Environmental Law and Fossil Fuels: Barriers to Renewable Energy

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Traditional energy policy has outlived its useful life.

— Joseph P. Tomain[1]

INTRODUCTION

Renewable energy is gaining momentum around the globe,[2] but the United States has only just begun to change its energy trajectory away from fossil fuels. Today, only about 10% of electricity in the United States is generated from renewable energy, and most of that comes from hydroelectric power plants that have been operating for many years.[3] The U.S. Energy Information Administration projects 30% of new capacity over the next twenty years will utilize renewable resources, without significant changes in U.S. energy policy, but at that pace renewable energy will still account for only 16% of generated

1. Joseph P. Tomain, "*Our Generation's Sputnik Moment": Regulating Energy Innovation*, 31 UTAH ENVTL. L. REV. 389, 391 (2011).

2. *See, e.g.*, BEYOND THE CARBON ECONOMY: ENERGY LAW IN TRANSITION 6–9 (Zillman et al. eds., 2008) (discussing factors driving interest in and support for renewable energy); RENEWABLE ENERGY POLICY NETWORK FOR THE 21ST CENTURY, RENEWABLES 2011 GLOBAL STATUS REPORT 49 (2011) (reporting that 118 countries had some type of policy target or promotion policy for renewable energy by early 2011, representing more than half the countries in the world); *Welcome to the UNEP Climate Pledges Site*, UNITED NATIONS ENV'T PROGRAMME, http://www.unep.org/climatepledges/ (last updated Nov. 23, 2010) (listing current country pledges and the remaining gap for reaching global climate change mitigation goals).

3. *AEO2012 Early Release Overview*, U.S. ENERGY INFO. ADMIN. (Jan. 23, 2012), http://www.eia.gov/forecasts/aeo/er/early_elecgen.cfm.

electricity.[4] These prospects stand in sharp contrast to the immense potential that exists in U.S. renewable resources which, according to the National Academy of Sciences, "can supply significantly greater amounts of electricity than the total current or projected domestic demand."[5] Yet those resources remain "largely untapped today."[6]

This Article is concerned with renewable energy's too-slow transition and with how existing legal regimes work to preserve fossil energy dominance. The normative assertion that the transition is occurring too slowly proceeds from four related premises: First, that climate change threatens human well-being and the environment and is largely the result of unsustainable overconsumption of fossil energy. Second, that a transformation of the energy sector is possible with existing resources and technologies. Third, that policies to promote renewable energy in the United States have so far been adopted and sustained inconsistently, with federal progress trailing the states. And fourth, that law and policy responses to curtail fossil energy use are needed immediately to avoid the worst risks associated with climbing atmospheric temperatures.

The relationship between law and renewable energy development is complex and often contradictory. Certainly law serves as a catalyst—legal efforts have resulted in expedited federal and state approval for renewable projects, in federal and state financial incentives for renewable energy, and in the renewable portfolio standards ("RPS") that mandate renewable energy generation in a majority of states.[7] At the same time, law can also serve as a barrier to renewable energy, even where it does not directly burden or prohibit the use of renewable resources.

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4. *Id.*

5. NAT'L ACAD. OF SCIS., ELECTRICITY FROM RENEWABLE RESOURCES: STATUS, PROSPECTS, AND IMPEDIMENTS 3 (2010); *see also* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, RENEWABLE ENERGY SOURCES AND CLIMATE CHANGE MITIGATION 165 (O. Edenhofer et al. eds., 2012) [hereinafter IPCC] ("A wide range of estimates are provided in the literature but studies have consistently found that the total global technical potential for RE is substantially higher than both current and projected future global energy demand.").

6. NAT'L ACAD. OF SCIS., *supra* note 5.

7. *See* U.S. ENERGY INFO. ADMIN., *supra* note 3 ("Generation from renewable resources grows in response to Federal tax credits, State-level policies, and Federal requirements to use more biomass-based transportation fuels, some of which can produce electricity as a byproduct of the production process."); *see also* IPCC, *supra* note 5, at 889–913 (providing overview of policy options for renewable energy deployment); NAT'L ACAD. OF SCIS., *supra* note 5, at 16–27 (historical summary of federal and state policy developments for renewable energy); Fred Beck & Eric Martinot, *Renewable Energy Policies and Barriers*, *in* 5 ENCYCLOPEDIA OF ENERGY 365, 365–83 (Cutler J. Cleveland ed., 2004) (providing overview of policies designed to promote renewable energy); DATABASE OF STATE INCENTIVES FOR RENEWABLES & EFFICIENCY (DSIRE), http://www.dsireusa.org (last visited Sep. 1., 2012) (providing information on state policies promoting renewable energy).

The legal barriers operating in this transitional moment can be usefully conceived in two broad categories: (a) lagging development of affirmative new law to support renewable energy, and (b) existing law fashioned in support of a pre-renewables energy sector. These categorical problems in turn necessitate two very different but complementary and mutually reinforcing projects for advancing renewable energy: creating new law on the one hand, and dismantling (or working around) outmoded law on the other. Law that promotes renewables is likely to be less effective absent reforms to remove or mitigate the effects of legal frameworks supporting fossil energy. Conversely, removing barriers to renewable energy in existing frameworks may not be sufficient to stimulate a rapid, sector-wide transition without affirmative lawmaking to promote its growth.

My primary focus here is on pre-renewables law, and the Article develops from two related claims: that an implicit support structure for fossil energy is written into law in a range of areas, including environmental law, and that statutory and regulatory concessions to fossil energy inevitably distort how the costs of bringing new energy technologies to scale are perceived. Costs for both fossil and renewable resources are clearly miscalibrated, with social costs of fossil energy still unaccounted for in terms of price, and environmental and health benefits of renewable energy going mostly unrecognized in economic terms.

Environmental law has done more than any other field to internalize costs of environmental harm to the energy sector, yet I argue it remains integrally part of the distortion. In this context, I engage the work of scholars who recently have drawn attention to a problematic disconnection between energy law and environmental law.[8] Energy law has historically centered on utilities regulation and on the promotion of a range of economic objectives, which stands in contrast to environmental law's goals and origins in common law, aimed at reducing harm to the public health and the environment from industrial activity. It is now evident that approaching energy supply and environmental impacts through largely separate spheres of regulation has contributed to the failure to control for energy's role in

8. *See, e.g.*, JOSEPH P. TOMAIN, ENDING DIRTY ENERGY POLICY: PRELUDE TO CLIMATE CHANGE 235–38 (2011) (arguing that there is a public conflict between clean energy and environmental concerns and that tradeoffs between the two must be acknowledged); Lincoln Davies, *Alternative Energy and the Energy-Environment Disconnect*, 46 IDAHO L. REV. 473, 474–78 (2010) (explaining the historical "divorce" between energy and environmental law); Joseph P. Tomain, *The Past and Future of Electricity Regulation*, 32 ENVTL. L. 435, 465–68 (2002) (reviewing the political task to link energy and environmental policies through publications, reports, and legislation).

climate change. While I affirm that core proposition, I argue that the way in which environmental law *does* intersect with the energy sector is equally relevant. Despite its role in regulating and mitigating harms of energy production, environmental law has nonetheless reified the "cost effectiveness" of fossil energy. This effect obtains in at least three ways detrimental to renewables. The first is structural—although environmental law limits environmental harm from fossil energy production, it has provided structural support for continued dominance through its constrain-but-permit model. The second way can be found in accommodations to fossil energy in environmental law—specific exclusions and exemptions for coal, oil, and gas from otherwise-applicable federal controls. The third way is fossil-favoring implementation choices under existing statutory authority. Outraged responses to the Environmental Protection Agency's ("EPA") recent reforms targeting power plants show just how much energy producers have at stake in preserving status quo allocations of cost for the environmental harms they cause.

Part I draws from the literature on legal change and transition to provide context for this still-early moment in the renewable energy transition. Part II addresses primary obstacles to renewable energy expansion and the reinforcement they derive both from lagging development of new law that promotes renewables and legal regimes premised on a pre-renewables energy sector. Part III then turns to the intersection between energy and federal environmental law—a pre-renewables regime—to demonstrate the dual role of environmental law in constraining but also perpetuating fossil energy dominance. This perspective clarifies the contours of environmental law's relevance to and influence on renewable energy. Ultimately, it also strengthens justifications for making controls on fossil energy's environmental impacts more stringent and for advancing and sustaining policies that favor renewable energy, within existing legal frameworks and in *sui generis* rules.

I. CONTEXT: LAGGING LAW AND LEGAL TRANSITIONS

If Professor Joseph Tomain is right that "traditional energy policy has outlived its useful life," we are still living in the past.[9] In its focus on "Barriers to a Clean Energy Future," this Symposium is premised on the recognition that law is not exclusively an asset to such a transition—that the potential of resources like renewable energy and energy efficiency is bound up with barriers rooted in law.

9. Tomain, *supra* note 1, at 391.

This Article's pairing of legal impediments—lagging affirmative lawmaking and law tailored to a pre-renewables energy sector—is informed by three related perspectives on legal transitions: systemic barriers to change in and around the legal system; development of legal fields in response to changing circumstances; and concern over effects of transition on persons or industries. Each is relevant to the context, pace, and process of legal reform to promote renewable energy, and this Part addresses each briefly in turn.

A. Systemic Barriers

Changing and creating law for renewable energy inevitably occurs in context, constrained by intrinsic and systemic barriers in and around the legal system.[10] The pace of legal transition is affected by the structure of lawmaking institutions, characterized as they are by fragmented authority and jurisdictional gaps, as well as overlapping authority between multiple agencies, producing redundancies in some cases and requiring agency coordination in others.[11] This structure, for better and worse, exhibits a bias in favor of incremental governmental action.[12] The ever-increasing volume of regulatory law may overinvest agencies in completed rulemaking and overburden agency capacity for responsive implementation.[13] The "mismatch" between the scale of a problem and agency jurisdiction can preclude viable solutions.[14] Politically powerful groups invested in

10. *See* Craig Anthony (Tony) Arnold, *Fourth-Generation Environmental Law: Integrationist and Multimodal*, 35 WM. & MARY ENVTL. L. & POL'Y REV. 771, 777–88 (2011) (summarizing theories on evolution of law generally); Donald T. Hornstein, *Complexity Theory, Adaptation, and Administrative Law*, 54 DUKE L.J. 913, 928–34 (2005) (relating complexity theory to prior theories of changing law); J.B. Ruhl, *The Fitness of Law: Using Complexity Theory to Describe the Evolution of Law and Society and Its Practical Meaning for Democracy*, 49 VAND. L. REV. 1407, 1419–37 (1996) (providing an overview of the schools of jurisprudence and academic commentary on evolution of law).

11. William W. Buzbee, *Recognizing the Regulatory Commons: A Theory of Regulatory Gaps*, 89 IOWA L. REV. 1, 15–29, 37–44 (2003) (relating the agency "resource" of overlapping authority to the Tragedy of the Commons concept); Jody Freeman & Jim Rossi, *Agency Coordination in Shared Regulatory Space*, 125 HARV. L. REV. 1131, 1155–78 (2012) (recognizing challenges for agencies sharing regulatory space and assessing tools for structuring coordination).

12. Richard J. Lazarus, *Super Wicked Problems and Climate Change: Restraining the Present to Liberate the Future*, 94 CORNELL L. REV. 1153, 1173–87 (2009) (describing how human cognitive tendencies and the structure of lawmaking institutions produce a social trap of ineffective regulation for social problems like climate change).

13. *See* J.B. Ruhl & James Salzman, *Mozart and the Red Queen: The Problem of Regulatory Accretion in the Administrative State*, 91 GEO. L.J. 757, 804–12 (2003) (discussing system burdens and the effect of regulatory accretion on compliance).

14. John C. Dernbach, *Navigating the U.S. Transition to Sustainability: Matching National Governance Challenges with Appropriate Legal Tools*, 44 TULSA L. REV. 93, 105–13 (2008).

status quo regimes resist transition, thrive on the effect of lagging law, and employ strategic delay to their advantage—a tactic that electric utilities have deployed particularly effectively.[15] These contextual features have the effect of encouraging slow, additive evolution of law over legal transitions that mark significant departures from existing frameworks.[16]

B. Evolving Legal Fields

In addition to systemic barriers, inherent aspects of climate change complicate reform efforts to address it, including the promotion of fossil energy alternatives. These aspects are both practical and conceptual. Climate change poses unique geopolitical and equity challenges, with those who will be most harmed by climate impacts having the least control over options for mitigation.[17] And the

15. Joel B. Eisen, *The Environmental Responsibility of the Regionalizing Electric Utility Industry*, 15 DUKE ENVTL. L. & POL'Y F. 295, 298 (2005) ("The utility industry has the doubly dubious distinction of being one of the nation's most significant polluters and one of the most consistent avoiders, delayers, and subverters of enforcement."); *see* William W. Buzbee, *Clean Air Act Dynamism and Disappointments: Lessons for Climate Legislation to Prompt Innovation and Discourage Inertia*, 32 WASH. U. J.L. & POL'Y 33, 36–37 (2010) (discussing regulatory delay and its influences and effects); Daniel A. Farber, *Politics and Procedure in Environmental Law*, 8 J.L. ECON. & ORG. 59, 61 (1992) (reviewing interest group theory and "how the political system manages to overcome the inherent advantages of special interests"); Donald T. Hornstein, *Lessons from Federal Pesticide Regulation on the Paradigms and Politics of Environmental Law Reform*, 10 YALE J. ON REG. 369, 406–12 (1993) (explaining political interest groups, public choice theory, and related perspectives on external influences shaping legal reform); *see also* CATHERINE O'NEILL ET AL., CTR. FOR PROGRESSIVE REFORM, THE HIDDEN HUMAN AND ENVIRONMENTAL COSTS OF REGULATORY DELAY 3 (2009) (including case studies of regulatory delay, including one for mercury emissions from power plants which contributes to "some 637,000 American babies . . . born each year with unsafe levels of mercury in their blood as a result of exposure to human-based sources").

16. *See, e.g.*, Holly Doremus, *Takings and Transitions*, 19 J. LAND USE & ENVTL. L. 1, 14–24 (2003) (discussing inertia and status quo bias influence on legal transitions); Oona A. Hathaway, *Path Dependence in the Law: The Course and Pattern of Legal Change in a Common Law System*, 86 IOWA L. REV. 601, 606–22 (2001) (outlining three strands of path dependency theory); Mark J. Roe, Commentary, *Chaos and Evolution in Law and Economics*, 109 HARV. L. REV. 641, 643–52 (1996) (relating path dependence in law to chaos and evolutionary analysis and evaluating effects of "weak, semi-strong, or strong" form path dependencies); Frederick Shauer, *Legal Development and the Problem of Systemic Transition*, 13 J. CONTEMP. LEGAL ISSUES 261, 266–76 (2003) (addressing "systemic transition" and path dependency of law).

