *Massachusetts* decision. Importantly, the Court explained its decision as rooted in EPA's power under the Clean Air Act to regulate the existing power plants targeted by the common law plaintiffs, referencing Section 111(d)'s grant of authority as "most relevant" to its conclusion.[155] That language subsequently became

147. Edward L Rubin & Malcolm Feeley, *Federalism: Some Notes on a National Neurosis*, 41 UCLA L. REV. 903, 924 (1994) (distinguishing between mere decentralization and federalist structures which leave room for direct policy differences and ability to "choose different goals").

148. *See generally* Trevor W. Morrison, *The State Attorney General and Preemption, in* PREEMPTION CHOICE, *supra* note 5, at 81–89 (discussing state attorney general roles and suggesting that, due to their democratic accountability, Congress and courts should show "solicitude" for their roles rather than mandate or find preemption).

149. 549 U.S. 497 (2007).

150. *Id.* at 517–21, 527–28.

151. *Id.* at 519–20.

152. *Id.* at 521.

153. 64 U.S. 410 (2011).

154. *Id.* at 415–20, 422–24.

155. *Id.* at 411–12.

central to the Obama Administration's development and defense of the CPP described below.

Despite the Supreme Court's 2006 *Massachusetts* decision, EPA only made faltering responsive steps late in the Bush Administration. Early in the Obama Administration, however, EPA began to respond. It moved from an extensively documented Endangerment Finding about risks of climate change to the remarkable "car deal" that was issued with industry, state, and federal agreement to future auto emissions reductions to comply with transportation and environmental laws.[156] Then EPA issued the "Tailoring Rule" that sought to regulate existing stationary sources of large volumes of GHG emissions under the Act's Prevention of Significant Deterioration Program.[157] That regulation was partly struck down by the Supreme Court in the *Utility Air Regulatory Group (UARG)*[158] case, but most large emitters remained subject to regulation.[159]

Hence, triggered by state litigation, three Supreme Court decisions affirmed EPA power to regulate GHG emissions and, due to statutory language and the state of science, that translated into obligations of EPA to act. But EPA met with nonstop regulatory, judicial, and legislative opposition, as explicated more fully below.

In 2009 and 2010, the White House and allies in Congress decided to make a legislative push for a climate-tailored federal law.[160] Although climate bills had from time to time been proposed prior to 2009, none was close to politically viable. In 2009 and 2010, however, ever stronger science and Democratic majorities in Congress and a Democratic president in the White House improved the odds of passage. Democrats and a few wavering Republicans considered several climate bills, including one that passed in the House.

The leading bills were based on a cap-and-trade strategy, although they included an array of other regulatory strategies as well.[161] The

156. *See* Freeman *supra* note 118 and accompanying text.

157. *Clean Air Act Permitting for Greenhouse Gases*, EPA, https://www.epa.gov/nsr/clean-air-act-permitting-greenhouse-gases [https://perma.cc/E8H9-5J5A].

158. *Util. Air Reg. Group v. EPA*, 134 S. Ct. 2427 (2014).

159. *Id.* at 2444–46. The Court allowed EPA to regulate sources already regulated under the PSD program.

160. For a recounting of this legislative push and underlying political and economic dynamics, see ERIC POOLEY, THE CLIMATE WAR (2010).

161. The leading bills were the American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. (2009) (known as the Waxman-Markey Bill), the Clean Energy Jobs and American Power Act, S. 1733, 111th Cong. (2009) (the Boxer-Kerry Bill), and the American Power Act, 111th Cong. (2010) (another later bill publicly floated by Senators John Kerry and Joseph Lieberman). For a website with links to these bills, related analyses, and recounting of their political path, see *Congress*

bills' cap-and-trade design was modeled on the Clean Air Act's acid rain cap-and-trade successes and subsequent cap-and-trade climate laws enacted at the state level.[162] Because the earlier Clean Air Act cap-and-trade program was embraced by market-oriented scholars and think tanks and enacted as part of Clean Air Act amendments signed by President George H.W. Bush, a Republican, the bills' champions hoped for a bipartisan support. And some prominent industry actors saw a federal bill as a means to eliminate, through preemption, growing and disparate state regulation.[163]

The leading House (Waxman-Markey) and Senate (Boxer-Kerry) bills differed in some of their details, but in many respects shared similar architecture and regulatory strategies. Their key provisions would have set up a GHG cap-and-trade regime, under which GHG allowances and offset credits could have been bought and sold, provided the aggregate GHG levels stayed below a declining, federally set cap.[164] In addition, an array of other measures would have either mandated or encouraged lower pollution by large emitters,[165] greater efficiency of energy-draining appliances,[166] and smarter uses of transportation and urban planning.[167] Other provisions would have rewarded technological innovations that help address climate change causes and resulting harms.[168]

The bills met with fierce opposition, mostly along partisan lines. Despite the strong science, the very reality of climate change continued to be questioned and mocked.[169] And the use of a market-based form of regulation did not allay opponents, many of whom characterized the bills as federal central planning and evidence of an overbearing federal government.[170]

Even among supporters, a fierce debate ensued over the federalism choices: what state roles should remain after enactment of federal climate legislation? At the end of the day, no comprehensive federal

Climate Change History, CTR. FOR CLIMATE & ENERGY SOLUTIONS, https://www.c2es.org/content/congress-climate-history/ [https://perma.cc/X962-GEVB].

162. *See supra* note 160.

163. *See supra* notes 111–35 (recounting these arguments)

164. H.R. 2454, 111th Cong. §§ 704, 724, 781–82 (2009); S. 1733, 111th Cong. §§ 771–77 (2009).

165. S. 1733 §§ 703, 722.

166. *See* S. 1733 § 619; H.R. 2454 §§ 211–19.

167. S. 1733 § 831.

168. S. 1733 §§ 113, 143, 152; H.R. 2454 §§ 123–24.

169. *See* POOLEY, *supra* note 160 *(*recounting fights over climate legislation).

170. *See* MAYER, *supra* note 86, at 198–225 (recounting funding of opposition and coordination of opposition tactics).

climate and energy law was enacted. Drafting choices and public debate and analysis, however, illuminated federalism choices and institutional pluralism in leading bills and some proposed amendments.

Early legislative talking points revealed an initial assumption that a federal climate law would broadly preempt state and local climate-directed regulation. Legislators' comments, as well as comments of leading supportive industry actors, confirmed this preference and initial assumption, as reviewed above.[171] However, many states were already tackling climate change with their own state and regional plans and opposed such broad preemption.[172]

The final and most viable bills ended up largely preserving the power of state and local governments to take their own additional actions to address climate change, with the major exception that for six years states could not adopt or implement their own cap-and-trade climate law; during that period, only a federal cap-and-trade regime would have existed.[173] Thus, there would have been a federal cap-and-trade market, but states could have continued regulating GHGs through other regulatory strategies.[174]

Both to clarify what states could do at any time and avoid the risk of regulatory leakage, where one state's emissions reductions might just move elsewhere, the leading bills confirmed that states could retire GHG allowances or charge more allowances per unit of GHG emissions.[175] The net effect of the leading bills would have been the broad preservation of state authority.

The climate bills would thus have acted as a regulatory "floor," prohibiting states from pursuing a strategy of greater laxity.[176] In short, with the significant exception of the time-limited cap-and-trade preemptive period, states could clamp down on polluters more than federally required, could have pursued other climate-related regulation, but would not have had the option to allow additional pollution.

171. *See supra* notes 111–34 and accompanying text (discussing preemption arguments during this period and in 2017).

172. *See* Morford, *supra* note 126. Many states further showed their support for climate regulation when they supported the CPP in comments and later litigation briefs. *See infra* at notes 242–45 and accompanying text.

173. S. 1733 § 125; H.R. 2454 § 335.

174. S. 1733 §§ 124–125; H.R. 2454 §§ 334–335.

175. S. 1733 §§ 124–125; H.R. 2454 §§ 334–335.

176. William W. Buzbee, *Clean Air Dynamism and Disappointments: Lessons for Climate Change Legislation to Prompt Innovation and Discourage Inertia*, 32 WASH. U. J.L. & POL'Y 33, 44–45 (2010).

A slightly late Kerry-Lieberman bill was unsuccessfully pitched to elicit co-sponsorship by Republican Lindsay Graham.[177] Although press and legislator statements seemed to presage a much more unitary, federal-government-only sort of regime, it was similar to the other bills. [178] It too languished.

However, given the substantial similarities in the designs and choices in these three bills, they probably will be the starting point for any future cap-and-trade based climate legislative proposals. And while the 2017 "tax-and-dividend" proposal was only described in outline form, it too raised the specter of another push to preempt state law and reverse Clean Air Act-based climate regulation.[179]

Due to the absence of any enacted climate-tailored statute, federal climate action has had to rely on the Clean Air Act as last amended in 1990. Those subsequent regulatory developments, as well as the climate regulatory recoil commenced by the Trump Administration, reveal the benefits of federalism hedging facilitated by the Clean Air Act's federalism choices and energy laws' retention of overlapping or concurrent federal and state roles.

C. The Clean Power Plan's Emergence and Battles: 2014–17

Throughout and subsequent to the failed legislative push, the dynamics of federal hedging were apparent in the ongoing efforts of states and EPA to promulgate climate regulation and support clean energy innovations. The highest visibility and most embattled federal climate proposal during the Obama administration was presented in the CPP.[180] It was explicitly built upon progress and innovations of the states and businesses and was designed to further harness state tailoring and state latitude for cost-effective market-based regulatory strategies.

The CPP was finalized in 2015.[181] Its most important elements targeted GHG emissions from existing power plants.[182] The generative

177. Richard Cowan, *Senator Graham Criticizes Climate Bill*, REUTERS (May 25, 2010, 8:30 PM), http://uk.reuters.com/article/2010/05/25/us-climate-usa-graham-idUKTRE64O06U20100525 [https://perma.cc/TD38-D2VH].

178. David A. Fahrenthold, *Kerry, Graham, Lieberman Announce a "Dual Track" on the Climate Bill*, WASH. POST (Nov. 4, 2009), http://voices.washingtonpost.com/capitol-briefing/2009/11/kerry_graham_lieberman_announc.html [https://perma.cc/E36W-5U5N].

179. *See supra* note 114–16 (citing and describing the tax-and-dividend proposals of James Baker and other self-described "conservatives" with Republican affiliations).

180. *See* CPP, *supra* note 10 (citing the CPP final regulation and preamble in the Federal Register).

181. *Id.* at 64662.

benefits of overlapping and intertwined federal and state authority—a key attribute of federalism hedging—is evident in how EPA set its CPP emissions caps. Because Section 111(d) requires existing source regulation to be based on the "best system of emissions reduction adequately demonstrated," EPA's regulation had to be based on the best actually achievable levels of emissions reduction.[183] Section 111(d) also includes an explicit cross-reference to Section 110, the Clean Air Act's State Implementation Plan section, making clear that that Section 111(d) is supposed to use a similar "procedure."[184]

Rather than looking at each plant in isolation—an approach that state and fossil fuel opponents of the CPP favored and labeled the "inside the fenceline" approach—EPA looked at statutory language calling for an assessment of "systems" to reduce power plant emissions.[185] EPA hence considered levels of reduction already achieved by states and regions using energy and emissions trading-based strategies. In EPA's view, it was actually "demonstrated," as required by the statute. This approach, built on state-led innovations developed during periods of federal gridlock or faltering progress, justified substantially lower caps than would have been set looking at each power plant on its own.

This EPA statutory interpretation of Section 111(d) —namely that it authorized regulatory pollution caps set with reference to state and utilities already utilizing variants on cap-and-trade regulation and other clean energy initiatives—was actually consistent with extensive 2004 industry advocacy of cap-and-trade based regulation under Section 111(d). Industry associations championed cap-and-trade based regulation under the very same provision in supporting the George W. Bush Administration's proposal to regulate mercury emissions from power plants via a cap-and-trade program under Section 111(d) rather than under Clean Air Act Section 112.[186]

182. *Id.* at 64724.

183. *Id.* at 64663.

184. For closer analysis of these interrelated provisions, see Buzbee, *supra* note 19, at 463–77.

185. CPP, *supra* note 10, at 64723–27, 64758–60, 64768–69 (preamble explanation of final rule choices and discussion of reasons EPA rejected limiting its emissions limitation to "inside the fenceline" assessments due to "integrated" electricity system and established industry practices); EPA, LEGAL MEMORANDUM ACCOMPANYING CLEAN POWER PLAN FOR CERTAIN ISSUES 5–10, 118–19, 128 (2015), https://www.epa.gov/sites/production/files/2015-11/documents/cpp-legal-memo.pdf [https://perma.cc/D3GJ-GV6G] (further discussing basis for regulating based on more than "on-site" capacities, including past utility industry advocacy of regulation similar to CPP).

