ARTICLE

PREEMPTING PAROCHIALISM AND PROTECTIONISM IN POWER

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In the twenty-first century, the electric power industry is becoming increasingly regional in geographic scope. Due to the creation of wholesale power markets and the development of renewable energy resources, greater quantities of power flow across state lines today than at any time in the history of the industry. With this growth in the interstate trade in power, expanding the transmission grid can yield significant regional benefits. New transmission lines can enhance system reliability, produce lower and more stable power prices, and improve the environment on a local and global scale. While the benefits of new transmission are broadly shared, the costs of new transmission—both economic and non-economic—tend to be concentrated in the localities through which the lines run.

Despite the potentially large benefits from new transmission interconnections, aggregate transmission investment has stagnated in recent decades, in part, because of state jurisdiction over transmission siting. To facilitate the construction of socially beneficial grid expansions, Congress should preempt state and local authority over the siting and funding of new transmission lines. The Federal Energy Regulatory Commission should be granted exclusive authority over where to site and who pays for new transmission. A federal regulator would approve transmission projects based on a comprehensive examination of their benefits and costs, instead of the parochial assessment often performed today by states. Congress would be acting well within its constitutional authority and would, in fact, be following past legislative enactments in other network industries. Congress must act if the United States is to realize the vision of affordable, reliable, and clean electricity for all Americans.

I. INTRODUCTION

The integration of the world economy has been one of the major international developments of the past thirty years.[1] In addition to the much-heralded reductions in tariffs and quotas,[2] an important precondition for successful economic integration has been the existence of secure international transportation routes necessary to facilitate long-distance trade.[3] The elimination of regulatory trade barriers would not have had much practical effect

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[1] *See* RONALD A. REIS, THE WORLD TRADE ORGANIZATION 30 (2009).

[2] Arvind Panagariya, *Think Again: International Trade*, 139 FOREIGN POL'Y 20 (2003).

[3] *See* Reis, *supra* note 1, at 30. ("With the enormous reductions in the cost of communication and transportation that have taken place in the past 25 years, the barriers to the flow of capital, goods, services, knowledge, and people also have fallen.").

if highways and rail networks were underdeveloped and ocean shipping lanes were plagued by piracy.[4] In other words, it was necessary to overcome both legal and physical impediments to trade—one without the other would have been insufficient.

In the context of American electric power, however, such an incomplete restructuring of the industry has occurred on a national scale. Legal barriers to new entry and competition in the generation sector have been steadily removed. State and federal rules have, furthermore, sought to place renewable energy on an equal economic footing with fossil fuel technologies and encourage entry by clean technologies. As hoped, independent power producers have built significant amounts of new generation capacity—with investment in natural gas generation leading the way in the late 1990s and early 2000s,[5] and wind gaining share in recent years.[6] The transmission grid—the interstate highway system of electric power—has, however, not been adequately expanded and remains largely tied to the old model of geographically-small, electrically-isolated utilities.[7] A regime of long-distance trading of power has thus been superimposed on a fragmented grid. Although regional markets and renewable energy promise significant economic and environmental benefits, they are unlikely to realize their full potential without new transmission capacity.[8]

While there are multiple reasons for underinvestment in new transmission facilities, the near-exclusive jurisdiction states retain over the siting and cost allocation of transmission facilities is a principal cause.[9] The political incentives of state regulators explain why they have been reluctant to permit the construction of transmission facilities that strengthen regional power markets. In contrast to the broadly-shared benefits of increasing transmission capacity like enhanced reliability, decreased energy prices, increased fuel diversity, and reduced air emissions, the costs of new transmission—both economic and non-economic—tend to be concentrated in the localities through which the lines run. State regulators are reluctant to authorize new

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[4] Going back further in history, the construction of the transcontinental railroads helped create a single national market in the politically unified but previously economically fragmented United States. *See* FRANK A. WOLAK, THE BENEFITS OF AN ELECTRON SUPERHIGHWAY 1 (2003).

[5] Ken Costello, *Increasing Dependence on Natural Gas for Electric Generation: Meeting the Challenge*, ELECTRICITY J., June 2004, at 10, 10.

[6] Richard Schmalensee, *Renewable Electricity Generation in the United States*, *in* HARNESSING RENEWABLE ENERGY IN ELECTRIC POWER SYSTEMS: THEORY, PRACTICE, POLICY 209, 211–12 (Boaz Moselle, Jorge Padilla & Richard Schmalensee eds., 2010).

[7] *Id.*

[8] 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, 711–12 (2010).

[9] *See, e.g.*, *id.* at 710; Hoang Dang, Note, *New Power, Few New Lines: A Need for a Federal Solution*, 17 J. LAND USE & ENVTL. L. 327, 338 (2002); Steven L. Eagle, *Securing a Reliable Electricity Grid: A New Era in Transmission Siting Regulation?*, 73 TENN. L. REV. 1, 12–13 (2005); Richard J. Pierce, *Completing the Process of Restructuring the Electricity Market*, 40 WAKE FOREST L. REV. 451, 483 (2005).

transmission lines that increase rates for local ratepayers and impose aesthetic and environmental harms within the state, even if the lines yield net benefits to the larger region. Powerful stakeholders, whether landowners or incumbent utilities, have, moreover, sometimes used state regulatory processes to protect their economic interests at the expense of the larger public good. Although some states have taken a broader view of the benefits of transmission investment, the legislative mandates of many state transmission planners and significant anecdotal evidence suggest that state and local actors will continue to frustrate the construction of transmission lines needed to strengthen electricity markets.

This Article argues that Congress should preempt state and local authority over the siting and cost allocation of all new transmission facilities. The Federal Energy Regulatory Commission ("FERC") should be granted authority to site and allocate the costs of new transmission lines. Federal preemption would recognize in law that electricity is traded increasingly in regional markets that ignore state boundaries and that the American transmission grid is, in effect, three integrated "machines." Unlike parochial-minded state regulators, federal regulators would be more likely to approve transmission applications based on a comprehensive examination of a new line's effects and allocate the costs in an equitable manner across states. Increased transmission investment is by no means a panacea to the electricity sector's economic and environmental challenges. Grid expansion must be pursued in conjunction with demand-side response, distributed generation, efficiency measures, and the establishment of a price on greenhouse gas emissions. While far from being sufficient, facilitating investment in the transmission grid is a necessary step to establish regional electricity markets that produce clean, economical, and reliable power.

II. Evolution of the Industry and Its Regulation

A. Industry Overview

The electric power industry consists of four processes: generation, transmission, distribution, and retailing.[10] Generation involves the conversion of chemical, mechanical, or nuclear energy into electrical power using gas, steam, or water turbines. In the United States today, coal, natural gas, nuclear, and water are the principal means of electricity generation.[11] Transmission is the process of moving electricity at high voltage from generation sources to substations near the cities and industrial areas where power is consumed. Regardless of the seller and purchaser in wholesale transactions,

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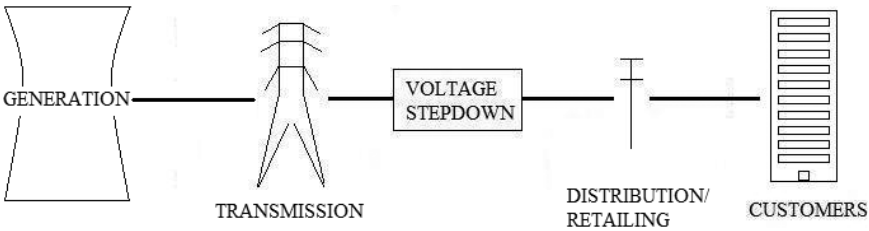
[10] Paul L. Joskow, *Restructuring, Competition and Regulatory Reform in the U.S. Electricity Sector*, 11 J. Econ. Persp. 119, 121 (1997).

[11] *Net Generation by Energy Source by Type of Producer*, U.S. Energy Info. Admin., http://www.eia.gov/cneaf/electricity/epa/epat2p1.html (last updated Apr. 2011).

electrons flow over the path of least resistance.[12] Due to the interconnections between utilities, the transmission grid in the United States and Canada can, in terms of physical flows, be thought of as three large machines—one covering the West, one covering the East, and one covering most of Texas.[13] Distribution is the movement of power at lower voltages from substations to local points of consumption. Transmission lines can be analogized to long-distance, limited-access highways while distribution lines can be thought of as local branch roads. Retailing comprises the metering and billing of customers' electricity usage.

FIGURE 1



Until the late 1970s, the entire industry was treated as a natural monopoly and regulated as such. Economies of scale and coordination were thought to exist at and between every stage of production from generation to retailing.[14] States granted utilities exclusive franchises in a given territory and entrusted them to construct, maintain, and operate the entire infrastructure.[15] To protect consumers from this legally granted monopoly power, states also imposed a cost-of-service regime on franchised utilities. Under this regulatory scheme, utilities were entitled to recover the costs they "prudently" incurred in providing service as well as a reasonable return on their capital investments.[16] State utility commissions adjusted rates periodically through an administrative proceeding (and still do in many states where residential retail service has not been opened to competition).[17] Customers paid a bundled rate that did not apportion costs among the generation, transmission, and distribution components of electricity service.[18]

Since the New Deal, utilities covering relatively small geographic territories have defined the industry. The collapse of Samuel Insull's nationwide

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[12] Pierce, *supra* note 9, at 462.

[13] *See id.*

[14] Sidney A. Shapiro & Joseph P. Tomain, *Rethinking Reform of Electricity Markets*, 40 WAKE FOREST L. REV. 497, 505 (2005).

[15] *See* Pierce, *supra* note 9, at 453.

[16] Shapiro & Tomain, *supra* note 14, at 508.

[17] David B. Spence, *The Politics of Electricity Restructuring: Theory vs. Practice*, 40 WAKE FOREST L. REV. 417, 421 (2005).

[18] Paul L. Joskow, *Transmission Policy in the United States*, 13 UTILITIES POL'Y 95, 99 (2005).

utility empire in 1933 radically changed the course of the industry's development.[19] In response to this massive corporate failure, Congress passed the now-repealed Public Utility Holding Company Act ("PUHCA")[20] in 1935 that broke up the large holding companies into hundreds of local- and state-level utilities.[21] Some interconnections existed between utilities, but only as a means of ensuring reliability.[22] A utility that could not satisfy its load using its own generation resources could obtain power from neighboring utilities that had spare capacity. Such trades were the exception rather than the rule for traditional utility operations; utilities expected to obtain power from their own generation facilities during most hours of the year.