17. *See, e.g.*, Ruth Gordon, *Climate Change and the Poorest Nations: Further Reflections on Global Inequality*, 78 U. COLO. L. REV. 1559 *passim* (2007) (addressing the irony that those nations hurt most by climate change have the least power to halt its progress). In frustration over policy stagnation, the concept of transition is providing a conceptual frame for community-scale efforts to make local and individual changes toward a collective transition to sustainability in spite of policy failures. The Transition Network, an international network of communities, has started local "projects in areas of food, transport, energy, education, housing, waste, arts etc. as small-scale local responses to the global challenges of climate change, economic hardship and shrinking supplies of cheap energy" with the goal that "these small-scale responses make up

problem presents new challenges of temporality, both political—law that addresses "delayed harm" finds especially fallow ground in narrow political cycles[18]—and representational—the arc of climate impacts across an uncertain future obscures the casualties of its "slow violence."[19]

At the same time, the climate change impacts may prove unprecedented in scope, and law is already beginning to account for this across a range of fields. Climate impacts are likely to affect basic legal interests in property and contracts; and the mere expectation of impacts is already affecting legal fields ranging from insurance and banking to land use to environmental law.[20] A common theme in the environmental law literature is that the need to address increasingly massive, complex, changing, and interdependent environmental problems is driving legal transition in the field.[21] Professor Tony Arnold, for example, maps a "fourth generation" of environmental law emerging in response to this complexity.[22] Environmental law mostly has evolved additively, by way of new features being added to existing statutes and regulations. But the multifaceted nature of the problem may be forcing the field in an interdisciplinary direction—toward

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something much bigger, and help show the way forward for governments, business and the rest of us." *See What Is a Transition Initiative?*, TRANSITION NETWORK, www.transitionnetwork.org/support/what-transition-initiative (last visited Sep. 1, 2012).

18. Eric Biber, *Climate Change, Causation, and Delayed Harm*, 37 HOFSTRA L. REV. 975, 980–81 (2009); *see also* Eric Biber, *Climate Change and Backlash*, 17 N.Y.U. ENVTL. L.J. 1295, 1299 (2009) [hereinafter Biber, *Backlash*] (discussing the political difficulty of maintaining a "policy structure over the long run precisely because climate change is a delayed harm"); Lazarus, *supra* note 12, at 1189–1231 (making the case for a lawmaking approach designed to produce legislation sufficiently durable to perform over the long term).

19. ROB NIXON, SLOW VIOLENCE AND THE ENVIRONMENTALISM OF THE POOR 2–3 (2011); *see also* Richard J. Lazarus, *Climate Change Law in and Over Time*, 2 SAN DIEGO J. CLIMATE & ENERGY L. 29, 32–36 (2010) (explaining the political forces that delay climate change legislation and suggesting strategies to achieve legislation that is effective over the long term).

20. Victor B. Flatt, *Adapting Laws for a Changing World: A Systemic Approach to Climate Change Adaptation*, 64 FLA. L. REV. 269, 274 (2012); *see also* Jonathan H. Adler, *Taking Property Rights Seriously: The Case of Climate Change*, 26 SOC. PHIL. & POL'Y 296, 307–12 (2009) (discussing the impacts to property rights that climate change will cause); J.B. Ruhl, *Climate Change Adaptation and the Structural Transformation of Environmental Law*, 40 ENVTL. L. 363, 397–402 (2010) (outlining the evolution of property rights and liability rules in response to climate change).

21. Arnold, *supra* note 10, at 774. *See generally* Lazarus, *supra* note 12, at 1179 (reviewing new governance challenges of climate change); J.B. Ruhl, *Thinking of Environmental Law as a Complex Adaptive System: How to Clean Up the Environment by Making a Mess of Environmental Law*, 34 HOUS. L. REV. 933, 967, 980 (1997) (arguing that environmental problems are neither reducible, linear, nor predictable, and that complex adaptive systems must provide the model for environmental law reform).

22. Arnold, *supra* note 10, at 792.

water, land use, and energy law[23]—as law scurries "to keep up with changes it can barely understand."[24] With a sense that climate mitigation policy is in gridlock at the federal level,[25] more attention has turned to climate adaptation, which has prompted analysis of how law itself can adapt to strengthen its capacity for responsiveness to external change. Indeed, climate change, and particularly climate adaptation, gives new contextual meaning to legal transition as potentially and necessarily in continuous flux—not a one-time shift in policy, but an ongoing process of adapting to a range of possible impacts that cannot be predicted with certainty.[26] In the energy context, the prospect of enhanced adaptability could be important to possibilities for reform of existing law as well as new policy design.[27]

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23. Arnold, *supra* note 10, at 792–97 (characterizing the new generation of environmental law as one of "integrationist multimodality"); *see also* John C. Dernbach & Joel A. Mintz, *Environmental Laws and Sustainability: An Introduction*, 3 SUSTAINABILITY 531, 535–36 (2011) (arguing that dismantling the "background law of unsustainable development" must be a central objective for reform); Ruhl, *supra* note 20, at 377–78, 391–433 (predicting that pressures of climate adaptation will prompt fundamental structural changes in environmental law, affecting the field's boundaries, capacity, institutional organization, decision methods, and instrument choice).

24. LEGAL TRANSITIONS: LEGAL CHANGE, LEGAL MEANINGS 1 (Austin Sarat et al. eds., 2012).

25. Ruhl, *supra* note 20, at 372–75. It was common for articles written in 2009 and the few years prior, for example, to refer to the passage of climate legislation at the federal level as almost inevitable. *See, e.g.*, Biber, *Backlash*, *supra* note 18, at 1296 ("[T]here is little doubt that some sort of climate change regulation bill will pass Congress in the foreseeable future."); J.R. DeShazo & Jody Freeman, *Timing and Form of Federal Regulation: The Case of Climate Change*, 155 U. PA. L. REV. 1499, 1538 (2007) (describing in detail the "regulatory sweet spot" creating the likelihood for federal climate legislation). This optimism, of course, has not been rewarded.

26. *See, e.g.*, Daniel A. Farber, *Uncertainty*, 99 GEO. L.J. 901, 935–45 (2011) (examining the implications of uncertainty in climate mitigation and adaptation policy contexts); *see also* Robin Kundis Craig, *"Stationarity is Dead" — Long Live Transformation: Five Principles for Climate Change Adaptation Law*, 34 HARV. ENVTL. L. REV. 9, 17 (2010) (citing the need for increased regulatory flexibility to implement law against moving targets, but urging a set of principles to ensure flexibility is not a code "for avoiding tough decisions and needed actions"); Holly Doremus, *Adapting to Climate Change with Law That Bends Without Breaking*, 2 SAN DIEGO J. CLIMATE & ENERGY L. 45, 67–83 (2010) (calling for adaptability in "more plastic laws" that are bendable, for better responsiveness to change, but also not breakable, preserving environmental law's "precommitments"); Flatt, *supra* note 20, at 290–91 (proposing a three-part protocol for adapting law to confront changing realities).

27. A similar shift in focus has occurred toward law for promoting clean energy innovation, an area that can advance even in the absence of decisive federal policy. *See, e.g.*, David E. Adelman & Kirsten H. Engel, *Reorienting State Climate Change Policies to Induce Technological Change*, 50 ARIZ. L. REV. 835, 846–57 (2008) (advocating for a two-tiered system where the federal government focuses on reducing greenhouse gas emissions and state governments concentrate on promoting technological change); Jonathan H. Adler, *Eyes on a Climate Prize: Rewarding Energy Innovation to Achieve Climate Stabilization*, 35 HARV. ENVTL. L. REV. 1, 4 (2011) (asserting that clean energy innovation may best be induced through private and public prizes); Elizabeth Burleson & Winslow Burleson, *Innovation Cooperation: Energy Biosciences and Law*, 2011 U. ILL. L. REV. 651, 683–87 (suggesting that clean energy innovation could be

C. Transition Side Effects

The perceived side effects of transitions provide a third perspective—one that also bears directly on the pace of change. Legal transitions produce winners and losers, and policy responses to this dynamic inevitably have normative implications.[28] Transition policy is often focused on providing transitional economic compensation or other support to industries invested in outdated legal regimes. Economic efficiency and fairness, based on reliance on the status quo and foreseeability of change, are common justifications.[29] Relief measures may also serve pragmatic political aims, helping to mollify affected entities that would otherwise oppose a legal change.[30] Yet softening the effects of legal transition may risk undermining reform objectives. So-called "grandfathering" under the original Clean Air Act

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encouraged by redirecting government subsidies and implementing renewable portfolio standards); Buzbee, *supra* note 15, at 43–48 (using the CAA to demonstrate how regulatory design affects capacity for effective implementation and can encourage or avoid delay); Tomain, *supra* note 1, at 404–05 (discussing how law might be used to advance innovation for clean energy).

28. *See* David M. Hasen, *Legal Transitions and the Problem of Reliance*, 1 COLUM. J. TAX L. 120, 124 (2010) (summarizing the critical questions of legal transitions literature); Louis Kaplow, *Transition Policy: A Conceptual Framework*, 13 J. CONTEMP. LEGAL ISSUES 161, 161–62 (2003) (offering a framework for evaluating the incentives, risks, desirability, and trade-offs of legal change); Lois R. Lupica, *Transition Losses in the Electric Power Market: A Challenge to the Premises Underlying the Arguments for Compensation*, 52 RUTGERS L. REV. 649, 655 (2000) (asserting that the normative choice of who gains from legal transition should be informed by efficiency and fairness considerations).

29. *See, e.g.*, Doremus, *supra* note 16 *passim* (addressing takings claims for compensation as conflicts over legal transition); Hasen, *supra* note 28, at 121–24 (summarizing literature on legal transition, noting the more recent focus on expectations and efficiency consequences after prior emphasis on fairness and reliance); Louis Kaplow, *An Economic Analysis of Legal Transitions*, 99 HARV. L. REV. 509 *passim* (1986) (rejecting economic justifications for transition relief and discussing common design features of transition relief policies); Kaplow, *supra* note 28, at 169–71 (summarizing criteria for evaluating transition policy, including reliance and expectations, government as a cause of harm, fairness in the distribution of governmental benefits or burdens, and horizontal equity); Lupica, *supra* note 28, at 672–83 (discussing transition losses that arise across a range of contexts, including federal tax law, international finance, and electric power markets); Jonathan S. Masur & Jonathan Remy Nash, *The Institutional Dynamics of Transition Relief*, 85 N.Y.U. L. REV. 391, 398–402 (2010) (identifying rationales for transition relief as efficiency, promotion of socially productive investment, political necessity, enhancement of governmental legitimacy, and fairness); Shauer, *supra* note 16, at 261–62 (asserting that the primary questions driving debates on transition consequences are: retroactivity of changes in legal rules, compensation for lost expectations, phasing-in of new rules, the effective date of legal changes, and entitlements based on reliance on now-obsolete rules).

30. *See* Bruce R. Huber, *Transition Policy in Environmental Law*, 35 HARV. ENVTL. L. REV. 91, 110–13 (2011) (describing political economy explanations for transition relief); Richard L. Revesz & Allison L. Westfahl Kong, *Regulatory Change and Optimal Transition Relief*, 105 NW. U. L. REV. 1581, 1621–32 (2011) (summarizing and countering public choice justifications for transition relief).

("CAA"), discussed below in Part III, is a well-known example in environmental law, allowing existing power plants to avoid the emissions standards imposed on new facilities.[31] Residual transition relief in environmental statutes undercuts their original environmental aims.

Finally, environmental justice has emerged in transition discourse to emphasize affirmative inclusion of disadvantaged communities in the shift to a green-energy economy.[32] Conversely, the effect of transitions on workers and their families, who are dependent on outmoded industries, raises equity concerns that may demand transitional relief and assistance.[33]

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31. *See generally* BRUCE A. ACKERMAN & WILLIAM T. HASSLER, CLEAN COAL/DIRTY AIR 9–12, 54–58 (1981) (discussing the disparity in treatment of existing and new power plants under the Clean Air Act); Jonathan Remy Nash & Richard L. Revesz, *Grandfathering and Environmental Regulation: The Law and Economics of New Source Review*, 101 NW. U. L. REV. 1677, 1724–30 (2007) (discussing the spectrum of transition relief and the accompanying incentives); Heidi Gorovitz Robertson, *If Your Grandfather Could Pollute, So Can You: Environmental "Grandfather Clauses" and Their Role in Environmental Equity*, 45 CATH. U. L. REV. 131, 134–38 (1995) (arguing that environmental grandfather clauses have a disproportionate and negative impact on low-income, minority communities by allowing inequitable regulation of facilities). These issues remain relevant to the energy sector today. *See* WILLIAM BLYTH, INT'L ENERGY AGENCY, THE ECONOMICS OF TRANSITION IN THE POWER SECTOR 5–7 (2010), *available at* http://www.iea.org/publications/freepublications/publication/economics_of_transition.pdf (assessing present transition impact expectations for the energy sector in emissions abatement scenarios).

32. *See, e.g.*, ALTS. FOR CMTY. & ENV'T, ENVIRONMENTAL JUSTICE AND THE GREEN ECONOMY: A VISION STATEMENT AND CASE STUDIES FOR JUST AND SUSTAINABLE SOLUTIONS 26–28 (2010), *available at* http://urbanhabitat.org/node/5310 (showcasing possibilities for inclusion in transition to greener economy); GREEN JOBS INITIATIVE, INT'L LABOUR ORG., WORKING TOWARD SUSTAINABLE DEVELOPMENT: OPPORTUNITIES FOR DECENT WORK AND SOCIAL INCLUSION IN A GREEN ECONOMY 6–15 (2012), *available at* http://www.ilo.org/global/publications/ilo-bookstore/order-online/books/WCMS_181836/lang--en/index.htm (discussing budget effects of green jobs, and the global net and gross effects of the transition to green energy); RENEWABLE ENERGY POLICY PROJECT, RESOLUTION ON SUSTAINABLE ENERGY AND LOW-INCOME AND MINORITY COMMUNITIES 3 (2000), *available at* www.repp.org/repp_pubs/articles/ej/resolution.html (outlining statement of environmental justice coalition, urging inclusion of minority groups in transition to sustainable energy); Elizabeth Ann Kronk, *Alternative Energy Development in Indian Country: Lighting the Way for the Seventh Generation*, 46 IDAHO L. REV. 449, 455–58 (2010) (arguing for opportunities to advance economic development for Tribal Nations via transition to renewable energy); Uma Outka, *Environmental Justice in the Renewable Energy Transition*, 19 J. ENVTL. & SUSTAINABILITY L. (forthcoming 2012) (addressing opportunities in renewable energy transition to affirmatively advance environmental justice priorities, in addition to avoiding traditional environmental justice harms); Dorceta E. Taylor, *Green Jobs and the Potential to Diversify the Environmental Workforce*, 31 UTAH ENVTL. L. REV. 47, 69–70, 75–77 (2011) (summarizing an inclusive approach to green economic development).

33. *See* DIV. FOR SUSTAINABLE DEV., UNITED NATIONS DEP'T OF ECON. & SOC. AFFAIRS, TRANSITION TO A GREEN ECONOMY: BENEFITS, CHALLENGES AND RISKS FROM A SUSTAINABLE DEVELOPMENT PERSPECTIVE 20–21 (2012), *available at:* http://www.uncsd2012.org/rio20/index.php?page=view&type=400&nr=12&menu=45 (outlining the risks of shifting to a green economy and recommending state intervention to correct negative externalities and promote activities with positive externalities); Patrick McGinley, *Collateral Damage: Turning a Blind Eye*

These generic contexts frame the renewable energy transition in important ways. Lawmaking for rapid development of renewable energy is limited both by systemic barriers to legal change and inherent challenges for climate mitigation policy. Law will always lag in response to changing problems, and be complicated by concerns about transition side effects. But the need to reduce fossil energy consumption is not so new a problem anymore. Part II addresses how primary barriers to renewable energy are reinforced by the continuing effects of pre-renewables law and a persistent lag in new law to promote faster renewable development.

