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FEDERALISM AND THE RISE OF RENEWABLE ENERGY: PRESERVING STATE AND LOCAL VOICES IN THE GREEN ENERGY REVOLUTION

Daniel A. Lyons†

The rise of renewable energy has disrupted the traditional regulatory structure governing electricity. Unlike traditional fossil fuel power plants, wind and solar facilities are geographically constrained: they exist where the wind blows and the sun shines. Large-scale renewable energy is more likely to flow interstate, from resource-rich prairie and Southwestern states to energy-hungry population centers elsewhere. The difficulties of coordinating interstate electricity policies have led some to call for greater preemption of the states' traditional duties as chief regulators of the electricity industry. But while preemption would eliminate some state-level roadblocks to interstate cooperation, it would sacrifice many of the benefits of local knowledge and experimentation in a diverse and innovative new marketplace.

This paper examines the benefits of a cooperative federalism approach to electricity regulation. The challenges facing renewable energy are regional in scope, and there is value in preserving state and local voices in policymaking decisions. It examines three aspects of the renewable energy debate—siting generation facilities, building transmission lines, and adopting demand-side renewable energy standards—and, for each, explores governance structures that would promote greater regional cooperation without sacrificing the benefits of decentralized government.

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INTRODUCTION

America is in the midst of a quiet electricity revolution. Spurred by federal policies promoting energy diversity[1] and state initiatives to decrease reliance on fossil fuels,[2] companies have begun investing significantly in renewable electricity generation. From 2000 to 2012, wind power capacity in the United States increased twenty-five fold to over 60,000 megawatts,[3] enough to power more than fourteen million homes.[4] Solar electricity capacity has quadrupled in the past four years alone, reaching the 10,000 megawatt milestone in 2013.[5] America currently generates approximately thirteen percent of its total electricity from renewable sources,[6] and the Department of

1. *See, e.g.*, Public Utility Regulatory Policies Act of 1978, Pub. L. No. 95-617, 92 Stat. 3119 (codified at 16 U.S.C. § 2601 (2012)) (requiring utilities to interconnect with non-utility-owned electricity generation facilities); Energy Policy Act of 1992, Pub. L. No. 102-486, 106 Stat. 2776 (codified at 42 U.S.C. § 13201 (2012)) (establishing renewable energy production tax credit and incentive payments for new renewable electricity sold on the wholesale market).

2. As discussed in greater depth below, thirty-nine states and the District of Columbia have adopted some form of a renewable portfolio standard (RPS), which requires utilities to purchase a certain percentage of their electricity from renewable sources or to offset a portion of their fossil-fuel-based electricity through renewable energy credits (REC). *See infra* Part I.C. The Department of Energy tracks state renewable portfolio requirements. *See Rules, Regulations, & Policies for Renewable Energy*, DATABASE FOR STATE INCENTIVES FOR RENEWABLES & EFFICIENCY, http://www.dsireusa.org/summarytables/rrpre.cfm (last visited Feb. 21, 2014) (providing "a snapshot of government and utility rules, regulations and policies that promote renewables in the United States").

3. U.S. Dep't of Energy, *Installed Wind Capacity*, ENERGY.GOV, http://www.windpoweringamerica.gov/wind_installed_capacity.asp (last visited Feb. 21, 2014) (noting that installed wind capacity was 2,472 megawatts as of December 31, 1999, and 60,005 megawatts as of December 31, 2012).

4. *See* Jason P. Brown, *The Cycles of Wind Power Development*, MAIN STREET ECONOMIST, no. 3, 2013, at 1, 1, *available at* http://www.kansascityfed.org/publicat/mse/MSE_0313.pdf ("By the end of 2012, estimated total capacity was about 60,000 MW, enough to power between 14 million and 24 million homes annually.").

5. *US Reaches Milestone of 10 Gigawatt Solar Photovoltaic Capacity*, SOLARBUZZ (July 9, 2013), http://www.solarbuzz.com/news/recent-findings/us-reaches-milestone-10-gigawatt-solar-photovoltaic-capacity-according-npd-sola ("Solar PV installations in the US have seen significant growth since the start of 2010; 83% of the 10 GW were completed within the past 14 quarters.").

6. *See* U.S. ENERGY INFO. ADMIN., ELECTRIC POWER MONTHLY WITH DATA FOR NOVEMBER 2013 12 (2014), [hereinafter DATA FOR NOVEMBER 2013] (showing summary statistics for net electricity generation from January through October 2013, which exhibit

Energy expects that share to grow.[7] It estimates that one-third of all new capacity built in the next quarter-century will be from renewable sources.[8]

Renewable energy differs from more traditional electricity sources in several important ways. Perhaps most obviously, renewable energy generates less carbon dioxide and air pollutants than traditional coal or natural gas-fired power plants, which makes it an attractive alternative for environmentalists.[9] And fuel costs are negligible: while traditional electricity often depends on fossil fuels whose prices vary in the market, wind and sunshine are free. But those fuel sources are intermittent. Renewable facilities produce energy only when the wind

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"hydroelectric conventional" and "renewable sources excluding hydroelectric" totals that make up 12.94% of the United States' total electricity generation).

7. *See* U.S. ENERGY INFO. ADMIN., ANNUAL ENERGY OUTLOOK 2013 6 (2013), *available at* http://www.eia.gov/forecasts/aeo/pdf/0383(2013).pdf. The report models six potential cases for a renewable share of the 2040 generation market, which range from a low of fourteen percent to a high of thirty-one percent. The base case projection of sixteen percent assumes that generation will grow as technology matures and costs decline, which make them more economical in later years of generation. Falling natural gas prices can negatively impact renewable generation, as it will lead companies to substitute natural gas-fired generation instead (driving the fourteen percent scenario). *Id.* at 5. Alternatively, a carbon tax will likely increase the share of generation from renewable sources, as it will raise the cost of fossil fuel generation (leading to estimates between twenty-three and thirty-one percent share for renewable energy, depending on the magnitude of the carbon tax). *Id.* Note that these figures include hydroelectric power as a renewable resource.

8. *Id.* at 72. Interestingly, although hydroelectric power comprises a significant portion of today's renewable energy, capacity growth in this sector is expected to be negligible. Almost all new renewable construction is expected to be solar, wind, and, to a lesser extent, biomass or geothermal energy. *Id.* at 74. As discussed in greater depth in Part II, the discrepancy between significant growth in renewable capacity and lesser growth in renewable share of total electricity generation stems from the fact that renewable resources typically have a lower capacity factor than traditional energy sources. Wind and solar power operate intermittently, so they do not generate maximum electricity for as long a period of time as traditional coal or gas-fired generators. *See, e.g.*, Bob Bellemare, *What is a Megawatt?*, COMMODITIES NOW (Mar. 2010), http://www.commodities-now.com/reports/power-and-energy/2136-what-is-a-megawatt.html. (noting that coal plants operate at a capacity of sixty percent or higher while wind sites and solar generators operate at a capacity of forty percent or less).

9. *See* David B. Spence, *Regulation, Climate Change, and the Electric Grid*, 3 SAN DIEGO J. CLIMATE & ENERGY L. 267, 270 (2012) (noting that the decrease in GHG emissions associated with wind and solar energy sources "may represent an environmental improvement").

blows or the sun shines, which poses challenges for grid regulators. And significantly, renewable electricity must be generated where its fuel is found. Unlike fossil fuel or nuclear power plants, which can be located virtually anywhere in the country, wind turbines can only be built in windy locations and large-scale solar projects are most feasible in hot, arid environments. Renewable energy thus requires significant infrastructure investment to bring electricity from generators to consumers.

Though renewable energy will not displace fossil fuels as American's primary electricity source anytime soon, its growth threatens the stability of the traditional regulatory model governing electricity. Like many New Deal–era administrative statutes, the Federal Power Act divided regulatory authority neatly between the federal government, which regulates interstate electricity sales, and state regulators, which regulate intrastate activity.[10] Historically this division favored state regulators, as electricity was primarily an intrastate industry: vertically integrated utilities built power plants near population centers then constructed transmission lines to carry electricity to the local community and distribution networks to deliver power to consumers.[11] Most utilities operated within a state-granted intrastate service area and were overseen primarily by state public utility commissions.[12]

But the deregulation of electricity generation, and the rise of renewable energy in particular, have threatened the states' primacy. Improvements in transmission technology and federal policies promoting independent (non-utility-owned) power production have created a competitive wholesale power market allowing for more interstate electricity sales.[13] In the renewable power sector, a significant portion of electricity is likely to flow interstate. Renewable energy potential is highest in the Midwest and southwestern states, where wind and sunshine are abundant. But it is likely to be consumed by load centers several hundred miles away.[14] The existing

10. *See* Ari Peskoe, Note, *A Challenge for Federalism: Achieving National Goals in the Electricity Industry*, 18 MO. ENVTL. L & POL'Y REV. 209, 220–21 (2011) (discussing the addition of federal regulatory authority meant to supplement present state regulation).

11. *See id.* at 217 (noting that early on "the electricity industry was vertically integrated with a single company producing, transmitting and distributing electricity to end users").

12. *See id.* at 212–16 (discussing regulation in the early 20th century by state public utility commissions); RICHARD J. PIERCE JR. & ERNEST GELLHORN, REGULATED INDUSTRIES IN A NUTSHELL 364 (4th ed. 1999).

13. *See infra* Part I.B.

14. *See* Ronald H. Rosenberg, *Making Renewable Energy a Reality—Finding Ways to Site Wind Power Facilities*, 32 WM. & MARY EVNTL. L. & POL'Y REV. 635, 666 (2008) (explaining that successful wind sites are

transmission network is insufficient to transport large quantities of renewable electricity to load centers, or to manage the variability created by intermittent renewable generation. And many states eager to promote "clean energy" will lack the ability to do so without cooperation from neighbors whose geography is more amenable to renewable generation.

With some states poised to become net exporters of renewable energy, and others net importers, some policymakers have questioned whether states should continue to serve as chief regulators of the electricity industry. Since 1978, Congress and the Federal Energy Regulatory Commission (FERC) have taken numerous steps to increase federal regulation of the electricity market, some of which have proven more successful than others. Citing the interstate nature of renewable energy markets, the national benefits of reduced fossil fuel consumption, and state and local barriers that inhibit renewables growth, more voices are calling for the federal government to displace the states and assume the primary role over the electricity industry.

But these calls for federal preemption overlook the ongoing interests of state and local governments in shaping the renewable energy sector. Many key policy questions facing the renewable power sector—where to build new renewable generation facilities, how to modify and extend the transmission network, and how to calibrate the appropriate fuel mix between renewable power and more traditional electricity sources—are *regional* in scope. While there is unquestionably a federal interest in preventing parochial state interests from jeopardizing broader regional benefits, there is a concomitant state interest in leveraging local knowledge and identifying instances where regional diversity makes a uniform federal policy inappropriate or inefficient. Especially in an industry as dynamic as electricity generation, it is important to preserve space for experimentation and innovation that could be crowded out by broad federal mandates.

This paper explores the ongoing role that state and local officials should play in the renewable energy sector. The dual federalism approach embodied by the Federal Power Act offers a false dichotomy between state and federal regulation. Cooperative federalism provides the potential for greater dialogue between state and local officials, and allows for more regional experimentation within broad federal confines. Cooperative federalism has been instrumental in helping policymakers manage transitions in many other regulated industries, and those insights can help inform regulation of the increasingly dynamic and complex electricity industry. While a complete overview of the electricity industry is beyond the scope of this article, the

typically located in remote places such as the Upper Midwest and often "great distances from the closest population source").

discussion focuses on three key policy issues implicated by renewable energy: siting renewable generation facilities, managing and expanding the transmission grid, and determining appropriate renewables demand. For each issue, the article applies federalism principles to identify the key interests involved and explores structures that would promote regional cooperation where necessary without sacrificing the benefits of decentralized government.

I. ELECTRICITY REGULATION AND THE RISE OF RENEWABLE GENERATION

A. The Traditional Regulated Utility Model

Analysts typically separate the American electricity industry into four segments: fuel, power generation, transmission, and distribution.[15] Within the generation segment, most of America's power plants run on fossil fuels. Two-thirds of all electricity generated in the United States in 2012 came from either coal or natural gas–fired power plants.[16] Nuclear power accounted for another nineteen percent, while renewable energy made up twelve percent of America's electricity in 2012 and has gained share slightly in 2013.[17] Once the electricity is generated, it travels over high-voltage transmission lines to a utility substation, where transformers convert the power to low-voltage electricity and distribution lines deliver it to customers.[18]

Traditionally, state public utility commissions have regulated the vast majority of this industry. As Richard Pierce and Ernest Gellhorn explain, "[u]ntil 1978, virtually all electricity service was provided on a fully bundled basis by one of hundreds of integrated firms. The

15. *See, e.g.*, Alexandra B. Klass & Elizabeth J. Wilson, *Interstate Transmission Challenges for Renewable Energy: A Federalism Mismatch*, 65 VAND. L. REV. 1801, 1805 (2012).

16. *See Electricity Explained: Electricity in the United States*, U.S. ENERGY INFO. ADMIN., http://www.eia.gov/energyexplained/index.cfm?page=electricity_in_the_united_states#tab2 (last updated Apr. 10, 2013) (noting thirty-seven percent of total electricity generation from coal, and thirty percent from natural gas).

17. *Id.* Hydroelectric power comprised seven percent of total electricity generation in 2012, with five percent from other renewable resources including wind, solar, and biomass energy. *Id.* Additional installation of wind and solar energy in 2013 accounts for the year-over-year growth in the renewables sector. *See* DATA FOR NOVEMBER 2013, *supra* note 6, at tbl.1.1.