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[19] Richard D. Cudahy & William D. Henderson, *From Insull to Enron: Corporate (Re)Regulation After the Rise and Fall of Two Energy Icons*, 26 ENERGY L.J. 35, 65–66 (2005).

> As the Great Depression deepened, the revenues of the nation's manufacturing companies would ultimately decline by sixty-three percent. In contrast, total revenues for the electric utility industry fell by only six percent. Remarkably, by mid-1931, this relatively modest drop in revenue had become an economic vise, squeezing the highly leveraged Insull empire. Although Insull's operating companies were regulated to earn a fixed rate of return on their capital, any increase in their earnings was, at this juncture, entirely consumed by interest payments to bondholders and guaranteed dividends to preferred stockholders. Insull had temporarily financed the purchase of Eaton's stock by intra-system loans to IUI and Corp. Since companies making up the pyramid required repayment of these loans in order to finance the expansion promised to President Hoover, Insull scrambled for the (relatively small) amount of cash needed to satisfy his New York creditors. By the end of 1931, Insull was out of options.

Id.

[20] Pub. L. No. 74-333, 49 Stat. 803 (1935) (codified as amended at 15 U.S.C. §§ 79–79z-6 (2000)) *repealed by* Energy Policy Act of 2005, Pub. L. No. 109-58, § 1263, 119 Stat. 594, 974.

[21] *See* Cudahy & Henderson, *supra* note 19, at 73 ("[T]he section 11 'death sentence' provision of the PUHCA was intended to permanently dismantle the power trust by local and regional power companies that could be effectively regulated at the state level.").

[22] *See* Richard Benjamin, *Principles for Interregional Transmission Expansion*, ELECTRICITY J., Oct. 2007, at 36, 36.

> Transmission planning and construction in the United States has historically been done at the level of the vertically integrated utility ("VIU"). In this framework, interconnections between utilities served mainly to increase the reliability of the grid. A utility that faced a temporary generation shortfall (e.g., due to an unplanned outage of a generating facility) would attempt to import power over an interconnecting line, thus maintaining system reliability. Given the relatively minor role of interconnecting lines, there was limited investment in transmission capacity connecting large geographic areas.

Id. See also Brown & Rossi, *supra* note 8, at 730.

> Under the traditional vertical integration monopoly paradigm, in which rate regulation was the norm, utilities had little incentive to expand transmission for non-utility generation sources that did not serve native load customers, since they could preserve their monopolies by building just enough transmission to allow their own power supply to reach their own customers.

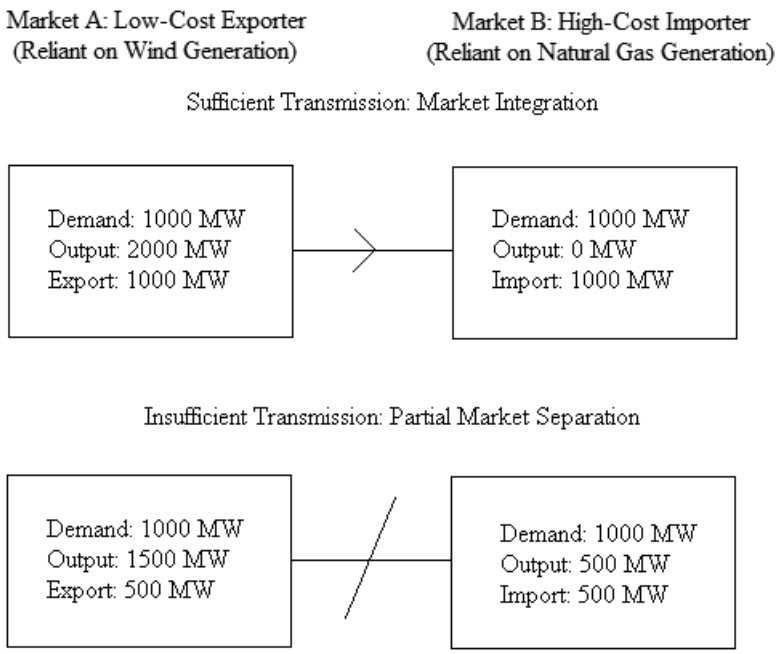
Id.

B. Regionalization of the Industry

In the face of two powerful trends, the model of geographically fragmented utilities is under increasing stress. The creation of wholesale markets and the development of renewable energy are making the norm of localized utility operations outdated. In fact, the great promise of both is premised on the existence of strong transmission grids.

The inadequacy of the existing grid most commonly manifests itself in the form of transmission congestion. When a transmission line is congested, the desired amount of power cannot be transmitted over it due to its physical limits.[23] Exceeding the physical limits of the line can result in the failure of the larger electrical system.[24] To avoid creating these emergency conditions, generators on the export side of the transmission constraint reduce their output while generators on the import side increase their output, as Figure 2 illustrates. In effect, transmission congestion can cleave a single geographic market into multiple, smaller markets that need to rely on more costly local generation to meet demand.

FIGURE 2



[23] *See* Brendan Kirby & Eric Hirst, *Maintaining Transmission Adequacy in the Future*, ELECTRICITY J., Nov. 1999, at 62, 65–66.

[24] *Id.*

1. From State-Regulated Natural Monopolies to Regional Markets

Frustration with rising power rates and technological changes in the 1970s motivated academic criticism and eventually, in many parts of the country, political rejection of the vertically integrated natural monopoly model.[25] Cost-of-service regulation was thought to encourage overinvestment in capital assets and weaken incentives for efficiency because utilities could persuade regulators to allow most costs to be passed through to ratepayers, regardless of whether they were prudently incurred.[26] Technological advances had also reduced the economies of scale in generation and created the possibility of a competitive wholesale market.[27] In 1978, Congress enacted the Public Utility Regulatory Policies Act ("PURPA"), which required utilities to purchase power from certain non-utility owned generation sources.[28] PURPA helped create a class of non-utility power generators.[29]

The federal government and the states have enacted rules to ensure all generators have equal access to the grid. Non-discriminatory access to the grid is necessary for wholesale market competition. Otherwise, transmission owners could manipulate access to their facilities to benefit affiliated generators at the expense of non-affiliates and, in effect, leverage their transmission monopoly into generation.[30] In 1992, Congress passed the Energy Policy Act ("EPAct of 1992"),[31] which removed the remaining regulatory barriers to entry in the generation sector and directed transmission owners to provide grid access to all generators on non-discriminatory terms.[32] In 1996, FERC issued Orders 888 and 889,[33] which require transmission owners to offer non-discriminatory access to and transparent pricing of their facilities.[34] Viewing this regulatory solution as inadequate, some states went further to address this threat of monopoly leveraging. They ordered transmission owners to sell their generation assets and join a non-profit independent system operator or regional transmission organization (hereafter collectively referred to as "RTOs") that would be responsible for the day-to-day management of the transmission grid and wholesale power markets.[35] In these states

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[25] *See* Pierce, *supra* note 9, at 454. A landmark Brookings Institution study by now-Justice Stephen Breyer and Paul MacAvoy documented the inefficiencies of the cost-of-service model in electricity. STEPHEN G. BREYER & PAUL W. MACAVOY, ENERGY REGULATION BY THE FEDERAL POWER COMMISSION (1974).

[26] Pierce, *supra* note 9, at 457.

[27] *See* Joskow, *supra* note 10, at 123, 126.

[28] *Id.* at 124.

[29] Spence, *supra* note 17, at 424.

[30] Paul L. Joskow & Roger G. Noll, *The Bell Doctrine: Applications in Telecommunications, Electricity, and Other Network Industries*, 51 STAN. L. REV. 1249, 1298 (1998).

[31] Pub. L. No. 102-486, 106 Stat. 2776 (1992).

[32] Joskow & Noll, *supra* note 30, at 1300.

[33] 18 C.F.R. § 35.28 (2011); 18 C.F.R. § 37.6 (2011).

[34] Joskow, *supra* note 10, at 133.

[35] *See* Joskow, *supra* note 10, 132–33; *Regional Transmission Organizations (RTO)/Independent System Operators (ISO)*, FERC, http://www.ferc.gov/industries/electric/indus-act/rto.asp (last visited Nov. 2, 2011).

most committed to reform, the previously vertically integrated utilities became "load-serving entities" that owned the wires, metered usage and billed retail customers.[36]

These legislative and regulatory initiatives have transformed the industry, albeit to varying degrees, across the country. In much of the West and Southeast, most utilities remain vertically integrated and regulated as natural monopolies.[37] Because of the open access requirements imposed on transmission owners by Orders 888 and 889, however, new firms can enter the generation sector in these areas and sell their power to utilities through bilateral contracts.[38] Elsewhere, in a significant fraction of states, only transmission and distribution are treated as natural monopolies;[39] generation and retailing are open to competition.[40] In many of the same areas, centralized wholesale markets today facilitate the sale of billions of dollars of power annually.[41] In the Mid-Atlantic and portions of the Midwest, for example, an RTO called PJM operates the largest wholesale power market in the world.[42] In addition to entering into bilateral contracts with utilities and industrial customers, generators located everywhere from Illinois in the west to New Jersey in the east can submit hourly bids into wholesale spot markets.[43] Even if market transactions do not correspond to the actual physics of the electricity grid,[44] coal-fired generators in Ohio and West Virginia can sell power to

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[36] *Load Serving Entities*, ERCOT, http://www.ercot.com/services/rq/lse/ (last visited Oct. 21, 2011).

[37] Pierce, *supra* note 9, at 479.

[38] *See* Seth Blumsack, *Measuring the Benefits and Costs of Regional Electric Grid Integration*, 28 ENERGY L.J. 147, 153 (2007).

[39] Joskow, *supra* note 10, at 120.

[40] *See* Johannes Pfeifenberger, Joseph Wharton & Adam Schumacher, *Keeping Up with Retail Access? Developments in U.S. Restructuring and Resource Procurement for Regulated Retail Service*, ELECTRICITY J., Dec. 2004, at 50, 51 (map summarizing status of retail competition in all fifty states and District of Columbia).

[41] *See Company Overview*, PJM INTERCONNECTION, http://www.pjm.com/about-pjm/who-we-are/company-overview.aspx (last visited Oct. 31, 2011); *Frequently Asked Questions*, MIDWEST ISO, https://www.midwestiso.org/AboutUs/Pages/MISOFAQ.aspx (last visited Oct. 31, 2011); *US Independent System Operators*, U.S. ENERGY INFO. ADMIN., http://www.eia.doe.gov/cneaf/electricity/page/channel/fig8.html (last visited Nov. 2, 2011).

[42] *PJM's Markets*, PJM (Mar. 30, 2011), http://www.pjm.com/~/media/about-pjm/newsroom/downloads/pjms-markets-fact-sheet.ashx.