186. *See, e.g.*, Electric Power Supply Association, Comment Letter on the Proposed Mercury Rule, 69 Fed. Reg. 4652 (Jan. 30, 2004), and EPA's Supplemental

A further benefit of concurrent and independent state authority was harnessed in the CPP's menu of compliance options. While existing utilities could choose to achieve necessary reductions through plant-specific improvements, the CPP's language created incentives for a national embrace of energy and pollution trading, but via states making such a choice.[187]

The regulatory design of the CPP is notable in its embrace of state and utility innovations. The CPP's intertwining of federal regulation and state leadership has a seemingly paradoxical but beneficial impact. Without mandating anything other than performance results, but by allowing and actually encouraging continued state and utility use of pollution trading linked to energy production, the CPP embraced flexibility and cost-effective technological change and business arrangements.[188] This design was crafted to reduce resistance to regulation and also harness constituencies invested in clean energy progress and linked business opportunities.[189]

In addition, if the CPP were implemented, more regulators and businesses would step into the clean energy and linked pollution reduction realm. If this continued to grow as a business model, additional regulators, businesses, and consumers would find reason to resist unsettling webs of relationships. By avoiding blunt mandates or rigid regulatory tools that would fit nobody and that also would create

Notice, 69 Fed. Reg. 12398 (Mar. 16, 2004) (Apr. 30, 2004), https://www.regulations.gov/document?D=EPA-HQ-OAR-2002-0056-2224 [https://perma.cc/AW6D-XD8U] (calling a cap-and-trade program "the best approach for the power sector" because it is "cost-effective," provides "flexibility," creates "incentives" to "accelerate . . . environmental benefits" and arguing against "unit-specific" regulation); *see* EPA, Response to Significant Public Comments on the Clean Air Mercury Rule (March 15, 2005) at 5-1–5-5 (summarizing many supportive industry comments).

187. CPP, *supra* note 10 at 64723, 64727-33, 64783, 64840 (reviewing ways CPP was built on the integrated grid and state and utility flexibility and existing accomplishments in meeting energy and environmental requirements and, for compliance, would provide states and utilities many means to comply with the CPP). For more in-depth exploration of how statutory structures retaining roles for state and federal governments have led to regulatory progress during a time of legislative gridlock, *see* Buzbee, *supra* note 19. For discussion of the regulatory petition and Supreme Court litigation leading to *Massachusetts,* see *id.* at 463–68.

188. CPP, *supra* note 10 at 64,727-33, 64,767, 64,783, 64,840 (reviewing ways CPP provides states and utilities choices and flexibility in devising means of compliance).

189. Businesses and states did indeed support the CPP. *See infra* notes 241–46 and accompanying text. EPA explicitly referenced its goal of encouraging technological and business innovations that would reduce GHG pollution. *See* CPP, *supra* note 10, at 64, 775–76. Even opponents of how EPA derived the CPP's pollution limitation asked EPA to allow utilities and states to rely on those very strategies to ease compliance costs and burdens and maximize flexibility. *Id.* at 64, 784–85.

little or no room for comparative advantage, the CPP was crafted to draw new players into the regulatory effort and create business opportunities.

Nonetheless, from 2015 through 2017, many of the same groups that in 2004 had advocated power plant cap-and-trade regulation under the very same Section 111(d) reversed themselves, claiming that not only did EPA lack such power, but that consideration of trading regimes was an egregious power grab.[190] Challengers mounted a fierce assault on the CPP that itself heavily relied on federalism. Challengers argued that alleged impingements on traditional state regulatory turf should lead to loss of deference to EPA's law interpretation judgments.[191] The level of vitriol directed at EPA and the Obama administration over this regulation was extraordinary, as was the Supreme Court's completely unprecedented decision to stay the finalized rule.[192] This stay was legally questionable, but provides another strong indication of ongoing regulatory reversal risks.

And, as mentioned earlier, during 2017 the Trump administration overtly declared the goal of dismantling the CPP and started down that path; it also commenced efforts to reverse other climate regulatory initiatives.[193] Whether these reversals will succeed remains to be seen, but additional federal progress combatting climate change is highly unlikely during this administration.

D. Clean Energy Growth, Federalism, and Regulatory Signals

The CPP, if it comes into effect, would broaden private and governmental clean energy investment and build likely support for its regulatory design. But the CPP is far from the only catalyst for clean energy and GHG reduction progress. In fact, it was built on clean energy and GHG emission reduction investments that were incentivized by governmental grants, subsidies, loans, and federal and state energy and tax policies that made a shift to clean energy profitable for investors, at least as a stable source of returns or a tax-reduction

190. The Bush administration mercury regulation, which embraced these industry calls for a trading-based regime, was rejected in court due to EPA's failure to delist mercury as a hazardous substance using the process provided by Section 112. *New Jersey v. EPA*, 517 F.3d 574 (D.C. Cir. 2008). The court did not address EPA's authority to regulate under Section 111(d) through a cap-and-trade strategy. *Id.*

191. *See* Buzbee, *supra* note 19, at 464.

192. *See* Lisa Heinzerling, *The Supreme Court's Clean-Power Power Grab*, 28 GEO. ENVTL. L.J. 425, 430 (2016) (questioning Court's authority to take such action).

193. *See supra* note 11 (reviewing Trump administration directives and proposals to reverse climate regulations promulgated during the Obama administration).

strategy.[194] The shift of the clean energy sector from a largely policy-dependent investment to a viable and competitive sector is directly linked to the latitude for state and federal overlap and intertwined activity that is an essential element of federalism hedging.

Despite the clean energy progress traced below, policy shifts remain essential to bring market signals into closer congruence with societal impacts of energy-linked pollution.[195] First and most obviously, subsidies for the fossil fuel sector need to be eliminated or greatly reduced and GHG emissions subject to some sort of Pigouvian taxes or comprehensive regulation that functions like a tax. Such emissions are still largely unpriced, at least at the federal level.[196] When fossil fuels and products generated with fossil fuels are sold with prices benefited by subsidies or untaxed harms, those prices skew market activity and disadvantage clean energy alternatives.[197]

Nevertheless, states embracing renewable portfolio standards created demand for such cleaner energy.[198] Linked businesses emerged,

194. For a review essay discussing policy support for "clean tech," see David Rotman, *Cash for Infrastructure*, TECH. REV., Sept.–Oct. 2010, at 100, 100–02. Some of this shift is also attributable to private sector programs that reward reduced emissions of GHGs. *See* Sarah E. Light, *The New Insider Trading: Environmental Markets Within the Firm*, 34 STAN. ENVTL. L.J. 3, 36–37 (2015).

195. *See* David M. Hart, *Rescuing the Low-Carbon Energy Transition From Magical Thinkin*g, INFO. TECH. & INNOVATION FOUND. (Oct. 27, 2016), https://itif.org/publications/2016/10/27/rescuing-low-carbon-energy-transition-magical-thinking [https://perma.cc/9QX2-QGKQ] (stating government must lead to produce innovations and emissions reductions needed); *see also* Christa Marshall, *Bold Initiatives Needed to Reach U.S. Climate Goals—Report*, E&E NEWS (Oct. 27, 2016), https://www.eenews.net/greenwire/stories/1060044919/ [https://perma.cc/255L-EFWH] (summarizing Hart report).

196. For additional discussion of fossil fuel subsidies and need for corrective policy changes, see *supra* notes 103–10, *infra* note 197, and accompanying text.

197. *See supra* notes 103–10 and accompanying text; *see also* Chris Wold et al., *Leveraging Climate Change Benefits Through World Trade Organizations: Are Fossil Fuel Subsidies Actionable?*, 43 GEO. J. INT'L L. 635, 637 (2012) (calculating fossil fuel subsidies and resulting market distortions); Tracey M. Roberts, *Picking Winners and Losers: A Structural Examination of Tax Subsidies to the Energy Industry*, 41 COLUM. J. ENVTL. L. 63, 137 (2016).

198. *See* Amy L. Stein, *Renewable Energy Through Agency Action*, 84 U. COLO. L. REV. 651, 679 (2013) (discussing state renewable portfolio standard mandates); *see also Renewable and Alternative Energy Portfolio Standards*, CTR. FOR ENERGY & CLIMATE SOLUTIONS, http://www.c2es.org/us-states-regions/policy-maps/renewable-energy-standards [https://perma.cc/LL4E-G4T3] (providing an interactive map of all the states with renewable portfolio standards); *State Climate and Energy Maps: Renewable Portfolio Standards*, GEO. CLIMATE CTR., http://www.georgetownclimate.org/clean-energy/state-energy-profiles-and-data-maps.html?criteria=renewable_portfolio_standards [https://perma.cc/WXC3-D2H7] (same).

as did advances in clean energy technology.[199] But when a state or the nation reversed course, such clean energy businesses for years suffered severe setbacks.[200]

When United States congressional support grew in 2009 and 2010 for comprehensive climate cap-and-trade legislation, interest in linked clean energy businesses grew further.[201] A new market exchange that had recently been created, the Chicago Climate Exchange, was poised to service this new market.[202] When that congressional movement came to a halt, however, values of clean and renewable energy companies and providers of linked services dropped dramatically.[203] Investment banks and trading firms that had begun to create linked divisions and products scaled back or shut them down.[204] The Chicago Exchange went out of business.[205] Similarly, when federal and state tax credits for clean and renewable energy initiatives were imperiled or for periods of

199. *See* Heather Payne, *A Tale of Two Solar Installations: How Electricity Regulations Impact Distributed Generatio*n, 38 U. HAW. L. REV. 135, 141 (2016) (linking growth in solar energy states with renewable energy mandates); *see also Research Shows Demonstrable Benefits from State Renewable Energy Portfolio Standards*, ENERGY DESIGN UPDATE, Feb. 2016, at 9, 9 (same).

200. *See* Alex Rice Kerr, *Why We Need a Carbon Tax*, ENVIRONS ENVTL. L. & PO'LY J. 69, 72–73 (2010); Ryan Wiser et al., *Using the Federal Production Tax Credit to Build a Durable Market for Wind Power in the United States*, ELECTRICITY J., Nov. 2007, at 77, 80 (observing "tight and frenzied windows of development" and "boom-and-bust cycles in renewable energy development" due to lack of stable policy).

201. *See* Tseming Yang, *The Problem of Maintaining Emission "Caps" in Carbon Trading Programs without Federal Government Involvement: A Brief Examination of the Chicago Climate Exchange and the Northeast Regional Greenhouse Gas Initiative*, 17 FORDHAM ENVTL. L. REV. 255 (2008).

202. *Trading Hot Air: A New Approach to Global Warming*, ECONOMIST (Oct. 17, 2002), http://www.economist.com/node/1392773 [https://perma.cc/9UJH-JKSL] (reporting business voluntary commitments to reduce GHG emission and creation of the Chicago Climate Exchange (CCX)).

203. *See* David R. Wooley & Elizabeth M. Morss, *Clean Air Act Handbook: A Practical Guide to Compliance* § 10:24 (2015) (discussing CCX ending its GHG emission allowances trading program following failed legislation).

204. *See* Larry Bell, *The Chicago Climate Club Gets Capped*, FORBES (Dec. 22, 2010, 12:00 AM), https://www.forbes.com/2010/12/22/chicago-climate-club-carbon-barack-obama-opinions-contributors-larry-bell.html [https://perma.cc/T723-7AP6] (reporting CCX shutdown due to legislative and Democratic party congressional losses).

205. Nathanial Gronewold, *Chicago Climate Exchange Closes Nation's First Cap-and-Trade System but Keeps Eye to the Future*, N.Y. TIMES (Jan. 3, 2011), http://www.nytimes.com/cwire/2011/01/03/03climatewire-chicago-climate-exchange-closes-but-keeps-ey-78598.html?pagewanted=all [https://web.archive.org/web/20160412050514/http://www.nytimes.com/cwire/2011/01/03/03climatewire-chicago-climate-exchange-closes-but-keeps-ey-78598.html?pagewanted=print] (exploring reasons for market's closure).

time nonexistent,[206] businesses in that sector and linked investment vehicles (such as green funds), experienced drops in market value.[207] The arrival of cheap natural gas due to fracking also hurt clean energy investments.[208]

Nonetheless, many states and other nations stuck with their clean energy efforts and climate change regulation.[209] Moreover, the United States Supreme Court's several decisions affirming federal power to regulate greenhouse gas emissions set in motion the federal regulatory initiatives described above to limit such emission from motor vehicles, stationary sources, and from new and existing power plants, with more regulation in the pipeline.[210] FERC policy shifts also provided a boost for such initiatives.[211]

As a result, clean energy businesses continued to invest, gain experience, innovate, and improve their technologies.[212] The federal Department of Energy also provided research and financial support. Prices for wind and solar power continued to drop and installations grow.[213] The palatability and sophistication of regulatory work

206. *See, e.g.*, *supra* note 200 (discussing the effect the PTC's periodic non-renewal on wind industry investments).