18. Klass & Wilson, *supra* note 15, at 1805–06. Transmission lines include lines carrying power at 115 kilovolts and above. By comparison, standard distribution lines deliver energy at 34.5 kilovolts or less. REGULATORY ASSISTANCE PROJECT, ELECTRICITY REGULATION IN THE US: A GUIDE 65 (2011), *available at* http://www.raponline.org/document/download/id/645.

integrated utility generated its own electricity, transmitted that electricity across its high voltage lines, and distributed the electricity to all customers in its service territory."[19]

Typically, a utility received a certificate of public convenience and necessity from state regulators, which granted it the exclusive legal right to provide electric service within a territory. State regulators oversaw most aspects of the utility's operations, including facilities construction, rate regulation, and customer service.

The vertical integration of intrastate utility operations was not an accident; rather, it was a deliberate choice by policymakers to tame what economists considered a natural monopoly industry. Like other infrastructure industries, electricity providers must incur substantial fixed (and sunk) costs to bring electricity into a service area. But once the infrastructure is in place, the marginal cost of extending service to any given customer is trivial. This means that the average cost per customer falls with each additional customer added to the utility's grid. As a result, regulators quickly determined that customers were better served by a single utility that built one grid and spread the costs across the entire population, rather than multiple utilities that built unnecessarily duplicative infrastructures at higher per-customer costs.[20] In 1907, Wisconsin passed the first state public utility law,[21] which represented a grand bargain between the utility and the state.[22] In Wisconsin and states that followed, each investor-owned utility was chartered as the exclusive provider of electricity within a given service area, which insulated the utility from potentially destructive competition and reduced the financial risk of building electricity infrastructure. In exchange, utilities were obligated to provide reliable service throughout the service area on nondiscriminatory terms and were subject to rate regulation that guaranteed a reasonable rate of return without abusing their monopoly status.[23] By 1920, almost every

19. PIERCE & GELLHORN, *supra* note 12, at 364.

20. Very early in the history of the electricity industry, some cities encouraged competition among electricity providers. *See, e.g.*, Peskoe, *supra* note 10, at 212–13 (discussing early efforts to promote electricity competition in Chicago). But these experiments typically ended in consolidation, which left customers effectively with one choice for electricity while wasting substantial capital on duplicative infrastructure that proved ultimately to be unnecessary. *See* Gregg A. Jarrell, *The Demand for State Regulation of the Electric Utility Industry*, 21 J.L. & ECON. 269, 274 (1978).

21. Peskoe, *supra* note 10, at 212.

22. Electricity regulation began at the municipal level, but municipal franchises were widely seen as corrupt, and even honest city regulators were no match for a well-organized utility. *See id.* at 213.

23. *See id.* at 213–14 (noting that rates were to be based on a fair valuation of property); Spence, *supra* note 9, at 274–75 (noting that in return for

state had a similar law governing the electricity industry. And when utilities threatened to outgrow their state regulators, the Public Utility Holding Company Act of 1935[24] limited the corporate structure of public utilities in a fashion that effectively confined most utilities to a single state.[25]

The federal government played a much smaller role in electricity regulation. The Federal Water Power Act of 1920[26] created a Federal Power Commission, which built and operated hydroelectric dams on navigable waters, a traditionally federal resource.[27] After the Supreme Court ruled that states could not regulate electricity sales across state lines,[28] Congress in 1935 passed the Federal Power Act,[29] which gave the Federal Power Commission authority over interstate electricity transmission and interstate wholesale power sales.[30] The language of the Federal Power Act seemed broad, granting the Commission wide-ranging authority to enforce "just and reasonable rates" on interstate power and to remedy "unduly discriminatory or preferential" practices.[31] But Congress explained that the statute was meant merely to fill the gap exposed by the Court's decision. The Act explicitly stated that the Commission's authority would "extend only to those matters which are not subject to regulation by the States."[32]

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their status as a monopoly, utilities "were obligated to provide reliable service on a nondiscriminatory basis").

24. Public Utility Holding Company Act, ch. 687, 49 Stat. 803 (1935) (codified at 15 U.S.C. § 79 (2000)) (repealed 2005).

25. Peskoe, *supra* note 10, at 218–19.

26. Federal Water Power Act, ch. 285, 41 Stat. 1063 (1920) (codified at 16 U.S.C. § 791 (2012)).

27. § 4(d), 41 Stat. at 1065.

28. Rhode Island Pub. Util. Comm'n v. Attleboro Steam & Elec. Co., 273 U.S. 83, 90 (1927). The case involved an agreement in which a Rhode Island electric utility agreed to sell a small portion of its electricity to a Massachusetts electricity utility for resale to customers in that state. *Id.* at 84. The Rhode Island utility later sought to increase the rate under the contract due to increasing generation costs. *Id.* at 85. The Rhode Island Public Utility Commission approved the rate increase, but the Massachusetts utility successfully argued in court that the Commission's order was an unconstitutional direct burden on interstate commerce. *Id.* at 90.

29. Federal Power Act, ch. 687, 49 Stat. 847 (1935) (codified at 16 U.S.C. § 824 (2012)).

30. § 201(b), 49 Stat. at 847–48.

31. §§ 205–06, 49 Stat. at 851–52.

32. § 201(a), 49 Stat. at 847. This savings clause was typical in New Deal–era statutes that allocated authority between the federal government and the states. For example, the Communications Act of 1934 explicitly provided that "nothing in this chapter shall be construed

The Federal Power Act thus created a clear division of authority over electricity issues between the federal government and the states. The Federal Power Commission oversaw interstate electricity sales.[33] But because federal securities laws largely prohibited electricity utilities from serving end-user customers in more than one state, the Commission's responsibility was generally limited to the occasional interstate sale of surplus power between utilities. The state public utility commissions served as the primary guardians of the public interest. In the words of one commentator, state public utility commissions served as the "primary administrators of the 'regulatory compact' between utilities, customers, and investors."[34]

B. Federal Deregulation of the Generation Market and the Birth of Renewable Energy

The decline of the traditional regulatory model, and the rise of renewable energy, both have their origins in the Public Utility Regulatory Policies Act of 1978,[35] commonly known as "PURPA." Passed as a reaction to the 1970s energy crisis, PURPA sought to diversify America's electric power industry and improve reliability by encouraging non-utility companies to generate their own electricity for consumption and sale.[36] PURPA provided special rights for small

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to apply or to give the [Federal Communications] Commission jurisdiction with respect to . . . charges, classifications, practices, services, facilities, or regulations for or in connection with intrastate communication service." Pub. L. No. 73-416, 48 Stat. 1065 (codified at 47 U.S.C. § 152(b) (2012)). States lobbied to include these savings provisions to avoid federal agencies from using their power over interstate activity to reach intrastate activities that had an effect on interstate commerce, as the Interstate Commerce Commission had successfully done in the Shreveport Rate Case. *See* Houston, E. & W. Tex. Ry. Co. v. United States, 234 U.S. 342, 351 (1914) (holding that the federal government could exert power over intrastate carriers); Daniel A. Lyons, *Technology Convergence and Federalism: Who Should Control the Future of Telecommunications Regulation*?, 43 U. MICH. J.L. REFORM 383, 386–90 (2010) (discussing state attempts to limit the scope of intrastate federal regulation).

33. The New Deal established several federal agencies that boosted federal electricity generation, such as the Rural Electrification Administration and the Tennessee Valley Authority. Peskoe, *supra* note 10, at 222. By 1950, the federal government generated twelve percent of all electricity in the United States. In addition, the Atomic Energy Act of 1954 gave the Atomic Energy Commission authority to license nuclear power plants, in conjunction with state officials. And the Clean Air Act permitted the Environmental Protection Agency to regulate air pollution from power plants. *Id.*

34. *Id.* at 222.

35. Pub. L. No. 95-617, 92 Stat. 3117 (codified at 16 U.S.C. § 2601 (2012)).

36. §§ 2, 210, 92 Stat. at 3119, 3144.

power production facilities that generated electricity from renewable resources and cogeneration facilities that produced electricity in tandem with another form of thermal energy. Dubbed "qualifying facilities," these entities had the right under PURPA to sell their surplus electricity at preferential rates to their electrical utilities.[37] PURPA also gave the Commission, now renamed the Federal Energy Regulatory Commission, authority to order an electrical utility to connect qualifying facilities to the utility's transmission system, so the facility could sell its surplus electricity elsewhere.[38]

PURPA was a prominent part of a larger movement in the 1970s to stimulate competition in markets traditionally considered natural monopolies. Within the electricity sector, PURPA built upon the Supreme Court's 1973 decision in *Otter Tail Power Co. v. United States*,[39] which upheld an antitrust claim against a utility that refused to allow an independent electricity producer use of its transmission lines to sell electricity to a customer within the utility's service area.[40] *Otter Tail* suggested that antitrust law may prohibit state-granted monopolies from wielding market power in ways that inhibit the development of competition. In the telecommunications industry, which similarly consisted of state-granted local monopolies that provided telephone service at just and reasonable rates, independent upstarts like MCI and Sprint sued the Bell telephone monopoly, alleging that Bell used its control over local telephone networks to thwart competition for long-distance calls.[41] The resulting antitrust investigation resulted in the landmark 1984 consent decree that broke up the Bell system and ultimately led to a competitive telephone industry.[42]

PURPA helped jumpstart the development of an independent renewable electricity industry in the 1980s. From 1980 to 1989, 1100

37. § 210(c), 92 Stat. at 3144–45 (stating that the rates "shall be just and reasonable" and "shall not discriminate against the qualifying cogenerators").

38. § 202, 92 Stat. at 3135.

39. 410 U.S. 366 (1973).

40. *Id.* at 377. The customer in question was a municipal utility that provided power to the city but lay completely within the defendant's service area and thus was dependent on the defendant's transmission network to receive any power the municipality did not generate itself. *Id.* at 371.

41. MCI Commc'ns Corp. v. AT&T Co., 708 F.2d 1081 (7th Cir. 1983). MCI's complaint included counts of "monopolization, attempt to monopolize, and conspiracy to monopolize—all under section 2 of the Sherman Act—and conspiracy in restraint of trade—under section 1 of the Sherman Act." *Id.* at 1092.

42. United States v. AT&T Co., 552 F. Supp. 131, 226 (D.D.C. 1982). The decree was entered in 1982 and took effect in 1984.

megawatts of wind capacity were added to the grid, compared to only 17 megawatts in the 1970s.[43] Geothermal energy (which uses the Earth's natural heat to generate electricity) saw 2135 megawatts installed in the 1980s, compared to 550 megawatts in the 1970s.[44] Wood-fueled power experienced additions of 1523 megawatts in the 1980s, compared to 212 megawatts in the 1970s.[45] Solar and other renewable generation grew as well. While renewable generation was still a small portion of total installed capacity in 1989, it had gained a toehold and was the fastest-growing segment of the generation market. Notably, most of this growth occurred in only a handful of states.[46] PURPA allowed state regulators to oversee the terms of sales agreements between qualifying facilities and traditional utilities, and some states, most notably California, interpreted this mandate more aggressively than others.[47]

The growth of independent electricity generators created significant pressure for regulators to mandate nondiscriminatory access to utility-owned transmission networks.[48] Although independent power generators were slowly bringing competition to the wholesale electricity market, many thought this competition was retarded by the utilities' continued monopoly over the transmission segment. Vertically integrated utilities had little incentive to provide transmission facilities to independent generators who competed against the utility's own electricity generation facilities. Without transmission, independent generators' opportunities to sell electricity were limited. FERC regulators agreed: although the Commission lacked authority under PURPA to order open access outright, throughout the 1980s it used its merger approval authority opportunistically to attach conditions requiring post-merger entities to provide transmission services to independent electricity generators.[49]

The Energy Policy Act of 1992[50] expanded access to the transmission grid. The Act granted FERC greater authority to require

43. *See* Peskoe, *supra* note 10, at 230 (analyzing data reported in U.S. Energy Info. Admin., *2009 Electric Generator Report*, EIA.GOV, http://www.eia.doe.gov/cneaf/electricity/page/eia860.html (follow 2009 "ZIP" hyperlink) (last visited Feb. 21, 2014)).

44. *Id.*

45. *Id.*

46. *Id.* at 231.

47. *Id.*

48. Spence, *supra* note 9, at 276.

49. *See* Joseph T. Kelliher, *Pushing the Envelope: Development of Federal Electric Transmission Access Policy*, 42 AM. U. L. REV. 543, 553 n.43, 606 (1992) (discussing FERC's indirect use of its merger authority).

50. Pub. L. No. 102-486, 106 Stat. 2776 (codified at 42 U.S.C. § 13201 (2012)).

utilities to provide transmission services to independent electricity producers (an arrangement known as "wheeling").[51] But this authority was incomplete: FERC could only order wheeling of specific utilities upon the request of an electricity generator, and only upon a finding that wheeling would serve the public interest.[52] The 1992 Act also made it easier for independent electricity generators to enter the market and introduced tax credits for construction of certain renewable resources.[53]

Ultimately, FERC imposed an open access requirement on the entire transmission system, not because of a new grant of authority from Congress, but by reinterpreting its original statutory mandate. As noted above, section 205 of the Federal Power Act requires utilities to sell interstate power and transmission at "just and reasonable rates" and refrain from "undue prejudice or disadvantage."[54] Section 206 allows the Commission to remedy "unduly discriminatory or preferential" practices.[55] Drawing upon this statutory language, the Commission issued Order 888 in 1996, which requires all public utilities that transmit electricity in interstate commerce to file nondiscriminatory open access transmission tariffs with the Commission.[56] Under Order 888, independent producers of renewable energy could now purchase transmission services from utilities at the same rate the utility charged itself, to sell its electricity to a wider audience of potential customers.