II. PRIMARY BARRIERS TO RENEWABLE ENERGY

In 2011, the National Academy of Sciences reported on renewable energy's status, prospects, and impediments, identifying the "primary current barriers" to renewable energy development.[34] Two are especially pertinent here.

The first is *cost competitiveness* between renewable and other sources of electricity.[35] Many things contribute to the cost of a renewable energy project, from capital equipment and land to operation and maintenance costs. And indeed, current projections show renewable energy coming closer to cost competitiveness in the near future based largely on technological innovation.[36] But costs are also dependent on the regulatory context in which they are defined and comparability depends on the assumptions employed.[37] Perceptions of the renewable energy price tag have consistently inhibited renewable energy policy adoption, "resulting in cost-driven decisions and policies that avoid renewable energy."[38] This avoidance is a rational response to what is ultimately a regulatory problem: "Electricity from renewables is more costly to produce than electricity

to Environmental and Social Injustice in the Coalfields, 19 J. ENVTL. & SUSTAINABILITY L. (forthcoming 2012).

34. NAT'L ACAD. OF SCIS., *supra* note 5, at 4.

35. *Id.*

36. INT'L ENERGY AGENCY, DEPLOYING RENEWABLES: BEST AND FUTURE POLICY 17 (2011).

37. *Id.* at 117 (in regard to levelized costs) and 357–59 (in regard to life-cycle assessment); *see also* David B. Spence & Robert Prentice, *The Transformation of American Energy Markets and the Problem of Market Power*, 53 B.C. L. REV. 131, 132 n.1 (2012) (explaining that markets are embedded in particular social, political, and legal contexts, which shape market behavior).

38. Beck & Martinot, *supra* note 7, at 366; *see also* U.S. DEP'T OF ENERGY, 20% WIND ENERGY BY 2030: INCREASING WIND ENERGY'S CONTRIBUTION TO U.S. ELECTRICITY SUPPLY 93–95 (2008) (noting that investment needed for renewable wind energy has historically lagged because of the implementation cost).

from fossil fuels without an internalization of the costs of carbon emissions and other potential societal impacts."[39]

The second primary barrier, fundamentally linked to the first, is a *lack of sustained policies* that promote renewable energy.[40] The political ambivalence suggested by ebb-and-flow renewables policies results in highly unreliable financial support for research and project development. The prospect of a 2012 expiration for the renewable energy Production Tax Credit ("PTC") is a prime example—a sudden shut off of support that has cast doubt on whether projects can go forward.[41] And this is not the first time the PTC's continuation has been in question; since its origin in the Energy Policy Act of 1992, the Union of Concerned Scientists counts "four extensions of the provision" and "three occasions [when] it has been allowed to sunset," creating an "on-again/off-again status" and "a boom-bust cycle" of renewable energy development.[42] Yet this problem harkens back decades. Recall President Ronald Reagan taking office and tearing down solar panels installed at the White House by predecessor President Jimmy Carter.[43] Regulatory uncertainty is an obvious and significant barrier to consistent investor confidence in renewable energy.[44]

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39. NAT'L ACAD. OF SCIS., *supra* note 5, at 178. I characterize this as a regulatory problem not to suggest that there are not potential market-based solutions to this issue, which of course there are, but because even market-based approaches will require some degree of regulatory initiation and structure. *See* MOVING TO MARKETS IN ENVIRONMENTAL REGULATION: LESSONS FROM TWENTY YEARS OF EXPERIENCE 6, 19 (Jody Freeman & Charles D. Kolstad eds., 2007) (defining market-based instruments as contextualized by a regulatory backdrop); Marc B. Mihaly, *Recovery of a Lost Decade (or Is It Three?): Developing the Capacity in Government Necessary to Reduce Carbon Emissions and Administer Energy Markets*, 88 OR. L. REV. 405, 412–13 (2009) (explaining the inevitable role of government regulation in cap-and-trade or carbon pricing).

40. NAT'L ACAD. OF SCIS., *supra* note 5, at 4; *see also* RENEWABLE ENERGY NETWORK FOR THE 21ST CENTURY, RENEWABLES 2011 GLOBAL STATUS REPORT 49 (2011) [hereinafter 2011 GLOBAL STATUS REPORT] (noting that policies promoting renewable energy only began to appear in the 1980s and have been repeatedly revised and updated).

41. *See, e.g.*, Daniel Cusick, *Renewable Energy: Wind Power Developers See Declining Costs, but Market Forces, Tax Credit Expiration Dim Growth Prospects*, E&E PUB./CLIMATEWIRE, Feb. 2, 2012; *see also* WORLD RES. INST., THE BOTTOM LINE ON RENEWABLE ENERGY TAX CREDITS 2 (2010), *available at* http://pdf.wri.org/bottom_line_renewable_energy_tax_credits_10-2010.pdf (providing a summary of incentives and limitations).

42. *See* Spence & Prentice, *supra* note 37, at 192–93 (remarking on the uncertainty associated with sunset provisions in renewable energy context); *Production Tax Credit for Renewable Energy*, UNION OF CONCERNED SCIENTISTS, http://www.ucsusa.org/clean_energy/solutions/big_picture_solutions/production-tax-credit-for.html (last revised Sept. 28, 2012) (outlining national renewable energy tax incentive policy as of 2010).

43. David Biello, *Where Did the Carter White House's Solar Panels Go?*, SCI. AM., Aug. 6, 2010, http://www.scientificamerican.com/article.cfm?id=carter-white-house-solar-panel-array.

44. *See, e.g.*, ACCENTURE, CARBON CAPITAL: FINANCING THE LOW CARBON ECONOMY 4 (2011) ("Uncertain policy frameworks . . . are increasing the difficulty of investing in low carbon

These are not the only barriers to renewable energy development—insufficient transmission capacity, for example, is another key limitation, among others.[45] But with progress on the

technology. We need clear and consistent policy frameworks to help unlock the required flow of private capital."); UNITED NATIONS ENV'T PROGRAMME, GLOBAL TRENDS IN SUSTAINABLE ENERGY INVESTMENT 2010, at 20 (2010), *available at:* http://www.rona.unep.org/documents /news/GlobalTrendsInSustainableEnergyInvestment2010_en_full.pdf ("Investors continued to look to Congress for passage of climate/energy legislation that would provide long-term certainty for investment, although as of early summer 2010, the chances of that happening in the near future looked uncertain."); *see also* INT'L ENERGY AGENCY, WORLD ENERGY OUTLOOK 2011, at 1–2 (2011); IPCC, *supra* note 5, at 870 (discussing the need for rapid and massive investment, and the need to scale up clean energy infrastructure within a response timeframe sufficient to match climate change projections).

45. NAT'L ACAD. OF SCIS., *supra* note 5, at 4. Transmission issues are beyond the scope of this Article and have been addressed elsewhere. *See, e.g.*, CHI-JEN YANG, CLIMATE CHANGE POLICY P'SHIP, ELECTRICAL TRANSMISSION: BARRIERS AND POLICY SOLUTIONS 5 (2009) (commenting on the lack of investment in transmission over the past thirty years); NAT'L COUNCIL ON ELEC. POLICY, COORDINATING INTERSTATE ELECTRIC TRANSMISSION SITING: AN INTRODUCTION TO THE DEBATE 7 (2008), *available at* http://www.ncouncil.org/Documents/ Transmission_Siting_FINAL_41.pdf (stating that twelve US states fail to address interstate transmission siting and interstate coordination); RES. FOR THE FUTURE, GREEN CORRIDORS: LINKING INTERREGIONAL TRANSMISSION EXPANSION AND RENEWABLE ENERGY POLICIES 27 (Shalini Vajjhala et al. eds., 2008), *available at* http://www.rff.org/rff/Documents/RFF-DP-08-06.pdf (suggesting that the location where agencies place new transmission corridors will impact renewable energy capacity); U.S. DEP'T OF ENERGY, *supra* note 38, at 93–100 (discussing the need for expanded transmission infrastructure); Ashley C. Brown & Jim Rossi, *Siting Transmission Lines in a Changed Milieu: Evolving Notions of the "Public Interest" in Balancing State and Regional Considerations*, 81 U. COLO. L. REV. 705, 727– 37 (2010) (addressing barriers to interstate transmission siting); Alexandra B. Klass & Elizabeth J. Wilson, *Interstate Transmission Challenges for Renewable Energy: A Federalism Mismatch*, 65 VAND. L. REV. __ (2012) (analyzing barriers to renewable energy in current statutory and regulatory frameworks for transmission); Uma Outka, *The Renewable Energy Footprint*, 30 STAN. ENVTL. L.J. 241, 256–62 (2011) (examining siting issues and cumulative impacts of renewable energy expansion); Jim Rossi, *The Political Economy of Energy and Its Implications for Climate Change Legislation*, 84 TUL. L. REV. 379, 382–97 (2009) (reviewing political economy sources of constrained transmission and public choice analysis). Other barriers include siting issues and storage capacity for intermittent resources like solar and wind. Advances in battery storage technology are critical because without them neither wind nor solar energy can provide base load power supply and must always be complemented by a nonintermittent back up power from nonrenewable sources like natural gas, coal, or nuclear. Intermittency poses a barrier to large-scale integration with the electrical grid beyond 20% of electricity produced—not a present day problem in most places, as there remains significant room for growth before we near 20% from wind and solar, but it is a barrier to increased reliance on wind and solar above that threshold, absent technical advances to address it. NAT'L ACAD. OF SCIS., *supra* note 5, at 140–42 (discussing intermittency and battery storage); *see also* PAUL DENHOLM ET AL., NAT'L RENEWABLE ENERGY LAB., THE ROLE OF ENERGY STORAGE WITH RENEWABLE ELECTRICITY GENERATION 28 (2010) (estimating the grid can sustain at least 20% intermittent renewables without upgrade). Offshore wind, which has significant potential, is in the nascent stages of development. *See* U.S. OFFSHORE WIND COLLABORATIVE, U.S. OFFSHORE WIND ENERGY: A PATH FORWARD 4 (2009), *available at*: http://www.usowc.org/ pdfs/PathForwardfinal.pdf ("Offshore wind energy has great potential to address the United States' urgent energy and environmental needs; however, this game-changing domestic renewable energy source remains untapped."). Other promising resources, such as ocean energy, are still not commercialized. *See* 2011 GLOBAL STATUS REPORT, *supra* note 40, at 26–27

primary barriers, the National Academy of Sciences considers it "reasonable to envision" that by 2035, renewables above and beyond existing hydropower could provide 20% or more of U.S. electricity.[46] This represents a possibility for significantly more growth than the U.S. Energy Administration projections, based on status quo policy. Although expanding renewables beyond 50% would require "new scientific advances . . . and dramatic changes in how we generate, transmit, and use electricity," the United States is still far from that threshold.[47] In short, renewable energy can provide much more of the nation's power than it does today without major new advancements.

These barriers—cost competitiveness and lack of sustained policy support—reflect the transitional dynamic between the development of new law and the operation of existing law. Both are important to the goal of aligning law with the promotion of renewable energy because they are mutually reinforcing.

A. Lagging Affirmative Law for Renewables

Despite policy progress that has been achieved to date—much of it at the state and local level—comprehensive and affirmative support for renewables lags at the federal level. There is, for example, no national renewable portfolio standard to mirror the measures adopted in most states. Of course, the work of crafting law and enacting law are fundamentally interdependent, and the inherent and systemic barriers identified in Part I are certainly in play. Creating political consensus sufficient to enact a national RPS has proven impossible to date, despite more than twenty-five attempts to pass such a measure.[48] Political and cultural divisions have likewise dominated the public discourse over federal climate legislation that would pave a clearer path for increased renewable energy generation.[49] Cap-and-trade and carbon pricing proposals, for

(reviewing the numerous technologies available to capture ocean energy and the limited commercial application and development of ocean energy technology).

46. NAT'L ACAD. OF SCIS., *supra* note 5, at 4.

47. *Id.*

48. Lincoln L. Davies, *Power Forward: The Argument for a National RPS*, 42 CONN. L. REV. 1339, 1341 (2010).

49. *See, e.g.*, MICHAEL J. GRAETZ, THE END OF ENERGY 217–48 (2011) (on political context surrounding recent climate legislation); IPCC, *supra* note 5, at 195 (discussing socio-cultural barriers to renewable energy) and 880–81 (other barriers to renewable energy policymaking); Arnold, *supra* note 10, at 786 (on wide-ranging factors affecting environmental law change); Craig A. Severance, *A Practical, Affordable (and Least Business Risk) Plan to Achieve "80% Clean Electricity" by 2035*, ELEC. J., July 2011, at 8, 15 (observing that "we've gotten used to driving the old paid-off clunker" and perceptions about what Americans should pay for electricity may simply have to change); E. Donald Elliott, *Why the U.S. Does Not Have a Renewable Energy*

example, do not directly address renewables but would dramatically affect the relative cost effectiveness of renewable and fossil energy, which the National Academy identified as renewable energy's primary barrier. A similar shift in focus has occurred toward law that promotes clean energy innovation, an area that can advance even in the absence of decisive federal policy.[50]

Affirmative law for renewables lags in many areas, however, not only in the category of ambitious comprehensive legislation like a national RPS, a carbon tax, or cap-and-trade. Attention is also needed to legal contexts that simply do not account for renewable energy, especially where opportunities exist to advance renewables that do not depend on federal consensus. Take, for instance, Sara Bronin's research on regulatory frameworks for alternative energy microgrids—a means of providing "energy in real time to small groups of end users from a location in and around existing development."[51] Bronin's work revealed that, despite present technical feasibility, no state had yet addressed microgrids directly and no legal analysis had yet been done to show how microgrids might be developed under existing state law.[52] Or consider the fact, as Joel Eisen has, that "throughout the United States, there is a near complete lack of a standard way to get solar technology."[53] Law that could assist more rapid and responsible project siting for renewable energy is also lagging. As I have argued elsewhere, state and local land use approaches vary significantly and typically maintain a reactive

Policy (John M. Olin Center for Studies in Law, Economics, and Public Policy Research Paper No. 433, 2011), *available at* SSRN: http://ssrn.com/abstract=1878616 (discussing legal and cultural explanations for the lack of coherent renewable energy policy in the United States); Dan M. Kahan et al., *The Tragedy of the Risk-Perception Commons: Culture Conflict, Rationality Conflict, and Climate Change* (Yale Law & Economics Research Paper No. 435, 2011), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1871503 (exploring cognitive bases for controversy over climate change).