207. *Id.*

208. Mason Inman, *Shale Gas: A Boon That Could Stunt Alternatives, Study Says*, NAT. GEO. (Jan. 17, 2012), https://news.nationalgeographic.com/news/energy/2012/01/120117-shale-gas-boom-impact-on-renewables/ [https://perma.cc/FM9R-E95Y].

209. *See* Bruce M. Pendery, *Generating Electricity with Natural Gas: It's Plentiful and Cheap, but Regulations Is Needed to Prevent Environmental Degradation*, 32 UTAH ENVTL. L. REV. 253, 257–58 (2012) (discussing natural gas advantages and ongoing reasons for movement towards renewable energy).

210. Elise Korican, Note, Massachusetts v. Environmental Protection Agency*, Exploring the Merits of Greenhouse Gas Regulation*, 28 J. NAT'L ASS'N ADMIN. L. JUDICIARY 193, 233 (2008) (reporting that "automotive industry . . . increase[d] fuel efficiencies out of fear of future stringent EPA regulations").

211. *See supra* notes 142–44 and accompanying text (discussing FERC order supporting wholesale demand response markets).

212. *See* Diane Cardwell, *Wind Industry's New Technologies Are Helping It Compete on Price*, N.Y. TIMES (March 20, 2014), https://www.nytimes.com/2014/03/21/business/energy-environment/wind-industrys-new-technologies-are-helping-it-compete-on-price.html [https://web.archive.org/web/20171208160332/https:/www.nytimes.com/2014/03/21/business/energy-environment/wind-industrys-new-technologies-are-helping-it-compete-on-price.html] (discussing innovations in the wind industry); Peter Behr, *Closing in on a Solar Power Breakthrough*, E&E NEWS (Oct. 21, 2016), https://www.eenews.net/stories/1060044628 [https://perma.cc/RA42-QCNT] (reporting innovations in the solar industry).

213. *See* Diane Cardwell, *Solar and Wind Energy Start to Win on Price vs. Conventional Fuels*, N.Y. TIMES (Nov. 23, 2014), https://www.nytimes.com/2014/11/24/business/energy-environment/solar-and-wind-energy-start-to-win-on-price-vs-conventional-fuels.html

underpinning such clean energy initiatives contributed to an ever-more stable and profitable market, despite headwinds from regulatory setbacks and the ongoing availability of cheap natural gas.[214] Still, renewable energy efforts in the United States, feed-in-tariffs in Europe, and governmental supports and mandates in China collectively built momentum and fostered technological advances and reductions in prices for clean and renewable energy technologies.[215]

Years of policy support and business investment have transformed the clean energy sector.[216] Costs of wind, energy storage, efficiency measures, and solar have dropped substantially and are now competitive or cheaper than fossil fuel-based energy.[217] The number of companies and employees now in clean energy-linked business has skyrocketed.[218] In fact, recent Department of Energy reports document that clean energy employment—mostly falling into the low carbon energy, solar, wind, and energy efficiency areas—now exceeds oil, gas, and coal extraction employment.[219] These reports also reference the

[https://web.archive.org/web/20171208161046/https:/www.nytimes.com/2014/11/24/business/energy-environment/solar-and-wind-energy-start-to-win-on-price-vs-conventional-fuels.html].

214. *See* Gary Litvak, *Full Steam Ahead: Renewable Energy Gains Momentum, Despite Falling Oil*, WEISERMAZARS LEDGER, June 2016, at 10, 12 (stating that the "renewable energy industry in the United States has reached a critical mass" and can secure "capital from the investors and lending institutions").

215. *See* Mark Wu & James Salzman, *The Next Generation of Trade and Environment Conflicts: The Rise of Green Industrial Policy*, 108 NW. U. L. REV. 401, 403–07 (2014).

216. *See* Christopher Dann et al., *Renewables at a Crossroads*, 149 PUB. UTIL. FORT. 42, 43 (2011) (tracing renewable energy growth to policy support); *see also* Kerr, *supra* note 200, at 73 (same).

217. For one recent comparative assessment of types of energy and their costs without subsidies, see LAZARD, LAZARD'S LEVELIZED COST OF ENERGY ANALYSIS—VERSION 9.0 at 4, 14, 19 (2015) (finding that on an unsubsidized basis, numerous "alternative generation technologies" are "cost-competitive with conventional generation technologies;" study also includes comparisons of effects of subsidies, changing fuel prices, and carbon abatement costs); *see also* Diane Cardwell, *Capacity of Wind Power Surpasses Hydroelectric*, N.Y. TIMES, Feb. 10, 2017, at B2 (reporting massive increase in wind power capacity and also reporting Department of Labor prediction that "wind service technician" would be the nation's "fastest growing occupation over the next decade").

218. DEP'T OF ENERGY, U.S. ENERGY AND EMPLOYMENT REPORT 8–10 (2017).

219. *Id.* (executive summary reporting these overall conclusions and trends); *id.* at 21 (reporting changes in the nation's energy mix and providing a breakdown of employment numbers and trends); DEP'T OF ENERGY, U.S. ENERGY AND EMPLOYMENT REPORT 7–9 (2016) (summarizing findings and providing data on employment in various sectors).

rapid increases in employment linked to energy efficiency, wind, and solar energy.[220]

It is clear that by 2016, and even into 2017, the ongoing existence and competitiveness of such businesses have ceased to be wholly dependent on regulatory policy.[221] When the CPP, for example, met with its unexpected regulatory stay issued by the Supreme Court, clean energy markets barely reacted.[222] Many states, their electricity sector, and public utility commissions continued with efforts to structure effective regimes supporting clean power production.[223] Green energy-

220. DEP'T OF ENERGY, *supra* note 218; DEP'T OF ENERGY, *supra* note 219.

221. DEP'T OF ENERGY, *supra* note 219.

222. *See* Thad Huetteman & Laura Martin, *Clean Power Plan Accelerates the Growth of Renewable Generation Throughout United States*, U.S. ENERGY INFO. ADMIN. (June 17, 2016), http://www.eia.gov/todayinenergy/detail.cfm?id=26712 [https://perma.cc/F59U-6H88] (stating that "even without the CPP, significant growth in renewables generation is projected . . . due in large part to Congress's recent extension of favorable tax treatment for renewable energy sources"); John Larsen et al., *What Happens to Renewable Energy Without the Clean Power Plan?*, RHODIUM GROUP (Feb. 25, 2016), http://rhg.com/notes/renewable-energy-without-the-clean-power-plan [https://perma.cc/7P4B-7DJQ] (finding that even were the CPP to be rejected, "tax extenders alone provide a bigger medium-term boost to renewables than just the CPP, but not as big as with both policies in place"); ETHAN HOWLAND, CQ ROLL CALL, REPORT: TAX BREAKS OUTWEIGH CLEAN POWER PLAN (2016) (stating that "[r]ecently extended federal tax breaks for renewable generation are more important to spur" renewables growth than the CPP); *NREL Analysis Finds Tax Credit Extensions Can Impact Renewable Energy Deployment and Electric Sector CO2 Dmissions*, NAT'L RENEWABLE ENERGY LAB. (Feb. 22, 2016), http://www.nrel.gov/news/press/2016/22645 [https://perma.cc/YXF8-KJ2B] (citing Trieu Mai et al., *Impacts of Federal Tax Credit Extensions on Renewable Deployment and Power Sector Emissions*, NAT'L RENEWABLE ENERGY LAB., i, iv (Feb. 22, 2016) for evidence of ongoing link of tax policies to renewables investment).

223. *See* Hannah J. Wiseman & Hari M. Osofsky, *Regional Energy Governance and U.S. Carbon Emissions*, 43 ECOLOGY L.Q. 143, 210–11 (2016) (discussing varied state responses to CPP stay); Rod Kuckro, *New England Says No to Natural Gas, Yes to Renewables*, E&E NEWS (Oct. 27, 2016), https://www.eenews.net/stories/1060044883/print [https://perma.cc/5HWX-EMJE] (discussing ongoing plans for seven solar and wind projects); Benjamin Hulac, *R.I. Department Unveils $17M for Efficiency, Renewables,* E&E NEWS (Aug. 12, 2016), https://www.eenews.net/climatewire/stories/1060041527/print [https://perma.cc/6XWV-39QK] (discussing ongoing support for renewables); *see also E&E's Power Plan Hub*, E&E NEWS, http://www.eenews.net/interactive/clean_power_plan#planning_status [https://perma.cc/8HUK-V8BS] (infographic summarizing state response to CPP following SCOTUS' stay); Jocelyn Durkay, *States' Reactions to EPA Greenhouse Gas Emissions Standards*, NAT'L CONFERENCE ST. LEGIS. (April 18, 2016), http://www.ncsl.org/research/energy/states-reactions-to-proposed-epa-greenhouse-gas-emissions-standards635333237.aspx [https://perma.cc/4H93-ET9R] (summarizing state response to CPP following Court's stay).

linked funds did not tank.[224] Sellers of solar power products continued to see increasing market demand.[225] Companies like the Southern Company ceased opposing distributed solar energy.[226] Utilities that had successfully sought state-level public utility commission approval of clean energy investments now oppose commission reversals.[227] Which companies and business models will emerge as market winners remains highly uncertain, but the challenge now is about winning in an increasingly competitive business that is undergoing a rapid change; the hurdle is not a technological impossibility or uncompetitive costs of the underlying technology. [228]

The unexpected 2016 election of Donald Trump as president despite contrary polling further confirmed both the importance of government policies to clean energy and the clean energy sector's new durability. Coal company stocks rebounded, while solar stocks

224. *See* Valay Shah et al., *Tax Equity Financing of Alternative Energy,* REAL EST. FIN., Spring 2016, at 154 (discussing role of tax equity financing of clean energy); *see also* ALICE C ORRELL ET AL., 2015 DISTRIBUTED WIND MARKET REPORT 18 (2016), https://energy.gov/sites/prod/files/2016/08/f33/2015-Distributed-Wind-Market-Report-08162016_0.pdf [https://perma.cc/UKF8-X2N4] (reporting on wind equity financing); AARON SMITH ET AL., 2014-2015 OFFSHORE WIND TECHNOLOGIES MARKET REPORT 75 (2015), https://www.nrel.gov/docs/fy15osti/64283.pdf [https://perma.cc/HD87-BS9A] (with information on particular projects); RYAN WISER ET AL., 2015 WIND TECHNOLOGIES MARKET REPORT vi–vii (2016), https://energy.gov/sites/prod/files/2016/08/f33/2015-Wind-Technologies-Market-Report-08162016.pdf [https://perma.cc/324Q-7CC4] (tracking and predicting tax equity financing).

225. *U.S. Solar Market Set to Grow 119% in 2016, Installations to Reach 16 GW*, SOLAR ENERGY INDUS. ASS'N (Mar. 8, 2016), https://www.seia.org/news/us-solar-market-set-grow-119-2016-installations-reach-16-gw [https://perma.cc/Y8KK-GF88].

226. Kristi E. Swartz, *Southern Power's Slow-and-Steady Transformation,* E&E NEWS (Sept. 8, 2016), https://www.eenews.net/stories/1060042386 [https://perma.cc/JYJ4-6RHG]; Kristi E. Swartz, *Georgia Power Won't Meet Ambitious Goal for Arrays*, E&E NEWS (Aug. 26, 2016), https://www.eenews.net/energywire/stories/1060042068/print [https://perma.cc/7QWE-BMQX]; Sweet, *supra* note 141.

227. *See, e.g.*, Jeff Stanfield, *Ore. Clean Energy Groups, Utilities Agree to Seek 50% RPS, Coal Phase-Out*, SNL ENERGY RENEWABLE ENERGY WEEK, Jan. 15, 2016.