C. State Growth in Demand for Renewable Energy

As federal policy was making it easier to supply renewable electricity to the market, state renewable portfolio standards stimulated demand for the product. Iowa adopted the nation's first renewable portfolio standard in 1983, when the state passed an Alternative Energy Production law requiring its two investor-owned utilities to contract for a combined total of 105 megawatts of

51. § 721, 106 Stat. at 2915. PURPA had given FERC limited authority to order wheeling by a recalcitrant utility, but because of the conditions Congress placed on that authority, FERC never exercised it. *See supra* note 32 and accompanying text.

52. § 721, 106 Stat. at 2915 (requiring certain rates and conditions for issuing an order for a wholesale transmission service).

53. *Id.* (granting certain benefits to entities that control and deliver electric energy to consumers).

54. 16 U.S.C. § 824d(a), (b) (2012).

55. § 824e(a).

56. Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities; Recovery of Stranded Costs by Public Utilities and Transmitting Utilities, 61 Fed. Reg. 21,540 (Apr. 21, 1996) (to be codified at 18 C.F.R. pts. 35, 385).

generation from renewable energy resources,[57] an amount equal to a mere two percent of the state's overall energy consumption.[58] Since then, thirty-nine states and the District of Columbia have adopted renewable portfolio standards, alternative energy portfolios, or voluntary goals to encourage growth in renewable energy generation.[59]

State renewable portfolio standards (RPS) typically require a specified percentage of annual electricity sales to be generated from renewable resources. The percentage varies significantly from state to state. For example, Minnesota requires that twenty-five percent of its total electricity consumption come from renewable sources by 2025.[60] California has been even more aggressive, mandating twenty-five percent by 2016 and thirty-three percent by 2020.[61] At the other end of the spectrum, North Carolina mandates only 12.5 percent by 2021.[62] Virginia has targeted fifteen percent by 2025, but its goal is merely voluntary.[63]

The definition of "renewable energy" also varies among states. Every state gives credit for electricity generated from wind, photovoltaic solar, biomass, and methane, and all but one include thermal solar generation.[64] But only twenty-nine states count geothermal energy toward the total, and only twenty-three include ocean and tidal energy.[65] States are also divided regarding whether to consider large hydroelectric power as part of their overall goal. While hydroelectric generation is emission-free, some argue that large hydroelectric dams have other deleterious effects on the environment

57. Thomas P. Lyon & Haitao Yin, *Why Do States Adopt Renewable Portfolio Standards?: An Empirical Investigation*, 31 ENERGY J. 133, 134 (2010).

58. Christine Real de Azua, *The Future of Wind Energy*, 14 TUL. ENVTL. L.J. 485, 501 (2001).

59. *See* DATABASE FOR ST. INCENTIVES FOR RENEWABLES & EFFICIENCY, *supra* note 2.

60. MINN. STAT. ANN. § 216B.1691(2a) (West Supp. 2014).

61. CAL. PUB. UTIL. CODE § 399.30(c)(2) (West Supp. 2014).

62. *See Renewable Portfolio Standard Policies,* DATABASE FOR ST. INCENTIVES FOR RENEWABLES & EFFICIENCY (Mar. 2013), http://www.dsireusa.org/documents/summarymaps/RPS_map.pdf (giving an overview of the renewable portfolio standard policies of states and territories).

63. *See Virginia: Incentives/Policies for Renewables & Efficiency,* DATABASE FOR ST. INCENTIVES FOR RENEWABLES & EFFICIENCY (Mar. 2013), http://www.dsireusa.org/incentives/incentive.cfm? Incentive_Code=VA10R.

64. Lincoln L. Davies, *Power Forward: The Argument for a National RPS*, 42 CONN. L. REV. 1339, 1376 (2010).

65. *Id.*

and therefore should not be encouraged through RPS standards.[66] States also vary regarding which electricity utilities are subject to the requirement. Some states place renewable portfolio restrictions only on investor-owned utilities, while others include alternative electricity distributors such as municipal utilities and rural electric cooperatives.[67] These limitations affect the overall impact of the renewable portfolio standard: Illinois, for example, has a somewhat aggressive goal of twenty-five percent by 2025,[68] but the standard only applies to one-third of total electricity sales in the state.[69]

In some, but not all states, utilities subject to the standard may meet the law's requirements by purchasing renewable energy credits (RECs) from out-of-state renewable suppliers. RECs are tradable certificates meant to represent the environmental benefit of renewable energy. A renewable energy generator that participates in REC markets may issue a REC for each megawatt of renewable energy produced, which virtually decouples the environmental benefit from the electricity itself. Utilities needing to meet resource portfolio standards in REC-friendly states may purchase RECs in lieu of generating or purchasing renewable electricity. Once the REC is unbundled, the renewable energy generator remains free to sell the underlying megawatt in the electricity market, but cannot market it as a renewable resource. Because some states produce renewable energy more efficiently than others, one state's renewable portfolio standard can lead a utility to purchase RECs from renewable generators in other states and thus fund the development of renewable resources throughout a region.[70]

II. CHALLENGES TO RENEWABLE ENERGY DEVELOPMENT

As states increase their demand for renewable electricity, policymakers and industry participants will inevitably come under greater pressure to expand the renewable power sector. To do so, they must confront several obstacles that inhibit the growth of renewable energy. These obstacles include local opposition to new electricity generation facilities, lack of transmission infrastructure to carry

66. *See id.* at 1377–78 (noting, for example, that Arizona counts only projects with 10 megawatts of capacity or less, while California counts up to 30 megawatts if the project does not impact "instream beneficial use" and Maine counts projects up to 100 megawatts).

67. Klass & Wilson, *supra* note 15, at 1810 (observing differing renewable portfolio restrictions between states and municipalities).

68. 20 ILL. COMP. STAT. ANN. 3855/I–75 (West Supp. 2013).

69. Klass & Wilson, *supra* note 15, at 1810.

70. *See id.* at 1810–11 (noting how the RECs in neighboring states can drive the "need for additional regional transmission projects").

renewable electricity to load centers, and grid instability fostered by the intermittent nature of many renewable resources.

A. Local Opposition to Renewable Generation Facilities

Companies seeking to construct new renewable power generating facilities often find their efforts thwarted by local opposition. This phenomenon is particularly prominent when considering wind turbines, which often attract significant community criticism. Although some communities welcome the investment, jobs, and lease payments that wind farms bring to a local community, these projects often face significant hurdles and fierce opposition. Ashira Ostrow quotes one energy siting consultant as remarking that "wind energy is fast becoming 'the mother of all NIMBY wars.'"[71]

Often the local residents' concerns are primarily aesthetic. Many wind farms are located in mostly rural areas. In many cases, the proposed wind turbines, which can measure up to twenty-five stories tall, would dominate a landscape that contains no structures more imposing than a grain silo.[72] Community activists resent the intrusion on what would otherwise be open rural, agricultural landscapes. Others focus on the fact that spoiling scenic views (such as the ocean views of Nantucket Sound off Cape Cod) can impact local property values and tourist revenue.[73]

Perhaps surprisingly, environmental groups sometimes oppose wind farms, because of the potential risk of bird strikes and other wildlife harm. The Center for Biological Diversity unsuccessfully sued the owners of wind turbines in the Altamont Pass Wind Resource Area, one of California's oldest and largest wind farms, alleging the wind farms killed birds in violation of the public trust doctrine.[74] More recently, Duke Energy Corporation pleaded guilty and paid a $1 million fine in late 2013 to settle a Justice Department suit alleging

71. Ashira Pelman Ostrow, *Process Preemption in Federal Siting Regimes*, 48 HARV. J. ON LEGIS. 289, 336 (2011) (citations omitted). NIMBY, short for "Not In My Backyard," is a common term used to define local opposition to a proposed facility.

72. TOM STANTON, PUT IT THERE! WIND ENERGY & WIND-PARK SITING AND ZONING BEST PRACTICES AND GUIDANCE FOR STATES 1 (2012), *available at* http://www.naruc.org/Publications/FINAL%20FINAL%20NRRI_Wind_Siting_Jan12-03.pdf.

73. *See* Patricia E. Salkin & Ashira Pelman Ostrow, *Cooperative Federalism and Wind: A New Framework for Achieving Sustainability*, 37 HOFSTRA L. REV. 1049, 1074–75 (2009) (observing the concern of some residents that installing wind farms will have a negative effect on tourism and property value).

74. Ctr. for Biological Diversity, Inc. v. FPL Grp., Inc., 83 Cal. Rptr. 3d 588, 588 (Cal. Ct. App. 2008).

that a Wyoming wind farm killed several eagles and other birds protected by the Migratory Bird Treaty Act.[75]

Other concerns sound in nuisance or public health and safety. Residents sometimes complain about the potential noise of wind turbines, although Patricia Salkin and Ashira Ostrow note that noise levels, like bird strikes, have decreased in recent years with industry experience and technological advancements.[76] In Falmouth, Massachusetts, several residents allege in a lawsuit that local turbines have given them "wind turbine syndrome," a controversial diagnosis marked by headaches, vertigo, and insomnia.[77] Other complaints include safety threats from falling blades or ice thrown from blades, construction-related damage to nearby roads, and interference with microwaves and telecommunications signals.[78]

Of course, community opposition is common to many new electricity generation projects, not just wind. Anti-nuclear activists fought a high-profile battle against nuclear power in the 1970s and 1980s,[79] and again following the 2011 Fukushima disaster.[80] Similarly, traditional fossil fuel plants are often subject to challenge because of the air pollution they generate. PJM Interconnection, which manages portions of the electricity grid in the northeastern United States, noted that "increasingly contentious local opposition to siting" of new generation facilities made it unlikely that new generation capacity

75. *See* Dina Capiello, *Guilty Plea in Bird Deaths at Wind Farms a First*, ASSOCIATED PRESS, Nov. 23, 2013, *available at* http://news.yahoo.com/guilty-plea-bird-deaths-wind-farms-first-081651963--finance.html (detailing the conditions under which Duke Energy Corp. pleaded guilty).

76. *See* Salkin & Ostrow, *supra* note 73, at 1072–73 (claiming that advancing technology has reduced wildlife deaths to an "anomaly" and has positively affected noise levels) (citation omitted).

77. *See* Susan Donaldson James, *"Wind Turbine Syndrome" Blamed for Mysterious Symptoms in Cape Cod Town*, ABC NEWS, Oct. 21, 2013, http://abcnews.go.com/Health/wind-turbine-syndrome-blamed-mysterious-symptoms-cape-cod/story?id=20591168 (describing the conditions under which the Hobarts filed a nuisance lawsuit).

78. Salkin & Ostrow, *supra* note 73, at 1075.

79. *See, e.g.*, Tanya Mortensen, *An Unattainable Wedge: Four Limiting Effects on the Expansion of Nuclear Power*, 5 ENVTL. & ENERGY L. & POL'Y J. 60, 79–80 (2010) (following Chernobyl and TMI, protesters forced the shutdown of numerous nuclear plants).

80. *See "We Want to Fight for This Cause": Nuclear Refugees from Fukushima Join Anti-Nuke Protests,* DEMOCRACY NOW!, Jan. 17, 2014, http://www.democracynow.org/2014/1/17/we_want_to_fight_for_this (providing a rough transcript of the interviewed accounts of those joining the Fukushima Refugees protests).

would be added in the Washington, D.C. metropolitan area to meet future demand increases.[81]

But wind siting disputes are different than fossil fuel siting disputes, in three key ways. First, the nature of the costs and the benefits of the project are different, which can affect how the community weighs approval of a project. The primary costs of fossil fuel plants (largely air pollution and increased carbon emissions) are regional or national in scope. But the benefit, electrical power, is often enjoyed by the local community, because many fossil fuel plants are located near the load centers that they serve. By comparison, the primary costs of wind power (aesthetics, nuisances, and safety risks) are borne locally, while the primary benefit (reduced emissions) is enjoyed by the nation as a whole. Therefore when assessing a wind project, a community is more likely to recognize most of the harm but only reap a portion of the benefit—and this imbalance is exacerbated when the proposed wind farm is in an area of low population density and would therefore be exporting much of its generation. At the margin, it is possible that communities will reject wind farms even if they produce a net benefit to society as a whole.

Second, new fossil fuel capacity tends to be sited in different environments than new wind capacity. As Salkin and Ostrow note, fossil fuel plants are often built in industrial areas, where the landscape is already afflicted by progress and additional aesthetic harm is a difference of degree rather than kind.[82] But wind projects are often located in undeveloped places, which can generate more opposition. Robert Kahn observes that "[a] project which fits into a preexisting industrial mold is not likely to be accused of ruining the landscape. A renewable energy project is not as lucky. Americans put a high value on wilderness and open space. Sparks fly when lands viewed as public viewscapes . . . appear threatened."[83]

Finally, renewable projects are more likely than fossil fuel projects to be site-specific. Fossil fuels are portable. If a local jurisdiction denies a particular project, the company can seek out another site in the vicinity that may serve as an adequate substitute. But wind and solar generation depend on site-specific criteria. Wind turbines can only be located where the wind blows with regularity and strength sufficient to produce cost-efficient electricity. And utility-scale solar projects must be built in hot, arid climates were solar power is strongest and weather is least likely to interfere with operations. The

81. PJM INTERCONNECTION, LLC, 2007 REGIONAL TRANSMISSION EXPANSION PLAN 66 (2008), *available at* http://pjm.com/~/media/documents/reports/2007-rtep/2007-section3a.ashx.

82. Salkin & Ostrow, *supra* note 73, at 1071.

83. Robert D. Kahn, *Siting Struggles: The Unique Challenge of Permitting Renewable Energy Power Plants*, ELECTRICITY J., Mar. 2000, at 21, 23.

denial of a permit to build on a particular site is often not a delay until an alternative site is found, but instead a more permanent denial of an opportunity to add to the nation's renewable energy capacity.