50. *See, e.g.*, Adelman & Engel, *supra* note 27, at 858; Adler, *supra* note 27, at 4; Burleson & Burleson, *supra* note 27, at 683–87 (with a focus on renewable energy); Buzbee, *supra* note 15, at 76 (using the CAA to demonstrate how regulatory design affects the capacity for effective implementation and can encourage or avoid delay); Tomain, *supra* note 1, at 426 (discussing how law might be used to advance innovation for clean energy).

51. Sara C. Bronin, *Curbing Energy Sprawl with Microgrids*, 43 CONN. L. REV. 547, 561 (2010). For technical information, see, for example, *Distributed Energy Resources Integration: CERTS Microgrid Concept*, CONSORTIUM FOR ELECTRIC RELIABILITY TECHNICAL SOLUTIONS, http://certs.lbl.gov/certs-der-micro.html (last visited Aug. 20, 2012).

52. Bronin, *supra* note 51, at 566.

53. Joel Eisen, *Can Urban Solar Become a "Disruptive" Technology? The Case for Solar Utilities*, 24 NOTRE DAME J.L. ETHICS & PUB. POL'Y 53, 73 (2010) [hereinafter Eisen, *Urban Solar*]; Joel Eisen, *Residential Renewable Energy: By Whom?*, 31 UTAH ENVTL. L. REV. 339, 368 (2011); *see also* Garrick Pursley & Hannah Wiseman, *Local Energy*, 60 EMORY L.J. 877, 907–08 (2010) (demonstrating the need for local zoning and building codes to recognize and accommodate distributed renewables).

posture to applications, offering few signals for developers.[54] The result is often poor siting choices, local controversy, and undue delay that might have been avoided with affirmative law in place to guide projects to suitable sites.[55] Examples of other contexts in which affirmative lawmaking is needed include property rights recognition for renewable resources[56] and further development of frameworks for offshore renewable energy.[57]

Research of this kind highlights where law is lagging and might advance renewable energy, as well as where progress short of comprehensive new approaches is possible.[58] This research also shows that it is possible to anticipate the legal changes that will be needed to recognize renewable energy as it emerges in new legal contexts. Model statutes, ordinances, standards, and rules[59] tailored to specific contexts encourage the adoption of policies that ensure lagging law does not hinder otherwise "shovel-ready" progress. Inevitably, in areas

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54. Outka, *supra* note 45, at 283.

55. *Id.* at 283–85; *see also* Sean F. Nolon, *Negotiating Wind: A Framework to Engage Citizens in Siting Wind Turbines*, 12 CARDOZO J. CONFLICT RES. 327, 366 (2011) (noting that "substantive assistance and process assistance" can assist in the placing of turbines); Ashira P. Ostrow, *Process Preemption in Federal Siting Regimes*, 48 HARV. J. ON LEGIS. 289, 305–07 (2011) (describing how federal preemption of state land use law could address environmental spillover problems); Uma Outka, *Siting Renewable Energy: Land Use and Regulatory Context*, 37 ECOLOGY L.Q. 1041, 1044–45 (2010) (noting the national implications often involved in local siting issues); Hannah Wiseman, *Expanding Regional Renewable Energy Governance*, 35 HARV. ENVTL. L. REV. 477, 480–86 (2011) (proposing a "regional energy governance structure" for new energy institution development).

56. Alexandra Klass, *Property Rights on the New Frontier: Climate Change, Natural Resource Development and Renewable Energy*, 38 ECOLOGY L.Q. 63, 118 (2011); Troy Rule, *Air Space in a Green Economy*, 59 UCLA L. REV. 270, 319–20 (2011); Hannah Wiseman et al. *Formulating a Law of Sustainable Energy: The Renewables Component*, 28 PACE ENVTL. L. REV. 827, 829–31 (2011).

57. Joseph J. Kalo & Lisa C. Schiavinato, *Wind Over North Carolina Waters: The State's Preparedness to Address Off-Shore Water-Based Wind Energy Projects*, 87 N.C. L. REV. 1819, 1823 (2009).

58. The IPCC refers to this as promoting "complementarities of policies across multiple sectors." IPCC, *supra* note 5, at 199.

59. *See, e.g.*, INTERSTATE RENEWABLE ENERGY COUNCIL, COMMUNITY RENEWABLES MODEL PROGRAM RULES 3 (2010) (providing model policies for community-sale renewable projects to "address such issues as renewable system size, interconnection, eligibility for participation, allocation of the benefits flowing from participation, net metering of system production"); INTERSTATE RENEWABLE ENERGY COUNCIL, MODEL INTERCONNECTION PROCEDURES 6–17 (2009) (providing model policies connecting non-utility renewable energy projects to the electrical grid); INTERSTATE RENEWABLE ENERGY COUNCIL, NET METERING MODEL RULES 2–6 (2009) (providing model policies for net metering, which allows utility accounting for energy added to the grid from distributed energy systems, such as rooftop solar installations); *see also Model Ordinances*, COLUMBIA L. SCH., http://www.law.columbia.edu/centers/climatechange/resources/municipal (last visited Aug. 20, 2012); *Gaining Ground Database*, PACE L. SCH., http://law.pace.edu/gaining-ground-database (last visited Aug. 20, 2012) (providing sample local ordinances and policies on energy and land use issues).

where law to support renewables lags, existing advantages for fossil energy are preserved.

B. Law for the Pre-renewables Energy Sector

Counterbalancing the force of affirmative lawmaking efforts is the current energy system; and as the Intergovernmental Panel on Climate Change has recognized, the "existing energy system exerts a strong momentum for its own continuation."[60] Law crafted for fossil fuel resources is a critical part of that momentum, to the detriment of renewable alternatives.[61] Perhaps the most readily apparent vestige of the pre-renewables energy sector is the continuation of federal subsidies for fossil fuels.[62] Around the world, the International Energy Agency estimates government subsidies for fossil fuels topped four hundred billion dollars in 2010.[63] The effect of such subsidies not only keeps prices artificially low, but also affects energy consumption; the World Bank has reported that eliminating them would decrease energy use by 13% and reduce CO_2 emissions by 16%.[64] According to the U.S. Department of Energy ("DOE"), total U.S. energy subsidies doubled between 2007 and 2010.[65] While renewables received the most subsidies among resources used for electricity generation, subsidies to coal, oil, and gas also increased[66] and continue to be substantial.[67]

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60. IPCC, *supra* note 5, at 881.

61. *See, e.g.*, Buzbee, *supra* note 15, at 33–34 ("Antiquated and often more lax requirements imposed on established polluters can provide an economic advantage to existing polluters and serve as a barrier to entry by new competitors.").

62. *See, e.g.*, SALVATORE LAZZARI, CONG. RESEARCH SERV., RL33578, ENERGY TAX POLICY: HISTORY AND CURRENT ISSUES 2–14 (2008), *available at* www.nationalaglawcenter.org/assets/crs/RL33578.pdf (providing history and data on trends in U.S. energy subsidies); John Broder, *Obama's Bid to End Oil Subsidies Revives Debate*, N.Y. TIMES, Jan. 31, 2011, at A14.

63. *Energy Subsidies*, INT'L ENERGY AGENCY, http://www.iea.org/publications/worldenergyoutlook/resources/energysubsidies/ (last visited Aug. 20, 2012) (providing database of worldwide subsidies for fossil fuels; the $409 billion estimate represents a significant increase from over $300 billion just a year earlier in 2009 due to rising costs; almost half were oil subsidies).

64. THE SOCIAL COST OF ELECTRICITY: SCENARIOS AND POLICY IMPLICATIONS 198 (Anil Markandya, Andrea Bigano & Roberto Porchia eds., 2010) (citing WORLD BANK, WORLD DEVELOPMENT REPORT 2003, SUSTAINABLE DEVELOPMENT IN A DYNAMIC WORLD: TRANSFORMING INSTITUTIONS, GROWTH AND QUALITY OF LIFE (2003)).

65. U.S. ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, DIRECT FEDERAL FINANCIAL INTERVENTIONS AND SUBSIDIES IN ENERGY IN FISCAL YEAR 2010, at xi (2011), *available at* http://docs.wind-watch.org/US-subsidy-2010.pdf (noting that the "value of direct federal financial interventions and subsidies in energy markets doubled between 2007 and 2010, growing from $17.9 billion to $37.2 billion").

66. *EIA Releases New Subsidy Report: Subsidies for Renewables Increase 186 Percent*, INST. FOR ENERGY RES., (Aug. 3, 2011), http://www.instituteforenergyresearch.org/2011/08/03/ eia-releases-new-subsidy-report-subsidies-for-renewables-increase-186-percent/ (summarizing EIA

Fossil energy subsidies of the sort measured by the DOE—direct expenditures, tax incentives, and the like—are straightforward examples of outmoded law at cross purposes with subsidies for renewables, designed as they are to foster renewable energy's competitiveness with traditional fuels.[68] They also give only a limited picture of the public funds supporting fossil energy. They do not measure, for example, the cost of military and diplomatic operations to secure oil supplies overseas. Considered narrowly, such subsidies are relatively simple to isolate and eliminate as a practical, if not political, matter.

Structural disadvantages for renewable energy are both harder to isolate and more intractable. These barriers are built into long-standing legal frameworks designed for a fossil-dominant energy sector, and are basic elements of the legal regimes that interface with energy production. A number of energy law scholars have explored how such barriers operate in electric utility regulation. Tomain has shown, for example, that as a body of law "constructed to serve traditional investor-owned utilities," electric utility regulation rewards utilities "for building fossil fuel plants rather than investing in alternative or renewable resources."[69] Professor Jim Rossi has highlighted barriers to transmission lines for renewable energy stemming from limited federal jurisdiction and state public utility commissions' narrow construction of "need" for new facilities.[70]

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findings and contrasting with the following: "Federal subsidies for coal increased 44 percent from $943 million to $1,358 million. Federal subsidies for oil and natural gas increased 40 percent from $2,010 million to $2,820 million. Federal subsidies for nuclear energy increased 46 percent from $1,714 million to $2,499 million.").

67. *Id.*; *see also* ENVTL. LAW INST., ESTIMATING U.S. GOVERNMENT SUBSIDIES TO ENERGY SOURCES: 2002-2008, at 3 (2009) (noting that federal subsides "to fossil fuels . . . totaled approximately $72 million" for fiscal years 2002 to 2008); LUCY JOHNSTON ET. AL., SYNAPSE ENERGY ECON. INC., PHASING OUT FEDERAL SUBSIDIES FOR COAL 1 (2010) ("Federal agencies continue to have policies and programs that provide substantial subsidies for . . . coal-fired power plants.").

68. *See, e.g.*, Robert Stavins, *Environmental Economics*, *in* 2 THE NEW PALGRAVE DICTIONARY OF ECONOMICS 889 (Lawrence E. Blume & Steven N. Durlauf eds., 2d ed. 2008) (explaining that "subsidies increase profits in an industry," and "many subsidies promote economically inefficient and environmentally unsound practices. In such cases, reducing subsidies can increase efficiency and improve environmental quality," giving the example of "increased attention" on "cutting inefficient subsidies that promote the use of fossil fuels.").

69. *See* Joseph Tomain, *Steel in the Ground: Greening the Grid with the iUtility*, 39 ENVTL. L. 931, 940, 952 (2010); *see also* TOMAIN, *supra* note 8, at 126–28.

70. *See* Rossi, *supra* note 45, at 421–22; *see also* Steven Ferrey, *Restructuring a Green Grid: Legal Challenges to Accommodate New Renewable Energy Infrastructure*, 39 ENVTL. L. 977, 1004–05 (2009) (describing Commerce Clause issues when "states promote renewable resources in state to the exclusion of power produced out of state"); Jim Rossi, *Clean Energy and the Price Preemption Ceiling*, 3 SAN DIEGO J. CLIMATE & ENERGY L. 243, 259–63 (2012) (arguing that

Renewable energy's cost competiveness is inextricable from this context of historical and structural advantages to fossil energy.[71] Moreover, these advantages extend beyond electric utility regulation. The most basic distortion of cost comparability is the market and regulatory failure to internalize the social costs of fossil fuels—a failure that sits at the intersection of energy and environmental law, and of energy law and the environment.[72] Although "economic theory supports the idea that the true price of electricity should be charged to customers,"[73] it is commonly acknowledged that it has never come close.[74] Electricity from fossil fuels is "cost effective" in part because law instantiates a negotiated balancing of energy production and environmental goals that ignores significant impacts on health and the environment. Some view this as the result of substantive flaws in the dominant modes of welfare economics—analytical approaches that depend on assumptions that by their own terms obscure the reasons for federal environmental protection.[75] Methodological critiques

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federal price preemption in wholesale electricity markets hinders renewable energy by capping state experimentation with feed-in tariffs).

71. Buzbee, *supra* note 15, at 35–39; Tomain, *supra* note 8, at 444–56 (discussing historical context).

72. *See, e.g.*, IPCC, *supra* note 5, at 870 (identifying two "separate market failures" that "create the rationale for the additional support of innovative RE technologies").

73. Tomain, *supra* note 69, at 948.

74. *See, e.g.*, U.S. GOV'T INTERAGENCY WORKGROUP ON SOC. COST OF CARBON, TECHNICAL SUPPORT DOCUMENT: SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12866, at 2 (2010) (attempting to estimate "the monetized damages associated with an incremental increase in carbon emissions in a given year"). Other commentators offered this analysis:

> The pricing structures of energy markets in both developed and developing countries mostly do not reflect the full costs of producing energy to society, and make renewable energy less competitive with conventional energy choices. Conventional energy supplies are highly subsidized in many countries, both directly and indirectly. As well, the full costs of producing energy from conventional fuels are not normally factored into energy pricing, including external costs (also called 'externalities') such as human health impacts, environmental damage, and the global impacts of climate change.

JOHN CHRISTENSEN ET AL., CHANGING CLIMATES: THE ROLE OF RENEWABLE ENERGY IN A CARBON-CONSTRAINED WORLD 14 (2006); *see also* T. Randall Curlee, *Historical Response to Environmental Externalities in Electric Power*, 21 ENERGY POL'Y 926, 927 (1993) ("[T]he price of electricity has not historically included the full social costs associated with health and environmental damages."); *cf.* FRANK ACKERMAN & ELIZABETH A. STANTON, THE SOCIAL COST OF CARBON: A REPORT FOR THE ECONOMICS FOR EQUITY AND THE ENVIRONMENT NETWORK 2 (2010) (criticizing U.S. government cost-benefit analyses used to date to calculate "the estimated price of the damages caused by each additional ton of carbon dioxide (CO_2) released into the atmosphere").

75. *See* DOUGLAS A. KYSAR, REGULATING FROM NOWHERE: ENVIRONMENTAL LAW AND THE SEARCH FOR OBJECTIVITY 100–19 (2010) (discussing and offering a critique of welfare economics applied in environmental law); *see also* DAVID M. DREISEN, *An Introduction to the Economic Dynamics of Law*, *in* THE ECONOMIC DYNAMICS OF LAW 1 (2012), *available at* http://ssrn.com

notwithstanding, the common approach to comparing costs resource-by-resource estimates "levelized cost," a measure of "the cost of an energy generating system over its life-time" based on "all private costs that accrue upstream in the value chain, *but . . . not includ[ing] . . .* external environmental or other costs."[76] This is, to say the least, ironic, given that the objective to increase renewable energy reflects a basic policy conviction that ignoring fossil energy's impacts, particularly climate impacts, is no longer viable.[77] These conflicting positions—an outmoded balancing and a commitment to renewable energy as an antidote—cannot be reconciled.