228. *See* LAZARD, *supra* note 217; Litvak, *supra* note 214; *see also* Sweet, *supra* note 141 (discussing business and policy-driven reasons "power companies are investing in more wind and solar farms"); *Siemens Slashes 7,000 Jobs Amid Shift to Renewables*, E&E NEWS (Nov. 17, 2017), https://www.eenews.net/greenwire/2017/11/17/stories/1060066847 [https://perma.cc/E2AX-TCJ8] (reporting on Siemens layoffs following reduced demand for traditional utility turbines in light of rapid shift to renewables).

dropped, but not to any devastating extent.[229] Many states continue to pursue their clean energy initiatives, and market watchers still see clean energy as a sound investment; in fact, between the CPP's final issuance in 2015 and January 2017, clean energy trends accelerated more than expected by EPA when crafting the CPP.[230]

Thus, despite the disadvantages faced by purveyors of clean energy and linked products—namely subsidies for carbon extractive businesses, unpriced carbon emissions, scattered and erratic subsidies and tax incentives for clean energy, and several major federal regulatory reversals of efforts to regulate carbon emissions—those markets and business sectors survive and show less vulnerability to regulatory setbacks.[231] But an important caveat is necessary: these ongoing state efforts and corporate clean energy progress still benefit from federal and state tax advantages and purchase mandates in some states.[232]

Hence, this confluence of federal regulation, state regulation, aligned initiatives abroad, and technological and business advances have combined to shift the competitiveness and affordability of clean energy. Due to the ongoing embrace of regulatory concurrence that is a crucial underpinning of federalism hedging, clean energy and climate progress no longer wholly depend on any single government actor's policy support or any single policy. In short, progress made has shifted the technology and markets. No single governmental actor can destroy the complex web of regulation that catalyzed that progress, nor can any single governmental actor unsettle deeply entrenched shifts in energy production and resulting pollution reductions.

E. Regulatory Reversal Risks and Coalitional Entrenchment

This growing profitability of clean energy businesses and state commitment to climate regulation and clean energy are favorable

229. *See supra* note 70 and accompanying text (discussing effect of Trump's election on clean energy businesses).

230. *See infra* note 247 and accompanying text. On January 11, 2017, EPA, still under the Obama Administration's leadership, issued a substantial document explaining the denial of petitions to reconsider the CPP. It reviewed how clean energy trends have accelerated, how carbon emissions have dropped more and at lower cost than expected, and reported that numerous jurisdictions and their utilities were already accomplishing emissions reductions that were not anticipated until near the CPP's reduction target date of 2030. U.S. EPA ET AL., BASIS FOR DENIAL OF PETITIONS TO RECONSIDER AND PETITIONS TO STAY THE CAA SECTION 111(D) EMISSION GUIDELINES FOR GREENHOUSE GAS EMISSIONS AND COMPLIANCE TIMES FOR ELECTRIC UTILITY GENERATING UNITS 1–3, 22–32 (2017).

231. *See* LAZARD, *supra* note 217; Litvak, *supra* note 214.

232. *See supra* note 231.

developments for mitigating the causes of climate change. Federal level policy reversals, however, still matter. After eight years of federal momentum and more than a decade of state progress, federal policy reversals look likely with the arrival of the Trump administration.[233]

Regulatory reversal risks are also posed by Congress.[234] Congress has for many years proposed to divest EPA of power to address climate change and continues to do so in 2017.[235] In fact, since the 2009 to 2010 flurry of unsuccessful legislative efforts to pass comprehensive climate legislation, dozens of congressional bills addressed federal authority to regulate pollutants or activities linked to climate change.[236] Only a handful of such bills strengthened such authority.[237] Instead, the far more frequent bills have sought in some form to bar, defund, or stay such efforts.[238] For example, a 2017 short House bill "finds" that EPA lacked the power to regulate GHG emissions and climate and, if passed, would divest the agency of power to regulate GHGs as pollutants under five specified laws.[239] While unsuccessful as of the fall of 2017, these bills confirm the insight that regulatory enactments are subject to political reversal; even a string of decisions, regulatory actions, and overwhelming supportive science seemingly in line with explicit Supreme Court language will not prevent such efforts.[240]

But this is where federalism hedging's great value becomes most apparent. First, legislative, regulatory, and judicial challenges through 2016 mostly failed, with state and federal regulatory experience a crucial variable. Second, the CPP, climate regulation, and clean energy initiatives gained substantial state and industry support. These growing coalitions that by 2017 support climate and clean energy regulation got

233. *See* Juliet Eilperin & Chelsea Harvey, *Congress and Trump Have Begun Reversing Multiple Obama Rules on the Environment—and More*, WASH. POST (Feb. 1, 2017), https://www.washingtonpost.com/news/energy-environment/wp/2017/02/01/congress-and-trump-have-begun-reversing-multiple-obama-era-rules-on-the-environment-and-more/?utm_term=.dea60bdb8b70 [https://perma.cc/RZT7-HWKC].

234. *Id.*

235. Devin Henry, *Lawmakers: Congress Has Not Given EPA Power to Enact Climate Rule*, HILL (Feb. 23, 2016, 12:34 PM), http://thehill.com/policy/energy-environment/270419-lawmakers-congress-has-not-given-epa-power-to-institute-climate [https://perma.cc/69LE-R3NU].

236. Memorandum from the Georgetown Univ. Law Library Research Servs. on Climate-Related Legislation (111-115th Congresses) to William W. Buzbee 4–7 (Mar. 2, 2017) (available upon request).

237. *Id.* at 8–9, 14–17, 33–35.

238. *Id.* at 9–14, 17–33, 35–44.

239. H.R. 637, 115th Cong. (2017).

240. *See supra* note 13 (discussing reversal risks); PATASHNIK, *supra* note 13, at 17 (exploring post-enactment efforts to attack and shape implementation of a law).

to that point due to recent decades' web of state policy initiatives that, coupled with federal incentives, collectively solidified the viability, competitiveness, and regulatory efficacy of clean energy and climate regulation and businesses developed to service these market and regulatory demands.[241]

This new coalitional support was evident in CPP comments and briefing. EPA explicitly justified the design of the CPP based on what it observed in the states and among electric utilities.[242] Many states, businesses, and even some utilities submitted comments and later briefs supporting the CPP.[243] They were able to argue, based on actual business and regulatory experience, that the measures assessed and embraced in the CPP are already "business as usual," and that the CPP is by no means a radical or even burdensome proposal.[244] State and business supporters also argued that the CPP would create additional business opportunities.[245]

Third, these state and business supporters of the CPP favored its design due to how it would allow states and industry to tailor compliance to their distinctive markets, energy profiles, and regulatory structures.[246] In those submissions, these state and industry CPP

241. For analysis both of development of green business viability and linked coalition building, see Meckling et al., *supra* note 62, at 1170–71; Rodrik, *supra* note 62, at 471, 473, 483–85.

242. CPP, *supra* note 10, *passim*.

243. Brief for Intervenors Calpine Corp. et al., at 3, *West Virginia v. EPA*, (D.C. Cir. 2016) (No. 15-1363) (the case is currently pending in the U.S. Court of Appeals for the D.C Circuit).

244. *See* Brief for State and Municipal Intervenors in Support of Respondents, at 25–29, *West Virginia v. EPA*, (D.C. Cir. 2016) (No. 15-1363) (arguing that CPP builds on state and municipal efforts to combat climate change); Brief for National League of Cities et al. Amici Curiae in Support of Respondent, at 17–30, *West Virginia v. EPA*, (D.C. Cir. 2016) (No. 15-1363) (providing overview of cities' adaptation and mitigation efforts to combat climate change and arguing that vacatur of CPP will harm these efforts); Brief for Intervenors Advanced Energy Economy et al., at 13–15, *West Virginia v. EPA*, (D.C. Cir. 2016) (No. 15-1363) (arguing that Building Block 2 of CPP is reasonable because it reflects the power industry's already occurring shift from high-emitting generation to lower-emitting natural gas); Brief for Intervenors Calpine Corp. et al., *supra* note 243, at 12–13 (same).

245. *See* Amici Curiae Brief of Sustainable Business Organizations in support of Respondent, at 13–16, *West Virginia v. EPA*, (D.C. Cir. 2016) (No. 15-1363) (arguing that implementation of CPP will provide a net increase in jobs, gross state product, and personal income); *see also* Brief of Amici Curiae Adobe Inc. et al. in Support of Respondents, at 7–13, *West Virginia v. EPA*, (D.C. Cir. 2016) (No. 15-1363) (arguing that vacatur of CPP will harm the sustainability initiatives employed by many major corporations and will make such corporations susceptible to price spikes and other economic uncertainties plaguing the fossil fuel industry).

246. *See* Amici Curiae Brief of Sustainable Business Organizations in support of Respondent, *supra* note 245, at 6 (arguing that CPP "employs a cooperative

supported the CPP because of desire to reduce climate risks, but repeatedly referenced how it built on existing investments and practices. Because the CPP harnessed state-tested, cost-effective, and flexible strategies to reduce GHG pollution, supportive invested businesses and regulatory coalitions fought in its support.

Even if President Trump succeeds in undoing or weakening the CPP, or Congress weakens federal law, the very practices and state experiences on which the CPP was built remain. And since the CPP was proposed, many utilities sought state public utility commission approval for clean energy investments that will provide multiple long-term benefits, among them readiness to comply with a CPP, other climate regulation, or to take advantage of or remain competitive in light of FERC actions opening up the wholesale energy market sector to greater competition and reduced pollution.[247] Further clean energy progress can be logical as a business and political matter, even without a federal regulatory mandate.

And because cost-of-service approvals typically make utility investments a source of guaranteed returns, and other FERC and state measures also undergird the booming clean energy sector, it is doubtful that a CPP reversal would lead to state-level reversals.[248] Thus, even in the short time since the CPP was finalized, further progress and entrenchment of clean energy trends have occurred.[249] A Trump administration EPA revisiting the CPP in a way compliant with established administrative law doctrine will have to examine business

federalism approach" that allows states to tailor compliance to their unique geography, energy resources, and markets); *see also* Brief of Amici Curiae Grid Experts Benjamin F. Hobbs et al., at 27–31, *West Virginia v. EPA*, (D.C. Cir. 2016) (No. 15-1363) (arguing that CPP provides states with a multitude of "familiar" alternatives for compliance).

247. For sources discussing utility support for the plan, ongoing clean energy plans, and progress towards meeting CPP goals with or without it, see, e.g., *2017 AEP Corporate Accountability Report*, AM. ELECTRIC POWER, http://aepsustainability.com/environment/regulations/carbon.aspx [https://perma.cc/8X3Y-JJZ7]; John Downey, *Duke Energy Wants N.C. to Open Up Planning for EPA Carbon Mandate*, CHARLOTTE BUS. J. (Feb. 1, 2016, 1:20 PM), http://www.bizjournals.com/charlotte/blog/energy/2016/01/duke-energy-wants-n-c-to-open-up-planning-for-epa.html [https://perma.cc/Z4F2-4APH]; Nicholas Bianco et al., *Compliance with Clean Power Plan is Within Reach – Even for States Opposing It*, ENVTL. DEF. FUND.: CLIMATE 411 (Sept. 21, 2016), http://blogs.edf.org/climate411/2016/09/21/compliance-with-clean-power-plan-is-within-reach-even-for-states-opposing-it/ [https://perma.cc/WC7P-KEMV].

248. *See supra* notes 64–67 and accompanying text (discussing cost-of-service based regulation and how it rewards utility projects with guaranteed returns).

249. *See* U.S. EPA ET AL., *supra* note 230 (in EPA's denial of petitions to reconsider the CPP, reviewing accelerating clean energy trends and reductions in emissions and associated costs).

and regulatory practices due to the Clean Air Act's "best demonstrated" formulation and also the obligation of all agencies to engage with their past reasoning to survive hard look review.[250] A complete federal regulatory reversal is not certain, plus federal compulsion of business and state abandonment of clean energy progress is a virtual impossibility.

However, this is by no means a claim that climate progress will proceed apace or that the loss of federal climate regulation is unimportant. Federal recoil will constitute a major environmental setback. Without a national CPP guideline or other climate regulation initiatives, some states and utilities will remain clean energy laggards. Other utilities enjoying the benefits of rate regulation will continue high polluting approaches with little pressure to do better. All states will worry about disadvantaging themselves. States with large coal or oil and gas sectors may find that continued embrace of coal mining and use and denigration of climate science and regulation is good politics and locally advantageous, even if not economical or beneficial for most states, utilities, consumers of electricity, health, or the environment. After all, fossil fuel extraction, processing, shipping cause many environmental and health harms apart from climate effects.[251] From the perspective of businesses involved in clean energy, it seems, the rewards for such business models will dwindle without the CPP, but will still be rewarded in many jurisdictions. The point is that due to federalism hedging, expertise gained and coalitions built as a result of state and federal concurrent authority ensure that federal regulatory reversals will not be fatal or final.

The next Part links this regulatory and market change history to the theory of federalism hedging, further showing how climate change's attributes make retention of overlapping regulatory authority especially important to address an array of regulatory failures and reversal risks.