B. Transmission Challenges

The development of new renewable energy is somewhat of a "chicken and egg" problem: power companies are reluctant to develop new renewable generation facilities without adequate transmission capacity to bring the electricity to load centers.[84] But transmission companies are unlikely to build lines to new areas without a guarantee that there will be sufficient generation in the area to make the lines cost-effective.[85]

The need for additional transmission capacity is one of the most significant stumbling blocks to further development of renewable energy. As Alexandra Klass and Elizabeth Wilson note, the "first generation" of installed wind was often located in areas served by existing transmission capacity.[86] With this low-hanging fruit gone, the "second generation" of renewable energy will likely require new transmission lines to connect these energy sources to the power grid.

Of course, renewable generation is inextricably intertwined with transmission investment. And as noted above, because renewable electricity is location-constrained, new generation cannot simply be built in a convenient location close to existing transmission lines and load centers. Some of the greatest wind and solar potential lies in the prairie states and the southwestern United States, respectively. But these are remote areas that are not sufficiently connected to the existing transmission grid. Transmission line upgrades can be both slow and expensive: the estimated cost of upgrading the Western Interconnection grid to integrate just currently planned renewable projects within the grid's footprint is $200 billion.[87]

Constructing new transmission lines is also difficult because of the fragmented regulatory authority over the transmission system. As noted above, FERC regulates interstate power sales and oversees operation of the existing transmission system. But while the agency has assumed for itself a role in planning future transmission capacity

84. STAN MARK KAPLAN, CONG. RESEARCH SERV., R40511, ELECTRIC POWER TRANSMISSION: BACKGROUND AND POLICY ISSUES 19 (2009); Jennifer E. Gardner & Ronald L. Lehr, *Enabling the Widespread Adoption of Wind Energy in the Western United States: The Case for Transmission, Operations and Market Reforms*, 31 J. ENERGY & NAT. RES. L. 237, 249 (2013).

85. *See* Gardner & Lehr, *supra* note 84, at 249 ("[T]ransmission is often not built because it is not clear that renewable energy projects will actually be developed to use the transmission.").

86. Klass & Wilson, *supra* note 15, at 1811.

87. *Id.* at 1812.

projects, it lacks general authority to approve the siting of new transmission lines.[88] That authority remains with state and local officials. To construct an interstate transmission line from a resource-rich Midwestern state to a coastal load center, the applicant must pay for, and receive, regulatory approval from each state along the line's path, and often various local authorities as well.[89] These applications are costly to prepare and can subject even the most obviously beneficial projects to lengthy regulatory delays. And since each state along the line has an effective veto right, any one of them can effectively eliminate the line or extract rents as a condition of approval.

Like generation siting authority, the placement of transmission line siting authority at the state or local level raises the possibility that parochial opposition will delay or eliminate a proposal that is a net benefit to society. Like wind turbines, the installation of new high-voltage power lines often draws substantial local opposition, both in populated areas and more rural environments.[90] Power lines are aesthetically displeasing, especially when poised to cross recreational land, scenic trails, or parks.[91] They also interfere with activities like crop dusting and can be dangerous when downed by storms or accidents. Given these local costs, many state and local officials are unwilling to approve a transmission project that does not directly benefit that area, even if there is a clear regional or national benefit from installing the line.[92]

One sees the parochial nature of such decisions in the saga surrounding California Edison's proposed 230-mile transmission line from California to the Palo Verde Nuclear Generating Station in Arizona in 2005. Although the line would be funded entirely by California ratepayers, and the California Public Utilities Commission approved the California portion of the line,[93] the Arizona Corporation

88. *Id.* at 1815. The Energy Policy Act of 2005 gave FERC limited backstop authority to approve interstate transmission lines under limited circumstances, but the agency has been unable to exercise that authority. *See infra* Part III.A.

89. *See* Jim Rossi, *The Trojan Horse of Electric Power Transmission Line Siting Authority*, 39 ENVTL. L. 1015, 1018–33 (2009) (outlining the various problems associated with erecting interstate transmission lines).

90. James A. Holtkamp & Mark A. Davidson, *Transmission Siting in the Western United States: Getting Green Electrons to Market*, 46 IDAHO L. REV. 379, 381 (2010) (discussing the "NIMBY syndrome" as related to electric transmission lines).

91. *Id.*

92. *Id.*

93. S. Cal. Edison Co., 07-01-040 2007 WL 951285, at *2, *52 (Cal. P.U.C. Jan. 25, 2007), *available at* http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/64017.pdf.

Commission rejected the line.[94] Ostensibly, Arizona rejected the line because of environmental concerns. But in an accompanying press release, one commissioner stated, "[i]t comes down to this: California wants to drop a 230-mile extension cord into Arizona at a time when Arizona is the fastest growing state in the nation."[95] Another explained, "I don't want Arizona to become an energy farm for California. This project, if we approved it, would use our land, our air and our water to provide electricity to California."[96] Importantly, the Supreme Court long ago ruled that the Commerce Clause prohibited one state from hoarding its electrical power for its own residents.[97] Yet Arizona used its transmission siting authority to accomplish precisely this goal.

As Ashley Brown and Jim Rossi have explored at length, several states' siting laws also act as barriers to transmission construction.[98] Many state public utility commissions must certify that new construction is in the "public interest," which requires them to balance the benefits and the costs of the new line, but only with focus on in-state residents.[99] This standard, a relic of the era of vertically integrated intrastate utility operations, can be the death knell of transmission projects that are beneficial to the country as a whole but a net negative to residents within a particular state that the line must traverse. In other states, entities that are not classified as in-state utilities holding a certificate of public convenience and necessity may be ineligible to build a transmission line, or may not qualify to use eminent domain like a utility would.[100]

The dearth of recent transmission construction projects testifies to the difficulties under the existing model. Alexandra Klass notes that although demand for electricity rose twenty-five percent from 1990 until 2009, construction of new transmission lines fell by thirty

94. S. Cal. Edison Co., 69638 2007 WL 2126365, at *1 (Ariz. Corp. Comm'n June 6, 2007), *available at* http://images.edocket.azcc.gov/ docketpdf/ 0000073735.pdf.

95. Press Release, Ariz. Corp. Comm'n, Regulators Reject "Extension Cord for Cal.": Comm'rs Reject Palo Verde to Devers II Power Line 1 (May 30, 2007), *available at* http://www.azcc.gov/divisions/administration/ news/Devers_II_Vote.pdf (quoting Commissioner Kris Mayes).

96. *Id.* at 2 (quoting Commissioner Bill Mundell); *see also* Rossi, *supra* note 89, at 1022.

97. New England Power Co. v. New Hampshire, 455 U.S. 331 (1982).

98. *See, e.g.*, Rossi, *supra* note 89; 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 (2010).

99. Brown & Rossi, *supra* note 98, at 706–07.

100. *Id.* at 720.

percent.[101] Klass further notes that "[b]etween 2000 and 2008, the United States added only 668 total miles of interstate transmission lines."[102] New transmission construction is particularly important for renewable energy, whose best sources lie largely in sparsely populated areas without sufficient transmission capacity to carry the electricity to the existing grid. This results, says Klass, in "new renewable generation sources waiting for years to connect to the transmission grid in many regions of the country."[103]

While there are many reasons for this phenomenon, the American Society of Civil Engineers echoes the views of many by citing "[o]verly stringent permitting requirements, lawsuits, and other regulatory issues" as the primary culprits.[104] One finds support for this assertion in the high incidence of new construction that takes advantage of various loopholes to avoid state-by-state siting approval. For example, several currently planned interstate transmission construction projects will occur largely on federal land, particularly those designed to bring more renewable energy to the grid. These include SunZia, a proposed 500-mile line to bring wind and solar energy across the southwestern United States, and the Zephyr Project, a proposed 950-mile line from eastern Wyoming to the Southwest, both of which seek to put significant portions of the line on land managed by the federal Bureau of Land Management.[105] The federal government has authority to permit construction on federal land, which bypasses potentially more cumbersome state procedures. In addition, a number of new projects are so-called "merchant lines," which are privately owned and financed by nonutilities. Because the merchant-line owners are not subject to Public Utilities Commission jurisdiction, they can sometimes sidestep Commission "public interest" review. SunZia and Zephyr are both merchant-line projects, as is the recently completed Cross-Sound Cable from Connecticut to Long Island, New York.[106]

Cost allocation is also a significant challenge for new transmission generation. Traditionally, state public utility commissions factor transmission costs into the retail rate base for utility customers, on

101. Alexandra B. Klass, *Takings and Transmission*, 91 N.C. L. REV. 1079, 1084 (2013). This mismatch stemmed in part from conscious efforts by utilities to use their transmission capacity more efficiently. This means more lines run closer to full capacity, which reduces system redundancy and therefore stability.

102. *Id.* at 1085.

103. *Id.* at 1116.

104. *Id.* at 1086 (citing AM. SOC'Y CIVIL ENG'RS, 2009 REPORT CARD FOR AMERICA'S INFRASTRUCTURE 136 (2009), http://www. infrastructure reportcard.org/2009/sites/default/files/RC2009_full_ report.pdf).

105. Klass & Wilson, *supra* note 15, at 1826–27.

106. Klass, *supra* note 101, at 1122.

the theory that transmission costs are part of the costs of providing service to those customers.[107] Of course, not all of a utility's transmission capacity serves its retail customers; some is sold to other utilities through wheeling arrangements. Ratemakers generally adjust for this by granting retail customers a credit for wheeling and other revenues that the utility receives from transmission activities. But as Rossi notes, this leaves the retail customers bearing the residual risk of transmission costs—risk that would be better divided among the utility's various transmission customers.[108] At the margin, this can lead state regulators to deny approval of transmission projects that impose significant residual risk on consumers who do not benefit from the project. And even where costs are allocated across the line owner's transmission customers, significant disputes arise about which entities should bear which costs, which can hamstring complex, expensive interstate transmission projects.

C. Grid Stability Challenges

Renewable generation also endangers the stability of the electricity grid's ongoing operations. Because electricity is not easily stored, electricity supply must constantly match electricity demand. At any given time, the amount of energy that generators dispatch to an electricity grid must match the amount that consumers are taking off the grid. Otherwise blackouts may result.[109] In the days of vertically integrated monopolies, the utility performed this load management function internally, bringing on additional generation as needed to meet demand and managing fluctuations in the electricity supply.[110] Today, many utilities source their electricity from generators in wholesale markets, through long-term power contracts coupled with instantaneous spot markets to fill momentary demand variations.

Renewable energy exacerbates the already-challenging task of grid management because renewable energy tends to be intermittent rather than constant and is often difficult to predict. Unlike fossil fuel or nuclear generators, which can be activated or idled on planned schedules, wind turbines generate electricity only when the wind blows, and the power produced varies as wind speeds change. Similarly, solar panels generate more electricity when the sun is shining and skies are not overcast.[111] And unfortunately, nature does

107. Brown & Rossi, *supra* note 98, at 727.

108. *Id.*

109. *See* Spence, *supra* note 9, at 273–74 ("If [generation and consumption] loads are not balanced, the system will fail, causing blackouts . . . .").

110. *Id.* at 274–75.

111. *See* DAVID J. HURLBUT, NAT'L RENEWABLE ENERGY LAB., COLORADO'S PROSPECTS FOR INTERSTATE COMMERCE IN RENEWABLE

not always accede to meet peak demand, nor can excess energy be stored away for use during high-demand periods. Generally, grid operators seek to dispatch electricity to the grid in "ascending order of marginal cost."[112] Because the marginal costs of renewable generation is nearly zero, it is dispatched first. But anytime intermittent, unpredictable sources of renewable energy are dispatched to the system, overall grid stability suffers because the electricity is subject to reduction or interruption without notice.

To meet this challenge, grid operators must maintain reliable backup reserves that can ramp up quickly to fill gaps in demand.[113] Fossil fuel generators such as natural gas or coal can meet this need most efficiently, but their use negatively impacts the environmental benefits of renewable generation. Even in a backup role, natural gas and coal reactors must remain "spinning," burning fuel and producing emissions, to reduce the lag time from dispatch to delivery of backup electricity.[114] And if these generators are constantly cycled up and down to fill the gaps created by renewable energy variation, they will operate less efficiently than if they were running at a constant rate. This means they will consume more fuel per megawatt-hour generated and will see greater wear and tear on the power plant.[115] Nuclear power has a significant lag between startup and delivery of electricity to the grid, which reduces its usefulness as a source of backup power. Most other generation sources lack the scale to serve as effective sources of backup generation.

Over time, industry maturity and technological advancement may give grid operators additional tools to address the variability of wind and other intermittent renewable generation. For example, development of energy storage solutions such as pumped hydro (which uses excess electricity capacity during periods of low demand to pump water uphill, which can then be used to generate hydroelectric power during peak times) may provide an alternative to backup generators to fill gaps in energy supply. Diversifying wind production across several different geographic areas within a grid area can reduce the variation in total wind energy delivered to the grid, because momentary losses of generation in one area may be offset by momentary generation increases elsewhere. And better predictive models can give grid operators more insight into variation, allowing

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POWER 16 (2009) (discussing the difficulties wind and solar power create for "routine grid operations").

112. Spence, *supra* note 9, at 288.

113. Klass & Wilson, *supra* note 15, at 1811.

114. Spence, *supra* note 9, at 289

115. *Id.*

them to be better prepared when renewable energy is interrupted.[116] But these potential future innovations do little now to alleviate the pressure that grid operators currently face as greater amounts of renewable energy come online.