Disadvantages for renewable energy thus run in two directions—renewables compete with their best attributes, and fossil energy's worst, not fully accounted for in price.[78] As Joel Eisen has noted, "even assuming" that fossil-fueled power plants were to "internalize the harmful effects of air pollution . . . we have not accounted for potential advantages of renewable resources that produce no pollution at all."[79]

III. BARRIERS AT THE INTERSECTION OF ENERGY AND ENVIRONMENTAL LAW

This Part considers environmental law's role in this distortion. Although energy law has recently become more attentive to

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/abstract=1983965 (opening with a critique of the dominant modes of economic analysis and proposing a shift to economic dynamic and empowerment analysis).

76. T. Bruckner et al., *Annex III: Recent Renewable Energy Costs and Performance Parameters*, *in* IPCC SPECIAL REPORT ON RENEWABLE ENERGY SOURCES AND CLIMATE CHANGE MITIGATION 1001, 1002 n.3 (O. Edenhofer et al. eds., 2011) (discussing and defining levelized costs).

77. On potential costs of inaction, see, for example, CTR. FOR INTEGRATIVE ENVTL. RESEARCH AT THE UNIV. OF MD., THE US ECONOMIC IMPACTS OF CLIMATE CHANGE AND COSTS OF INACTION 9 (2007) (highlighting that "[t]he definitive total cost of inaction is lacking due to the diversity of methodological approaches in estimating impact and adaptation cost, and the diversity of climate-induced challenges faced by society"), *available at* http://www.cier.umd.edu/climateadaptation/; FRANK ACKERMAN ET AL., NATURAL RES. DEF. COUNCIL, THE COST OF CLIMATE CHANGE: WHAT WE'LL PAY IF GLOBAL WARMING GOES UNCHECKED iv–vii (2008), *available at* http://www.nrdc.org/globalwarming/cost/cost.pdf (on predicted costs to the United States due to climate change in four sectors: hurricane damage, property loss, energy, and water and agriculture).

78. *See, e.g.*, William Moomaw et al., *Renewable Energy and Climate Change*, *in* IPCC SPECIAL REPORT ON RENEWABLE ENERGY RESOURCES AND CLIMATE CHANGE MITIGATION, *supra* note 76, at 166 (noting that policies for renewable energy "typically address two market failures: (1) the external cost of GHG emissions are not priced at an appropriate level; and (2) RE creates benefits to society beyond those captured by the innovator, leading to underinvestment in such efforts").

79. Eisen, *supra* note 15, at 300 (referring to pollution from generating electricity).

electricity's environmental impacts,[80] it nevertheless operates with an implicit assumption that environmental law will address the environmental effects of energy production. Climate change forcefully underscores that this is not the case. In a recent pair of insightful articles, Lincoln Davies and Amy Wildermuth explore what this tells us about energy and environmental law. Davies considers what he terms the "energy-environment disconnect," concluding that the divergent origins of energy law and environmental law have led the fields to develop on separate tracks. This "divorce," he argues, hinders alternative energy development with inefficiency, policy inefficacy, and "forgone synergies" between the fields that leave U.S. energy policy incomplete.[81] Wildermuth, asking whether environmental law is a barrier to renewable energy, concludes "not really," reasoning that environmental law treats renewable energy producers "just as it treats every other industry."[82] At the same time, she observes that environmental law does not promote renewable energy—it may be "anti-anti-environment," but does "not necessarily favor 'greener' solutions."[83]

I will expand on these conclusions here by looking specifically at the relationship between fossil energy and environmental law and the implications for renewable energy. Undeniably, environmental law has been the primary source of legal tools for converting "social" to "private" costs in the energy sector.[84] Perhaps more than ever, this role has made the current EPA a lightning rod for criticism by fossil energy proponents decrying what they see as overregulation of

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80. *See, e.g.*, MARC J. ROBERTS & JEREMY S. BLUHM, THE CHOICES OF POWER: UTILITIES FACE THE ENVIRONMENTAL CHALLENGE 337–49 (1981) (evaluating utility responses to environmental problems primarily through theories of organizational behavior); David Berry, *The Structure of Electric Utility Least Cost Planning*, 26 J. OF ECON. ISSUES 769, 769–72 (1992) (describing development among state utility regulatory commissions of least cost planning approaches to expand the range of issues considered in long-range electric utility planning, including conservation and alternative technologies); S.D. Cohen et al., *Environmental Externalities: What State Regulators Are Doing*, ELEC. J., July 1990, at 24, 25–30 (discussing approaches emerging in the late 1980s and early 1990s); Catherine M.H. Keske, *Costs of Environmental Performance Attributes of the Colorado Electricity Sector*, ELEC. J., Nov. 2011, at 75, 76 (noting that interest in environmental "adders" for electricity pricing began in the 1980s and 90s, but "the majority of adders policies were never implemented").

81. Lincoln Davies, *Alternative Energy and the Energy-Environment Disconnect*, 46 IDAHO L. REV. 473, 500–01 (2010).

82. Amy J. Wildermuth, *Is Environmental Law a Barrier to Emerging Alternative Energy Sources?*, 46 IDAHO L. REV. 509, 531–37 (2010).

83. *Id.* at 537.

84. IPCC, *supra* note 5, at 851–52 ("[P]rivate costs and benefits are defined as costs or benefits accounted for by the agents responsible for the activity.").

utilities.[85] The degree of animus toward the EPA makes it especially important to evaluate the limits of this narrative and consider environmental law's dual role: on the one hand, it reifies the "cost effectiveness" of fossil energy through structural and specific accommodation and implementation; on the other hand, it demands environmental controls.

A. Structural Support for Fossil Energy

According to Richard Lazarus, the "core regulatory premise" of environmental law is "the sovereign's police power to regulate private activities that adversely affect public health and welfare because of the impact of those activities on the natural environment . . . ."[86] If there are endangered species concerns for a wind farm, the Endangered Species Act applies just as it would for construction of a new fossil energy power plant (or an airport, or a strip mall, or anything else).[87] The same is true for many environmental law requirements—if a solar power plant will disturb jurisdictional waters of the United States, it may be required to obtain a permit under section 404 of the Clean Water Act ("CWA").[88] Environmental law is, in a sense, a set of barriers that are socially desirable, crafted with specific environmental aims to protect the public interest. Considered this way (and leaving aside for the moment accommodations to fossil energy, which I take up in the next Section), environmental law only stands in the way of a renewable energy project (or any other project) in the way Congress intended—by restricting activities that harm endangered species or pollute U.S. waterways.

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85. *See, e.g.*, John Broder, *Bashing EPA Is New Theme in GOP Race*, N.Y. TIMES, Aug. 18, 2011, at A1; Chip Jacobs et al., *Room for Debate, What if Republicans Closed the EPA?*, N.Y. TIMES, Aug. 24, 2011, http://www.nytimes.com/roomfordebate/2011/08/24/what-if-republicans-closed-the-epa (weighing merits and potential effects of some Congressional Republican's goal of abolishing the EPA); *see also* INST. FOR ENERGY RESEARCH, UPDATE ON THE IMPACT OF EPA'S UTILITY MACT AND TRANSPORT RULES: NEW REGULATIONS TO TAKE 30 GW OF ELECTRICITY GENERATION OFFLINE AND THE ANNOUNCEMENTS KEEP COMING… (2011) (listing coal plants claimed likely to close based on new environmental regulation); Manuel Quinones, *AIR POLLUTION: Ohio Power Company to Shutter 6 Coal Plants, Blames EPA Rules*, GREENWIRE (Jan. 27, 2012), http://www.eenews.net/Greenwire/2012/01/27/archive/3?terms=coal.

86. RICHARD J. LAZARUS, THE MAKING OF ENVIRONMENTAL LAW 50 (2004).

87. *See* J.B. Ruhl, *Harmonizing Commercial Wind Power and the Endangered Species Act Through Administrative Reform*, 65 VAND. L. REV. __ (2012); Wildermuth, *supra* note 82, at 534–35.

88. *See, e.g.*, Letter from U.S. EPA Region IX, to Western Area Power Administration (Jan. 19, 2011) (comment letter on Draft Environmental Impact Statement (DEIS) for the Rice Solar Energy Project Riverside County requesting additional information to determine applicability of Clean Water Act § 404), *available at* www.epa.gov/region9/nepa/letters/RiceSolarEnergyProjDEIS.pdf.

Moving from a project-scale to sector-scale analysis, however, the relationship between environmental law and fossil energy is even more pertinent to renewable energy's comparative footing. Federal environmental law emerged in reaction to major energy projects and pollution events, such as Con Edison's power plant proposal for the Hudson River Valley's Storm King Mountain, the Santa Barbara oil spill, and, most famously, the Cuyahoga river fires, among other environmental disasters.[89] Fossil fuels defined the energy landscape—environmental law was the "radical intruder."[90] But environmental law sought to mitigate the environmental harms of fossil energy use, not curtail them. Current regimes originated at a time when the use of fossil energy was not in serious question and the argument for renewables was far from mainstream.[91] As a result, as a general matter, to this day environmental law does not scrutinize consumption levels or resources being consumed.[92]

This is amply reflected in the primary mode of environmental law implementation: the permitting program. Environmental law is, at its most basic, structurally accommodating to polluting activity—the federal statutes "permit" externalities, with limitations and conditions to mitigate harm. These limits express a politically negotiated toleration for health and environmental harms, bolstered by what Douglas Kysar has called "the normativity of policy analysis."[93] Even as environmental law constrains the damage that would result absent environmental controls, its structurally reactive posture preserves the primacy of polluting, legally, *with a permit*. This provides a structural advantage for fossil energy relative to nonpolluting alternatives that receive no similar compromise simply

89. MICHAEL J. GRAETZ, THE END OF ENERGY: THE UNMAKING OF AMERICA'S ENVIRONMENT, SECURITY, AND INDEPENDENCE 41–59 (2011); LAZARUS, *supra* note 86, at 59; Jonathan H. Adler, *Fables of the Cuyahoga: Reconstructing a History of Environmental Protection*, 14 FORDHAM ENVTL. L.J. 89, 129–37 (2002).

90. LAZARUS, *supra* note 86, at 253.

91. This is not to say the argument had not been articulated, for it has been. *See, e.g.*, Amory B. Lovins, *Energy Strategy: The Road Not Taken*, 55 FOREIGN AFF. 186, 208–17 (1976) (arguing for a redirection of U.S. energy policy and resources away from fossil and nuclear energy and toward renewables, energy efficiency, cogeneration, and distributed generation). Lovins recently reiterated his core arguments in the same publication. *See* Amory B. Lovins, *A Farewell to Fossil Fuels: Answering the Energy Challenge*, 91 FOREIGN AFF. 134, 136 (2012).

92. *See, e.g.*, Noah M. Sachs, *Greening Demand: Energy Consumption and U.S. Climate Policy*, 19 DUKE ENVTL. L. & POL'Y F. 295, 296–302 (2009) (noting that, except in moments of crisis, "the United States has focused primarily on finding (or militarily defending) sources of energy supply"); James Salzman, *Sustainable Consumption and the Law*, 27 ENVTL. L. 1243, 1244–49 (1997) ("Put simply, in concentrating our laws on the reduction of waste from pipes and smokestacks, we have largely neglected to address the reason we produce the waste in the first place.").

93. KYSAR, *supra* note 75, at 66.

because their inherent qualities do not require it. With the exception of biomass, renewable electricity generation involves "inherently low or zero direct emissions."[94] With no means to account for the benefits of renewable energy, advantage accrues to a coal plant that gets a permit—that a wind farm will never need—to legally emit sulfur dioxide, nitrogen oxides, mercury, and the list goes on, by the ton, year after year. That is to say nothing of carbon dioxide, which accounts for the vast majority of U.S. greenhouse emissions, and for which the EPA has only this year proposed uniform emissions limits applicable to new power plants.[95] Environmental law constrains the impacts of fossil-fueled power plants, but gives a free pass for more pollution in their first year of operation than a renewable project will emit across its useful life.

This perspective underscores two important aspects of the relationship between environmental law and renewable energy. First, the effect of environmental law expands beyond its direct application to renewable projects to how it frames the "cost effectiveness" of fossil energy more broadly. Second, environmental law is designed to ignore, and exclude from private costs, a degree of environmental harm that renewable alternatives do not cause.

An alternative way, then, to conceive of the disconnection between energy and environmental law is as outmoded integration—it advantages fossil energy *relative to* renewables because it rests on assumptions from a pre–climate change energy landscape, when the need for alternative sources of energy was not yet culturally pronounced. These conceptions are not mutually exclusive, and both appear vital to current debates. The emphasis on disconnection highlights how the parallel-track development of energy law and environmental law allowed critical questions to go unasked. U.S. energy policy is not built on the goal of making energy sufficiently abundant, reliable, and available to all in an environmentally sustainable way. Rather, the policy approach has bifurcated between the primary goal of support for energy production and the distinctly secondary goal of controlling for whatever impacts result. Lost in the bifurcation is the key question of what we should be using to generate

94. NAT'L ACAD. OF SCIS., *supra* note 5, at 8.

95. *Greenhouse Gas Emissions*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/climatechange/ghgemissions/gases/co2.html (last updated June 14, 2012); *see* Standard of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, 77 Fed. Reg. 22,392, 22,392–22,441 (proposed Apr. 13, 2012), *available at* http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2011-0660-0001.

energy—the question to which renewable energy responds.[96] The emphasis on outmoded integration demonstrates the constrain-and-permit model's submissive posture to fossil energy. A legal regime that protects an outmoded cost structure for fossil energy inevitably exacerbates its cost differential with renewables. This conclusion is underscored by the claim that the cost of complying with more stringent air pollution controls will make many of the nation's coal plants no long economically viable.[97] Viewed another way, for coal to approach the emissions profile of wind or solar, carbon capture and storage would be required—a process that significantly affects cost comparisons between renewables and coal.[98]

These observations do not call into question environmental law's vital importance. Environmental law has protected and improved the environment and public health, and energy production in the United States is far cleaner than it was before federal environmental law.[99] Rather, these observations recognize descriptively that the compromise structure of environmental permitting is not neutral toward renewables' quest for equal footing, even as it remains the primary forum for internalizing social costs to the energy sector.

B. Statutory Accommodations to Fossil Energy

The structural advantage to fossil energy in the compromise framework described above is reinforced by exclusions and exemptions tailored to assist the coal, oil, and gas industries in avoiding full compliance with federal environmental law. As permits assist fossil fuels' "cost effectiveness" relative to renewables by delineating private and social costs, specific concessions further insulate coal, oil, and gas from accounting for their full range of impacts. The following brief examples convey a sense of how targeted preferential treatment is embedded in environmental statutes.

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96. *See, e.g.*, David M. Driesen & Amy Sinden, *The Missing Instrument: Dirty Input Limits*, 33 HARV. ENVTL. L. REV. 65, 115 (2009) (arguing for a reorientation from concerns about air or water pollution to "fossil fuel use itself" being "the problem to solve").