250. The CPP repeal proposal, however, barely addresses the many legal and factual underpinnings of the CPP, leaving it vulnerable to eventual judicial rejection. *See* Repeal of Carbon Pollution Emission Guidelines, *supra* note 11. Agency obligations to provide a reasoned explanation for a policy change are set forth in *Encino Motorcars v. Navarro*, 136 S. Ct. 2117, 2126 (2016) (discussing and setting forth such requirements, including agency obligation to provide "good reasons" and provide a "reasoned explanation" for "disregarding facts and circumstances that underlay or were engendered by the prior policy") (citing cases and quoting portions of *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 515–16 (2009)).

251. *See* U.S. EPA, *supra* note 81, at 4-1–4-2, 4-11–4-14, 4-22–4-36 (discussion of co-benefits of regulation).

IV. FEDERALISM HEDGING AND CLIMATE PROGRESS

If markets were perfect and regulatory implementation and enforcement also flawless and stable, the arguments would be quite strong for a unitary federal climate bill or comprehensive federal regulation that preempted state climate regulatory authority. However, once one relaxes the assumption of perfection and policy stability, then the flaws of such unitary and preemptive federal regulation become apparent. Retaining room for state climate and linked clean energy regulation provides a valuable hedge against regulatory failure.

This Part builds on this Article's history of climate regulation battles and exploration of federalism hedging dynamics. It integrates theories about federalism's effects with theories pertaining to regulatory learning via policy diffusion, coalitional entrenchment, especially the literature on path dependence, all in the service of both understanding the particulars of the climate regulatory challenge and more generally illuminating federalism hedging dynamics. The answer to pro-preemption arguments hinges on regulatory error and derailment risks, the market impacts of such risks, and how regulation that develops sequentially and in an overlapping and interactive manner can provide a resilient web of regulation for dependent markets. The existence (and retention) of federalism hedging structures will also undergird future efforts to enact more comprehensive national climate legislation or regulation.

A. Federal Laxity Risks, Complementarity, and Catalysts

Probably the biggest risk of federal climate legislation or regulation, especially legislation relying primarily on a cap-and-trade strategy or another setting of a federal emissions cap, is that it would prove too lax.[252] (Although this Article returns to the tax versus cap-and-trade question later, it is worth noting here that an unduly low Pigouvian tax would also create risks of ineffective federal regulation and make state regulatory authority important.) A national carbon cap—whether under legislation or a cap-like strategy via regulation like the CPP—would only create substantial innovation incentives if its cap were low enough to economically reward innovations reducing emissions. Until a cap's stringency is on the immediate horizon, innovation incentives will be weak.[253]

252. Lesley K. McAllister, *The Overallocation Problem in Cap-and-Trade: Moving Towards Stringency*, 34 COLUM. J. ENVTL. L. 395, 396–97 (2009).

253. *See* David M. Driesen, *Free Lunch or Cheap Fix?: The Emissions Trading Idea and the Climate Change Convention*, 26 B.C. ENVTL. AFFAIRS L. REV. 1, 41–46

The leading 2009 to 2010 cap-and-trade bills confirmed that this risk of laxity is substantial.[254] They proposed to hand out a huge percentage of pollution allowances for free, to the largest polluters.[255] The cap itself would not have kicked into effect for years, and the leading bills required little for many years.[256] In addition, GHG allowances and offset credits could have been "banked."[257] Thus, if they had been enacted, the leading bills' minimal regulatory costs and rewards for innovation would not have been felt for years. The CPP was met with a deluge of criticism and lawsuits, but for many states and utilities, its actual pollution caps were often unchallenging; recent evidence indicates that substantial GHG emissions reductions at moderate cost have already been made since 2015, even with the CPP stayed by the courts.[258] Hence, it too may have set a lax pollution cap.

Preserving state and local latitude to address causes of climate change in the face of a lax federal law provides several benefits. First, in the face of federal laxity, state and local action complements federal efforts both directly and by supporting technological innovation. As would have been allowed under the leading 2009 to 2010 climate bills, states could retire carbon allowances or increase the price per unit of GHG emitted. Or state and local governments might reduce emissions from sources and sectors missed under a federal law, or require earlier reductions. And while a perfect tax could correct market signals and would decrease GHG emissions, getting that tax right is difficult. Furthermore, allowing states (or EPA under earlier statutes) to continue using old-fashioned "Best Available Technology" based performance standards could at a far earlier date lead polluters to ratchet back GHG emissions.[259]

(1998); David M. Driesen, *Emissions Trading Versus Pollution Taxes: Playing Nice With Other Instruments*, 48 ENVTL. L. (forthcoming 2018) (manuscript at 8–10) (on file with author).

254. For more complete description of the bills' key provisions and designs, see GLICKSMAN ET AL., *supra* note 20, at 1203–05, 1211.

255. *Id.* at 1204.

256. *Id.*

257. *Id.*

258. CPP opposition briefs nowhere identified excess stringency. Supportive briefs and the CPP Federal Register preamble discussed the reasonableness of the targets. *See* discussion *supra* notes 242–48 and accompanying text. EPA's January 2017 Basis for Denial, cited *supra* note 230, finds that the CPP substantially overestimated the difficulty and costs of reducing GHG emissions.

259. Robert L. Glicksman, *Balancing Mandate and Discretion in the Institutional Design of Federal Climate Change Policy*, 102 NW. U. L. REV. COLLOQUY 196, 204–06 (2008), http://scholarlycommons.law.northwestern.edu/cgi/viewcontent.cgi?article=1088&context=nulr_online [https://perma.cc/NRT2-T5M3].

Second, regulatory pressures of both sorts—earlier state emissions reductions and earlier and unavoidable pollution reductions under traditional performance standards— would create market rewards for reduction strategies even if a federal target were lax. As seen in state and business responses to the CPP, cost-effective and tested pollution reduction and clean energy strategies will, over time, reduce resistance to more comprehensive or stringent regulation.[260] Each state and federal initiative provides environmental benefits and educates both other policymakers and constituencies about the implications of possibly diverse strategy choices to achieve similar ends.[261] As Professor Carlson and researchers at MIT have demonstrated, cap-and-trade plus complementary policies could lead overall costs of GHG reductions to increase but still provide other benefits and address predictable forms of market failure.[262]

A notable example of such experience-based suggestions for regulatory design and improvement was evident in FERC's deliberations over its embrace of wholesale demand response markets; numerous states and market monitors for multi-state energy transmission markets drew on their experience to suggest ways to ensure that this new wholesale market would function well.[263]

Allowing such state and local regulation does not mean that leakage risks are altogether misguided; they would still exist, and that risk surely discourages stringent regulation by any unit of government. However, environmental compliance costs tend to be dwarfed by labor costs and other location-dependent advantages.[264] Thus, at the margins, climate and energy-directed state regulation might modestly influence locational choices, but an argument claiming that state regulation of GHG emission would be an act of self-defeating regulatory futility is, upon examination, overly strong.[265]

260. *See supra* notes 241–47 and accompanying text.

261. DeShazo & Freeman, *supra* note 71, at 1522–23.

262. *Designing Effective Climate Policy*, *supra* note 5, at 35–40 (citing studies from MIT and others predicting increased overall costs with cap-and-trade plus complementary policies, but also predicting lowered carbon emissions).

263. Demand Response Compensation in Organized Wholesale Energy Markets; Final Rule, 76 Fed. Reg. 16658, 16660 & nn.15–19 (March 24, 2011) (codified at 18 C.F.R. pt. 35).

264. *See* McAllister, *supra* note 252, at 396–97, 443–45; Porter & van der Linde, *supra* note 96, at 120–22. The literature on leakage risks tends to find modest levels of pollution movement or rebound, likely due to the greater importance of other variables influencing production and pollution choices. *See supra* note 133. Of course, disparate regulatory burdens over the long term would influence choices about the movement of linked capital.

265. *See* Wiener, *supra* note 120, at 1967–76, 1979 (arguing the leakage and futility points).

Importantly, as is particularly evident in early 2017, whether due to implementation failures or policy reversals, no federal regulation is invulnerable to derailment.[266] Under the non-preemptive regime created under current law, if federal climate regulation remains lax in its aggregate impacts, as is likely under the Trump administration, states would still retain authority to take climate and clean energy-related actions to address laxity and implementation risks. That very retained possibility or reality of state regulation creates incentives for targets of regulation to support a revised federal law or improved implementation that would address a law that is ineffective due to its laxity.[267] And businesses in the clean energy sector have, over time, become increasingly invested in the new status quo and will defend it, as seen in climate legislation debates and later Clean Power Plan battles.

The value of retained, potentially overlapping federal and state authority is especially evident if one imagines the changed political and economic dynamics and incentives that would exist under a preemptive federal law. If federal climate or clean energy laws were falling short and in the hands of a hostile administration, but state climate actions were preempted, then no one could turn to the states to press for action. No other venue for climate action would exist unless a new federal law re-empowered the states.

A derailed but still existing federal law with a broadly preemptive effect hence could easily create a situation where no one could regulate GHG emissions at all. For polluters and politicians whose ideal world would include no regulation, a preemptive federal law would hence create incentives for a massive investment in derailing federal law and thereby altogether escaping or delaying regulation.

Just this sort of risk is evident now with the political alignments and majorities enjoyed by Republicans in Congress and President Trump starting in 2017. Republicans since 2008 have overwhelmingly opposed climate regulation and denigrated climate science. Candidate Trump did the same, calling it a "hoax."[268] It appears likely that Republicans will not have numbers sufficient to overcome a filibuster, but if one reexamines 2009 to 2010 climate federalism battles, the risks of the proposed preemptive strategy become apparent.

266. *See* Engel & Saleska, *supra* note 92, at 224–28; Revesz, *supra* note 33, at 1244–47.

267. *See supra* note 74 (citing sources regarding catalyst theory).

268. Chris Cillizza, *Donald Trump Doesn't Think Much of Climate Change, in 20 Quotes*, CNN (Aug. 8, 2017, 11:17 AM), http://www.cnn.com/2017/08/08/politics/trump-global-warming/index.html [https://perma.cc/UL5S-C979]; *see supra* note 11 (citing articles discussing the views of Trump and Pruitt regarding climate).

Had climate legislation in 2010 passed with a preemptive "federal only" structure advocated by prominent scholars and stakeholders, then through an appropriations rider, other focused legislative maneuver, or simple agency delay, Republicans and President Trump in 2017 likely could have found ways to preclude or at least delay federal implementation of any climate law and resulting regulation. No separate action, however, would have been necessary to preclude state action if the federal law already was preemptive. Congressional inertia or opposition to re-empowering state climate authority would have left no actor with climate authority. The result could have been no government-led climate regulatory progress and likely efforts to squelch state clean energy progress as preempted.[269]

However, because the most significant federal climate actions between 2010 and 2016 were taken under the Clean Air Act, which retains its strong savings clause preserving state authority to do more, even complete federal paralysis via agency foot-dragging or a focused legislative fix killing the CPP would not result in such a loss of state authority. The next section further explores implementation and regulatory reversal incentives and risks.

B. Risks of Implementation Failures and Policy Reversal

Risks of climate-related regulatory implementation failures and policy reversals are substantial and would undercut innovation incentives and climate progress. They are distinct from laxity risks analyzed above, which focus on an undemanding environmental target. By regulatory implementation failure, this Article alludes to failures to implement a law after its enactment. Relatedly, policy reversals remain a risk, as is especially apparent in 2017.

First, both to secure favorable regulation or simply delay the effective date of regulatory burdens, industry targeted by any regulation (be it in legislation or regulation) will vigorously participate in regulatory venues. Even if industries benefited by climate regulation tried to keep implementation on track, agencies implementing a federal climate law might fall behind. Delay is among the most common and pervasive form of regulatory implementation failures.[270] Under the leading 2009 to 2010 climate bills, hundreds of rulemakings and other

269. *See infra* notes 326–40 (reviewing federalism and preemption cases and how lack of statutory clarity on federalism choices generates preemption and constitutional challenges).

270. *See* Daniel A. Farber, *Taking Slippage Seriously: Noncompliance and Creative Compliance in Environmental Law*, 23 HARV. ENVTL. L. REV. 297, 301–03, 315 (1999) (discussing delay among other forms of agency "slippage").

complicated regulatory tasks would have been required, many of which would have led to regulatory challenges.[271] Similarly, even if the CPP survives court challenges and is not officially revoked via another notice and comment rulemaking, foot-dragging in federal implementation and state compliance is likely and hard to remedy. Absent specific statutory mandates and deadlines, recent Supreme Court cases make challenges to agency delay and inaction difficult.[272]

Furthermore, even if regulatory infrastructure setting forth mitigation obligations remained in place, GHG markets dependent on regulation would also need effective monitoring and enforcement. Especially if a federal climate law or regulation credited offset-linked actions or relied on complex trading regimes, risks of illusory beneficial activity would arise. If cheating were not caught or markets simply became muddled and lacking in transparency, the market could collapse. Retaining state authority, and ideally also state and citizen enforcement of federal law, might help preserve the integrity of regulation-dependent markets.