D. Demand Side Concerns

Finally, several commentators have found fault with state-driven renewable portfolio standards. Although these critics recognize that state standards have played an important role in stimulating demand for renewable generation, they recognize two problems with state-based renewable energy targets.

First, state standards vary with regard to their renewable targets, which renewable resources count toward those targets, whether tradable REC certificates can satisfy renewable portfolio requirements, and compliance mechanisms. As one commentator put it, "[i]f America's interstate highway system were structured like our renewable energy market, drivers would be forced to change engines, tire pressure, and fuel mixture every time they crossed state lines."[117] A uniform definition would unify the market, allowing for greater economies of scale in renewable energy and reducing the costs and risks of investment in renewable generation.[118]

Second, state-based initiatives create somewhat of a free-rider problem. The environmental benefits of substituting renewable energy for traditional fossil fuels are regional or national in scope. But because renewable energy is more expensive than conventional power, the costs are borne largely by customers in states that have enacted renewable portfolio standards. Those states that have not enacted binding renewable requirements are, in essence, reaping the benefits of renewable energy without shouldering their share of the costs.[119]

III. FEDERAL PREEMPTION OF ELECTRICITY REGULATION AND ITS ALTERNATIVES

A. Federal Governance Through Preemption

Many proponents of renewable energy have looked toward federal preemption as a solution to all or part of these obstacles. Some of these efforts have been successful: for example, the Energy Policy Act

116. Klass & Wilson, *supra* note 15, at 1811.

117. Benjamin K. Sovacool & Christopher Cooper, *Congress Got it Wrong: The Case for a National Renewable Portfolio Standard and Implications for Policy*, 3 ENVTL. & ENERGY L. & POL'Y J. 85, 92 (2008).

118. *Id.*; *see also* Davies, *supra* note 64, at 1366.

119. Benjamin K. Sovacool & Christopher Cooper, *The Hidden Costs of State Renewable Portfolio Standards (RPS)*, 15 BUFF. ENVTL. L.J. 1, 9–13 (2007).

of 2005[120] gave the federal government limited backstop authority over transmission siting issues,[121] although, as detailed below, legal challenges have precluded the agency from exercising that authority.[122] Other proposed legislation would go further. In 2009, for example, members of Congress introduced at least five different bills that would have granted FERC increased oversight of new transmission line construction projects.[123] Perhaps the most prominent of these was the mammoth American Clean Energy and Security Act of 2009,[124] better known as the Waxman-Markey Bill. While the Waxman-Markey Bill was most famous for its attempt to create a federal cap-and-trade provision for greenhouse gases, other provisions would have expanded federal oversight of transmission decisions, including establishing a FERC-supervised regional transmission planning process and expanding the agency's backstop siting authority.[125] The bill also would have established a federal minimum resource portfolio requirement of six percent of electric power from renewable resources by 2012, rising to twenty percent by 2020.[126] Though the bill passed the House, it was never considered by the Senate.

There is little dispute that the federal government could regulate virtually the entire electricity industry, if it chose to do so. Over thirty years ago, the Supreme Court explained in *Federal Energy Regulatory Commission v. Mississippi*[127] that Congress could have preempted the field of electricity regulation completely and that continued state regulation exists merely because Congress allows it. The deregulation of electricity generation and the growth of renewable energy have only increased the interstate character of the industry in the years since.

Moreover, federal preemption is not an unprecedented solution to coordination problems, particularly in the energy sector. As far back as 1938, the Natural Gas Act[128] granted the Federal Power Commission (now FERC) with exclusive jurisdiction over construction

120. Pub. L. No. 109-58, 119 Stat. 594 (codified in scattered titles of U.S.C.).

121. § 1221.

122. *See infra* text accompanying notes 197–99.

123. *See* Tara Benedetti, *Running Roughshod? Extending Federal Siting Authority over Interstate Electric Transmission Lines*, 47 HARV. J. ON LEGIS. 253, 261–67 (2010) (summarizing legislation).

124. H.R. 2454, 111th Cong. (1st Sess. 2009).

125. H.R. 2454, § 151.

126. H.R. 2454, § 101.

127. 456 U.S. 742, 759 (1982).

128. Pub. L. No. 688, 52 Stat. 821 (1938) (codified at 15 U.S.C. § 717).

of interstate natural gas pipelines and facilities, including siting authority.[129] In 2005, FERC and California clashed over whether that authority extended to liquefied natural gas facilities that lie entirely within a state.[130] At FERC's request, Congress settled the dispute by granting FERC "exclusive authority to approve or deny an application for the siting, construction, expansion, or operation of an LNG terminal."[131]

But the question of whether Congress *could* preempt state electricity regulation is quite different, and far easier, than the question of whether, and to what extent, it *should* do so. The answer to this question turns upon the relative strength of federal actors as regulators vis-à-vis their state counterparts. While federalism scholars have identified several potential justifications for a move toward more centralized regulation,[132] two stand out as potentially applicable to the renewable energy debate: controlling spillover effects and the need for uniformity or harmonization.

In the context of federalism, spillovers occur when a regulator's activities have effects beyond the scope of the regulator's jurisdiction. In economic terms these are known as externalities. As Professor (and former Judge) Michael McConnell explains:

> [e]xternalities present the principal countervailing consideration in favor of centralized government: if the costs of government action are borne by the citizens of State C, but the benefits are shared by the citizens of States D, E, and F, State C will be unwilling to expend the level of resources commensurate with the full social benefit of the action.[133]

129. *See, e.g.*, N. Natural Gas Co. v. Iowa Utils. Bd., 377 F.3d 817, 821 (8th Cir. 2004) (finding that federal regulations and the NGA occupy the field of "extension, operation, and acquisition of natural gas facilities," thereby preempting any state authority to do so).

130. Sound Energy Solutions, 106 FERC ¶ 61,279 (2004) (declaratory order asserting exclusive jurisdiction).

131. Energy Policy Act of 2005, Pub. L. No. 109-58, § 311(c)(2), 119 Stat. 686 (codified at 15 U.S.C. § 717b(e)).

132. *See, e.g.*, Amy L. Stein, *The Tipping Point of Federalism*, 45 CONN. L. REV. 217, 227 (2012) (discussing transboundary issues, the need for uniformity, avoiding a race to the bottom by state regulators, countering NIMBY opposition, and providing public goods that require resource pooling) (citing Robert Glicksman & Richard E. Levy, *A Collective Action Perspective on Ceiling Preemption by Federal Environmental Regulation: The Case of Global Climate Change*, 102 NW. U. L. REV. 579, 594–600 (2008)).

133. Michael W. McConnell, *Federalism: Evaluating the Founders' Design*, 54 U. CHI. L. REV. 1484, 1495 (1987).

To control spillover effects, the policy choice should be vested at a level large enough that decisions reflect the full costs and full benefits of the proposed action.[134]

Preemption also has the benefit of uniformity: it replaces a patchwork of potentially inconsistent or contradictory standards with a single rule and a single government interface. Uniformity reduces the transaction costs of compliance with government mandates, as a company need only approach a single federal authority to seek regulatory action, guidance, or exemption. Uniformity also reduces uncertainty: a company can enter a regional or national market knowing the legal framework that will govern the service throughout the market, with minimal risk that the law will suddenly shift in part, but not all, of the applicable service area.

When viewed through these lenses, one can understand why renewable energy advocates are drawn to preemption-based policy solutions. Expansion of the renewable power sector is an interstate matter. The central challenge is how to generate electricity in resource-rich Midwestern and Southwestern states and bring that electricity to load centers in other parts of the country. State and local officials with veto authority can block specific renewable generation facilities or transmission lines. As noted above, the costs of these facilities are largely local, but the benefits are regional or national in scope.[135] Because the state decision maker is structurally inhibited from considering the full benefits of such facilities, a decentralized scheme makes it possible for parochial interests to block new construction that will be a net benefit to society. Preemption of siting authority would vest final decision making in a national official, whose scope of inquiry is large enough to encompass all of the costs and all of the benefits of a proposed facility.

Preemption would also facilitate greater economies of scale in grid operations. In investing, diversification is often a successful strategy to mitigate risk from a volatile asset. Similarly, one can smooth the disruptions caused by intermittency of wind and solar energy by increasing the area from which the grid may dispatch power. Wind speeds may slow in eastern Colorado, but if they pick up in Wyoming or the sun comes out in New Mexico, the gains offset the losses as long as all the assets are tied to the same grid. And if scale alone does not smooth out renewable intermittency, a larger grid area increases the potential alternatives from which to source backup generation assets. Building interstate economies of scale may mean placing grid operations in the hands of a regulator above the state level. This

134. *Id.* at 1494.

135. *See supra* notes 72–74 and accompanying text.

minimizes the likelihood that parochial interests will disrupt those economies of scale and unnecessarily destabilize the system.[136]

Finally, preemption proponents claim that a national resource portfolio standard would provide uniformity and clarity to investors seeking to develop renewable generation. Lincoln Davies argues that by clarifying the rules and reducing uncertainty, a national standard would eliminate potential jurisdictional concerns and "make the renewables market more liquid, transparent, and uniform."[137] It would also increase total renewable electricity demand by eliminating the opportunity for states to free ride on the efforts of their neighbors.[138]

B. The Matching Principle and Regional Governance

On first glance, therefore, federal preemption appears to be an attractive option for overcoming the obstacles to renewable energy development. A federal approach would correct for state actors' disincentives to consider interstate benefits of flowing renewable energy and eliminate free riding by recalcitrant fossil-fuel-friendly states. A uniform, consistent approach would also provide predictability and certainty to key industry players.

But upon closer examination, much of this analysis merely suggests that state and local regulation alone is insufficient to solve the problem of renewable electricity. This does not necessarily imply that a federal solution is better. Traditional preemption analysis and dual federalism regimes like that created under the Federal Power Act often assume a false dichotomy between state and federal officials. The optimal jurisdiction may instead lie somewhere in between.

McConnell warns that while it is "well understood" that externalities warn against placing national decisions in the hands of local officials, "[i]t is less well understood that nationalizing decisions where the impact is primarily local has an equal and opposite effect."[139] Centralized decision makers often lack the ability or inclination to understand how a project will impact a specific local community. This opens the door for one strong local or regional interest to capture the decision-making process and use it to shift

136. *Cf.* Thomas W. Hazlett, *Is Federal Preemption Efficient in Cellular Phone Regulation?*, 56 FED. COMM. L.J. 155 (2003) (discussing the role of preemption in building and preserving national economies of scale for wireless telephone service).

137. Davies, *supra* note 64, at 1366.

138. *See id.* at 1366–67 (discussing the "value of renewable power" across state boundaries).

139. McConnell, *supra* note 133, at 1495.

costs to less politically powerful regions.[140] It is just as problematic to go "too large" in jurisdictional design as it is to go "too small."

Thus when designing a governing scheme, "[t]he unit of decision making must be large enough so that decisions reflect the full costs and benefits, but small enough that destructive competition for the benefits of central government action is minimized."[141] Henry Butler and Jonathan Macey have dubbed this approach "the Matching Principle."[142] The Matching Principle states that, in general, the size of the geographic area affected by a specific decision should determine the appropriate governmental level for regulation.[143] Jonathan Adler and others have used the Matching Principle to diagnose jurisdictional mismatches in environmental policy.[144] The approach is equally useful when examining any question of optimal jurisdiction analysis, including the challenges posed by renewable energy.

Using the Matching Principle, one quickly realizes the error in traditional preemption analysis: for many issues, the relevant geographic area is not national, but regional. Many factors testify to the fact that electricity markets are regional in scope. Perhaps most fundamentally, electricity dissipates as it travels over transmission and distribution lines. This is known as "line loss."[145] Although it can be mitigated by using more expensive, higher-voltage transmission lines or DC transmission lines, line loss places physical limitations on the distance that electricity can travel economically between generators and load centers.

This truth is reflected in the structure of the nation's transmission system. Although policymakers often refer to the nation's "electricity grid," in fact the contiguous United States is divided into three

140. *Id.* at 1496. McConnell cites the use of federal environmental laws to "protect eastern 'dirty' coal from competition from western 'clean' coal[,]" and federal railroad regulation that favored the maintenance of traffic to areas of low population density at the sacrifice of traffic in more urban areas. *Id.* (citing BRUCE A. ACKERMAN & WILLIAM T. HASSLER, CLEAN COAL/DIRTY AIR (1981); S. Ry. v. North Carolina, 376 U.S. 93 (1964)).

141. McConnell, *supra* note 133, at 1494–95.

142. Henry N. Butler & Jonathan R. Macey, *Externalities and the Matching Principle: The Case for Reallocating Environmental Regulatory Authority*, 14 YALE L. & POL'Y REV. 23 (1996).

143. *Id.* at 25.

144. *See id.* at 25–26; Jonathan H. Adler, *Jurisdictional Mismatch in Environmental Federalism*, 14 N.Y.U. ENVTL. L.J. 130 (2005).

145. *See* Richard L. Fanyo, *State Jurisdiction and Retail Wheeling*, *in* THE ELECTRIC INDUSTRY: OPPORTUNITIES AND IMPACTS FOR RESOURCE PRODUCERS, POWER GENERATORS, MARKETERS, AND CONSUMERS pt. 4, at 4–2 (1996).