[43] *Id.*

[44] *See* Charles H. Koch, Jr., *Control and Governance of Transmission Organizations in the Restructured Electricity Industry*, 27 FLA. ST. U. L. REV. 569, 572 (1999).

> [E]nvision a person in Spain buying a cup of water from someone in the United States. The seller in the United States must deliver the water by dropping it into the Atlantic Ocean. To receive the delivery, the purchaser in Spain then dips into the Atlantic Ocean to withdraw the cup of water. The seller delivered a cup of water into the system and the purchaser withdrew a cup of water, but in no sense can either party identify the particular molecules of water that were the subject of their market transaction. The transportation of the seller's cup never literally occurs, and the cup withdrawn actually comes from an unidentifiable source, which in all probability is not the seller. Similarly, a generator plant adds unidentifiable units of electricity to the flow from which a consumer extracts electricity for personal use. The generator plant's agreement to supply the consumer with electricity can be honored only in the

load-serving entities in cities like Washington, D.C. and Philadelphia located hundreds of miles away.[45]

As regional power markets have developed, inadequate transmission capacity has become a serious problem. Power purchasers across the nation spend hundreds of millions of dollars more per year because congested transmission lines prevent them from obtaining power from the lowest-cost generators.[46] The Northeastern Blackout in August 2003 serves as perhaps the most dramatic illustration of the inadequacy of the existing grid. The failure of a nuclear power plant and transmission lines serving Cleveland, Ohio on a hot summer day triggered cascading line outages that left tens of millions of people in the Northeastern United States and Ontario without power.[47] The series of transmission line outages separated the power importing markets of New York State and points north from the power exporting markets of Ohio and Appalachia.[48] Without sufficient local generation, parts of the Northeast were in the dark for up to four days, resulting in economic losses of over five billion dollars in the United States and Canada.[49] Notably, parts of the Northeast that had sufficient local generation—areas that had not departed from the traditional model—faced almost no disruptions in their power supply.[50] In short, superimposing regional markets on top of a grid not designed for them had contributed to the most spectacular failure of the electric power system in United States history[51]—a fact that the official report on the blackout acknowledged.[52] Capturing public sentiment after the event and

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> most artificial sense. Adding to this artificiality is the fiction that a particular unit of electricity is transported and transmitted directly to the user. In actuality, the consumed unit may have traveled any number of routes from any number of sources to the consumer.

Id.

[45] *See* Clinton A. Vince et al., *What Is Happening and Where in the World of RTOs and ISOs?*, 27 ENERGY L.J. 65, 76–77 (2006).

[46] *See, e.g.*, MONITORING ANALYTICS, LLC, STATE OF THE MARKET REPORT FOR PJM 167 (2010) [hereinafter PJM STATE OF MARKET] ("Total [economic] congestion costs increased by $237.3 million or 58 percent from $408.2 million in the first six months of 2009 to $645.5 million in the first six months of 2010.").

[47] *See* U.S.-CANADA POWER SYSTEM OUTAGE TASK FORCE, FINAL REPORT ON THE AUGUST 14, 2003 BLACKOUT IN THE UNITED STATES AND CANADA: CAUSES AND RECOMMENDATIONS 73–90 (2004) (explaining how overloading and failure of lines near Cleveland led to subsequent overloading and failure of other lines in Ohio and Pennsylvania—the so-called "cascade").

[48] *Id.* at 89–90.

[49] *Id.* at 1.

[50] *See id.* at 99–100 ("The small remaining load in the northern portion of the eastern [electrical] island (the Albany area) retained electrical service, supplied by local generation until it could be resynchronized with the western New York island.").

[51] *See id.* at 103–07 (comparing August 2003 blackout to other major blackouts in the twentieth century).

[52] *See id.* at 32.

> Load-serving entities today purchase power for the same reason they did before the advent of competition—to serve their customers with low-cost energy—and the U.S. Department of Energy estimates that Americans save almost $13 billion (U.S.) annually on the cost of electricity from the opportunity to buy from distant, economical

with perhaps justified hyperbole, former Energy Secretary Bill Richardson condemned the condition of the electrical grid in the United States as "Third World."[53]

2. *Development of Renewable Energy Sources*

For the worst effects of climate change to be averted, the world's energy economy will require radical restructuring.[54] Electricity generation, which relies heavily on fossil fuels in the United States and many parts of the world, will be subject to a fundamental makeover.[55] Although the federal government has yet to implement comprehensive climate regulations and appears unlikely to do so in the immediate future,[56] more modest measures to reduce greenhouse gas emissions have been enacted at the state and federal level.[57] Whether by putting a price on greenhouse gas emissions or through direct technological mandates, policymakers are encouraging utilities to invest more in renewable energy sources like solar and wind at the expense of polluting sources like coal.[58]

Many of the most promising regions for geothermal, solar, and wind energy development in the United States are located far from major urban areas. For example, the best areas to site wind farms are in the sparsely populated corridor running from the Dakotas to North Texas and in territorial waters off the Atlantic and Pacific coasts.[59] Likewise, the regions with the most geothermal and solar energy potential are the Mountain West[60] and

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> sources. But it is likely that the increased loads and flows across a transmission grid that has experienced little new investment is causing greater "stress upon the hardware, software, and human beings that are the critical components of the system."

Id. (quoting Letter from Michael H. Dworkin, Chairman, State of Vt. Pub. Serv. Bd., to Alison Silverstein & Jimmy Glotfelty (Feb. 11, 2004)). *See also* Wolak, *supra* note 4, at 3.

[53] Barton Gellman & Dana Milbank, *Blackout Causes Mass Disruption; Millions Struggle Without Power From N.Y. to Toronto to Detroit*, WASH. POST, Aug. 15, 2003, at A01.

[54] *See* RALPH E.H. SIMS ET AL., FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE: MITIGATION OF CLIMATE CHANGE 253 (2007).

[55] *See id.* at 303–04 ("[S]ignificant reductions in emissions from the energy-supply sector are technically and economically feasible using both the range of technology solutions currently available and those close to market.").

[56] Editorial, *Outlook Chilly For a Smart Climate Bill; A Failure to Prioritize Limits Democrats' Chances of Putting a Price on Carbon*, WASH. POST, July 25, 2010, at A18.

[57] *See, e.g.*, Steven Ferrey, *Goblets of Fire: Potential Constitutional Impediments to the Regulation of Global Warming*, 35 ECOLOGY L.Q. 835, 838–39 (2008); Shelley Welton, *From the States Up: Building a National Renewable Energy Policy*, 17 N.Y.U. ENVTL. L.J. 987, 991 (2008); Gabriel Nelson, *It's Red States vs. Blue in Legal War Over EPA Greenhouse Gas Rules*, N.Y. TIMES GREENWIRE (Oct. 12, 2010), http://www.nytimes.com/gwire/2010/10/12/12greenwire-its-red-states-vs-blue-in-legal-war-over-epa-g-99648.html.

[58] Lori Bird et al., *Evaluating Renewable Portfolio Standards and Carbon Cap Scenarios in the U.S. Electric Sector*, 39 ENERGY POL'Y 2573, 2573–74 (2011).

[59] *See Wind Resources and Transmission Lines*, U.S. DEPT. OF ENERGY NATIONAL RENEWABLE ENERGY LABORATORY (Apr. 19, 2007), http://www.nrel.gov/wind/systemsintegration/images/home_usmap.jpg [hereinafter *NREL Wind*].

[60] *See Geothermal Resource of the United States*, U.S. DEPT. OF ENERGY NATIONAL RENEWABLE ENERGY LABORATORY (Oct. 13, 2009), http://www.nrel.gov/gis/images/geothermal_resource2009-final.jpg.

Desert Southwest,[61] respectively. Unlike coal, natural gas, and other fossil fuels, which can be moved by pipeline, rail or ship, renewable resources are location-specific and cannot be transported to points closer to load centers and used to generate power there. For these non-polluting resources to be fully tapped, new transmission lines running hundreds of miles and crossing several states will need to be constructed.[62]

The inadequacy of the existing grid to handle output from renewable resources is apparent. For instance, Texas, perhaps a surprising leader in wind energy development given its close association with the oil and gas industry,[63] has faced substantial difficulties in handling the output from new wind farms. Financier T. Boone Pickens had announced a plan to build the world's largest wind farm in the Texas Panhandle in 2008.[64] He has, however, scaled back this project, partly citing the lack of sufficient transmission capacity to send the power to in-state load centers like Dallas-Fort Worth and Houston.[65] Because of constraints on the existing grid, even operational wind farms in Texas have been forced to curtail their output.[66] This narrative is likely to repeat itself on a multistate level as renewable resources are developed throughout the country. In the Midwest, the prime location for wind energy development in the continental United States, new wind farms are causing significant congestion on transmission lines in parts of the Great Plains.[67]

3. Partial Federalization and Regionalization of Transmission Planning

In the area of transmission planning, states continue to retain significant regulatory authority. State public utility commissions retain primary jurisdiction over the siting of transmission lines.[68] They authorize the route and construction of both intrastate and interstate transmission lines based on a

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[61] *See Photovoltaic Solar Resource of the United States*, U.S. DEPT. OF ENERGY NATIONAL RENEWABLE ENERGY LABORATORY (Oct. 20, 2008), http://www.nrel.gov/gis/images/map_pv_national_lo-res.jpg [hereinafter *NREL Solar*]; *Concentrating Solar Resource of the United States*, U.S. DEPT. OF ENERGY NATIONAL RENEWABLE ENERGY LABORATORY (Oct. 20, 2008), http://www.nrel.gov/gis/images/map_csp_national_lo-res.jpg.

[62] *See* Brown & Rossi, *supra* note 8, at 737–38.

[63] *Texas*, U.S. ENERGY INFO. ADMIN., http://www.eia.gov/state/state-energy-profiles.cfm?sid=TX (last updated Nov. 2009).

[64] Clifford Krauss, *Move Over, Oil, There's Money in Texas Wind*, N.Y. TIMES, Feb. 23, 2008, at A1.

[65] Kate Galbraith, *Pickens Scales Back Ambitious Wind Farm*, N.Y. TIMES, July 8, 2009, at B3.

[66] Kate Galbraith, *Texas Clean Energy Hampered by Location*, INT'L HERALD TRIB., Sept. 13, 2010, at 20.

[67] *See* POTOMAC ECONOMICS, 2009 STATE OF THE MARKET REPORT FOR THE MIDWEST ISO 83 (2010) ("Congestion was down 10 percent in the East and 14 percent in the Central region, respectively, while it rose 50 percent (to $167 million) in the West due to increasing supply in that region (primarily wind resources).").