As noted in connection with the laxity scenario, under a preemptive law or regulation, even if that federal climate law or regulation were exemplary in its goals and strategies, polluters opposed to such regulation would have heightened incentives to cause such implementation delays, regulatory failures, or secure a policy reversal. They would undoubtedly engage in the sort of "blood sport" regulatory attacks analyzed by Professor McGarity.[273] In fact, the regulatory payoff for regulatory obstruction at the federal level would be greater if that derailment promised a complete escape from regulation.[274]

In contrast, if federal climate regulation implementation delays or enforcement laxity did not cause a regulatory vacuum, but would revive more rigorous or diverse forms of state regulation, then affected industry might reluctantly support more effective federal law over a wave of potentially disparate or stringent state regulation. Relatedly, if

271. Sharon Tompkins et al., *Litigating Global Warming: Likely Legal Challenges to Emerging Greenhouse Gas Cap-and-Trade Programs in the United States*, 39 ENVTL. L. REP. NEWS & ANALYSIS 10389, 10390 (2009).

272. *See* Michael C. Blumm & Sherry L. Bosse, Norton v. SUWA *and the Unraveling of Federal Public Land Planning*, 18 DUKE ENVTL. L. & POL'Y F. 105, 123–41 (2007) (discussing *Norton v. S. Utah Wilderness Alliance*, 542 U.S. 55 (2004)); Ronald M. Levin, *Understanding Unreviewability in Administrative Law*, 74 MINN. L. REV. 689, 710–19 (1990) (discussing *Heckler v. Chaney*, 470 U.S. 821 (1985)).

273. Thomas O. McGarity, *Administrative Law as Blood Sport: Policy Erosion in a Highly Partisan Age*, 61 DUKE L.J. 1671, 1671 (2012).

274. *See* Lynn E. Blais & Wendy E. Wagner, *Emerging Science, Adaptive Regulation, and the Problem of Rulemaking Ruts*, 86 TEX. L. REV. 1701, 1705–15 (2008).

in the future industry faced a choice between a tailored climate law and a revival of climate-related actions under earlier laws like the Clean Air Act that are not tailored to climate's particular attributes, industry might favor a more tailored, effective and likely less costly federal climate bill. Hence, the mere retained possibility of state regulation creates incentives for greater commitment to the successful implementation of a federal law, be it in climate legislation or regulation under broader existing laws.

C. Anticipating Overinclusion Risks

Efforts to preempt state and local climate efforts would actually be difficult to accomplish and would unsettle linked markets. Given the ubiquity of GHG emissions and the existence of other linked risks and harms of those GHGs or co-pollutants, it would be difficult to identify and distinguish legitimate versus preempted state and local regulation.[275] GHGs are seldom regulated just for their climate effects. Either they cause other harms, are emitted with other co-pollutants, or might be regulated to achieve other state goals.[276] For example, energy conservation might be motivated by a desire to reduce rate hikes, attack other pollution harms, or reduce power plants' use of vast amounts of water, not to address climate change.

Broad preemptive language could lead to litigation challenging state regulation that, in effect, imposed burdens on emitters complying with federal climate law. Industry would make conflict preemption claims, especially under 'obstacle' preemption case law since any state-imposed burdens might undercut federal cost-effectiveness goals.[277] Resulting uncertainty about the scope of preemption would create market uncertainty.

Although a familiar refrain in preemption battles, the anti-"patchwork" and "fifty different states" arguments of industry favoring a unitary preemptive climate regime in 2009 and 2010 both sought too much and disregarded how the largest emitters of GHGs are actually regulated. The very ubiquity of GHG sources undercuts this argument. With a huge diversity of sources, and thousands of types of regulation directly or indirectly influencing GHG emission levels, a truly

275. Kaswan, *supra* note 5 and accompanying text.

276. U.S. EPA, *supra* note 81, extensively analyzed such co-pollutants risks and benefits of emissions reductions and reductions in reliance on fossil fuels.

277. *See* Robert L. Glicksman, *Federal Preemption by Inaction*, *in* PREEMPTION CHOICE, *supra* note 5, at 182–83; Catherine M. Sharkey, *Federalism Accountability: "Agency-Forcing" Measures*, 58 DUKE L.J. 2125, 2190–91 (2009); Buzbee, *supra* note 69, at 1545–46.

preemptive federal law trying to prohibit all state regulation of GHG emissions could have a massive disabling effect on the states and agencies. Such a broad preemption campaign would even impinge on traditional state turf like energy utility rate regulation and management of water use and supply. It is hard to imagine that such massive preemption of state and federal power to address other ills would be anyone's goal.

The anti-patchwork arguments also are misdirected, at least when one considers how large stationary sources of GHG pollution are actually regulated. First, most energy utilities are subject to individualized state regulatory oversight for anti-monopoly and consumer protection reasons.[278] In fact, the same power company operating in different states will already predictably face different regulatory regimes and attitudes.[279] Second, because federal emission standards set only a regulatory floor, states and local governments have long been able to require greater pollution reductions.[280] State Implementation Plan (SIP) efforts under the Clean Air Act also allow states and their cities to allocate burdens among pollution sources as they devise strategies to attain or make progress towards National Ambient Air Quality Standards.[281]

Third, apart from obligations imposed under a SIP, any large stationary source's regulatory compliance obligations are typically individualized and linked to its size, age, production techniques, and many other variables.[282] Individualized source obligations also exist under the Clean Air Act's New Source Review program, where limitations for new or modified sources are set on a permit-by-permit basis based on referenced best performers or most stringent limitations imposed on other sources.[283] Thus, both within and among states, large pollution sources already face individualized regulation imposing a variety of obligations.

278. *See* Boyd & Carlson, *supra* note 60, at 822–24.

279. *See id.*

280. *Asymmetrical Regulation*, *supra* note 3, at 1564–68.

281. States fight hard to remain in attainment and avoid unfavorable nonattainment treatment and possible loss of federal highway dollars, plus federal regulators themselves are reluctant to retake a delegated program from a state. Ellen R. Zahren, *Overfiling Under Federalism: Nipping at State Heels to Protect the Environment*, 49 EMORY L.J. 373, 415–18 (2000) (discussing and citing sources discussing state and federal resistance to state loss of delegated program authority).

282. For example, even under New Source Performance Standards under Clean Air Act Section 111(b)(2), promulgated regulations typically allow if not require obligations tailored to "classes, types, and sizes" of regulated categories of polluters. 42 U.S.C § 7411(b)(2) (2012).

283. Buzbee, *supra* note 176, at 54–55.

D. Entrenching Climate Progress Through a Web of Regulatory Authority

This Article started with a more general and theoretical discussion of the dynamics and values of federalism hedging. This section further explores the important role of regulatory entrenchment, illustrated with reference to the particular attributes of climate change and climate regulatory battles.

Somewhat counterintuitively, allowing for the possibility of federal, state and local climate regulation, and even different cap-and-trade regimes, could provide greater market stability and rewards for clean energy and climate-linked investments than under an exclusively federal regime, even if such laws cause some increase in transaction costs and reduce economies of scale.[284] Of course, if a perfectly crafted, stable, and enforced federal carbon cap-and-trade market existed, then the need for other regulatory actors would be greatly reduced. But such stability and invulnerability to regulatory reversals can never be assumed and is unlikely, for reasons discussed above.

Diffused and diverse regulatory authority would provide substantial benefits in a real world where climate regulation imperfection, opposition, and instability are a near certainty. Enriching Part I's explanation of federalism hedging by linking it here to political science and political economic scholarship, this section's discussion builds on several interrelated observations and theories about the political and economic dynamics of legislation and regulation leading to policy entrenchment.

The tendency of law and regulation to become entrenched and resistant to change is often noted as a problem since rigid and prescriptive regulation can create little inducement for ongoing improvement or updating.[285] However, where a regulatory challenge is pervaded by shared fears that regulatory commitments will prove unstable or unmatched by other jurisdictions, a central task is to balance the need for ongoing governmental and private sector learning and adjustment with regulatory frameworks that are nonetheless stable and widely embraced. Professor Patashnik therefore suggests the use of cap-and-trade regulation of GHG emissions due to how that regulatory tool would shape incentives and possibly 'create a business

284. Andrew H. Van de Ven, *Central Problems in the Management of Innovation*, 32 MGMT. SCI. 590, 600 (1986) (noting that redundancy can sometimes increase innovation).

285. *See* COGLIANESE & D'AMBROSIO, *supra* note 111, at 1423–25 (articulating arguments against state-level climate regulation and noting 'lock-in' risks).

constituency' supportive of regulation.[286] Professor Lazarus similarly proposes legislation "pre-commitment" strategies that would discourage easy legislative reversals.[287] Professors Stewart, Biber, and Brewster each note that regulatory progress at the state level creates interest groups invested in that regulation.[288] Professors Engel and Adelman analyze how fostering technological innovation is an independent grounds for retaining state climate regulatory authority.[289]

The soundness of these observations is especially evident when one focuses on regulatory derailment risks, associated market instability, and how the retained possibility of state climate regulation—even if little used—changes political and legal dynamics.

Retaining federal plus state regulatory authority facilitates the spread and tailoring of regulatory strategies via "policy diffusion" dynamics analyzed in political science scholarship.[290] Policy diffusion occurs when a jurisdiction's policy ideas or regulatory actions move to other jurisdictions, which either adopt similar measures or often tailor them for the latter jurisdiction's context. Innovations inherently mean a degree of difference among jurisdictions, thus reducing economies of scale, but policy diffusion still results in the spread of similarly focused bodies of regulation. Innovations can diffuse through numerous actors and in vertical (federal-state) or horizontal (state-state) directions or through other institutional arrangements and expert actors.[291]

However, although political scientists analyze when and why jurisdictions follow and learn from each other, sequentially improving

286. PATASHNIK, *supra* note 14, at 179.

287. Lazarus, *supra* note 13.

288. *See* Stewart, *supra* note 5; Biber, *supra* note 5; Brewster, *supra* note 5.

289. David E. Adelman & Kirsten H. Engel, *Adaptive Environmental Federalism*, in PREEMPTION CHOICE, *supra* note 5, at 277, 293, 296–99; David E. Adelman & Kirsten H. Engel, *Reorienting State Climate Change Policies to Induce Technological Change*, 50 ARIZ. L. REV. 835 (2008).

290. Charles R. Shipan & Craig Volden, *The Mechanisms of Policy Diffusion*, 52 AM. J. POL. SCI. 840, 843 (2008). *See also* Andrew Karch, *Policy Diffusion and Climate-Change Policy*, *in* NAVIGATING CLIMATE CHANGE POLICY: THE OPPORTUNITIES OF FEDERALISM 103 (Edella C. Schlager et al. eds., 2011). For more recent application of diffusion literature to climate change, see Boyd & Carlson, *supra* note 59; *Iterative Federalism*, *supra* note 5 (not citing diffusion literature but describing state-state and state-federal policy learning). Benjamin Sovacool describes such climate policy spreading as "positive contagion." Benjamin K. Sovacool, *The Best of Both Worlds: Environmental Federalism and the Need for Federal Action on Renewable Energy and Climate Change*, 27 STAN. ENVTL. L.J. 397, 436–39 (2008).

291. *See* Farber, *supra* note 133, at 362, 373, 375–76 (analyzing how measures to reduce GHG emission can spread through "positive spillover effects" and a "virtuous cycle" that is "mutually reinforcing"); *but see* Hannah Wiseman, *Regulatory Islands*, 89 N.Y.U. L. REV. 166 (2014) (analyzing challenges to dissemination of regulatory innovations).

similar regulation, an additional benefit of diffused policy innovations to market actors is neglected but illuminated by this climate and clean energy policy case study. Innovations will lead to some difference. So, for example, strategies to incentivize distributed solar investment, or reward demand reductions, or other energy efficiency measures might vary.