97. *See, e.g.*, INST. FOR ENERGY RESEARCH, *supra* note 85, at 3. CAA reforms are discussed *infra* Section III.C.

98. MASS. INST. OF TECH., THE FUTURE OF COAL: OPTIONS FOR A CARBON-CONSTRAINED WORLD SUMMARY REPORT xi (2007). For model CCS policy design, see INT'L ENERGY AGENCY, CARBON CAPTURE AND STORAGE MODEL REGULATORY FRAMEWORK 116–23 (2010).

99. *See*, *e.g.*, LAZARUS, *supra* note 86**,** at 67–75 (describing the enactment of major federal environment laws during the 1970s as "revolution in law"); Robin Kundis Craig, *The Public Health Aspects of Environmental Enforcement*, 4 PITTSBURGH J. ENVTL. & PUB. HEALTH L. 1, 5–10 (2010) (on positive health benefits of environmental law).

1. Air Emissions: Clean Air Act

Power plants that existed before the 1970 CAA was passed—the ones whose pollution profiles helped create the impetus for the Act—were "grandfathered" for transition relief, avoiding application of new air pollution control standards. This concession to the energy sector was modified in 1990 with Amendments that subjected existing power plants to technology-based pollution control, but still to a significantly lesser degree than new facilities.[100] As many have observed,[101] the CAA gave utilities an incentive to keep the oldest, dirtiest plants running for as long as possible without improvement, as any physical change to a plant that increases emissions amounts to a "modification" that triggers controls otherwise reserved for new facilities.[102] To this day, as a result of that early transition relief, the oldest power plants across the country have continued to operate with pollution control standards that are outmoded—that is, that would not be accepted in new facilities—by the CAA's own terms.

A second statutory concession to oil and gas can be found in exemptions for drilling wells from pollutant controls that could reduce toxic emissions released during extraction. Federal hazardous air pollutant controls, which apply to "major sources" of hazardous air pollutants and to smaller "area sources" in aggregate,[103] explicitly exempt oil and gas wells and pipeline facilities.[104] Oil and gas production wells are also exempt from treatment as an "area source category" for which the EPA is otherwise required to establish

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100. *See, e.g.*, DANIEL A. FARBER ET AL., CASES AND MATERIALS ON ENVIRONMENTAL LAW 551 (8th ed. 2010) (showing technology-based control standards applicable to existing and new or modified stationary sources of air emissions).

101. *See, e.g.*, Nash & Revesz, *supra* note 31, at 1708–20; Arnold W. Reitze, Jr., *State and Federal Command-and-Control Regulation of Emissions from Fossil-Fuel Electric Power Generating Plants*, 32 ENVTL. L. 369, 381–87 (2002).

102. *See* Clean Air Act, 42 U.S.C. § 7411 (2006) (New Source Performance Standards), § 7478 (Prevention of Significant Deterioration), § 7501 (Nonattainment Areas); *see also Coal Plants Without Scrubbers Account for a Majority of U.S. SO2 Emissions*, U.S. ENERGY INFO. ADMIN. (Dec. 21, 2011), http://www.eia.gov/todayinenergy/detail.cfm?id=4410#.

103. Clean Air Act § 112(a), 42 U.S.C. § 7412(a).

104. The Clean Air Act provides:

> Notwithstanding the provisions of subsection (a) of this section [defining major sources and aggregation of area sources], emissions from any oil or gas exploration or production well . . . and emissions from any pipeline compressor or pump station shall not be aggregated with emissions from other similar units, whether or not such units are in a contiguous area or under common control, to determine whether such units or stations are major sources, and in the case of any oil or gas exploration or production well . . . such emissions shall not be aggregated for any purpose under this section.

Clean Air Act § 112(n)(4)(a), 42 U.S.C. § 7412(n)(4)(A).

stringent emissions standards.[105] Yet the EPA reports that "[s]ome of the largest air emissions in the oil and gas industry occur as natural gas wells that have been fractured are being prepared for production."[106] With these exemptions, oil and gas wells emit hazardous air pollutants including five hundred thousand tons of volatile organic compounds ("VOCs") emissions per year—a key contributor to ground level ozone, or "smog," as well as the air toxics benzene and methane—a potent greenhouse gas.[107]

2. Waste: Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act ("RCRA") includes at least two significant concessions to fossil energy. RCRA provides a so-called "cradle to grave" regime for disposal of hazardous solid wastes. Subtitle C regulates hazardous wastes, either through the EPA or a delegated state program; Subtitle D regulates nonhazardous solid wastes at the state and local levels.[108]

A longstanding concession to the coal industry has been the exemption of coal combustion waste from RCRA Subtitle C. Coal ash is a broad term that includes a range of residuals from coal combustion. According to the EPA, coal ash can leach into groundwater and contaminate drinking water supplies with mercury, cadmium, and arsenic, all of which are "associated with cancer and various other serious health effects."[109] Coal ash storage drew national

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105. *See id.* § 7412(n)(4)(B) (providing a caveat of authorization for the EPA Administrator in her discretion to establish an area source category for wells located in metro areas with populations over one million upon a determination "that emissions of hazardous air pollutants from such wells present more than a negligible risk of adverse effects to public health").

106. *See Proposed Amendments to Air Regulations for the Oil and Natural Gas Industry Fact Sheet*, U.S. ENVTL. PROTECTION AGENCY (July 28, 2011), http://epa.gov/airquality /oilandgas/pdfs /20110728factsheet.pdf.

107. *See* Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews, 76 Fed. Reg. 52,738 (proposed Aug. 23, 2011) (to be codified at 40 C.F.R. pts. 60, 63); *Proposed Amendments to Air Regulations for the Oil and Natural Gas Industry Fact Sheet*, *supra* note 106; *see also* ENVTL. WORKING GRP., FREE PASS FOR OIL AND GAS: ENVIRONMENTAL PROTECTIONS ROLLED BACK AS WESTERN DRILLING SURGES (2009), *available at* http://www.ewg.org/book/export/html/27154; NATURAL RES. DEF. COUNCIL, DRILLING DOWN: PROTECTING WESTERN COMMUNITIES FROM THE HEALTH AND ENVIRONMENTAL EFFECTS OF OIL AND GAS PRODUCTION 8–9 (2007), *available at* http://www.nrdc.org/land/use/down/contents.asp.

108. References to Subtitles C and D relate to the public law. RCRA is the popular name for the Solid Waste Disposal Act, 42 U.S.C. §§ 6901–6992k (2006), which RCRA amended in its entirety, Pub. L. No. 94-580, 90 Stat. 2795 (1976).

109. *Frequent Questions: Coal Combustion Residues (CCR) – Proposed Rule*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/epawaste/nonhaz/industrial/special/fossil/ccr-rule/ ccrfaq.htm#4 (last updated Apr. 3, 2012); *see also* ENVTL. INTEGRITY PROJECT, RISKY BUSINESS: COAL ASH THREATENS AMERICA'S GROUNDWATER RESOURCES AT 19 MORE SITES 1–4 (2011),

attention when a "massive spill" from a ruptured impoundment "covered millions of cubic yards of land and river" in Tennessee, causing "hundreds of millions of dollars in cleanup costs," displacing residents, and harming the environment.[110] RCRA specifically excludes from the definition of hazardous wastes "[f]ly ash waste, bottom ash waste, slag waste, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels," despite the significant harm they can cause to public health and the environment.[111] The status of coal combustion residuals has been debated since at least 1978 when the EPA proposed, and Congress later confirmed, that determination of the Subtitle C status be deferred for what were termed "special wastes" directly connected to fossil fuel production until further "study" of the risks could be performed.[112] The debate has been largely framed in terms of how defining coal ash as hazardous would affect reuse of some coal ash, rather than its hazardous effects upon disposal.[113]

The oil and gas industry has received similar special treatment under RCRA. Like coal ash and related combustion wastes, oil and gas exploration and production ("E&P") wastes were initially defined as "special" for more study[114] and subsequently exempted, following an EPA determination in 1988 that federal control of such wastes under

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available at http://www.environmentalintegrity.org/documents/121311eipthirddamagereport.pdf; ENVTL. INTEGRITY PROJECT & EARTHJUSTICE, OUT OF CONTROL: MOUNTING DAMAGE FROM COAL ASH WASTE SITES ix–xxii (2010), *available at* http://earthjustice.org/sites/default/files/library/reports/ej-eipreportout-of-control-final.pdf (discussing environmental and health impacts of coal ash and describing damages cases resulting from coal ash contamination); Mark Harrison Foster, Jr., *Ash Holes: The Failure to Classify Coal Combustion Residuals as a Hazardous Waste Under RCRA and the Burden Borne by a Minority Community in Alabama*, 12 VT. J. ENVTL. L. 735, 756–61 (2011).

110. U.S. ENVTL. PROTECTION AGENCY, *supra* note 109.

111. Resource Conservation and Recovery Act (RCRA) § 3001(b)(3)(A)(i), 42 U.S.C. § 6921(b)(3)(A)(i) (2006); 40 C.F.R. § 261.4(b)(4) (2012).

112. Hazardous Waste Guidelines and Regulations, 43 Fed. Reg. 58,946 (proposed Dec. 18, 1978). Congress followed this deferral by adding RCRA § 3001(b)(3)(A)(ii) (the so-called "Bevill exclusion") as a new section in 1980. 42 U.S.C. § 6921(b)(3)(A)(ii). For a brief summary of this history, see *Special Wastes*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/osw/nonhaz/industrial/special/index.htm (last updated July 16, 2012).

113. *See* Steven T. Moon & Amanda B. Turner, *Coal Ash Law and Regulation in the United States: An Overview*, 18 SOUTHEASTERN ENVTL. L.J. 173, 190–91 (2010) (providing a history of coal ash regulation and characterizing the RCRA debate between the view "that coal ash is hazardous to the environment and human health" and the view that the label "hazardous" would " 'overload the management system, substantially increase costs, decrease the reliability of the electric system, and undermine recycling and [re-use] of waste' "). The EPA issued a proposed rule to reform the treatment of coal combustion residues, discussed *infra* Section III.C.1.a.

114. Resource Conservation and Recovery Act (RCRA) § 3001(b)(2)(A), 42 U.S.C. § 6921(b)(2)(A) ("Bentsen Amendment").

Subtitle C was "not warranted."[115] Nonetheless, as the EPA states explicitly in a document designed to clarify the line between exempt and nonexempt wastes from E&P, exemption from RCRA Subtitle C "does not indicate the hazard potential of the exempt waste."[116]

3. Surface Water Pollution: Clean Water Act

Under the CWA, a significant concession for oil and gas (and oil- and gas-dependent states) comes in section 502, which excludes from the definition of "pollutant" "water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil or gas production and disposed of in a well . . . ."[117] Characterization of a substance as a "pollutant"—otherwise defined broadly[118]—is a threshold trigger of federal jurisdiction under the CWA.[119] This is a targeted accommodation for fossil energy that has the effect of "entirely eliminating" CWA jurisdiction over a broad range of oil and gas extraction processes, leaving regulation of these processes to the states.[120]

Related accommodations are in place for "stormwater runoff from oil, gas, and mining operations," which are largely exempt from NPDES permitting.[121] When "industry stakeholders notified EPA" that the exemption was insufficient to shield small drilling sites from runoff regulations, and that this would affect "approximately 30,000 sites annually and would have a significant economic impact on the

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115. U.S. ENVTL. PROTECTION AGENCY, EXEMPTION OF OIL AND GAS EXPLORATION AND PRODUCTION WASTES FROM FEDERAL HAZARDOUS WASTE REGULATIONS 5 (2002), *available at* http://www.epa.gov/osw/nonhaz/industrial/special/oil/oil-gas.pdf.

116. *Id.* at 19; *see* 40 C.F.R. § 261.4 (providing a list of exclusions); *see also* Hannah Wiseman, *Regulatory Adaptation in Fractured Appalachia*, 21 VILL. ENVTL. L.J. 229 (2010) (discussing the exemption). For a good summary with citations of ways RCRA does apply to the energy sector, see ENERGY LAW AND TRANSACTIONS § 120.03 (Matthew Bender ed., 2012).

117. 33 U.S.C. § 1362(6)(B) (2006); 40 C.F.R. § 122.2.

118. Clean Water Act (CWA) § 502(6), 33 U.S.C. § 1362(6).

119. "Except as in compliance with [specified sections] the discharge of any *pollutant* by any person shall be unlawful." Clean Water Act § 301(a) (emphasis added).

120. ROBIN CRAIG, ENVIRONMENTAL LAW IN CONTEXT 678 (2008). The term "pollutant" is deemed not to apply if the well "is approved by authority of the State in which the well is located, and if such State determines that such injection or disposal will not result in the degradation of ground or surface water resources." Clean Water Act § 502(6).

121. The CWA provides that a NPDES permit cannot be required for:

> [D]ischarges of stormwater runoff from mining operations or oil and gas exploration, production, processing, or treatment operations or oil and gas exploration, production, processing, or treatment operations or transmission facilities . . . which are not contaminated by contact with . . . any overburden, raw material, intermediate products, finished product, byproduct, or waste products located on the site of such operations.

Clean Water Act § 402(l)(2).

industry,"[122] Congress responded by expanding the exemption. The Energy Policy Act of 2005 amended the CWA exemption to more broadly cover "all field activities or operations associated with exploration, production, processing, or treatment operations, or transmission facilities, including activities necessary to prepare a site for drilling and for the movement and placement of drilling equipment . . . ."[123]

4. Underground Water Pollution: Safe Drinking Water Act

The Safe Drinking Water Act ("SDWA") provides standards for the protection of drinking water and creates a permitting program for underground injection of substances that may contaminate underground drinking water supplies.[124] Oil and gas extraction methods, such as hydraulic fracturing, involve injecting water and chemicals into the ground to release the trapped resource.[125] The oil and gas industry, however, has benefited from an explicit exclusion from SDWA standards for "underground injection of fluids or propping agents (other than diesel fuels) pursuant to hydraulic fracturing operations" related to oil and gas.[126] This exclusion, now commonly referred to as "the Halliburton loophole," has attracted attention as the use of hydraulic fracturing has increased with new natural gas exploration—and pressure is building for Congress to repeal this exemption.[127]

122. *Fact Sheet to Final Rule: Amendments to the Storm Water Regulations for Discharges Associated with Oil and Gas Construction Activities*, U.S. ENVTL. PROTECTION AGENCY (June 2006), http://www.epa.gov/npdes/regulations/final_oil_gas_factsheet.pdf.

123. Clean Water Act § 502(24); 40 C.F.R. § 122.26 (2012); *see also* Tex. Indep. Producers & Royalty Owners Ass'n v. EPA, 435 F.3d 758, 760 (7th Cir. 2006) (confirming application of the exemption to oil and gas). For a summary of litigation related to rulemaking under this provision, see *Regulation of Oil and Gas Construction Activities*, U.S. ENVTL. PROTECTION AGENCY, http://cfpub.epa.gov/npdes/stormwater/oilgas.cfm (last updated Mar. 9, 2009).

124. 42 U.S.C. § 300f–300j-26 (2006).

125. For a detailed discussion of hydraulic fracturing, including the SDWA exclusion, see Hannah Wiseman, *Regulatory Adaptation in Fractured Appalachia*, 21 VILL. ENVTL. L.J. 229 (2010).