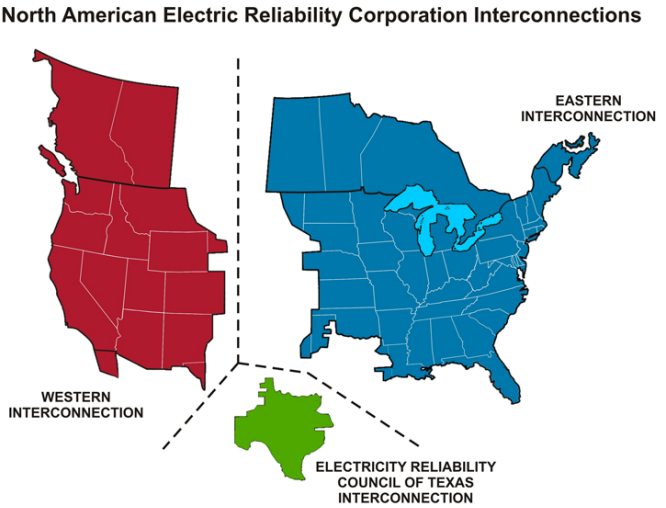
separate grids, known as "interconnections."[146] The Continental Divide roughly separates the Western Interconnection from the much larger Eastern Interconnection, while most of Texas is on a separate Interconnection known as the Electric Reliability Council of Texas, or ERCOT.[147] These Interconnections developed organically over the past century as individual utilities slowly linked their transmission systems together to operate joint power plants or to sell surplus electricity to one another.[148] Within each Interconnection, the AC grid must be precisely synchronized so that all generators rotate at sixty cycles per second. There are only eight low-capacity links, known as DC ties, connecting the Interconnections to one another. In essence, the continental United States is physically divided into three separate electricity grids with limited connections.

146. *See* KAPLAN, *supra* note 84, at 3.

147. *Id.* at 3 fig.2.

148. *Id.* at 3. ERCOT is a purely intrastate transmission system that Texas utilities purposely separated from the rest of the electricity grid in the 1930s to avoid Federal Power Commission jurisdiction. *See* Ron Santini, *Electric Transmission and Distribution Network*, PA. ST. U., https://www.e-education.psu.edu/geog469/node/222 (last visited Feb. 17, 2014).

Figure 1[149]



But even this image gives the impression that regional electricity markets are much larger than they are. Within these three interconnections, approximately 130 different balancing authorities are charged with operating the grid.[150] Each balancing authority is responsible for matching generation to demand within a specific geographic area on a real-time basis.[151] These balancing authorities range in size from single-utility-sized authorities to massive multistate regional transmission organizations. Although some electricity flows between balancing authorities through a process known as "dynamic transfer,"[152] these balancing authorities can be considered a rough proxy for regional electricity markets within which most generation, transmission, and distribution occurs.[153]

149. Santini, *supra* note 148.

150. KAPLAN, *supra* note 83, at 4.

151. *See Glossary of Terms Used in NERC Reliability Standards*, N. AM. ELECTRIC RELIABILITY CORP. 9, http://www.nerc.com/pa/stand/glossary%20of%20terms/glossary_of_terms.pdf (last updated Feb. 4, 2014).

152. *See* Timothy P. Duane & Kiran H. Griffith, *Legal, Technical, and Economic Challenges in Integrating Renewable Power Generation into the Electricity Grid*, 4 SAN DIEGO J. CLIMATE & ENERGY L. 1, 45 (2013).

153. *Cf.* Seth Blumsack, *Measuring the Benefits and Costs of Regional Electric Grid Integration*, 28 ENERGY L.J. 147 (2007) (discussing the development of regional energy markets through transmission coordination).

The Matching Principle thus suggests that many renewable energy challenges are thus best addressed through efforts at creating regional governance. But because regions are not distinct political entities like states or the national government, there is no obvious pre-existing institution in which to vest decision-making authority. The Matching Principle helps identify the appropriate size of the jurisdiction but offers little insight regarding how one might foster greater regional governance.

C. Building Regional Governance Through Cooperative Federalism

There are two primary ways that one might encourage regional governance. The first is a top-down approach, preempting state authority and replacing it with a series of regional institutions designed and overseen by federal authorities. The second is a bottom-up approach, which uses incentives to encourage state and local officials to work together in pursuit of broader regional objectives. The issue of which strategy to pursue depends largely upon a weighing of the benefits of a more centralized governance structure against the potential gains from a more decentralized approach.

Because it is a function of federal preemptive authority, top-down initiatives tend to benefit from the uniformity and consistency of preemptive models. Overall policy is set by the federal regulator and is imposed upon the regional structures, which act essentially as regional subdepartments of the federal government. This model is most appropriate when enforcing policies upon which there is a broad national consensus and where there is little difference among regions in ways that are relevant to carrying out the policy objective. In these situations, regional entities are less like policymakers and more like regional enforcement authorities, determining the best way to carry out the federal government's will within a specific geographic region.

In recent years, cooperative federalism has emerged as an alternative to top-down imposition of federal policies.[154] As its name implies, cooperative federalism involves a shared power arrangement between the federal government and the states. Typically, the federal government sets the basic policy goals of a regulatory scheme, but states rather than federal subordinates are enlisted to carry out the mandate. These states are generally given some latitude in enforcement as long as they stay within the broad confines of the federal guidelines.[155]

Phil Weiser explains "the cooperative federalism regulatory strategy makes sense where the benefits of allowing diversity in federal regulatory programs outweigh the benefits of demanding

154. *See* Stein, *supra* note 132, at 226 (internal quotations omitted).

155. *See* Jonathan H. Adler, *Judicial Federalism and the Future of Environmental Regulation*, 90 IOWA L. REV. 377, 384 (2005).

uniformity in all situations."[156] It thus works well when the federal government has a broad policy that it wishes to pursue, but there is no clear consensus regarding precisely how that policy should be achieved. Cooperative federalism regimes then seek to capture many of the benefits of federalism and decentralized policymaking, while using a light federal touch to make sure state and local experimentation do not disrupt broader national objectives. Weiser and other commentators have identified several related ways in which cooperative federalism promotes policy diversity.

The first is to allow states to tailor the application of the federal policy to local conditions.[157] It is thus helpful in situations where local conditions differ in ways that are relevant to the broader federal scheme. Federal regulators often lack familiarity with the idiosyncrasies of a local area. By co-opting state and local officials who are much closer to the constituents that they serve, cooperative federalism allows policymakers to leverage local knowledge in pursuit of broader national or regional objective.[158]

Second, cooperative federalism fosters competition between states. Within the confines of the federal scheme, different states can experiment with different policy approaches, allowing society to test empirically the results of particular policy choices. Citizens and businesses unsatisfied with a state's approach may "vote with their feet" by relocating to a more hospitable regulatory climate; as jurisdictions tailor their policies to compete for such residents, society arrives at an efficient level of provision of public services.[159] Although competition between states can sometimes result in a destructive race to the bottom, Weiser notes that "at least four decades of economic

156. Philip J. Weiser, *Federal Common Law, Cooperative Federalism, and the Enforcement of the Telecom Act*, 76 N.Y.U. L. REV. 1692, 1698 (2001).

157. *Id.* at 1698–1700.

158. *Id.* at 1699–1700.

159. *See* Charles Tiebout, *A Pure Theory of Local Expenditures*, 64 J. POL. ECON. 416 (1956). Of course, voting with one's feet is expensive. Tiebout's model only really affects those public goods that consumers determine are important enough to relocate. Public education and crime are quintessential examples. It is unclear whether the issues surrounding renewable energy generation are sufficiently important to the average residential consumer as to affect his or her choice of where to live. It may, however, be an important factor for businesses when deciding where to build operations. *See* PAUL E. PETERSON, CITY LIMITS 32–37 (1981) ("[R]esidents can migrate freely from one community to another and, as a consequence, they will calculate the impact of local government decisions in choosing their community of residence."). And of course, competition among states is likely to influence the deployment of renewable energy specifically within a state.

theory and empirical research" supports the notion that competition among states can produce better policy outcomes.[160]

Third, cooperative federalism allows states to experiment with different ways to accomplish a federal objective. As Justice Kennedy aptly summarized, when "considerable disagreement exists about how best to accomplish [a] goal . . . the theory and utility of our federalism are revealed, for the States may perform their role as laboratories for experimentation to devise various solutions where the best solution is far from clear."[161] This allows individual states to test new and innovative policy approaches without risking harm to the country as a whole.[162] From these experiments, states may uncover new and better ways to accomplish federal goals that would have never been discovered had the country been subjected to a comprehensive federal scheme from the beginning.

Finally, cooperative federalism helps preserve some of the accountability that decentralized government provides. A decentralized regime brings decision making closer to the people affected by regulation.[163] Local governments are responsible for a much smaller polity than their federal counterparts, and therefore are in a better position to know and respond to local concerns.[164] This greater responsiveness encourages public participation and accountability, and more broadly may foster the development of social capital that helps make a community greater than the sum of its parts.[165] Of course, this can be a double-edged sword. Many commentators have noted that cooperative federalism can lead to constituent confusion, because the federal government sets the policy objective but state and local officials are the face of that policy to the local community.[166] This was, of course, the primary reason that

160. Weiser, *supra* note 156, at 1700.

161. United States v. Lopez, 514 U.S. 549, 581 (1995) (Kennedy, J., concurring).

162. Weiser, *supra* note 156, at 1702–03.

163. *See* Ernest A. Young, *The Rehnquist Court's Two Federalisms*, 83 TEX. L. REV. 1, 59 (2004).

164. *See id.* (quoting Barry Friedman, *Valuing Federalism*, 82 MINN. L. REV. 317, 395 (1997) ("Officials ought to look their constituents in the eye on the street and see them in the grocery store.")).

165. *See* Jason Mazzone, *The Social Capital Argument for Federalism*, 11 S. CAL. INTERDISC. L.J. 27, 29 (2001) (arguing federalism provides social benefits by promoting relationships that to "allow citizens to overcome collective action barriers and to get things done").

166. *See, e.g.*, Adler, *supra* note 155, at 386. Adler notes that blurring lines of accountability may be one reason why federal policymakers favor cooperative federalism regimes: they allow policymakers to take credit for the benefits of an initiative while shifting the cost of unpopular enforcement to state officials. *Id.*

Montana Sheriff Jay Printz objected to being commandeered to serve as the face of federal gun control efforts.[167]

Together, these rationales support a bottom-up, cooperative federalism approach to achieving regional cooperation for renewable energy. The federal government has recognized a broad policy objective of pursuing more renewable electricity generation in order to reduce carbon emissions, diversify America's energy mix, and reduce its dependence on foreign energy sources.[168] But although it has been around for three decades, the renewable power sector is still relatively young and is just starting to achieve economies of scale that will make it a viable alternative to fossil fuel generation. There is no clear consensus yet regarding which forms of renewable energy are best, how best to bring new generation to market, or what the ideal fuel mix is between renewable energy and more traditional energy sources. Given that there is so little consensus on these important policy questions, the industry is likely to benefit from continued interstate competition and experimentation as policymakers find the best way to develop more renewable energy.

Moreover, different regions have different renewable energy stores available. Prairie states and offshore Atlantic wind farms are likely to pursue wind energy; southwestern states may develop more solar and geothermal energy; southern states are more likely to harness biomass; and so on. A comprehensive renewable energy plan will thus depend on local knowledge of the strengths and weaknesses of several local geographic areas, which argues in favor of a greater role for state and local authorities.

IV. OVERCOMING OBSTACLES TO RENEWABLE ENERGY THROUGH COOPERATIVE FEDERALISM

Thus cooperative federalism provides a mechanism by which state and local officials can, and should, play a significant role in helping develop the future of renewable energy. Although, as noted above, state and local officials can be obstacles to renewable energy development, this stems in part from the fact that renewable development implicates many state and local issues. This section examines specific ways that the federal government can use cooperative federalism to increase state and local officials' sensitivity to broader regional goals and to encourage greater regional cooperation in pursuit of national objectives.

167. Printz v. United States, 521 U.S. 898, 904–05 (1997).

168. *See* Energy Policy Act of 2005, Pub. L. No. 109-58, 19 Stat. 594 (codified in scattered sections of 42 U.S.C.).

A. Siting Renewable Generation Facilities

Like most land use regulations, the siting of specific renewable generation facilities is largely a local issue.[169] The questions of whether, when, and how a company should be permitted to build a wind turbine or photovoltaic solar array in a local community depends significantly upon local information regarding the impact of the access on the surrounding environment. Local officials will know key issues such as the value to the community of scenic vistas that may be affected by construction, and the proximity of the proposed turbine to local population centers and therefore the extent to which its operations would pose a nuisance to the community. Finally, local officials would be in the best position to determine what conditions may be appropriate to abate any potential nuisances, such as limited hours of operation, setbacks, or safety regulations.

It would be a mistake for the federal government to preempt renewable generation siting authority, as it has done with regard to liquefied natural gas terminals. This move may bring new generation to market faster and provide an easy avenue to overcome local opposition, though that is not certain: federal siting authority may be subject to federal statutes such as NEPA, which create additional veto gates that determined opponents could use to slow the federal siting process.[170] But even if it could, this expediency comes at the expense of local knowledge. Federal regulators would be less capable of assessing proposed sites and distinguishing valid from invalid objections to assess the true cost that the project will impose on the local community. As Kenneth Kristl explains, preemption eliminates the political mechanism that keeps local officials attuned to the community's needs: to wit, the political risk of ignoring community opposition and being voted out of office.[171]

But as noted above, purely local siting decisions run the risk of denying projects that are net beneficial to society. A local decision maker will weigh the largely local costs of construction to the community, but may fail to account for the benefit of renewable energy, which is largely regional in scope. Moreover, denial of a renewable generation facility may disrupt economies of scale across the interstate electricity grid, as it reduces a source of renewable

169. Stein, *supra* note 132, at 221.

170. *Cf.* Holtkamp & Davidson, *supra* note 90, at 384–85 (noting that state and local opposition to federal transmission project approvals can delay construction by challenging federal environmental impact statements or by litigating the line until the impact statement expires).