Nevertheless, the critical point here is that the spread of *similarly targeted regulation* means that, overall, more and more jurisdictions would be invested in a regulatory field to achieve a shared goal. From the perspective of private market actors, diffused but similarly targeted regulation can result in a web of regulation that in aggregate creates stable policy and resulting markets, even if some variety among jurisdictions remains. For the inventor of, for example, new energy storage technology, new high-efficiency solar energy technologies, an energy-efficient appliance, or other means to reduce carbon emissions resulting from energy production, the existence of many jurisdictions driving markets for such products will maintain incentives for investment, even with regulatory variety. Ongoing state and business interest in clean energy progress and reductions in GHG emissions even during periods of federal reversal provide an example of how aggregate demand from disparate but similarly targeted regulation can serve to maintain business progress and also reduce resistance to regulation.[292]

Furthermore, every time a jurisdiction tailors its adoption of a diffused policy to its own distinctive needs, attributes, and resources, it provides three benefits. First, that tailoring reduces the costs of adoption and, unless the jurisdiction is irrational, would also maximize local benefits. Incremental regulatory innovations can teach other states and federal regulators, and the demonstration that regulation and linked businesses really are both viable can also change federal regulatory and legislative dynamics.[293] States really can serve as "laboratories of democracy."[294] Second, every regulatory tweak and adjustment may open new market opportunities and reduce the costs borne by later following jurisdictions. Hence, regulatory costs would tend to drop, benefits increase, and sequential learning and regulatory and market

292. *See supra* notes 194–232 and accompanying text (linking federal and state policy progress and increasingly cost competitive clean energy businesses).

293. *See Iterative Federalism*, *supra* note 5, at 1101, 1109; DeShazo & Freeman, *supra* note 75, at 1533–36; Farber, *supra* note 133, at 375–76.

294. *See* Sovacool, *supra* note 290, at 430; *but see* Brain Galle & Joseph Leahy, *Laboratories of Democracy? Policy Innovation in Decentralized Governments*, 58 EMORY L.J. 1333 (2009) (critiquing the theory that states function as policy laboratories).

innovations would follow.[295] Again and again, despite industry predictions that new regulation in a wide array of fields would impose massive regulatory compliance costs on them, actual compliance costs have been far more modest.[296]

The third benefit relates in a somewhat paradoxical way to the same dynamics that can drive race-to-the-bottom environmental concerns. States will inevitably compete against each other to attract businesses and their attendant employment and tax benefits.[297] They will also seek to grow and retain businesses linked to their particular economies, universities, research and development facilities, and other endowments. That diversity of endowments, aspirations, and political environments is likely to generate a different mix of policy initiatives. That competitive state hunt for the next big industry, or technological breakthrough, is inherently a hunt for relative advantage. That some states would not want to be regulatory innovators or do more than the federal government does not matter; all it takes is a state innovator or business leader to demonstrate new means to further regulatory ends. For example, states with businesses heavily invested in carbon offset activities would likely face interest group pressure to reward such climate change-fighting strategies even if the federal impetus weakened or disappeared.[298]

The experience of state brownfield law innovations when the United State federal Superfund law proved dysfunctional provides an important analogous lesson.[299] The federal Superfund law frustrated both private sector and state and local goals due to potentially vast and uncertain cleanup liabilities.[300] States came up with improvements to reduce this uncertainty and encourage investment in former industrial sites known as brownfields, and other states learned and imitated.[301]

295. Professor McAllister reviews the tendency of pollution reductions to be far easier and cheaper than threatened by regulatory opponents. *See* McAllister, *supra* note 250.

296. *See* THOMAS O. MCGARITY, FREEDOM TO HARM: THE LASTING LEGACY OF THE LAISSEZ FAIRE REVIVAL (2013) (reviewing and questioning claims of disastrous regulatory burdens as part of anti-regulatory rhetoric and movement); McAllister, *supra* note 250 (same).

297. *See* Engel, *supra* note 29, at 304–05 (showing through survey how jurisdictions compete for business investment).

298. *See* Boyd & Salzman, *supra* note 61, at 78 (discussing forest-related offsets and linked regulatory activity).

299. For recounting and analyses of this paragraph's brownfields legal history, see *Contextual Environmental Federalism*, *supra* note 3, at 119–21; Heidi Gorovitz Robertson, *Legislative Innovation in State Brownfields Redevelopment Programs*, 16 J. ENVTL. L. & LITIG. 1, 11–15 (2001); Revesz, *supra* note 53, at 598–03.

300. Revesz, *supra* note 53, at 594–95, 600.

301. *Id.* at 600–02; Roberston, *supra* note 299, at 1–3.

The federal government through regulatory measures then imitated the states and sought to reduce the harshness and liability uncertainty under the law.[302] Ultimately, a federal legislative amendment encouraging brownfields reuse was enacted that modeled improvements on those state innovations and interim federal regulatory measures.[303]

Similarly, retained state latitude in the climate and clean energy areas for such incremental improvement, experimentation, and innovation has been critical to climate progress and provided the underpinning of the CPP.[304] Years of climate and clean energy regulation at the state level, assisted by an array of other state and federal tax and financial incentives, created constituencies invested in and supportive of the flexible and market-based and trading-friendly CPP.

As seen with the CPP, as each state creates regulation that in turn fosters linked private investment, private and public constituencies will arise that are invested in that regulation and linked market. Those invested in the status quo have incentives to oppose its wholesale abandonment.[305] A federal policy that precluded or hindered such state differences, however, could derail such a balance of beneficial innovation and a collectively large aggregate web of regulation supporting business investment.

When one starts to compare a single preemptive federal climate regime and a regime that embraces diffused authority with latitude for state difference and change, the benefits of non-preemptive regimes become especially apparent. Federalism-facilitated policy diffusion ends up looking much like the "learning by monitoring," benchmarking and "experimentalist" learning touted for many settings by Charles Sabel and other scholars working with his concepts, as well as the functioning of adaptive systems.[306] Regulatory interactions and sequential

302. Revesz, *supra* note 53, at 594–95, 602–03.

303. *Contextual Environmental Federalism*, *supra* note 3, at 120.

304. Kaswan, *supra* note 4 at 67, 69.

305. *See* Biber, *supra* note 5, at 411–16.

306. *See, e.g.*, Michael C. Dorf & Charles F. Sabel, *A Constitution of Democratic Experimentalism*, 98 COLUM. L. REV. 267, 287–88 (1998) (arguing for benefits of continuous generation of new information and adjustment and improvement in an array of legal areas); Bradley C. Karkkainen, *Environmental Lawyering in the Age of Collaboration*, 2002 WIS. L. REV. 555, 567–71 (2002) (discussing "collaborative ecosystem management" and the room it leaves for regionally tailored solutions with broad coordination and public accountability); Bradley C. Karkkainen, '*New Governance' in Legal Thought and in the World: Some Splitting as Antidote to Overzealous Lumping*, 89 MINN. L. REV. 471 (2004) (discussing similar legal innovations known by the 'new governance' label and related approaches to governance); Orly Lobel, *The Renew Deal: The Fall of Regulation and the Rise of Governance in Contemporary Legal Thought*, 89 MINN. L. REV. 342, 396, 461 (2004)

improvements, coupled with the benefits of responsive businesses developing products and services, have led to ongoing innovations and rapid progress, not the sort of frozen regulation criticized by Sabel.

Relatedly, scholarship on "path dependence" and "increasing returns" or increasing "costs of exit," mostly from political science scholarship, similarly reveals how retaining state climate authority can over time increase investment in and commitment to what may still be an ever-changing status quo.[307] As similarly directed policy initiatives are embraced in multiple jurisdictions, policymakers and dependent businesses and individuals will resist change that undercuts that investment.[308] Time and changing increased investments create a path that is hard to abandon.[309]

This observation links closely to scholarship on legislative dynamics: any legislation, or even authoritative interpretation of legislation by an agency or court, will lead to investment in that new status quo and create political opposition to change.[310] Again, each step down the legal path creates greater and broader sequential lock-in of interests, thereby changing incentives. Even the growing body of behavioral economics observes a similar tendency at the individual level; people become attached to the status quo. Individuals hence may initially resist changes wrought by regulation, but once they start to adjust to a new normal, they may resist a return to the old ways or at least form new attachments.[311] Many state and business CPP supporters fought for the regulatory program due to how it would integrate and preserve such investments.[312]

From the viewpoint of private market actors, an additional crucial insight is that universal change or deregulation is harder to achieve with diffused policy authority; multiple veto players would need to be overcome.[313] Ongoing clean energy momentum in many states despite

(discussing similar legal innovations and methods of governance); *see also* AYRES & BRAITHWAITE, *supra* note 12 (exploring similar issues).

307. *See* Biber, *supra* note 5, at 402–03, 434–40; Brewster, *supra* note 5, at 250–51, 263–64, Pierson *supra* note 15, at 251–56, 263–64.

308. Pierson, *supra* note 15, at 252–55.

309. *Id.* at 252.

310. WILLIAM N. ESKRIDGE, JR. & JOHN FEREJOHN, A REPUBLIC OF STATUTES: THE NEW AMERICAN CONSTITUTION 12–22 (2010); William N. Eskridge, *Interpreting Legislative Inaction*, 87 MICH. L. REV. 67, 99, 114 (1988). *See also* Mathew D. McCubbins & Daniel B. Rodriguez, *Superstatutory Entrenchment: A Positive and Normative Interrogatory*, 120 YALE L.J. 387, 395–401 (2011).

311. *See* Jeffrey J. Rachlinski, *The Psychology of Climate Change*, 2000 ILL. L. REV. 299, 307–08.

312. *See supra* notes 241–49 and accompanying text.

313. *See, e.g.*, Josephine T. Andrews & Gabriella R. Montinola, *Veto Players and the Rule of Law in Emerging Democracies*, 37 COMP. POL. STUD. 55, 56–59

federal setbacks or inertia illustrates the benefits of concurrent state regulatory authority.[314] States face different political dynamics than do federal legislators or the president.

Federal derailment hence indicates little about the fate of state-level efforts to reverse climate and clean energy regulation. This is in part due to the political reality that respect for federalism and state policy turf is itself a politically salient policy choice; even if a politician might dislike a federal law providing, for example, clean energy incentives, preempting similar state-level efforts would have to overcome both supporters of the energy incentives and supporters of state policy independence under federalism principles.[315] In addition, the linkage of GHG emissions and energy production make preemption of such state regulation close to impossible to design. As a matter of coalitional politics, adding such anti-state provisions would engender opposition.

Furthermore, consideration of legislative inertia and status quo dynamics further reveals benefits of federal law retaining overlapping state and federal authority for a regulatory challenge like climate change. Legislative inertia would work in favor of retaining those state roles even during a period of regulatory recoil. Interests seeking to derail climate efforts would not only have to derail federal implementation or repeal a federal climate law, but also gain supermajority support of federal legislators to disempower the states and unsettle bargains struck under other laws.[316] Or they would have to battle in state after state to preclude state and local climate regulation. But federalism politics are far more complicated and less predictable along party lines than are pro-environmental or anti-environmental lines, or pro-climate or anti-climate legislation lines. [317]

(2004); George Tsebelis & Eric C. Chang, *Veto Players and the Structure of Budgets in Advanced Industrialized Countries*, 43 EUR. J. POL. RES. 449, 449–50 (2004). *See also* Jody Freeman & Daniel A. Farber, *Modular Environmental Regulation*, 54 DUKE L.J. 795, 809–10, 813 (2005) (discussing implications of diffused, divided, and fragmented authority).

314. *See supra* Section III.D.

315. *See* SCHAPIRO, *supra* note 43, at 97–107 (discussing values and instrumental benefits associated with federalism).

316. *See* Ahdieh, *supra* note 49, at 866 (2006) (noting that environmental law is prime example of "intersystemic regulation"); Robert A. Schapiro & William W. Buzbee, *Unidimensional Federalism: Power and Perspective in Commerce Clause Adjudication*, 88 CORNELL L. REV. 1199, 1246–47 (2003).

317. Robert A. Schapiro, *Not Old or Borrowed: The Truly New Blue Federalism*, HARV. L. & POL'Y REV., Winter 2009, at 33, 33–42; Barry G. Rabe et al., *State Competition as a Source Driving Climate Change Mitigation*, 14 N.Y.U. ENVTL. L.J. 1, 2–8 (2005); Jonathan Baert Wiener, *On the Political Economy of Global Environmental Regulation*, 87 GEO. L.J. 749, 749–50 (1999) (noting that existing

A diffused regulatory environment retaining roles for federal and state regulators is akin to a fabric with many different threads providing strength. To destroy that web of laws would require many successful political attacks. In contrast, if all climate regulatory authority rested on a single federal law, then intense federal lobbying, a sympathetic president, or a slow or lax federal regulator could result in complete destruction of the single thread supporting climate regulation that, in turn, would no longer be there to undergird linked business investment.