126. Safe Drinking Water Act § 1421, 42 U.S.C. § 300h(d)(1)(B)(ii). The exclusion also applies to "geothermal production activities." *Id.*

127. *See, e.g.*, ENVTL. WORKING GRP., DRILLING AROUND THE LAW (2009) (detailing petroleum distillates used in hydraulic fracturing and threats to public water supplies, and making recommendations for improving the law to ensure safety).

5. Land Contamination: Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA") creates a framework of liability to hold potentially responsible parties accountable for cleaning up hazardous contamination.[128] Preferential treatment for oil and gas, however, provides insulation from CERCLA's reach. For example, the statute provides that contamination resulting from a "federally permitted release" cannot trigger CERCLA liability.[129] The term "federally permitted release" is expanded to include fluid injection for production or recovery of crude oil or natural gas.[130] As a result, liability for contamination from these activities will be governed (or not) according to applicable state law. Even more significant is the exclusion of natural gas and petroleum from the statutory definition of "hazardous substance,"[131] the release of which is a threshold element of CERCLA liability.[132]

6. Public Accountability: Emergency Planning and Community Right to Know Act

The Emergency Planning and Community Right to Know Act ("EPCRA") makes information about hazardous and toxic chemicals available to the public through reporting requirements on industry; federal, state, and local governments; and Indian tribes.[133] It also addresses planning requirements for chemical emergencies.[134] With the increased use of hydraulic fracturing in natural gas drilling, environmental advocates have raised concerns about limits on

128. 42 U.S.C. §§ 9601–75.

129. *Id.* § 9607(j) (providing that recovery "for response costs or damages resulting from a federally permitted release shall be pursuant to existing law in lieu of this section").

130. Comprehensive Environmental Response, Compensation, and Liability Act § 101(10)(I), 42 U.S.C. § 9601(10)(I) (defining as a "federally permitted release" for purposes of avoiding CERCLA liability "any injection of fluids or other materials authorized under applicable State law (i) for the purpose of stimulating or treating wells for the production of crude oil, natural gas, or water, (ii) for the purpose of secondary, tertiary, or other enhanced recovery of crude oil or natural gas, or (iii) which are brought to the surface in conjunction with the production of crude oil or natural gas and which are reinjected").

131. *Id.* § 101(14) (providing that the term "hazardous substance" "does not include petroleum . . . and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel").

132. *Id.* § 107.

133. Emergency Planning and Community Right-to-Know Act (EPCRA) § 304, 42 U.S.C. § 11004 (Emergency Release Notification); *id.* §§ 311–12 (Hazardous Chemical Storage Reporting); *id.* § 313 (Toxic Chemical Release Inventory).

134. *Id.* §§ 301–03.

EPCRA's reach for oil and gas producers.[135] Drilling companies have resisted disclosing the chemicals they inject underground in the course of hydraulic fracturing, citing the statute's protection for trade secrets. As Professor Hannah Wiseman has explained, federal law neither provides specific disclosure requirements for hydrofracking chemicals, nor does it require oil and gas producers to comply with EPCRA's annual reporting for toxic releases if each individually falls below emergency thresholds.[136]

The statutory accommodations on this nonexhaustive list enhance fossil energy's structural advantage in environmental law. They do not relate exclusively to emissions contributing to climate change, allowing instead for a greater degree of other environmental harms. Such accommodations bear nonetheless on renewables' comparative footing when they ease fossil industries' responsibility for environmental and health impacts that renewables do not cause. These accommodations thereby relieve fossil industries of private costs that they *would* incur if those costs were not externalized by exemption or exclusion.

C. Fossil-Favoring Regulatory Implementation and Current Reform

Even as Congress has provided statutory accommodations to fossil energy in federal environmental statutes, regulatory implementation of Congressional mandates has also often minimized the impact of federal environmental statutes on fossil energy resources. This Part highlights some key regulatory reforms under the current EPA that affect fossil energy, and responses to that agenda.

1. Shifting Implementation of Existing Statutory Authority

The current EPA has engaged in a number of high-profile and environmentally significant rulemaking proceedings that directly affect electric utilities and other segments of the fossil energy sector. This agenda reflects new approaches to the implementation of existing statutory authority—that is, each rule addresses an environmental harm associated with energy production, and does so in a way that did not require new Congressional authorization. As the rules are subjected to judicial review, it will become clear whether the particular features of each rule are consistent with the policy space

135. *See, e.g.*, ENVTL. WORKING GRP., *supra* note 107.

136. Hannah Wiseman, *Trade Secrets, Disclosure, and Dissent in a Fracturing Energy Revolution*, 111 COLUM. L. REV. SIDEBAR 1, 5–6 (2011), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1743650; *see also* Spence & Prentice, *supra* note 37.

allowed for agency discretion under relevant statutory provisions.[137] There is little question, however, that existing federal environmental law provides authority for regulatory reform of the kind the EPA is pursuing. The reforms now underway reflect how fossil-favoring regulatory treatment and lagging implementation—sometimes due to agency delay, sometimes legal challenges—have resulted in less accountability for the electric power industry's impacts below what existing law could require.

The advantages to fossil energy of externalizing the cost of such impacts are evident in how strenuously the energy sector has opposed new regulations that apply existing law more stringently. Consider the recently adopted Mercury and Air Toxics Standards ("MATS") and the Oil and Gas Air Pollution Standards, both promulgated under CAA authority, as exemplary.[138] I consider these rules for two reasons: first, because they provide a view into the regulatory environment for electricity generation as well as energy production; and second, because they both federally regulate particular environmental harms for the first time.[139] My interest in them as exemplars lies both in the shift in regulatory approach they represent, and in what the opposition to these changes suggests about the advantages fossil energy has historically garnered, to the detriment of alternatives today.

a. Hazardous Air Pollutants: Mercury and Air Toxics Standards

In May 2011, the EPA proposed the first emissions standards for mercury and other toxic air pollutants from coal- and oil-fired electric utility steam generating units ("EGUs").[140] The EPA proposed,

137. *See* J.B. Ruhl, *Ecosystem Services and the Clean Water Act: Strategies for Fitting New Science Into Old Law*, 40 ENVTL. L. 1381, 1385–87 (2010) (summarizing rules of federal administrative law that govern latitude afforded to agencies in interpreting how much regulatory reform is possible under existing statutory authority).

138. For purposes of this Article, I discuss these standards for their exemplary features rather than substantive details. *See infra* notes 140–51 and accompanying text.

139. A prior mercury emissions control regulation was adopted but struck down, the result being that mercury emissions from power plants have never been regulated at the federal level. *See generally* Keith Harley, *Mercurial But Not Swift – U.S. EPA's Initiative to Regulate Coal Plant Mercury Changes Course Again as It Enters Third Decade*, 86 CHI.-KENT L. REV. 277 (2011) (discussing history of efforts to regulate mercury in the United States).

140. National Emission Standards for Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units, 76 Fed. Reg. 24,976 (proposed May 3, 2011) [hereinafter National Emission Standards Proposal].

and in April 2012 finalized,[141] the rules under existing authority in Clean Air Act sections 111 (performance standards for new sources of air pollution) and 112 (national emission standards for toxic air pollutants).[142] EGUs, a number of which typically operate at a single power plant, emit "millions of pounds" of hazardous air pollutants each year "that are known to cause or are suspected of causing cancer, birth defects, reproduction problems, and other serious health effects."[143]

The history of the rules traces back over twenty years to the 1990 Clean Air Act Amendments, which added new mandates for regulating hazardous air pollutants ("HAPs") of the very sort addressed in this Rule. In another example of favorable statutory treatment of the electric power industry, Congress predicated application of mercury emissions standards to power plants on the EPA first performing a series of studies to determine that regulation was "appropriate and necessary."[144] While the history of efforts to regulate mercury is beyond the scope of this Article, it is a fascinating and disturbing case study in regulatory delay and imbalanced participation in rulemaking with industry decisively dominating.[145] The EPA estimates that environmental and health benefits far outweigh costs associated with the new federal standards,[146] but industry objections to the proposed rule were wide ranging, with an emphasis on a too-short compliance window, excessive costs, and the prospect of older coal-fired units being retired sooner, thus undercutting their economic viability. Duke Energy, for example, which owns over sixty potentially affected coal-fired EGUs, submitted comments to the proposed MATS calling it "the most expensive and far reaching rule ever proposed by EPA for the electric utility

141. National Emission Standards for Hazardous Air Pollutants From Coal- and Oil-Fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units, 77 Fed. Reg. 9304 (Feb. 16, 2012) (to be codified at 40 C.F.R. pts. 60, 63).

142. 42 U.S.C. §§ 7411–12 (2006).

143. National Emission Standards Proposal, *supra* note 140, at 24,980.

144. *Id.*

145. *See* O'NEILL ET AL., *supra* note 15; Harley, *supra* note 139; Arnold W. Reitze, Jr., *The Intersection of Climate Change and Clean Air Act Stationary Source Programs*, 43 ARIZ. ST. L.J. 901, 935–37 (2011); *see also* Wendy Wagner, *Rulemaking in the Shade: An Empirical Study of EPA's Air Toxic Emission Standards*, 63 ADMIN. L. REV. 99 (2012) (a study of interest group participation in HAPs-related rulemaking).

146. U.S. ENVTL. PROTECTION AGENCY, REGULATORY IMPACT ANALYSIS FOR THE FINAL MERCURY AND AIR TOXICS STANDARDS (2011), *available at* http://www.epa.gov/ttn/ecas/regdata/RIAs/matsriafinal.pdf.

industry."[147] Westar Energy argued in its comments that CAA section 112 would require it to consider costs when determining whether power plant regulation is "appropriate and necessary."[148] It criticized the agency for proposing "to implement prohibitively costly regulation of coal- and oil-fired EGUs" and argued that the three-year compliance period would increase such costs.[149]

Nevertheless, a number of analyses support the EPA's general assertion that the standards will have far less dramatic effects on utilities' costs than the comments suggest.[150] In the absence of sustained federal regulation, over twenty states have already adopted some form of mercury emissions limitation, and utilities in those states have survived.[151] Nonetheless, the specter of power plants shutting down if required to operate cleaner facilities—in many cases the same plants that already have shirked costs for decades under CAA grandfathering provisions—underscores how weak regulatory implementation of the HAPs mandates has assisted the "cost effectiveness" of electricity from fossil fuels.

147. Comment submitted by John L. Stowell, Vice President, Energy & Envtl. Policy, Duke Energy Bus. Serv. LLC on behalf of Duke Energy, at 3 (Aug. 4, 2011), *available at* http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2011-0044-5000.

148. Comments submitted by Dennis Lane, Stinson Morrison Hecker LLP, Westar Energy, Inc, at 4 (Aug. 4, 2011), *available at* http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2011-0044-4842.

149. *Id.* at 11, 15–16.

150. *See, e.g.*, JAMES E. MCCARTHY & CLAUDIA COPELAND, CONG. RESEARCH SERV., R41914, EPA'S REGULATION OF COAL-FIRED POWER: IS A "TRAIN WRECK" COMING? (2011), *available at* www.fas.org/sgp/crs/misc/R41914.pdf (analyzing the Mercury and Air Toxic Standards (pp. 13–14) and other rules on EPA's regulatory agenda relating to power plants, finding that costs of the rules collectively will be outweighed by benefits to human health and the environment (pp. 40–42), and including a bibliography of analytic reports on EPA's power plant regulations (app. B)); M.J. BRADLEY & ASSOC. LLC & ANALYSIS GROUP, ENSURING A CLEAN, MODERN ELECTRIC GENERATING FLEET WHILE MAINTAINING ELECTRIC SYSTEM RELIABILITY (2010, Supp. June 2011, Supp. Nov. 2011), *available at* http://www.mjbradley.com/sites/default/files/MJBAand AnalysisGroupReliabilityReportAugust2010.pdf (2010 original); http://www.mjbradley.com/sites/default/files/MJBA%20Reliability%20Report%20Update%20June%207%202011.pdf (June 2011 supplement); http://www.mjbradley.com/sites/default/files/ReliabilityUpdateNovember 202011.pdf (Nov. 2011 supplement) (concluding that the industry is well positioned to comply with the new rules and the transition will not be too costly or lead to closure of otherwise economically viable plants); *cf.* STEVEN FINE ET AL., ICF INT'L, POTENTIAL IMPACTS OF ENVIRONMENTAL REGULATION ON THE U.S. GENERATION FLEET, FINAL REPORT (2011), *available at* http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Integrated_Resource_Plan/2011IRP/EEIModelingReportFinal-28January2011.pdf (predicting a wave of power plant closures).

151. O'NEILL ET AL., *supra* note 15, at 11.

b. Emissions from Oil and Natural Gas Wells: Oil and Natural Gas Air Pollution Standards

Although much of the EPA's regulatory agenda affects the electric power industry, especially utilities heavily invested in coal, the EPA has also issued important new regulations affecting oil and gas. In April 2012, the EPA finalized new national emission standards for hazardous air pollutants ("NESHAP") for oil and gas wells under CAA section 112—the first federal air regulation applicable to hydraulic fracturing—and expanded regulation of oil and natural gas operations with revised new source performance standards ("NSPS") under CAA section 111.[152] Prior to the new rule, NSPS applied to natural gas processing plants, but not to wells, storage vessels, compressors, and other equipment to which the new rule applies.[153] According to the EPA, the rule will reduce by 95% "VOCs emitted from more than 11,000 new hydraulically fractured gas wells each year," by requiring operators to capture natural gas that currently escapes to the air. [154] The oil and gas industry is responsible for nearly 40% of U.S. emissions of the greenhouse gas methane, which—though not regulated under the rule—will be significantly reduced.[155]

In sharp contrast with the expense to industry of the mercury rule, the EPA estimates that the oil and natural gas emissions rule will actually net the industry $11–19 million in annual profits, alongside climate co-benefits valued over $1 billion by 2015.[156] Nevertheless, industry opposed the rule, arguing that the cost of technological and administrative compliance with emissions controls

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152. Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews, 77 Fed. Reg. 49,490 (Aug. 16, 2012) [hereinafter New Source Performance Standards] (to be codified at 40 C.F.R. pts. 60, 63). *See generally Oil and Natural Gas Air Pollution Standards*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/airquality/oilandgas/ (last updated Apr. 18, 2012) (providing broad overview of EPA regulations aimed at reducing air pollutants from oil and natural gas industry); *A 1st for Fracking: EPA's Air Emissions Regulations*, LAW360 (May 11, 2012, 1:42 PM), http://www.law360.com/articles/334261/a-1st-for-fracking-epa-s-air-emissions-regulations (paid subscription required).

153. New Source Performance Standards, *supra* note 152, at 49,492–93.

154. U.S. ENVTL. PROTECTION AGENCY, OVERVIEW OF FINAL AMENDMENTS TO AIR REGULATIONS FOR THE OIL AND NATURAL GAS INDUSTRY: FACT SHEET 1 (2012), *available at* http://www.epa.gov/airquality/oilandgas/pdf/20120417fs.pdf.