[68] Jim Rossi, *The Trojan Horse of Electric Power Transmission Line Siting Authority*, 39 ENVTL. L. 1015, 1019 (2009) [hereinafter *Trojan Horse*].

state-level cost-benefit analysis,[69] which includes an examination of the proposed line's environmental effects.[70] To acquire the necessary rights-of-way for the project, states can exercise their power of eminent domain or delegate it to the transmission line developer.[71] In some states, local governments also have jurisdiction over transmission projects and can veto proposals that they believe would harm local interests without providing an adequate benefit to them.[72] State public utility commissions also regulate the rates of intrastate transmission lines whose costs are incorporated into the transmission line developer's retail rates.[73] For such facilities, the costs of transmission investment, including a reasonable rate of return, are recovered directly from the project developer's customers.[74] Because third party market participants are today entitled to use the grid for wholesale transactions, the revenues from granting transmission access are implicitly used to reduce the costs passed through to local ratepayers.[75]

As electricity markets have expanded beyond state boundaries, regional planning bodies have assumed some regulatory authority. Although they lack the powers of eminent domain and cannot authorize line construction, RTOs, where they exist, now play a lead role in regional transmission planning. Based on their system modeling, RTOs identify corridors in need of transmission upgrades for reasons of economics or reliability and review transmission proposals.[76] RTOs also make cost allocation decisions for transmission projects that FERC then reviews.[77] Even in parts of the country without RTOs, transmission planning at the regional level will soon become the norm. FERC, in the summer of 2011, issued Order 1000, which requires

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[69] *See id.*

> The need determination at the state level has historically balanced various interests within individual states, with the primary motivation of protecting in-state customers and ensuring that any new transmission line that was approved would benefit them. On the one hand, customers did not want to see utilities invest in wasteful projects, and the need determination served to ensure that the need for power transmitting over a new line was justified in light of alternatives, including conservation and improved efficiency at the local level. On the other hand, customers had an interest in seeing facilities expand in order to enhance the reliability of the system serving the customers within that state.

Id.

[70] *Id.* at 1021.

[71] *Id.* at 1019.

[72] *See* Dang, *supra* note 9, at 343.

[73] Joe McGarvey, *Transmission Investment: A Primer*, ELECTRICITY J., Oct. 2006, at 71, 74.

[74] *Id.* at 76.

[75] *Id.*

[76] Brown & Rossi, *supra* note 8, at 758.

[77] *See Transmission Infrastructure: Hearing Before the S. Comm. on Energy and Natural Res.*, 111th Cong. 12 (2009) (statement of Jon Wellinghoff, Acting Chairman, Fed. Energy Regulatory Comm'n).

that all transmission owners join regional planning entities and that these entities establish cost allocation methods.[78]

In addition to the states and RTOs, FERC also exercises limited jurisdiction over some transmission planning matters. The Energy Policy Act of 2005 ("EPAct of 2005")[79] granted FERC "backstop" siting over transmission lines.[80] In areas that the Department of Energy has defined as National Interest Electric Transmission Corridors ("NIETC"), FERC can authorize the construction of transmission lines if the relevant state actors cannot approve the line under state law or fail to take action in a timely manner.[81] In addition, FERC is responsible for allocating the costs of interstate transmission facilities and intrastate facilities in areas where rates have been unbundled into generation, transmission, and distribution components.[82]

III. Transmission Investment in the New Milieu: Regional Benefits and Local Costs

In the new milieu of wholesale markets and renewable energy, the construction of new transmission lines—even wholly intrastate lines—can yield significant regional benefits.[83] Transmission expansions can reduce the occurrence of congestion and widen the geographic reach of electricity markets. This market expansion can yield four benefits—(1) enhanced system reliability; (2) decreased energy costs due to more efficient generation dispatch and greater market competition; (3) increased fuel diversity; and (4) reduced emissions of air pollutants—that are often regional in nature.[84] In contrast to the dispersed benefits of transmission development, the costs, both economic and non-economic, tend to be concentrated in the areas where the lines are located. They include cost recovery from ratepayers and

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[78] 18 C.F.R. § 35 (2011).

[79] Pub. L. No. 109–58, 119 Stat. 594 (codified as amended in scattered sections of 42 U.S.C.).

[80] Debbie Swanstrom & Meredith M. Jolivert, *DOE Transmission Corridor Designation & FERC Backstop Siting Authority: Has the Energy Policy Act of 2005 Succeeded in Stimulating the Development of New Transmission Facilities?*, 30 Energy L.J. 415, 431 (2009).

[81] *Id.*

[82] McGarvey, *supra* note 73, at 76.

[83] *See* Transmission Access Policy Study Group, Effective Solutions for Getting Needed Transmission Built at Reasonable Cost 6 (2004), *available at* http://www.tapsgroup.org/sitebuildercontent/sitebuilderfiles/effectivesolutions.pdf.

> Due to the dynamic and highly integrated nature of the [alternating current] grid, an upgrade in one state may be required to enhance reliability and relieve congestion in an adjacent state. Also, a transmission addition may be required in a state to enable an upgrade undertaken in an adjoining state to function as planned.

Id.

[84] *Id.* at 5–7. This paper does not examine a macroeconomic benefit of transmission investment: employment of unemployed workers and idle resources during a recession. In the current regulatory environment, these benefits may not always be in harmony. More efficient and lower-cost dispatch, for example, may mean increased greenhouse gas emissions as cheap coal-fired generators displace more expensive gas-fired units.

the adverse aesthetic, environmental, and health effects. In economic terms, transmission lines generate broadly dispersed positive externalities but locally-concentrated negative externalities.

A. Regional Benefits of Transmission Investment

1. Enhanced System Reliability

System reliability is, perhaps, the most important feature of any electrical system.[85] Unlike other forms of energy, electricity cannot be stored in an economical manner.[86] Also, unlike with most commodities, demand for electricity is largely unresponsive to prices at present.[87] With the infeasibility of electricity storage and prices failing to perform their usual rationing function, supply therefore has to equal demand at every second. Because supply and demand must always equate and generators experience periodic scheduled and unscheduled outages, every electrical system must have generation reserves in excess of peak demand to avoid blackouts and brownouts. Fundamentally, reliability is a function of how much backup generation capacity can be accessed in response to plant outages.[88]

Transmission congestion, by shrinking the geographic scope of power markets, reduces the amount of backup generation that is available. If local generation is inadequate and transmission lines do not allow for sufficient imports, system reliability may be threatened.[89] To prevent this from occurring, system operators may have to pay older, less dependable units to remain on the market as a means of preserving adequate generation reserves.[90] These units would otherwise be retired on account of their age and costs.[91]

Building more generation is the most obvious way to enhance reliability. A system with more surplus generation capacity is more reliable than an otherwise equal system with less surplus generation capacity. More generation capacity, however, is not always the most efficient way to obtain reliability. Generation development entails significant fixed costs and so

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[85] James Bushnell, *Electricity Resource Adequacy: Matching Policies and Goals*, ELECTRICITY J., Oct. 2005, at 11, 12.

[86] Pumped storage hydroelectricity that uses surplus power during low-demand hours to pump water to the top of a dam and then releases the water to produce electricity during high-demand hours can in effect "store" power. Its unfavorable economics, however, prevent its widespread use at present. *See* Claude Crampes, *Pumped Storage and Cost Saving*, 32 ENERGY ECON. 325 (2010).

[87] *See infra* Part IV.B.

[88] *See* PETER FOX-PENNER, SMART POWER: CLIMATE CHANGE, THE SMART GRID, AND THE FUTURE OF ELECTRIC UTILITIES 25–29 (2010) (explaining role of generation and transmission in promoting system reliability).

[89] *See* Seth Blumsack et al., *A Quantitative Analysis of the Relationship Between Congestion and Reliability in Electric Power*, 28 ENERGY J. 73, 74 (2007).

[90] Paul L. Joskow, *Lessons Learned from Electricity Market Liberalization*, 29 ENERGY J. 2, 25 (2008)

[91] *Id.*

constructing reserve margins that remain idle at most times is not necessarily the most economical means of guaranteeing system reliability.

Under certain conditions, transmission can serve as a more cost-effective way of protecting system reliability. Interconnections can facilitate trade among utilities; one utility can purchase power from another when its own generation resources are not sufficient to meet load.[92] By creating a larger pool of backup generation, new transmission lines can enhance system reliability.[93] Historically, the primary reason utilities built intersystem transmission lines was to strengthen reliability.[94]

The electricity trade between Southern California and the Pacific Northwest over the course of every calendar year illustrates this reliability benefit of transmission investment.[95] In the summer when Southern California experiences high temperatures while the Pacific Northwest is mild, surplus generation exists in Washington State because its hydroelectric dams do not need to produce at maximum capacity to satisfy in-state demand.[96] In winter, the roles are reversed: the Pacific Northwest experiences cold temperatures while Southern California remains temperate.[97] Fossil fuel generators in Southern California do not need to operate at full capacity to meet local demand.[98] To permit North-South trade in summer and South-North trade in winter, the federal government constructed the Pacific Intertie in the 1960s and 1970s.[99] The Intertie is a system of two alternating current lines and one direct current line running from the Washington-Oregon state line to Los Angeles.[100] As a result, both regions can rely on the spare generation of the other to ensure reliability, instead of constructing expensive reserve generation that would remain idle for a significant fraction of the year.[101]

2. Reduced Energy Costs

In theory, a competitive market for electricity can function like a competitive market for any other good or service. In a well-functioning market with purchasers submitting hourly demand schedules, all generators should bid their marginal cost of production.[102] Arranging the bids from lowest- to highest-cost, the marginal cost of the most expensive generator needed to

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[92] FOX-PENNER, *supra* note 88, at 27–29.

[93] *See* Paola Bresesti et al., *The Benefits of Transmission Expansions in the Competitive Electricity Markets*, 34 ENERGY 274, 278 (2009).

[94] *See* Rossi, *Trojan Horse*, *supra* note 68, at 1019.

[95] *See* Paul L. Joskow, *California's Electricity Crisis*, 17 OXFORD REV. ECON. POL'Y, 365, 367 (2001).