171. Kenneth T. Kristl, *Renewable Energy and Preemption: Lessons from Siting LNG Terminals*, NAT. RESOURCES & ENV'T, Winter 2009, at 58, 60.

power and therefore a chance to smooth intermittent renewable resources through expansion.

One can solve this problem by using cooperative federalism to constrain the local official's discretion and require him or her to examine the project from a more regional scope. Ostrow recommends a "process preemption" approach that leaves primary siting authority in local hands but places explicit procedural and sometimes substantive limits on the local official's authority.[172] This approach is modeled on the provisions in the Telecommunications Act of 1996[173] governing cell tower siting. Prior to the 1996 Act, communities frequently opposed the installation of cell towers, because of aesthetic harm and the fear of electromagnetic radiation. The 1996 Act helped curtail this behavior by reining in the local siting approval process.[174] The Act places numerous procedural requirements on the local authority, including a shot clock requiring a response within a reasonable period of time, a requirement that any decision be in writing and a federal right of action to appeal a denial in federal court if the denial "unreasonably discriminate[s] among providers of functionally equivalent services" or "prohibit[s] or has the effect of prohibiting the provision of personal wireless service."[175] The Act also prohibits local authorities from rejecting cell towers because of the fear of electromagnetic radiation, if the tower is within the parameters set by the agency.

Similarly, the Federal Communications Commission has placed procedural restrictions on municipal authority to license cable systems. The Communications Act of 1934[176] prevents a cable provider from installing or operating a cable system within a city without a license from the local franchising authority (usually a subdivision of the municipal government).[177] This requirement allows

172. Ostrow, *supra* note 71, at 290.

173. Pub. L. No. 104-104, 110 Stat 56 (codified in scattered sections of the U.S.C.).

174. *See* Ostrow, *supra* note 71, at 292–93.

175. 47 U.S.C. § 332(c)(7)(B)–(C) (2012).

176. 47 U.S.C. § 541 (2012)

177. Some states, such as California and Texas, were wary of the potential for municipal abuse of the franchising process and therefore provide an alternative for cable companies to receive statewide franchises. The Communications Act allows the states the flexibility to determine what the local franchising authority should be for a given market. *See generally* Thomas Hazlett, *Cable TV Franchises as Barriers to Video Competition*, 12 VA. J.L. & TECH. 2, 6 (2007) ("Proposed national legislation would substantially restrict a local government's ability to regulate competitive cable operators while several state legislatures are considering issuing statewide cable franchises to phone carriers.").

local entities to monitor the cable company's installation of a network into the public right-of-way, so as to minimize the disruption that this construction would have on municipal operations. But the Commission found that local franchising authorities sometimes abused the franchise process, by delaying or denying new entrants[178] and by attaching conditions that had very little to do with providing cable, such as requiring AT&T to provide free wireless telephone service to city employees or fund construction of a community swimming pool. The Commission found that these abuses of the local licensing process had national consequences by making it harder for telephone companies, which sought to enter the cable market, to build the economies of scale necessary to compete against entrenched cable incumbents. As a result, the Commission enacted rules limiting the local government's ability to abuse the franchising process, including a shot clock for applications, limits on reasons a franchise may be rejected, and restraints on the types and amounts of conditions that a franchising authority can place on approvals.[179]

The federal government can similarly adopt very narrow general guidelines that would limit the potential for abuse of the siting process and force state and local officials to consider the regional benefits of a project. Ostrow recommends a bundle of guidelines that read almost as an Administrative Procedures Act for local siting authority. These include a "shot clock" that requires the local authority to issue a decision within a certain number of days after the application is filed. The guidelines would also require that any decision be supported by substantial evidence contained in a written record and that the decision be subject to judicial review in federal court (which is more likely than state courts to be independent of the parochial interests that would otherwise jeopardize the project).[180] Together, these guidelines help provide some regularity to the process and force the decision maker to justify his or her decision to a neutral magistrate.

In addition to these recommendations, the guidelines might require that the decision maker take into consideration the regional environmental benefits that would be gained from the project. This substantive requirement would effectively force the local decision maker into more of a regional role and correct some of the

178. Because the city received a percentage of cable sales as a franchise tax, it had incentives to preserve an incumbent monopolist's market power and thus maximize its own tax revenue.

179. Implementation of Section 621(a)(1) of the Cable Communications Policy Act of 1984 as amended, 22 FCC Rcd. 5101 (2007). *See generally* Alliance for Cmty. Media v. FCC, 529 F.3d 763 (6th Cir. 2008) (upholding Commission rules against challenge to statutory authority).

180. Ostrow, *supra* note 71, at 330–35.

externalities that would otherwise occur from the fact that renewable energy often displays concentrated costs and dispersed benefits. Furthermore, the guidelines might prohibit certain grounds for denial, such as denying a wind turbine on noise pollution grounds if the turbine is within federal noise limits. Like the electromagnetic limits in cell tower siting cases, this prevents entities from seizing upon spurious excuses to deny an unpopular project or denying the project because of unreasonable cost concerns.

B. Electricity Transmission

1. Grid Stability

The dynamics of the transmission market are quite different than the market for generation. The transmission grid is the interstate highway system of the electricity industry and carries an increasing amount of electricity across state lines, especially renewable energy. As a result, many of the key regulatory questions regarding transmission operations are regional in scope. These questions include: What policies will maximize the likelihood that the total amount of electricity dispatched to the grid at any given time is sufficient to meet aggregate electricity demand? Do we need an independent system operator to manage transmission capacity? How should wholesale power sales be regulated? How should the costs of new transmission lines be allocated among beneficiaries? Regulators' answers to these questions have effects that reach across state lines. When policies promote better grid management, the benefits flow to customers throughout the region. And when grid management fails, the costs are borne by customers across state lines—as they were when the 2003 blackout interrupted electrical power for a long period of time throughout the Eastern Seaboard. Because the challenges of grid management are regional in scope, they are best answered by a more significant regional entity.

Fortunately, the industry has already achieved a significant amount of regional cooperation through bottom-up coordination structures known as Independent System Operators (ISOs) and Regional Transmission Organizations (RTOs). When FERC mandated that utilities offer their transmission lines on a nondiscriminatory basis to independent power generators in 1996, it adopted a series of orders encouraging utilities to band together to form ISOs and RTOs.[181] ISOs and RTOs are separate, nonprofit

181. Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities; Recovery of Stranded Costs by Public Utilities and Transmitting Utilities, 61 Fed. Reg. 21,540 (Apr. 21, 1996) (to be codified at 18 C.F.R. pts. 35, 385); Regional Transmission Organizations, FERC Order 2000, 89 FERC ¶ 61,285 (1999) (to be codified at 18 C.F.R. pt. 35) (promoting the formation of RTOs).

entities charged with managing the transmission system on behalf of its member utilities. Utilities participating in these transmission organizations retain ownership of their transmission lines, but surrender daily operation of those lines to the organization.[182] The ostensible purpose of this requirement is to prevent utilities from using their control of transmission facilities to stifle competition in the generation market. But the organization brings the added benefit of building economies of scale in the transmission market: because the organization controls the flow of electricity over a larger portion of the grid, it can smooth out supply or demand variations over a larger footprint.

Today, there are six independent entities under FERC jurisdiction, each of which manage a portion of the transmission grid: the California ISO, the Midwest ISO, ISO New England, the New York ISO, the PJM Interconnection, and the Southwest Power Pool RTO.[183] ERCOT performs a similar function in Texas, independently of FERC oversight.[184] Notably, not all areas of the country are covered by these entities; many western and southern utilities have resisted turning over the management of their transmission systems to an independent operator and instead remain governed by tariffs filed with the Commission. In western states, however, many of these utilities cooperate on a less formal basis through participation in the Western Electricity Coordinating Council or the Western Area Power Administration.[185]

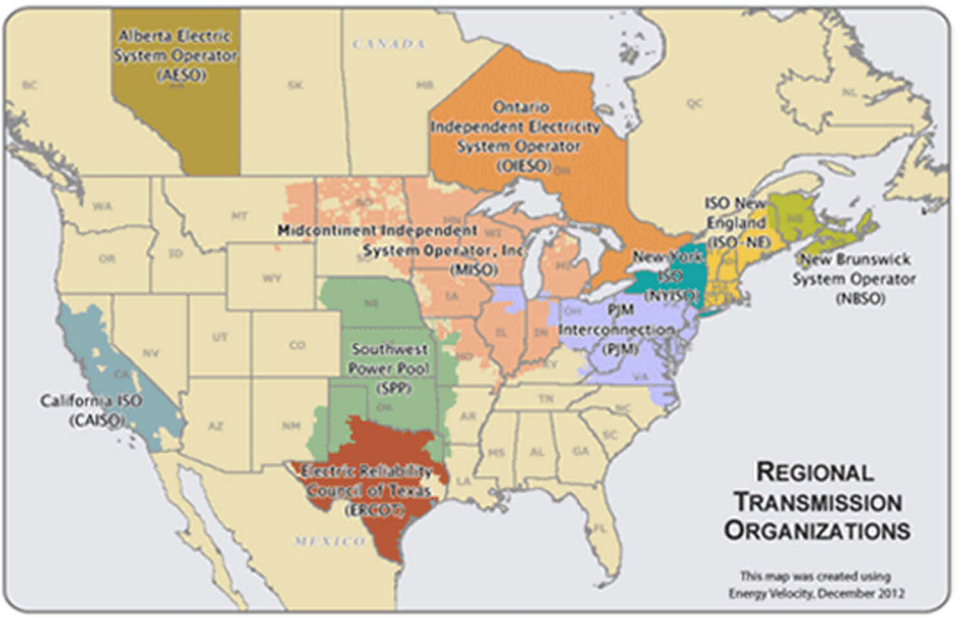
182. KAPLAN, *supra* note 84, at 7.

183. *Id.* at 8.

184. *Id.* at 6.

185. Klass & Wilson, *supra* note 15, at 1848–49.

Figure 2[186]



Although they are non-governmental entities formed by the utilities rather than by state or local government officials, these regional transmission organizations exhibit many of the benefits of cooperative federalism. They are, by definition, bottom-up organizations, formed by voluntary agreements between utilities and therefore operate in a geographic area no larger or smaller than necessary to manage grid stability for its member utilities. Because each organization manages the grid on behalf of its members, its operations leverage local knowledge about transmission capacity, generation capacity, and demand in real-time. This allows each organization to balance supply and demand efficiently.

Moreover, over the past fifteen years ISOs and RTOs have worked with federal and state officials to experiment with different ways of managing the transition to more deregulated wholesale markets. California's energy crisis was an obvious disaster, but its high-profile struggles have overshadowed more successful transitions in other regions, such as PJM.[187] And even the California experiment

186. Federal Energy Regulatory Commission, http://www.ferc.gov/market-oversight/mkt-electric/overview/elec-ovr-rto-map.pdf (last visited Sept. 3, 2014).

187. *See* Richard J. Pierce, Jr., *Completing the Process of Restructuring the Electricity Market*, 40 Wake Forest L. Rev. 451, 468–79 (2005).

yielded valuable lessons for other markets. The decentralized, bottom-up structure of grid operations has helped regulators and industry participants explore many potential market structures within the confines of broad federal mandates.

2. Transmission Line Planning and Siting

Planning and siting future transmission lines to bring renewable energy to market is also best done through a more formal regional structure. Decision makers must identify current pockets of congestion and forecast both demand growth and areas where renewable capacity growth is most likely to occur. With increasing diversification of the generation industry generally and the growth of the renewable sector specifically, an increasing amount of electricity is, and will be, transported between points in different states. Like grid operation, planning and siting requires a regional focus on the wholesale electricity market that state regulators are often unwilling or unable to consider.

Moreover, the planning process for new transmission capacity and the siting of specific transmission lines should work in tandem. As Jim Rossi has explained, states, such as Texas, that have focused on reforming their transmission siting regimes have had the most success in achieving their RPS goals.[188] As part of its 2005 revision to its renewable portfolio standards requirement, Texas designated five areas, mostly in the western part of the state, as "Competitive Renewables Energy Zones" (CREZs) with sufficient potential for large-scale development of renewable energy. The legislation also developed a plan to build new transmission capacity from CREZ areas to bring that new energy into the Texas grid.[189] The Texas Public Utilities Commission engaged in a comprehensive process to assess the CREZ areas, plan and site new lines, and determine how the lines' costs will be allocated to consumers. As a result, Texas achieved its 2025 wind energy target of 10,000 megawatts of renewable energy capacity on the Texas grid fifteen years ahead of schedule.[190]

Outside of Texas, there are many efforts to engage in regional transmission planning. The RTOs have long been a place for member utilities to forecast and plan new capacity. And outside the six

188. Jim Rossi, *The Shaky Political Economy Foundation of a National Renewable Electricity Requirement*, 2011 U. ILL. L. REV. 361, 377 (2011).

189. MARK DREYFUS, TEXAS CREZ POLICY AND TRANSMISSION EXPANSION UPDATE 5 (Dec. 2010), *available at* http://www.austinenergy.com/about%20us/newsroom/Reports/keyAccountsCREZ_TSAR.pdf.

190. *What are the Texas Renewable Energy Targets?*, STATEIMPACT, https://stateimpact.npr.org/texas/tag/texas-renewable-energy-targets/ (last visited Feb. 24, 2014).