155. NATURAL RES. DEF. COUNCIL, LEAKING PROFITS 4 (2012), *available at* www.nrdc.org/energy/files/Leaking-Profits-Report.pdf (citing U.S. ENVTL. PROTECTION AGENCY, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS (1990-2009) (2011)). For a discussion of the relationship of the rule to methane, and general anticipated benefits of the new standards, see New Source Performance Standards, Final Rule, *supra* note 152, at 49,513–14 and 49,533–36.

156. *See* U.S. ENVTL. PROTECTION AGENCY, *supra* note 154, at 2–3.

are too burdensome, and that oil and natural gas will be less cost-effective compared with alternatives if the industry internalizes the cost of these environmental impacts.[157] The rule comes at a time when the prospect of further federal regulation of hydraulic fracturing is a significant source of concern for the natural gas industry and producing states.

These are just two of the significant regulatory actions by the EPA affecting the energy sector. In both, cost has been a primary objection and a number of other rules have already been subject to challenge in court.[158] Perhaps most important among these are the Cross-State Air Pollution Rule ("CSAPR") and the Greenhouse Gas Tailoring Rule ("the Tailoring Rule"), both of which the D.C. Circuit considered and ruled on this year.

The CSAPR was designed to address power plant emissions of nitrogen oxides and sulphur dioxide that degrade air quality in downwind states.[159] Its predecessor regulation, the 2005 Clean Air Interstate Rule ("CAIR"), was struck down by the D.C. Circuit Court of Appeals; however, the court kept the requirements of CAIR in place temporarily until the EPA could finalize a replacement rule.[160] CSAPR was the EPA's effort to replace CAIR, and the DC Circuit just ruled in *EME Homer City Generation LP v. EPA* that the new regulation is also flawed.[161] For my purposes here, it is important to note that, like CAIR, CSAPR was struck down based on policy design flaws, not

157. *See, e.g.*, Comment submitted by Lisa S. Beal, Vice President, Env't & Constr. Policy, Interstate Natural Gas Ass'n of Am. (INGAA), at 1–2 (Oct. 11, 2011), *available at* http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2010-0505-2245 (objecting that "[t]he threatened capital and operating costs of the proposed standards are substantial, but the threatened administrative costs . . . are even more daunting and unnecessary"); Comment submitted by Brad Richards, Executive Vice President, Ill. Oil & Gas Ass'n, at 1 (Oct. 24, 2011), *available at* http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2010-0505-3447 (stating that "the cost to capture VOCs could easily be cost prohibitive"); Comment submitted by Kathleen M. Sgamma, VP, Gov't & Pub. Affairs, W. Energy Alliance (formerly IPAMS) et al., at 2 (Oct. 24, 2011), *available at* http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2010-0505-4231 (asserting that small businesses "do not have the resources that larger companies do to implement and comply with such burdensome, costly and complex regulations as the proposed NSPS/NESHAP rules").

158. A number of accessible summaries of EPA's agenda are available. *See, e.g.*, *EPA Regulatory Developments in Electricity Generation*, LAW360 (Jan. 30, 2012, 1:55 PM), http://www.law360.com/articles/302965/epa-regulatory-developments-in-electricity-generation (paid subscription required).

159. Federal Implementation Plans: Interstate Transport of Fine Particulate Matter and Ozone and Correction of SIP Approvals, 76 Fed. Reg. 48,208 (Aug. 8, 2011). *See generally Cross-State Air Pollution Rule (CSAPR)*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/airtransport/ (last updated Aug. 21, 2012).

160. North Carolina v. EPA, 550 F.3d 1176, 1178 (D.C. Cir. 2008).

161. EME Homer City Generation, L.P. v. EPA, ___ F.3d ___, 2012 WL 3570721 (D.C. Cir. 2012).

because the EPA lacks regulatory authority to regulate interstate air pollution. Indeed, this authority is explicitly affirmed.[162]

The Tailoring Rule represents a significant step by the EPA toward regulating greenhouse gas emissions from stationary sources for the first time under the CAA.[163] The rule "tailors" implementation to impose permitting requirements only on the biggest emitters—such as coal- and oil-fired power plants—while shielding smaller emitters from regulation.[164] The rulemaking stems, in part, from the Supreme Court's recognition of the EPA's authority to regulate greenhouse gases under the CAA in *Massachusetts v. EPA*.[165] In June 2012, in contrast to the more recent outcome, the D.C. Circuit sided with EPA to affirm the rule's validity in *Coalition for Responsible Regulation v. EPA*.[166]

Despite their divergent results before the D.C. Circuit, both the CSAPR and Tailoring Rule underscore two important aspects of federal environmental regulations as they relate to fossil fuels. First, Congress has authorized by statute more regulatory power to agencies than they have chosen or been able to effectively utilize. Second, the recent shift toward more stringent regulatory approaches highlights how the "cost effectiveness" of fossil energy has been buoyed by weak implementation of environmental statutes in the fossil energy sector. As Part I indicates, there are many constraints and influences—legal, political, historical, and practical—that shape an agency's regulatory agenda. Nevertheless, it remains true that regulatory implementation of federal environmental law produces a range of outcomes that affect cost perceptions about fossil energy relative to renewable resources, including—as was long the case with mercury and emissions from oil and natural gas wells—allowing harm to public health and the environment despite statutory authority to control it.

2. Retaliatory Legislation: Targeting EPA

The EPA deserves neither full blame nor full credit for its rulemaking agenda. Indeed, in most instances, the EPA initiated the

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162. *Id.* at *2 (explaining that "the statutory text grants EPA authority to require upwind States to reduce" their significant contributions "to a downwind State's nonattainment" of National Ambient Air Quality Standards).

163. Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 75 Fed. Reg. 31,514 (June 3, 2010) (codified at 40 C.F.R. pts. 51, 52, 70 and 71).

164. For an overview of the implementation and usage of the Tailoring Rule, see generally *Clean Air Act Permitting for Greenhouse Gases*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/nsr/ghgpermitting.html (last updated Sept. 18, 2012).

165. Massachusetts v. EPA, 549 U.S. 497, 532 (2007).

166. Coal. for Responsible Regulation v. EPA, 684 F.3d 102, 117 (D.C. Cir 2012).

rulemaking only when forced to do so by court order. The MATS, for example, were developed under a Consent Decree of the D.C. Court of Appeals.[167] The same is true for the Oil and Gas Air Pollution Standards.[168] Both arose out of public interest environmental litigation based on existing statutory mandates from Congress. As one commentator put it, "if Congress is not happy with the EPA, it really has only itself to blame."[169] Indeed, the EPA's rulemaking agenda—which the Institute for Energy Research has called "EPA's Regulatory Assault on Power Plants"[170]—has spurred a dramatic backlash against the agency by members of Congress.[171] A long list of bills has been proposed with provisions designed to curtail or constrain the EPA's regulatory authority or diminish its capacity to perform agency functions.

Perhaps the best known of these is the so-called TRAIN Act, which passed in the House of Representatives. It seeks to block regulatory reform under the CAA, identifies the MATS and CSAPR by name, and establishes a "Committee for the Cumulative Analysis of Regulations that Impact Energy and Manufacturing in the United States" to review the EPA's rulemaking.[172] The "Ensuring Affordable Energy Act" prohibits the EPA from implementing "any statutory or regulatory requirement pertaining to emissions of one or more greenhouse gases from stationary sources" or "a cap-and-trade program."[173] The "Defending America's Affordable Energy and Jobs Act" seeks to restrict "the President or the head of a Federal department or agency" from issuing any regulation "providing for the control of emissions of a greenhouse gas . . . tak[ing] action relating to or tak[ing] into consideration the climate effects of emissions of a

167. *Basic Information*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/mats/basic.html (last updated Apr. 10, 2012).

168. U.S. ENVTL. PROTECTION AGENCY, *supra* note 154, at 4.

169. Seth Jaffe, *Clean Power Plants Make Good Neighbors*, LAW360 (Nov. 14, 2011, 3:56 PM), http://www.law360.com/articles/285227/clean-power-plants-make-good-neighbors (paid subscription required) (The author, a partner at Holey Foag L.L.P., is the chair of that firm's administrative law group and coordinator of the firm's environmental law group); *see also* Jennifer Smokelin, *Respect the EPA's Authority – It's Not Going Away*, LAW360 (Mar. 21, 2012, 1:11 PM), http://www.law360.com/articles/319386/respect-the-epa-s-authority-it-s-not-going-away (paid subscription required) (discussing Tailoring Rule and related litigation).

170. *Update on the Impact of EPA's Regulatory Assault on Power Plants: New Regulations to Take 30 GW of Electricity Generation Offline and the Plant Closing Announcements Keep Coming...*, INST. FOR ENERGY RESEARCH (Feb. 7, 2012), http://www.instituteforenergyresearch.org/2012/02/07/impact-of-epas-regulatory-assault-on-power-plants-february-7-update/.

171. *Id.*

172. Transparency in Regulatory Analysis of Impacts on the Nation Act of 2011, H.R. 2401, 112th Cong. § 2 (2011). See *id.* § 5 for constraints on the MATS and CSAPR.

173. Ensuring Affordable Energy Act, H.R. 153, 112th Cong. § 2 (2011).

greenhouse gas, consider[ing] climate effects in implementing or enforcing any law (including a regulation), or condition[ing] or deny[ing] any approval based on climate effects . . . ."[174] It also preempts any similar provisions should they appear in a State Implementation Plan under the CAA.[175] The list goes on.[176]

This body of legislation reflects an entrenched political apparatus at work to preserve a dominant fossil energy sector. It also demonstrates considerable anxiety about the cost of alternatives. Both must be understood in the localized context of the U.S. economic recession, with which prospects for sustained policies to promote renewable energy are deeply entangled. Delaying the transition doesn't make it less necessary, however, just more expensive and more urgent.

D. Implications

This critique has immediate practical relevance in the framing of renewable energy policy and project proposals. First, it is important for purposes of deflating the anti-EPA and anti-environment rhetoric that is a significant political barrier to progress for cleaner energy. Affirmative lawmaking in support of renewable energy is lagging at the federal level as political polarization impedes policy innovation that could, and should, rest on common ground.[177]

Second, it undercuts questions about whether current regulatory reforms targeting power plants are going too far and concerns about costs overburdening fossil energy. Whatever validity there may be in specific critiques of the EPA's recently finalized and

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174. Defending America's Affordable Energy and Jobs Act, H.R. 750, 112th Cong. § 4(a)(1) (2011).

175. *Id.* § 4(a)(6).

176. *See, e.g.*, Energy Tax Prevention Act of 2011, H.R. 910, 112th Cong. § 2(330)(b) (2011) (prohibiting EPA from regulating greenhouse gases); Protect America's Energy and Manufacturing Jobs Act of 2011, H.R. 199, 112th Cong. § 2(a) (2011) (suspending EPA's regulatory action "with respect to any stationary source permitting requirement or any requirement under section 111 of [the CAA] relating to carbon dioxide or methane"); Free Industry Act, H.R. 97, 112th Cong. § 2 (2011) (amending the CAA "to provide that greenhouse gases are not subject to the Act").

177. This possibility of common ground is evident in a number of extra-governmental partnerships. *See, e.g.*, Llewellyn Wells, *Unlikely Partners: RMI and Duke Work Together to Create a New Energy Future*, SOLUTIONS J., Fall 2009, at 20 (describing the carbon-footprint reduction consulting relationship between Duke Energy and the Rocky Mountain Institute); Scott Streater, *Energy Group and Environmentalists Form Partnership*, E&E PUBL'G. (July 16, 2012), http://www.eenews.net/eenewspm/2012/07/16/archive/5?terms=Energy+Group+and+Environmentalists+Form+Partnership (describing Memorandum of Agreement between American Fuel and Petrochemical Manufacturers and Wildlife Habitat Council committing to work on projects that advance common goals).

proposed rules, such critiques must be contextualized by the longstanding and thoroughgoing structural advantages that fossil energy enjoys relative to renewable alternatives.

Third, it underscores the importance and legitimacy of crafting and sustaining policies that support renewables' cost competitiveness in three areas: within existing legal frameworks where possible; through reform of existing law that is fashioned for a pre-renewables energy sector where feasible; and through *sui generis* rules where necessary. Electricity regulation needs fundamental reform to reflect changing political and consumer expectations of the energy system, but no one doubts that such reform will require fierce and enduring political will.[178] Existing environmental law, as the EPA's recent rulemaking shows, can achieve more environmental protection and more cost internalization than it has to date. Its role, therefore, remains critical, both for the changes it has compelled within the energy sector and for how it may force cleaner use of fossil energy. Yet at a time when some of the key questions for energy policy are as basic as what resources, and in what proportions, should be used to power the nation, the sharp limits of environmental law's contribution to those questions is also evident. Given this dual role, and the present political vulnerability of environmental law and environmental goals, there is a strong argument for avoiding dramatic reform of what might be considered "minor political miracles."[179]

The limitations and continuing importance of environmental law, the challenge of thoroughgoing reform in electricity regulation, and renewables' unique benefits and structural disadvantage relative to fossil energy, all combine to justify sustained policy support and *sui generis* rules specific to renewable energy. This assertion brings the Article full circle, to affirmative lawmaking and to the primary barriers to renewable energy: cost effectiveness and lack of sustained policies. There is no shortage of good ideas or policy models[180]—rather, the public debate at this point is less centered on instrument choice than on whether to pursue concerted mitigation at the federal level at

178. *See, e.g.*, TOMAIN, *supra* note 8; Rossi, *supra* note 45, at 427 ("Congress cannot successfully address climate change through the adoption of regulatory mandates or piecemeal approaches that fail to confront basic economic incentives in the electric power industry."); Tomain, *supra* note 69, at 940 (proposing thoroughgoing reform proposal for electricity regulation to "green the grid").

179. Doremus, *supra* note 26, at 53.

180. *See, e.g.*, David M. Dreisen, *An Environmental Competition Statute*, 2 SAN DIEGO J. CLIMATE & ENERGY L. 199, 206 (2010) (suggesting an environmental competition statute to replicate the risk and reward of innovators in a traditional competitive market); Eisen, *Urban Solar*, *supra* note 53, at 59 (arguing for a new structure tailored to achieve rooftop solar proliferation).

all. The shaky political will to adopt and sustain renewable energy policy is driven in large part by perceptions of cost—perceptions which environmental law has powerfully, if often unintentionally, reinforced. Recognizing the depth of fossil energy's advantage provides a foundation for sustained and robust renewable energy policy, even if it is best grafted over outmoded aspects of existing regimes.

CONCLUSION

Environmental law's image as "radical intruder" is one that, somewhat ironically, both its supporters and detractors cathect. Yet, whether the image represents environmental law at its best or worst, it is neither accurate nor useful at this moment of energy transition. If, as Richard Lazarus has put it, law "expresses a tentative equilibrium struck between competing values and priorities at a moment in time," the priorities of this moment beg expression.[181] Fossil energy dominance remains insulated by law that was crafted for a pre-renewables and pre–climate change "equilibrium." Viewed critically, and with priority given to more rapid renewable energy development, environmental law reinforces renewable energy's cost barriers through structural and specific deference to traditional resources, even as regulatory reform tightens controls on electricity generation from fossil fuels.

181. LAZARUS, *supra* note 86, at 113.