[96] *Id.*

[97] *Id.*

[98] *Id.*

[99] *Id.*

[100] *Id.*

[101] *Id.*

[102] *See* Richard Green, *Reshaping the CEGB: Electricity Privatization in the UK*, 1 UTIL. POL'Y 245, 246 (1991) (describing the operation of a single-price power "pool").

meet demand in each hour is the market-clearing price.[103] The market operator dispatches only units with bids at or below the market-clearing price and pays them all the market price irrespective of their bids.[104] This process minimizes the aggregate cost of generating power.[105] In most markets, energy is not the only product being sold and so a similar price-setting process takes place for ancillary services—RTOs pay generators that are not operating in a given hour to remain on standby in the event real-time demand exceeds forecasted demand.[106]

Because demand for electricity fluctuates, the cost of meeting load can vary widely within a twenty-four hour period and over the course of a year (see Figure 3 below).[107] During off-peak hours, coal-fired and nuclear power plants, which generally have low marginal costs, are adequate to meet demand and set market prices at a low level.[108] At hours with higher demand, gas-fired combustion turbines, which have higher marginal costs but can quickly be "ramped" up and down in response to changing demand, are run to meet load and set the market price at a higher level.[109]

When transmission lines are congested, generators cannot be dispatched in the lowest-cost manner.[110] Congestion creates load pockets that are separated from the larger grid and so must rely on local generators to meet demand instead of on lower-cost units located further afield. This suboptimal dispatch of generators increases the aggregate costs of producing power. Due to wide variations in demand over the course of a day, the size of geographic markets can change from hour-to-hour. On a summer day, for instance, an integrated regional market in the low-demand morning hours can fragment into multiple markets in the high-demand afternoon hours due to transmission congestion. As demand rises, transmission lines can become congested; the most efficient generators cannot operate at full capacity and less efficient generators have to be dispatched to meet load.

Transmission congestion is an especially acute problem in large metropolitan areas; inadequate capacity on transmission facilities feeding these cities often necessitates the dispatch of old, high-cost generators within the

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[103] *Id.*

[104] *Id.*

[105] *Id.*

[106] Eric Hirst & Brendan Kirby, Office of Scientific and Technical Info., U.S. Dep't. of Energy, ORNL/CON-310, Ancillary Services (1996), *available at* http://www.osti.gov/bridge/servlets/purl/226116-8tdaIj/webviewable/226116.pdf.

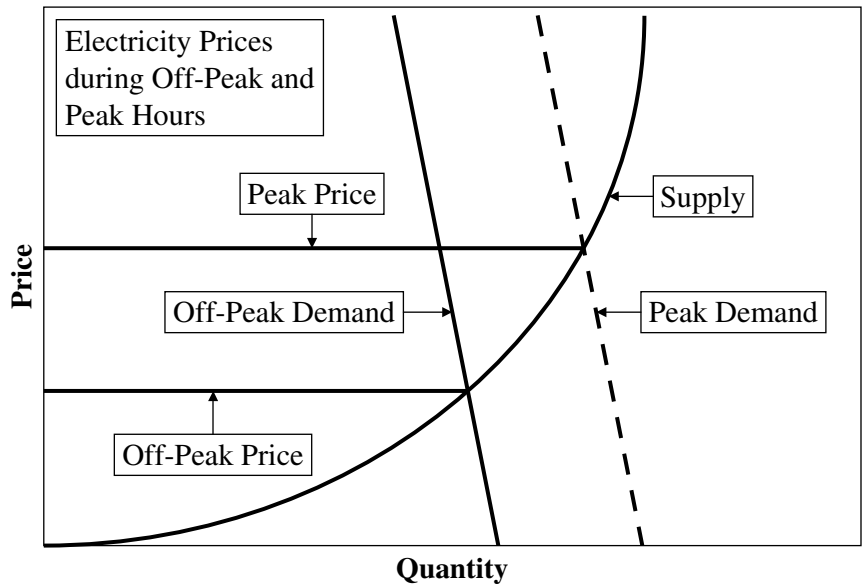
[107] Severin Borenstein, *The Trouble with Electricity Markets: Understanding California's Restructuring Disaster*, 16 J. Econ. Persp. 196 (2002).

[108] *See* Darren Bush & Carrie Mayne, *In (Reluctant) Defense of Enron: Why Bad Regulation Is to Blame for California's Power Woes (or Why Antitrust Law Fails to Protect Us Against Market Power When the Market Rules Encourage Its Use)*, 83 Or. L. Rev. 207, 236 (2004).

[109] *Id.*

[110] *See* Kirby & Hirst, *supra* note 23, at 65–66.

FIGURE 3



load pocket.[111] In principle, the high price of power within load pockets should induce the construction of new generators in these areas in the long term. This new generation would displace output from high-cost units and lower market prices, indirectly eliminating the economic costs of transmission congestion. Due to local environmental and zoning laws that exist for reasons of public health in many cities, however, new generation is often very difficult to construct near load centers.[112] With congested lines requiring the dispatch of expensive generators and yet failing to stimulate the construction of new generation in load pockets, the increased energy costs can be significant and persistent.[113]

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[111] *See, e.g.*, U.S. DEPARTMENT OF ENERGY, NATIONAL ELECTRIC TRANSMISSION CONGESTION STUDY 46 (2009) [hereinafter DOE CONGESTION STUDY] ("Transmission congestion affects New York's day-ahead and real-time markets, preventing customers from buying power from the least expensive producers."); *id.* at 90.

[112] *See* EDWARD N. KRAPELS, GOODBYE GRIDLOCK (2): HOW TO END THE SHORTAGE IN TRANSMISSION INVESTMENT THAT LED TO THE NORTHEAST BLACKOUT 7–8 (2003).

> In 90 percent of the landscape of the United States, it is challenging, but possible to establish a mix of generation and transmission assets that constitute an efficient power infrastructure. In the other 10 percent, it is extremely difficult to do so, and over time these areas have evolved into 'load pockets.' There are typically densely populated areas where generation facilities were built decades ago, are difficult to refurbish (and thus highly polluting) and where transmission grids are similarly dated and compressed.

Id.

[113] *See, e.g.*, PJM STATE OF MARKET, *supra* note 46, at 167.

The engineering and institutional features of power markets make them vulnerable to exercises of market power—a problem that transmission congestion can compound. Supply must equal demand every second, faces hard capacity constraints in the short run, and cannot be expanded quickly due to the substantial lead-time involved in building new generation.[114] At very high demand, supply is thus virtually fixed and inelastic with respect to price. Also, most consumers face a fixed average per-unit price and so pay the same rate over the course of a day regardless of the wholesale price.[115] Because ratepayers are insulated from underlying price signals, the elasticity of demand for electricity is low—the quantity of power demanded is insensitive to hourly price changes in the wholesale market.[116] Even if wholesale prices spike, demand is unlikely to fall significantly because most consumers still pay the same retail rate.

Due to the inelasticity of demand and supply, generators that are critical to meeting demand can profitably submit bids above their marginal cost (economic withholding) or refrain from offering all or a portion of their capacity into the market through pretextual outages (physical withholding) to raise prices well in excess of the competitive level.[117] Generators that are situated in load pockets and essential to meet demand, referred to as pivotal suppliers, know that they will be dispatched regardless of how high their bids are. In addition to the exercise of unilateral market power, the repeated game nature of centralized power markets is also conducive to tacit collusion between generators.[118] Even without reaching any explicit collusive arrangement, generators who submit daily bids into a spot market may recognize that it is in their collective interest to submit bids in excess of their marginal costs.[119] In the United States, furthermore, the courts, have prohibited private parties from bringing antitrust damages actions in electricity markets and thus eliminated an important deterrent against collusive conduct.[120]

The exercise of market power can result in massive wealth transfers from purchasing utilities (and ultimately their consumers) to generators.[121] This phenomenon by generators has been the bane of wholesale power mar-

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[114] Borenstein, *supra* note 107, at 196.

[115] *Id.*

[116] Demand-side response programs would expose customers to some daily price fluctuations and, in theory, make demand more price elastic. *See* Jon Wellinghoff & David L. Morenoff, *Recognizing the Importance of Demand Response: The Second Half of the Wholesale Electric Market Equation*, 28 ENERGY L.J. 389, 393–96 (2007).

[117] *See* Borenstein, *supra* note 107, at 200.

[118] Natalia Fabra, *Tacit Collusion in Repeated Auctions: Uniform Versus Discriminatory*, 51 J. INDUS. ECON. 271, 272–74 (2003).

[119] *Id.*

[120] Darren Bush, *Mission Creep: Antitrust Exemptions and Immunities as Applied to Deregulated Industries*, 2006 UTAH L. REV. 761, 796–800 (2006) (describing how courts have applied the filed rate doctrine to bar private damages actions against generators accused of anticompetitive conduct in deregulated power markets).

[121] *See, e.g.*, Severn Borenstein, James B. Bushnell & Frank A. Wolak, *Measuring Market Inefficiencies in California's Restructured Wholesale Electricity Market*, 92 AM. ECON. REV. 1376, 1398 (2002).

kets around the world.[122] The most dramatic example of generator market power abuse in the United States occurred in California in 2000 and 2001. Rampant market manipulation, including the unilateral withholding of generation,[123] led to a more than fourfold rise in energy costs and rolling blackouts across much of the state.[124]

New transmission investment can widen geographic markets and reduce the occurrence of load pockets. By relieving constraints on the grid, new lines can facilitate the lowest-cost dispatch of generators.[125] Along with permitting the most efficient dispatch of power plants on the grid, the market-widening function of new transmission can eliminate the pivotal status of plants within load pockets. If these units are no longer critical to meeting demand, their ability to raise prices above competitive levels is greatly diminished.[126] When other competitive generators are in the market, a plant that submits high bids pursues a potentially unprofitable strategy because it runs the risk of being idle and foregoing power sales. Because collusive arrangements are easier to maintain with fewer suppliers, a larger geographic market with more generators is also less susceptible to tacit collusion. New transmission lines, by expanding the scope of geographic markets, can allow for more economical dispatch and reduce generator market power, saving the public billions of dollars over time.[127]

3. Increased Fuel Diversity

Fuel diversity in a region's generation facilities can be analogized to financial portfolio diversification.[128] If a region is dependent largely on one

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[122] *See, e.g.*, *id.*; Svend Hylleberg, *On the Exploitation of Market Power in the Nordic Electricity Markets: The Case of Elsam* 19 (Univ. of Aarhus – Den., Dep't of Econ. Working Paper No. 2004–05, Aug. 2004), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=585401; Diana L. Moss, *Electricity and Market Power: Current Issues for Restructuring Markets (A Survey)*, 1 ENVTL. & ENERGY L. & POL'Y J. 11, 15–24 (2006) (reviewing theoretical and empirical literature on market power in electricity); Andrew Sweeting, *Market Power in the England and Wales Wholesale Electricity Market 1995–2000*, 117 ECON. J. 654, 681 (2007).