ISO/RTO areas, there has been substantial bottom-up regional planning as well, including efforts focused specifically on the need for new transmission capacity for renewable energy. Noteworthy in this respect is the Western Renewable Energy Zones initiative in 2008, a project funded by the Department of Energy but led by the Western Governors' Association to study and plan for future renewable transmission capacity.[191] In 2011 FERC issued Order 1000, which among other initiatives required all utilities to engage in regional transmission planning and ultimately produce a regional transmission plan.[192]

But siting authority remains decoupled from transmission planning and located primarily at the state or local level, which remains a stumbling block to new transmission construction. As noted above, state and local regulators lack incentives to assess the full benefits and costs of many transmission lines, particularly interstate lines. Congress attempted to solve this problem by granting FERC backstop siting authority as part of the Energy Policy Act of 2005.[193] The Act requires the Department of Energy to undertake a triennial study of electric transmission congestion and "designate any geographic area experiencing electric energy transmission capacity constraints or congestion that adversely affects consumers as a national interest electric transmission corridor" (NIETC)[194] Once an area is designated as an NIETC, the Act gives FERC "backstop" siting authority to override state barriers to new transmission construction.[195] To exercise this authority, FERC must determine that: (1) the state does not have authority to approve siting of facilities or to consider the interstate benefits of the project; (2) the utility does not qualify for state approval because it does not serve end-user customers in the state; (3) the state has authority to approve the siting but has withheld approval for more than a year; or (4) the state has approved the project with such conditions as to not significantly reduce interstate transmission congestion or to make the project economically infeasible.[196]

191. *See Western Renewable Energy Zones*, W. GOVERNORS' ASS'N, http://www.westgov.org/rtep/219 (last visited Feb. 24, 2014) (providing an overview of the Western Renewable Energy Zones initiative).

192. Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities, FERC Order 1000, 136 FERC ¶ 61,051 (2011) (to be codified at 18 C.F.R. pt. 35).

193. Pub. L. No. 109-58, § 1221(b), 119 Stat. 947 (2005) (codified at 16 U.S.C. § 824p(a)–(b) (2012)).

194. 16 U.S.C. § 824p(a)(2)

195. § 824p(b).

196. *Id.*

But thus far, courts have largely hamstrung the agencies' efforts to exercise this authority. In 2007, the Department of Energy designated the first two NIETCs under the Act: one in the southwest running from Arizona to California and one in the Mid-Atlantic between New York and Washington, DC.[197] But the Ninth Circuit Court of Appeals invalidated these designations in 2011, in part because the agency failed to adequately consult with the affected states.[198] Meanwhile, FERC promulgated regulations interpreting its siting authority broadly, to include instances in which states deny siting permits. But the Fourth Circuit invalidated this rule, rejecting FERC's argument that a denial constitutes the "with[olding] [of] approval . . . for more than a year."[199] The court explained that the agency's backstop authority extended to delayed or conditional approvals but not to explicit denials of siting applications.

Interestingly, the 2005 Act also authorized three or more states to enter an interstate compact to establish a regional siting agency.[200] To incentivize states to enter such agreements, the Act prohibits FERC generally from exercising its backstop authority to permit a line in a state that is a part of a compact.[201] But perhaps because neither the Department of Energy nor FERC has yet exercised its authority under the Act in a way that has undermined state siting authority, no states have entered into a compact.[202]

Going forward, the solution to the transmission dilemma requires a more successful integration of transmission planning and siting at the regional level. It is difficult for RTOs and other voluntary planning organizations to integrate siting into their portfolio, because as non-state actors they largely lack eminent domain authority. Ideally, this impetus would come from state compacts such as those envisioned in the Energy Policy Act of 2005, which would effectively create bottom-up regional governance structures with the planning and siting authority to plan comprehensive future transmission projects. But as the Act shows, sates are unlikely to do so without some impetus. One solution may be for Congress to grant federal

197. National Electric Transmission Congestion Report, 72 Fed. Reg. 56,992 (Oct. 5, 2007).

198. Cal. Wilderness Coal. v. U.S. Dep't of Energy, 631 F.3d 1072, 1079 (9th Cir. 2011). The Court also found that the department failed to satisfy certain requirements of the National Environmental Policy Act. *Id.* at 1096–106.

199. Piedmont Envtl. Council v. Fed. Energy Regulatory Comm'n, 558 F.3d 304, 310 (4th Cir. 2009).

200. Energy Policy Act of 2005, Pub. L. 109-58, § 1221(i), 119 Stat. 950–51 (codified at 16 U.S.C. §824q(i) (2012)).

201. § 1221(i)(4).

202. Klass & Wilson, *supra* note 15, at 1819–20.

eminent domain to any regional planning organization under Order 1000, but to exempt from this order any state that voluntarily enters into a compact that includes planning and siting. This approach may jumpstart state government initiatives to cooperate in the promotion of future transmission capacity, because a state's failure to do so risks the specter of federally chartered regional planning organizations riding roughshod over local opposition to new transmission capacity.

C. Renewable Portfolio Standards

As detailed at length above, state public utility commissions have largely driven greater demand for renewable energy, primarily through renewable portfolio standards that require utilities to purchase a certain percentage of their electricity for distribution from renewable sources. The Waxman-Markey Bill raised the question whether the federal government should set a national minimum renewable portfolio standard. Although the bill did not pass, the idea of a federal RPS has been repeatedly introduced in Congress[203] and has received significant attention from academics and policymakers.[204]

Advocates cite several reasons to support a federal renewable portfolio standard. Many of these simply mirror arguments made at the state level: renewable energy may reduce air pollution and greenhouse gas emissions, save on long-term energy costs, and increase American energy interdependence.[205] These are arguments to support renewable energy generally, but do not address the specific question of why the federal government is in the best position to do so. Addressing the jurisdictional question more directly, Lincoln Davies asserts that a national standard would make the renewable energy market "more liquid, transparent, and uniform" by setting a single nationwide definition for what counts as a renewable resource.[206] Because the different states have different RPS criteria, investors may be apprehensive about making long-term investments in renewable generation, and those investments they do make could be driven more by state political preferences than the product's "salient economic features."[207] Moreover, a national standard would

203. Davies, *supra* note 64, at 1364–65.

204. *See, e.g.*, *id.* at 1365; Joshua P. Fershee, *Changing Resources, Changing Market: The Impact of a National Renewable Portfolio Standard on the U.S. Energy Industry*, 29 ENERGY L.J. 49 (2008); Rossi, *supra* note 188 (arguing against a national portfolio standard); Mary Ann Ralls, *Congress Got It Right: There's No Need to Mandate Renewable Portfolio Standards*, 27 ENERGY L.J. 451 (2006) (same).

205. Davies, *supra* note 64, at 1370–75.

206. *Id.* at 1366.

207. *Id.*

"eliminate jurisdictional problems" of state standards that give preferential treatment to in-state resources.

In response, Jim Rossi notes that the environmental case for renewable energy is not as clear as proponents suggest.[208] The need to rely on inefficiently running fossil-fuel power plants to back up intermittent renewable generation detracts from the environmental benefits of renewable electricity production.[209] And given the decline in natural gas prices, investments in renewable energy likely replace investments in relatively low-emission natural gas plants, not in dirtier coal power plants. Moreover, Rossi notes that because most states already have RPS standards, the costs of a federal mandate would fall disproportionately on the handful of states that have not already done so.[210] It seems problematic to adopt a federal mandate for which costs fall primarily upon those few whose state-level policy choices reflect opposition to that mandate.

Ultimately, the state's choice whether to adopt an RPS standard is essentially a question whether end-user customers are willing to pay an additional cost for (potentially) cleaner energy. That will remain true as long as renewable energy remains more expensive than fossil fuel energy. The answer to this question depends on precisely how much more the consumer must pay for renewable generation—and that question varies by state. In states like Texas, where wind and solar resources are abundant, the difference between the price of renewable energy and conventional energy is relatively small. By comparison, a state like West Virginia, which has little renewable energy capacity but abundant coal reserves, the price differential is much greater. The decision whether to subject consumers to an RPS surcharge, therefore, turns on local knowledge about market conditions that states, not the federal government, are in the best position to assess.

Moreover, given the relatively immature state of the renewable energy generation market, state-level experimentation with different renewable sources is likely a net benefit to society. Far from being a problem, the lack of uniformity among state RPS qualifications represents Justice Brandeis's "laboratories of democracy" in action.[211] Different state standards are encouraging investors to test a wide range of alternatives. Some renewable resources, such as geothermal or tidal energy, may be uneconomical on a national scale but may prove to be viable in certain areas. A national standard established

208. Rossi, *supra* note 188, at 364–66.

209. *Id.*

210. *Id.* at 366.

211. *See* New State Ice Co. v. Liebmann, 285 U.S. 262, 310–11 (1932) (Brandeis, J., dissenting).

without the benefit of empirical results at the state level may prematurely reject these borderline viable sources of energy. Justice Brandeis's ode to federalism is most famous for its optimistic view of the states, but equally important is his opinion's warning about the risks of premature preemption: "[t]o stay experimentation in things social and economic is a grave responsibility. Denial of the right to experiment may be fraught with serious consequences to the Nation."[212]

One may object that state-level RPS standards underinvest in renewable technology. Assuming that there are environmental benefits to switching to renewable energy, these positive externalities are enjoyed nationwide—which may lead some states to free-ride on the investments of others. But if the federal government decides that reducing greenhouse gas emissions is in the national interest, it has other means of doing so.

For example, the federal government may choose to adopt a carbon tax or a cap-and-trade program similar to that proposed in Waxman-Markey. These initiatives would directly reduce greenhouse gases. They may also indirectly stimulate greater renewable energy production, because they would raise the price of fossil fuel-generated electricity and therefore make renewable electricity relatively less expensive.

Alternatively, the federal government could provide for greater funding for renewable energy research and subsidies for new construction of renewable energy. From PURPA forward, Congress has funded basic research into the feasibility of renewable technologies and provided tax credits and other subsidies for new renewable generation facilities. In 1992 Congress established a renewable energy production tax credit, which gave companies tax credits for each kilowatt hour for electricity produced by wind power.[213] The same act created the Renewable Energy Production Initiative, which gives federal incentive payments for electricity generated and sold in the wholesale market by new qualifying renewable energy sources.[214]

212. *Id.* at 311.

213. 26 U.S.C. § 45 (2006). Although the original Production Tax Credit expired in July 1999, Congress reauthorized the credit numerous times, including in the Energy Policy Act of 2005. *See* Job Creation and Worker Assistance Act, Pub. L. 107-147, § 603, 116 Stat. 21, 59 (2002) (codified at 26 U.S.C. § 45 (2012)); American Jobs Creation Act, Pub. L. 108-357, § 710, 118 Stat. 1418, 1552 (2004) (codified at 26 U.S.C. §45 (2012)); Energy Policy Act of 2005, Pub. L. 109-58, § 202, 119 Stat. 594, 651 (codified at 42 U.S.C. § 13317 (2012)). The fiscal cliff deal at the end of 2012 extended the production tax credit through the end of 2013. American Taxpayer Relief Act of 2012, Pub. L. 112-240, § 407, 126 Stat. 2313, 2340 (2013) (codified at 26 U.S.C. § 45 (2012)).

214. Energy Policy Act of 1992, 42 U.S.C. § 13317 (2012). The REPI is currently scheduled to sunset in October 2016. § 13317(c) (2012).

Congress has also regularly funded research into various renewable energy technologies, including setting aside $1.64 billion toward research and development of renewable energy technologies as part of the 2009 stimulus bill.[215]

As David Spence has noted, "[m]any analysts ascribe [much] of the credit for the growth in renewables to federal tax incentives."[216] They help incentivize initial investment in renewable technologies. Given the significant fixed cost and relatively small marginal cost of most renewable energy production, these initial investment decisions go far toward making renewable energy a more cost-efficient alternative to traditional energy generation. And credits for renewable energy production help reduce the per-megawatt hour price of wholesale electricity—occasionally to the point that wind generators actually paid utilities to take wind electricity, so as to receive the production tax credit.[217] Many have shown that the boom-and-bust cycle of federal production incentives has had a significant impact on overall investment in renewable facilities.[218]

CONCLUSION

State and local officials have played a significant role throughout the electricity industry's history. The deregulation of electricity generation, and the rise of renewable energy as an alternative to traditional fossil fuels, has increased the complexity of the industry. Going forward, a substantial portion of electricity sales are likely to be interstate, particularly given the need to move renewable energy from resource-rich middle America to electricity-hungry load centers on the coasts. For the renewable power sector, states have played a schizophrenic role as both accelerator and brake on industry growth, boosting demand for renewable energy while at the same time blocking the infrastructure that would bring it to market.

Federal preemption is a tempting solution to the obstacles posed by state and local officials. But succumbing to this temptation would sacrifice the valid interests that these officials maintain in renewable energy policy decisions, and fails to acknowledge the risks of vesting decision-making authority at too high a level.

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215. *See* American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, 123 Stat. 116 (codified in scattered sections of the U.S.C.).

216. Spence, *supra* note 9, at 283.

217. *See* CTR. FOR ENERGY ECON., UNIV. OF TEX. AT AUSTIN, LESSONS LEARNED FROM RENEWABLE ENERGY CREDIT (REC) TRADING IN TEXAS 20 (2009), http:// www.beg.utexas.edu/energyecon/transmission_forum/CEE_Texas_RPS_Study.pdf (noting that wind generators, which needed wind power to be dispatched to collect production tax credits, submitted negative bids in certain hours).

218. *See, e.g.*, Spence, *supra* note 9, at 283.

Ultimately, the challenges posed by renewable energy are regional in scope and require decision makers with a regional focus to respond. A bottom-up regional approach to policy questions, vesting authority in state and local actors guided toward regional coordination by federal prodding, is preferable to a top-down regional approach dominated by federal decision makers. Ultimately, a state-centered approach helps preserve the diversity that is a hallmark of our Federalism. In a market as diverse, young, and dynamic as renewable energy, these federalism values can help develop innovative new solutions to policy problems and discover the optimal regulatory scheme, or schemes, to realize renewable energy's full potential.