E. Entrenchment and the Tax Versus Cap-and-Trade Choice

Throughout this Article's exploration of federalism hedging and the climate change case study, regulation via a cap-and-trade program has generally been assumed. The other market-based regulatory strategy favored by economists and periodically revived by policymakers, most recently in the 2017 tax-and-dividend proposal,[318] is to deter harmful conduct through the use of Pigouvian taxes.[319] If a price is affixed to each unit of carbon, incentives would exist to reduce pollution.[320] Large carbon emitters would be disfavored in the market and benefits would flow either to pollution reduction techniques or to other market actors able to provide the good (be it energy or a product) at a lower carbon cost. Tax-induced development of viable means to reduce GHG emissions or energy use could help with regulatory stability.[321]

However, when examined from a perspective focused on the stability of the regulatory regime and linked markets, tax-based strategies appear less likely than cap-and-trade schemes to create the invested constituencies that would fight against implementation failures and policy reversal. A carbon tax would create less path-dependent

theory for environmental regulation lacks "a convincing account" that is "even more murky at the *global* level").

318. BAKER, III ET AL., *supra* note 114, at 1.

319. Thomas Merrill & David M. Schizer, *Energy Policy for an Economic Downturn: A Proposed Petroleum Fuel Price Stabilization Plan*, 27 YALE J. ON REG. 1, 4 (2010).

320. A.C. PIGOU, THE ECONOMICS OF WELFARE 172–203 (4th ed. 1932). *See also* WILLIAM H. BAUMOL & WALLACE E. OATES, THE THEORY OF ENVIRONMENTAL POLICY 21–23, 29 (2d ed. 1988).

321. As Jim Rossi observes, regulation itself can function like a carbon tax, and already does in the modern energy regulation, but could be designed to be more effective. Jim Rossi, *Carbon Taxation by Regulation*, 102 MINN. L. REV. (forthcoming 2018) (working paper no. 17-31), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2937783 [https://perma.cc/D2PD-JPL8].

increasing returns or high costs of exit.[322] After all, a tax involves little ongoing investment in and commitment to that regulatory regime. A tax can go away in a year or two with little disruption. Few if any entities would literally be invested in a carbon tax scheme.

In contrast, a cap-and-trade regime, especially if it included offset credit rewards, would immediately create a host of businesses and perhaps governments here and abroad that would be substantially invested in the value of their carbon allowances or offset credits. Trading markets would create yet another source of wealth and regulatory entrenchment.[323] Thus, from the perspective of businesses and other jurisdictions looking for signals of dependable climate commitments, a tax-based strategy might provide little reassurance. However, as analyzed by David Driesen, a carbon tax might "play more nicely" with complementary policies than a trading regime, plus would create an ongoing incentive for pollution reductions.[324] And political viability of course matters. Hence, which market-based tool—a carbon tax or cap and trade regime—would, in the end, be most effective involves an array of variables beyond this Article's focus on federalism hedging and entrenchment.

If a carbon tax became the preferred regulatory instrument to reduce GHG emissions, policymakers attending to regulatory stability concerns would need to create highly motivated supportive constituencies. The 2017 cap-and-dividend proposal, for example, proposed to put carbon tax revenues directly into taxpayers' pockets, much as a substantial portion of Alaska's oil revenue is allocated to its citizens.[325] Such a design might over time entrench policy reducing GHG emissions and hence reduce risks of regulatory reversal. Nonetheless, for the same reasons identified above, a preemptive federal carbon tax proposal could be set at the wrong level, be poorly implemented, or could later be abandoned. If preemptive of complementary state regulation, such a law could lead to a regulatory vacuum.

F. Climate Federalism Clarity and the Constitutional and Statutory Minefield

Rounded analysis of federalism hedging and the climate challenge requires a brief foray into doctrinal analysis. Whatever the federalism

322. *See* Pierson, *supra* note 15, at 252–54, 257–61, and accompanying text.

323. Stavins, *supra* note 69, at 298–99.

324. Driesen, *supra* note 253, at 23–29.

325. *See supra* notes 114–16 and accompanying text (summarizing this proposal).

and preemption mix ultimately adopted to address climate change, encourage clean energy, or address another regulatory challenge, federal statutory language about federalism must be clear and explicit to avoid regulatory and market uncertainty.

Even if a new federal climate-targeted law remains elusive, a modest statutory amendment to either federal environmental laws, energy laws, or a freestanding enactment addressing state climate and clean energy regulatory authority would help ensure that state and regional clean energy and climate regulation efforts do not run afoul of federal statutory law or face dormant Commerce Clause challenges. Current state and regional efforts are already imperiled by preemption and constitutional challenges.[326] Such arguable infirmities arise due to state efforts to take responsibility for reducing their jurisdiction's own emissions, reduce compliance costs by embracing cross-state and even international trading options, and, especially, ensure that their regulation does not simply result in the transfer of energy production or leakage of GHG emissions to other jurisdictions.

A raft of judicial rejections and some limited successes confirm the need for explicit and effective statutory drafting. For example, even if well-intentioned, state barriers to the interstate movement of business activity and energy can violate FERC's exclusive jurisdiction over interstate and wholesale energy markets, as the Supreme Court found in 2016 in striking down a Maryland law that sought to incentivize construction of clean energy production.[327] Under somewhat distinguishable programs, state clean energy strategies in California and Minnesota were challenged on both statutory and constitutional grounds. California's program to assess fees based on climate impacts of fuel transportation was upheld in a decision focused on dormant Commerce Clause doctrine.[328] Minnesota's limitation on importation of energy from out-of-state generators was rejected, but with the three appellate judges dividing on the underlying rationale.[329] Other energy and climate-linked measures also have met with judicial rejection due to

326. Steven Ferrey, *Solving the Multimillion Dollar Constitutional Puzzle Surrounding State "Sustainable" Energy Policy*, 49 WAKE FOREST L. REV. 121, 121–28, 135–47 (2014) (identifying constitutional and statutory infirmities of many state clean energy and climate regulatory regimes and suggesting means to eliminate such risks); Douglas A. Kysar & Bernadette A. Meyler, *Like a Nation State*, 55 UCLA L. REV. 1621, 1651–72 (2008) (same, with special focus on possible challenges to state trading regimes linked to foreign nations and dormant Commerce Clause).

327. *Hughes v. Talen Energy Mktg., LLC*, 136 S. Ct. 1288, 1298–99 (2016).

328. *Rocky Mountain Farmers Union v. Carey*, 730 F.3d 1070, 1102–03 (9th Cir. 2013), *cert. denied*, 134 S. Ct. 2875 (2014).

329. *North Dakota v. Heydinger*, 825 F.3d 912, 922–23, 927–29 (8th Cir. 2016).

preemption. For example, municipal measures to improve the energy efficiency of buildings were found by a district court to be preempted under a federal law setting uniform appliance efficiency standards.[330]

The Supreme Court's construction of the Clean Air Act's most preemptive provision further creates federalism and preemption uncertainties. In the *Engine Manufacturers*[331] case, despite the Clean Air Act's savings clause and State Implementation Plan provisions, the Supreme Court rejected local measures mandating clean motor vehicle fleets.[332] Such measures were held preempted by the Clean Air Act provision setting forth a national emissions standard for new motor vehicles, subject only to a carve-out for California; the Court declined to limit the reach of the law's preemptive language to regulation directed at manufacturers.[333] The Court held that the law also preempted state and local regulation targeting motor vehicle purchase choices.[334]

Efforts by municipalities to require clean taxicab fleets have been similarly rejected in the lower courts.[335] And when New York sought to preclude trades of power plant pollution that would result in increased Midwestern power plant pollution that would drift back to New York, the Second Circuit found that such regulation illegally frustrated the Clean Air Act's acid rain trading program's goals of a cost-effective freely operating market in sulfur dioxide allowances.[336]

Because so many activities and categories of regulation link to energy usage and GHG emissions, little state or local regulation is sure to avoid conflict with current federal laws or future climate-directed legislation or regulation. And if such a future federal climate law or regulation were to adopt market-based modes of regulation or in other respects seek cost-effective regulation or even just provide incentives for desired innovations, any additional state and local regulation could

330. *Air Conditioning, Heating and Refrigeration Inst. v. City of Albuquerque*, 835 F. Supp. 2d 1133, 1140 (D.N.M. 2010).

331. *Engine Mfrs. Assoc. v. S. Coast Air Quality Mgt. Dist.*, 541 U.S. 246 (2004).

332. *Id.* at 258–59.

333. *Id.* at 249–55.

334. *Id.* at 255, 258.

335. *See, e.g.*, *Ophir v. City of Bos.*, 647 F. Supp. 2d 86, 87–88, 94 (D. Mass. 2009); *Metro Taxicab Bd. of Trade v. N.Y.C.*, 615 F. 3d. 152, 154, 158 (2d Cir. 2010), *cert. denied*, 562 U.S. 1264 (2011).

336. *Clean Air Markets Group v. Pataki*, 338 F.3d 82, 87–89 (2d Cir. 2003).

be viewed as posing an obstacle to those market-facilitating and cost-effectiveness goals.[337]

Two main strategies could avoid constitutional and statutory challenges to state and local efforts to produce cleaner energy and limit GHG emission. The first option is for Congress or agencies to provide careful articulation of categories of permissible activity. Explicit statutory permission can overcome both statutory preemption concerns and dormant Commerce Clause infirmities. However, due to the massive variety of government choices and actions influencing energy usage and GHG emissions, comprehensive express carve-outs from conflict preemption risks would be difficult to craft.

A better or perhaps accompanying option would be to create a regulatory or adjudicatory regime that would protect state and local climate and energy efficiency regulation unless stakeholders in agency or judicial venues established that such state and local measures posed a substantial obstacle to federal ends.[338] Preemption doctrine may already be moving in the direction of assessing actual evidence of undue state frustration of federal ends.[339] Courts should not find obstacle preemption without assessment of the magnitude of the conflict, state and local motivations, and consideration of other benefits of such state and local regulation, including horizontal and vertical learning about the efficacy of alternative regulatory options.[340]

CONCLUSION

Monopolies are always problematic. In debates over the content of ideal federal climate legislation or regulation, prominent scholarly, political, and industry advocates have argued for preemption of state

337. *See* Buzbee, *supra* note 69, at 1553–61, 1572 (observing emergence of "preemption hard look review" under which courts examine the factual underpinnings of claimed preempted conflicts).

338. Michael Burger similarly suggests a regime favoring state and local authority, but still subject to a regulatory review process, using the Coastal Zone Management Act as an instructive analog. Michael Burger, *Empowering Local Autonomy and Encouraging Experimentation in Climate Change Governance: The Case for a Layered Regime*, 39 ENVTL. L. REP. 11161, 11170–71 (2009).

339. *See* Buzbee, *supra* note 69, at 1553–61, 1572 (noting preemption law shift toward a mode of review akin to administrative law "hard look review" in assessing the reality of claimed obstacles); Sharkey, *supra* note 277, at 2130–31 (arguing for more rigorous judicial review of claims of preempted obstacles posed by state and local regulation).

340. *See* Burger, *supra* note 338, at 11169 (criticizing courts addressing environmental setting obstacle preemption claims for failing to assess "actual impact[s]," federal and state planning, and "the devolutionary values" such efforts represent).

climate regulatory authority. Such arguments fail to consider the beneficial dynamics created by what this Article labels federalism hedging. Despite the intuitive appeal of a preemptive single market structure for a worldwide problem that would benefit from market-based regulation at the largest scale possible, a preemptive regime could create incentives for strategic reversal efforts or actions to derail legal implementation. This nation's progress would be almost completely dependent on a federal regulatory monopoly and a single law.

As with other regulatory challenges characterized by rapid change, innovation, and turbulent politics, retaining state and local climate authority both intertwined with and possibly independent from federal climate regulation would create a more sturdy and resilient web of regulation, stabilize linked markets, and discourage efforts to derail a federal climate law. The mere possibility of more state regulation would create heightened incentives for successful federal regulation that would, in turn, reduce potentially disparate state measures. With more regulatory stability, market rewards for innovation would also be enhanced.

Federal climate preemption and unitary regulatory scheme arguments may make sense in an idealized world of perfect, stable legal commitments, but in a real world pervaded by regulatory failure, reversal risks, and political instability, such unitary preemptive regimes would undercut climate progress. The more federal climate regulation or future legislation uses preemptive strategies, the more all hopes for climate progress would rest on one imperfect and vulnerable federal vessel. Retaining room for state and local climate regulation and linked clean energy efforts hedges regulatory risks. Such overlapping and potentially intertwined federal and state regulation may, somewhat paradoxically, be the most effective way to ensure that a future federal climate law or regulation under existing law will actually be implemented and endure despite ongoing political and legal contestation.

In the meantime, during times of federal policy reversal or inertia, the enduring norm of room for additional state regulation and innovation remains important. States, alongside intermittent federal progress and policy support, have been critical to climate and clean energy progress and in catalyzing federal climate engagement. During a period of federal recoil, states will again likely become the main vessel for climate momentum and in rewarding clean energy innovation. Through that retained and ongoing state authority, the pressure will build for federal reengagement. Through the benefits of federalism hedging, climate progress may slow but is unlikely to cease.