[123] Frank A. Wolak, *Diagnosing the California Electricity Crisis*, ELECTRICITY J., Aug. –Sept. 2003, at 11, 14.

[124] *See, e.g.*, Borenstein, Bushell & Wolak, *supra* note 121, at 1398.

> Between the summers of 1998 and 2000, the wholesale market cost of power rose from $1.67 billion to $8.98 billion. Efficient production costs more than tripled between these periods and with the marginal unit having higher costs, competitive rents for lower cost units quadrupled. Oligopoly rents, however, increased by an order of magnitude, from about $425 million to $4.44 billion between these summers.

Id.

[125] Joe Rossingnoli, Mary Ellen Paravalos & Janet Gail Besser, *Transmission: The Critical Link Delivering the Promise of Industry Restructuring to Customers*, ELECTRICITY J., Nov. 2005, at 18, 19–20.

[126] *Id.* at 20–21.

[127] *Id.* at 24.

[128] Ken Costello, *A Perspective on Fuel Diversity*, ELECTRICITY J., May 2005, at 28, 36.

fuel to generate its electricity, it may be exposed to dramatic swings in the price of electricity. A region relying on a single fuel for its electricity is akin to an investor placing her entire savings in the stock of a single company.[129] Depending on the correlation between fuel and electricity prices, profit maximization at the individual firm level may favor investing in "pure portfolios" of generation, which conflicts with the social objective of diversified generation.[130]

With the construction of hundreds of gigawatts[131] of natural gas-fired generation over the past fifteen years, the American electric power industry has followed this pure portfolio approach, making the volatility of power prices more salient than ever.[132] Because the demand for natural gas varies seasonally and must be met principally by North American supplies, the price of gas is very volatile.[133] In many markets, natural gas units are "on the margin" and set the price of power.[134] The price of power in these regions thus closely tracks the price of natural gas. In addition to creating volatile power prices, over-reliance on natural gas may even compromise system reliability because of constraints in the natural gas pipeline network. If gas-fired generators cannot obtain sufficient quantities of natural gas, non-gas generators may not be able to increase their output adequately to compensate.[135]

Market expansion through transmission investment can increase the fuel diversity of a region's generation portfolio. New transmission lines can facilitate trade between markets with very different generation portfolios. In the United States, this is not merely a theoretical possibility because neighboring regions in several instances have very different fuel mixes.[136] By way of example, the Pacific Coast has substantial hydroelectric capacity while the Rocky Mountain region to its immediate east is reliant on coal.[137] From a price stability perspective, new transmission lines between such regions can be especially beneficial when the two markets' primary fuels exhibit low correlation in their prices.[138] A gas-dependent market can, for example, obtain access to renewable generation in adjacent markets. Wind resources can displace gas-fired generation and potentially reduce the number of hours

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[129] *Id.*

[130] Fabien A. Roques et al., *Fuel Mix Diversification Incentives in Liberalized Electricity Markets: A Mean-Variance Portfolio Theory Approach*, 30 ENERGY ECON. 1831, 1832 (2008).

[131] One gigawatt equals one thousand megawatts or one billion watts. An average household light bulb runs on around 60 watts. One megawatt is enough to run approximately 300 homes. A large power plant produces one thousand megawatts or more.

[132] Costello, *supra* note 5, at 10.

[133] *U.S. Natural Gas Wellhead Price (Dollars per Thousand Cubic Feet)*, U.S. ENERGY INFO. ADMIN., *available at* http://www.eia.gov/dnav/ng/hist/n9190us3m.htm.

[134] Adam Newcomer & Jay Apt, *Near-Term Implications of a Ban on New Coal-Fired Power Plants in the United States*, 43 ENVTL. SCI. & TECH. 3995, 4000 (2009).

[135] Costello, *supra* note 5, at 13.

[136] Anonymous, *Regional Fuel Diversity*, ELEC. PERSP., Sept.–Oct. 2003, at 10.

[137] *Id.*

[138] Costello, *supra* note 128, at 42.

when costly natural gas generation sets the market price for electricity.[139] Similarly, the wind-dependent market can obtain power from fossil fuel generators during seasons with fewer windy periods. New transmission facilities can act like a financial hedge against volatility: in exchange for upfront investment in new lines, utilities and their customers may be able to obtain power at more stable prices over time.

4. Decreased Emissions of Local and Global Air Pollutants

Building new transmission lines into major metropolitan areas can significantly improve local air quality. Due to congestion on transmission lines feeding major cities, old, inefficient peaking units within the metropolitan area often need to be run to maintain system balance.[140] Because these units often utilize decades-old technology, they emit high levels of sulfur dioxide, nitrogen oxides, and particulate matter.[141] Operation of these units is blamed for impaired air quality in several major cities.[142] New transmission facilities can reduce or eliminate line congestion and allow cleaner generators located further away to displace the output from polluting generators located in or near population centers. If old peaking units are run less frequently, air quality within metropolitan areas may improve significantly. Lower concentrations of air pollutants, in turn, can produce tangible benefits for human health, including fewer asthma and heart attacks and premature deaths.[143]

In the long run, the greatest environmental benefits of transmission investment come from integrating geothermal, solar, and wind resources into regional power markets. With increased deployment around the world and the adoption of a price on greenhouse gas emissions in several parts of the country, many of these non-polluting technologies are likely to become cost-

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[139] MARK BOLINGER ET AL., QUANTIFYING THE VALUE THAT WIND PROVIDES AS A HEDGE AGAINST VOLATILE NATURAL GAS PRICES 13–14 (2002).

[140] *See* KRAPELS, *supra* note 112, at 7–8; Kevin Cooney & Heidi Nelson Ries, *Options for Improving Reliability: How Do They Impact Air Quality?*, ELECTRICITY J., June 2004, at 30, 33 ("In general, generating units that operate only during periods of peak demand are inefficient engines or simple cycle combustion turbines that are oil- or gas-fired and have minimal air pollution controls.").

[141] Cooney & Ries, *supra* note 140, at 37–38.

[142] *See, e.g.*, Kirk Johnson, *Promise and Peril in New York Power Plans*, N.Y. TIMES, Aug. 14, 2000, at A1 (explaining tension between economical and reliable power, on one hand, and clean air, on the other, in New York City); Jerry Markon, *Mirant Wants to Reopen Power Plant in Alexandria; In the Meantime, Pepco Looks to Fill Void*, WASH. POST, Sept. 15, 2005, at T8 (describing how Mirant's Potomac River plant in Alexandria, Virginia is necessary to maintain reliability but also produces significant amounts of air pollution).

[143] *See, e.g.*, Susannah Landes Weaver, *Setting Air Quality Standards: Science and the Crisis of Accountability*, 22 TUL. ENVTL. L.J. 379, 382 (2009) ("Studies have linked particulate matter exposure to premature death in people with heart or lung disease, decreased lung function, irregular heartbeat, nonfatal heart attacks, development of chronic bronchitis, and asthma exacerbation.").

competitive, vis-à-vis fossil fuel generation, in the coming years.[144] In the United States, however, many of the areas with the greatest renewable energy potential are far from major cities. For example, the Desert Southwest and the Great Plains—two areas with comparatively few population centers—have the greatest solar[145] and wind energy potential,[146] respectively. Because these areas did not represent an important source of power until recently, they have few transmission connections to regional grids.[147]

New transmission lines will be needed to connect solar and wind farms to regional power markets.[148] At present, many wind energy facilities, for instance, are situated in generation pockets—areas where generators cannot produce at full capacity due to congested transmission lines and are, in effect, trapped.[149] Because of their unfavorable location, wind resources often receive depressed prices for their energy, weakening the incentive to invest in new wind capacity.[150] Although the marginal cost of solar and wind energy is effectively zero, investors need high market prices to recover their upfront fixed costs and earn an economically adequate return on their investment.[151]

One major concern with renewable resources like solar and wind is that their power is intermittent and unpredictable. A wind farm, for example, produces energy only when the wind is blowing. The periods of maximum wind gusts, moreover, often do not coincide with high-demand periods;[152] encouragingly, this is less of an issue with solar energy whose output shows a strong positive correlation with peak demand.[153] Because electricity cannot be stored in an economical manner, the intermittency of renewable resources often requires the construction of fossil fuel-fired backup capacity, which can be operated when wind and solar farms cannot produce power.[154]

This intermittency, however, is not an entirely inescapable shortcoming of renewable resources. Due to variations in atmospheric and topographic

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[144] *See* Brett Buchheit, *The Economics of Alternative Energy: Decisions Following the IPCC's Report on Climate Change*, 38 TEX. ENVTL. L.J. 73, 96–97, 100–02 (2008) (explaining the improving economics of solar and especially wind power).

[145] *See* NREL Solar, *supra* note 61.

[146] *See* NREL Wind, *supra* note 59.

[147] Steven Ferry, *Restructuring a Green Grid: Legal Challenges to Accommodate New Renewable Energy Infrastructure*, 39 ENVTL. L. 977, 997 (2009).

[148] *Id.* at 998.

[149] Matthew Barmack et al., *Performance Incentives for Transmission*, ELECTRICITY J. Apr. 2003, at 9, 12.

[150] *See* POTOMAC ECONOMICS, LTD., 2008 STATE OF THE MARKET REPORT FOR THE ERCOT WHOLESALE ELECTRICITY MARKETS xxxviii (2010).

[151] *See, e.g.*, Matthew L. Wald & Tom Zeller, Jr., *Cost of Green Power Makes Projects Tougher Sell*, N.Y. TIMES, Nov. 7, 2010, at A1.

[152] Ronald H. Rosenberg, *Diversifying America's Energy Future: The Future of Renewable Wind Power*, 26 VA. ENVTL. L.J. 505, 526 (2008).

[153] Benjamin K. Sovacool, *The Intermittency of Wind, Solar, and Renewable Electricity Generators: Technical Barrier or Rhetorical Excuse?*, 17 UTIL. POL'Y 288, 294 (2008).

[154] *Id.* at 289.

conditions, high wind gusts occur at different locations at different times.[155] Because of this less than perfect correlation between wind conditions, geographically dispersed wind turbines have been found to exhibit less volatility in output than similar sized turbines built in close proximity.[156] A similar phenomenon of output "smoothing" exists with respect to geographically dispersed solar photovoltaic systems.[157] Compared to wind energy, in fact, photovoltaic or concentrated solar farms do not have to be spread out over as large an area.[158] Solar facilities built apart but still in close proximity have exhibited significant reductions in output volatility.[159]

Transmission expansions can allow scattered wind and solar farms to operate more like a single unit producing relatively constant levels of power.[160] The Atlantic Wind Connection, proposed by a group of investors including Google,[161] seeks to exploit this principle. According to the developers' public announcements, the project would be an offshore transmission "backbone" that would run along the Atlantic coast from southern Virginia to the New York City metropolitan area and bring the bountiful wind resources of the shallow coastal waters to the Northeast Corridor.[162] If constructed, it would not only transmit but also smooth the joint output from future offshore wind turbines spread along the Mid-Atlantic coast.[163] While complete elimination of the intermittency of renewable generation sources may not be possible, output variability can be managed, increasing the feasibility of large-scale renewable technologies.

Given the significant contribution of electricity generation to domestic and global greenhouse gas emissions,[164] the integration of renewable energy resources into the grid can yield significant benefits. Increased output from

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[155] Edward Kahn, *The Reliability of Distributed Wind Generators*, 2 ELEC. POWER SYS. RES. 1 (1979).

[156] TROY K. SIMONSEN & BRADLEY G. STEVENS, REGIONAL WIND ENERGY ANALYSIS FOR THE CENTRAL UNITED STATES 13 (2004).

[157] Matthew Lave & Jan Kleissl, *Solar Variability of Four Sites Across the State of Colorado*, 35 RENEWABLE ENERGY 2867, 2872 (2010).

[158] *Id.*

[159] *Id.*

[160] SIMONSEN & STEVENS, *supra* note 156, at 9, 13; Recognizing that wind gusts across regions do not exhibit perfect positive correlation, the futurist and engineer R. Buckminster Fuller imagined a fantastic system of wind turbines around the world, presumably millions of them, connected through an intercontinental transmission grid that would produce the lion's share of the world's electricity at zero marginal cost. *See* R. BUCKMINSTER FULLER, CRITICAL PATH 208 (1981).

[161] Matthew L. Wald, *Offshore Wind Power Line Wins Praise, and Backing*, N.Y. TIMES, Oct. 12, 2010 at A1.

[162] *Id.*

[163] Willett Kempton et al., *Electric Power from Offshore Wind Via Synoptic-Scale Interconnection*, 107 PROC. NAT'L ACAD. SCI. 7240, 7242–45 (2010).

[164] U.S. ENVTL. PROTECTION AGENCY, *Carbon Dioxide – Human-Related Sources and Sinks of Carbon Dioxide*, http://www.epa.gov/climatechange/emissions/co2_human.html (last updated Apr. 14, 2011) ("The process of generating electricity is the single largest source of CO_2 emissions in the United States, representing 41 percent of all CO_2 emissions.").

renewable resources could displace fossil fuel generation and protect the planet's climate, yielding a true global externality.[165]

B. State and Local Costs of Transmission Development

In contrast to their (often) regional benefits, the costs of transmission projects tend to be concentrated in the states and localities through which they run. The principal costs are the recovery of the upfront investment, and a reasonable return, from ratepayers, the aesthetic and environmental harms on areas surrounding the line, and the possible adverse health effects on those living nearby. The aesthetic, environmental and health effects could be mitigated, at least partly, through the placement of lines underground instead of on the conventional overhead towers. Burying transmission lines, however, is economically infeasible in most areas and can actually reduce system reliability.[166]

1. Recovering Project Costs

Notwithstanding the dramatic changes in the electricity sector, transmission is still a natural monopoly and regulated as such for the most part.[167] For intrastate transmission facilities in parts of the country that still have bundled electricity rates, transmission developers recover the costs of construction as well as a reasonable rate of return from their customers.[168] For all interstate transmission lines and intrastate lines in states with unbundled rates, FERC authorizes cost recovery.[169] FERC has used a variety of cost allocation methods in the past, including imposing costs on utilities that received only nominal benefits from a transmission project.[170] If other market participants use the line as they are entitled to under the open access regime established by Orders 888 and 889, these revenues are used to offset the amount recoverable from ratepayers.[171] Over the life of the project, parties may thus bear the costs in rough proportion to the benefit they derive from the line. Nonetheless, the customers of the transmission line developer are responsible for the residual costs that are not recovered through wholesale

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[165] *See* Jonathan B. Wiener, *Think Globally, Act Globally: The Limits of Local Climate Policies*, 155 U. PA. L. REV. 1961, 1964 (2007).

[166] AMY ABEL, CONG. RESEARCH SERV., RL33875, ELECTRIC TRANSMISSION: APPROACHES FOR ENERGIZING A SAGGING INDUSTRY 13–14 (2007) ("Although underground distribution is generally more reliable during storms, corrosion from water infiltration can cause outages in the days and weeks after severe storms. The uprooting of trees can damage underground lines directly. Underground lines can be more expensive and take longer to repair.").

[167] *See* Pierce, *supra* note 9, at 461.

[168] Brown & Rossi, *supra* note 8, at 709.

[169] McGarvey, *supra* note 73, at 76.

[170] *See infra* Part V.B (explaining how FERC allocates the costs of transmission projects).

[171] *Id.*

transactions regardless of whether they receive any actual benefits from the project.[172]

In theory, merchant transmission projects could obviate the issue of cost allocation. Such facilities earn revenues from exploiting price differentials between the nodes they connect on the grid.[173] In other words, these projects connect low-price power markets with surplus capacity to higher-price markets. Developers of these projects bear the economic risk, eliminating the need for regulators to determine beneficiaries and allocate costs accordingly.[174] This is a significant virtue of transmission lines developed on a merchant basis. Yet, merchant transmission is likely to remain an unfulfilled theoretical ideal for the most part. The economic and physical traits of the electricity grid suggest that merchant transmission investment cannot be expected to occur at socially desirable levels.[175] Investors in such lines want to preserve price differentials between markets; otherwise their profits would decrease. This, however, is not the economically optimal outcome, under which transmission congestion whose cost exceeds the cost of transmission investment would be eliminated.[176] Regulatory cost-allocation will likely remain the norm for transmission funding for the foreseeable future.

2. Aesthetic and Ecological Effects

While they can symbolize humankind's ingenuity and appeal to some people's subjective sense of beauty, transmission lines are generally thought to mar local landscapes. Because their steel pylons can be over one hundred feet high, opponents of transmission projects have described them as "aerial junkyard[s]."[177] Along with being visual eyesores, transmission lines can generate audible corona noise when carrying current, a sound reminiscent of a running air conditioner.[178] While the precise aesthetic reasons for finding transmission lines objectionable may often not be as colorful as aerial junkyards, contingent valuation studies, a method used commonly to price nonmarket goods, have found that those living near transmission lines are will-

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[172] *Id.*

[173] *See, e.g.*, James Bushnell & Steven Stoft, *Electric Grid Investment Under a Contract Network Regime*, 10 J. REG. ECON. 61, 66 (1996).

[174] *Id.* at 69–70.

[175] *See* Seth Blumsack, Lester B. Lave & Marija Ilic, *The Real Problem with Merchant Transmission*, ELECTRICITY J., Mar. 2008, at 9, 12–16 (explaining why the economics and engineering aspects of an alternating current-based transmission grid are not conducive to merchant investment).

[176] Vikram S. Budhraja et al., *Improving Electricity Resource-Planning Processes by Considering the Strategic Benefits of Transmission*, ELECTRICITY J., Mar. 2009, at 54, 57.

[177] *See* Eugene Levy, *The Aesthetics of Power: High-Voltage Transmission Systems and the American Landscape*, 38 TECH. & CULTURE 575, 584 (1997).

[178] John A. Molino et al., *Use of the "Acoustic Menu" in Assessing Human Response to Audible (Corona) Noise from Electric Transmission Lines*, 66 J. ACOUST. SOC'Y. AM. 1435, 1442 (1979).

ing to pay non-trivial amounts of money in return for more minimalist transmission tower designs.[179]

Beyond these aesthetic costs, the visual effect of transmission facilities can translate into more tangible economic harm. To protect against falling trees and other potential obstructions, transmission lines generally require corridors that are hundreds of feet wide and completely free of other structures and vegetation.[180] Establishing such corridors entails the condemnation of significant areas of land and can interfere with existing uses.[181] Local tourism may be harmed because visitors are less willing to visit an area where transmission lines blight previously pristine landscapes or interfere with recreational activities.[182] For local landowners, the visual pollution from transmission lines can result in reduced property values.[183]

New transmission lines can also have adverse effects on local ecosystems, especially on bird species. Given the height of most transmission lines, the adverse effects on bird populations are not surprising. Birds can collide with or be electrocuted by transmission lines while on their normal flight paths.[184] Because of their permanence, transmission lines may, in the long term, affect bird breeding habits and reduce their population densities.[185] Smaller bird species may feel the ecological effects of transmission lines most acutely. Transmission lines can serve as perches for predatory birds, which can use them to hunt smaller birds and other wildlife more effectively.[186] The effects on threatened and endangered bird populations are especially worrisome—protecting these species transcends local interests and is a matter of national and international concern.[187] While the effects are most pronounced on birds, the impact of transmission lines is not confined to them. Transmission corridors, which are usually wide enough to avoid contact with nearby structures and trees and cleared of all vegetation to reduce the risk of fire, can bisect wildlife habitats.[188] The resulting habitat frag-

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[179] Giles Atkinson et al., *'Amenity' or 'Eyesore'? Negative Willingness to Pay for Options to Replace Electricity Transmission Towers*, 11 APPLIED ECON. LETTERS 203, 207–08 (2004); Stale Navrud et al., *Valuing the Social Benefits of Avoiding Landscape Degradation from Overhead Power Transmission Lines: Do Underground Cables Pass the Benefit-Cost Test?*, 33 LANDSCAPE RES. 281, 288–93 (2008).

[180] *See* J.C. MOLBURG ET AL., THE DESIGN CONSTRUCTION, AND OPERATION OF LONG-DISTANCE HIGH-VOLTAGE ELECTRICITY TRANSMISSION TECHNOLOGIES 18 (2007).

[181] *Id.* at 20.

[182] *Id.* at 60.

[183] Stanley W. Hamilton & Gregory M. Schwann, *Do High Voltage Electric Transmission Lines Affect Property Value?*, 71 LAND ECON. 436, 442–43 (1995).

[184] Kjetil Bevanger, *Biological and Conservation Aspects of Bird Mortality Caused by Electricity Power Lines: A Review*, 86 BIOLOGICAL CONSERVATION 67, 67 (1998).

[185] João Paulo Silva et al., *Estimating the Influence of Overhead Transmission Power Lines and Landscape Context on the Density of Little Bustard* Tetrax Tetrax *Breeding Population*, 221 ECOLOGICAL MODELLING 1954, 1959 (2010).

[186] *Id.*

[187] Bevanger, *supra* note 184184, at 72.

[188] Gary Allen Breece & Bobby J. Ward, *Utility Terrestrial Biodiversity Issues*, 20 ENVTL. MGMT. 799, 802 (1998); Donna J. Clarke et al., *Powerline Corridors: Degraded Ecosystems or Wildlife Havens?*, 33 WILDLIFE RES. 615, 615 (2006).

mentation can impede breeding patterns of animal and plant species, reducing their long-term populations and harming biodiversity.[189]

3. Possible Health Effects on Nearby Residents

In recent decades, transmission lines have generated controversy and fear in the public's mind because of the alleged effects of electromagnetic fields ("EMF") on human health. Due to the ubiquity of electrical appliances and devices, virtually every member of industrialized society is exposed to EMF on a daily basis.[190] Field strength diminishes rapidly as the distance from an electric current increases,[191] so individuals who reside in close proximity to high voltage transmission lines can be expected to receive the greatest exposure to electromagnetic fields, all else being equal.

While empirical studies have not found conclusive and consistent evidence of a connection,[192] some research has reported a small but statistically significant association between electromagnetic field exposure and childhood leukemia and other cancers.[193] The theoretical connection between electromagnetic field exposure and leukemia is unclear but a few links have been posited. First, electromagnetic fields may suppress the human body's nighttime production of melatonin, a compound thought to have anti-carcinogenic properties.[194] Second, these fields may generate small amounts of electrical current in the body that can damage bone marrow where new blood cells are produced.[195] In addition to the association with childhood leukemia, electromagnetic field exposure has been associated with a small increase in the likelihood of developing brain tumors[196] and breast cancer.[197] Because the elevated risk of cancer is small and has an uncertain biological mechanism, some researchers have suggested public fixation on the connection between EMF and cancer is misplaced and may cause the public to

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[189] *See generally* Ramiro Aguilar et al., *Genetic Consequences of Habitat Fragmentation in Plant Populations: Susceptible Signals in Plant Traits and Methodological Approaches*, 17 MOLECULAR ECOLOGY 5177 (2008); Gary M. Koehler et al., *Habitat Fragmentation and the Persistence of Lynx Populations in Washington State*, 72 J. WILDLIFE MGMT. 1518 (2008).

[190] Margo R. Stoffel, *Electromagnetic Fields and Cancer: A Legitimate Cause of Action or A Result of Media-Influenced Fear?*, 21 OHIO N.U. L. REV. 551, 554 (1995).

[191] *Id.*

[192] *Electric and Magnetic Fields (EMF) Radiation from Power Lines*, U.S. ENVTL. PROT. AGENCY, http://www.epa.gov/radtown/power-lines.html (last updated July 19, 2010).

[193] *See, e.g.*, Gerald Draper et al., *Childhood Cancer in Relation to Distance from High Voltage Power Lines in England and Wales: A Case-Control Study*, 330 BRITISH MED. J. 1290, 1292 (2005).

[194] Joachim Schuz et al., *Nighttime Exposure to Electromagnetic Fields and Childhood Leukemia, An Extended Period Analysis*, 166 AM. J. EPIDEMIOLOGY 263 (2007).

[195] Leeka Kheifets & Riti Shimkhada, *Childhood Leukemia and EMF: Review of the Epidemiological Evidence*, 7 BIOELECTROMAGNETICS SUPPLEMENT S51, S55–S56 (2005).

[196] James G. Gurney & Edwin van Wijngaarden, *Extremely Low Frequency Electromagnetic Fields (EMF) and Brain Cancer in Adults and Children: Review and Comment*, 1 NEURO-ONCOLOGY 212, 212 (1999).

[197] Maria Feychting et al., *Magnetic Fields and Breast Cancer in Swedish Adults Residing near High-Voltage Power Lines*, 9 EPIDEMIOLOGY 392, 395–96 (1998).

discount other more serious carcinogenic and non-carcinogenic health risks.[198]

Even if research deems electromagnetic field exposure to be a secondary or insignificant concern in the universe of carcinogens, public aversion to transmission lines may nonetheless persist. Due to widespread concerns about the health risks of electromagnetic field exposure, transmission lines may create a feeling of dread among nearby residents—a real harm even if it is based on unfounded fears.[199] Because of the often-unfavorable prognosis and dire popular associations with cancer, individuals may be acutely aware of all carcinogenic risks and treat them all equally even if risks such as EMF exposure from transmission lines are insignificant.[200] Media coverage may also contribute to skewed popular perceptions: risks may be overstated or presented out of context.[201] Families with young children may view residences near power lines as especially undesirable on account of health grounds.[202] For all these reasons, buyers of properties near transmission lines may demand a discount for assuming a risk that is actually trivial or nonexistent.[203] Even if the cause is unfounded, a reduction in local property values due to health fears is a real cost to homeowners.

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[198] A.W. Wood, *How Dangerous Are Mobile Phones, Transmission Masts, and Electricity Pylons?*, 91 ARCHIVES DISEASE IN CHILDHOOD 361, 365 (2010).

> Causality has not been established, but if it were, estimates put the percentage of childhood leukaemia cases attributable to [electromagnetic fields from transmission lines] at around 1%. Some precautions with respect to the forms of EMF emissions are warranted, but given the enormous societal benefits of electric power . . . any such precautionary measures should take these benefits into account and also be commensurate with informed estimates of putative risk.

Id.

[199] Lita Furby et al., *Public Perceptions of Electric Power Transmission Lines*, 8 J. ENVTL. PSYCHOL. 19, 30 (1988).

[200] *See* Paul Slovic & Ellen Peters, *Risk Perception and Affect*, 15 CURRENT DIRECTIONS IN PSYCHOL. SCI. 322, 324 (2006).

> When the consequences of an action or event carry strong affective meaning, as is the case with a lottery jackpot or a cancer, the probability of such consequences often carries too little weight. As Loewenstein, Weber, Hsee, and Welch (2001) observe, responses to uncertain situations appear to have an all-or-none characteristic that is quite sensitive to the possibility of strong positive or negative consequences, regardless of their probability.

Id. (citing George F. Loewenstein et al., *Risk as Feelings*, 127 PSYCHOL. BULL. 267 (2001)).

[201] *See* John Weiss, *The Power Line Controversy: Legal Responses to Potential Electromagnetic Field Health Hazards*, 15 COLUM. J. ENVTL. L. 359, 382 (1990).

[202] *See* Furby, *supra* note 199, at 28.

[203] *See* Peter Elliott & David Wadley, *The Impact of Transmission Lines on Property Values: Coming to Terms with Stigma*, 20 PROP. MGMT. 137 (2002).

IV. State and Local Jurisdiction Frustrates Socially Desirable Transmission Upgrades

Theoretical and anecdotal evidence of state decision-making suggests that state jurisdiction over transmission siting and cost allocation has blocked necessary grid expansions. In spite of the potentially large net regional benefits of transmission expansions in the era of regional markets and renewable energy, transmission investment has stagnated in recent decades.[204]

State obstructionism occurs for three principal reasons. First, state regulators may be reluctant to approve a project whose in-state costs—both economic and non-economic—exceed the in-state benefits. Likewise, landowners and officials in local government may resist the erection of transmission lines that diminish property values without providing an adequate local benefit in return—local costs may exceed local benefits. These two obstacles to transmission can be dubbed "parochialism" and "NIMBY-ism," respectively. Furthermore, incumbent utilities with significant political clout in state government can use siting processes to block new transmission lines as a means to protect their existing market power. Utilities, in other words, can use the siting process to insulate themselves from competition, a classic case of protectionist conduct.

A. Parochialism

State regulators are politically accountable only to residents of their state and so typically value in-state benefits and costs more highly than regional benefits and costs. The degree of state-centric orientation in transmission line siting varies across states. Some states prohibit regulators from considering any out-of-state benefits when making their decisions.[205] In other states, regulators have the discretion to consider out-of-state benefits.[206] Finally, statutes in a small group of states encourage regulators to consider the

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[204] *See* Joskow, *supra* note 90, at 25.

> As wholesale markets have developed, congestion on the transmission network has not only increased but is increasingly recognized as a significant constraint on the development of efficient competitive wholesale markets for power. In many countries, states, provinces and regions that have liberalized their electricity sectors, investment in transmission capacity, especially interregional transmission capacity, has not kept pace with the expansion in demand, generating capacity, or the volume of wholesale trade. In Europe and the United States there has been almost no investment in interregional transmission capacity since the early 1990s.

Id. See also F.F. Wu et. al., *Transmission Investment and Expansion Planning in a Restructured Electricity Market*, 31 Energy 954, 959 (2006) ("[A]nnual investment on transmission in the US has dropped 50% since 1975.").

[205] Ashley C. Brown & Damon Daniels, *Vision Without Site; Site Without Vision*, Electricity J., Oct. 2003, at 23, 27.

[206] *Id.* at 29.

regional benefits of proposed transmission grid upgrades.[207] Even in more regionally-minded states, however, political pressures are likely to encourage parochial decision-making. Because state regulators have an incentive to avoid creating political backlash in their states, parochialism is an intrinsic feature of state-level decision-making. When considering the costs and benefits of a new transmission project, state officials likely place a greater weight on in-state costs and benefits and discount costs and benefits accruing to other states.[208] Because they often generate local costs and regional benefits,[209] many socially beneficial transmission projects face regulatory obstacles from the very outset. Intrastate and interstate transmission lines that yield a net benefit to a state may be able to win approval. Lines that fail to yield positive net benefits to an affected state are likely to face significant regulatory resistance, regardless of whether they are desirable from a larger regional perspective.

Southern California Edison's unsuccessful attempt to build a 230-mile transmission line from Palo Verde, Arizona to Devers, California exemplifies the impact of parochialism among state regulators. The project appeared to be a sensible way to strengthen wholesale markets in the Southwest. Arizona has surplus low-cost generation while California has less reserve capacity.[210] The line could have facilitated the export of power from Arizona to California, enhancing reliability and competition and reducing emissions of air pollutants.[211] Despite these benefits, regulators at the Arizona Corporation Commission unanimously rejected Edison's proposal.[212] For them, the project was unwelcome, as it would benefit California at the expense of Arizona, whose residents would have borne the aesthetic and environmental harms of a new transmission line and paid higher prices for electricity due to increased exports of power to California.[213] One Arizona commissioner memorably made this point, describing Edison's proposed line as a 230-mile "extension cord" for the Golden State.[214] Although it requested FERC to

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[207] *Id.* at 32.

[208] Brown & Rossi, *supra* note 8, at 710.

[209] *See supra* Part III.

[210] *See Power Line Battle with Calif. Heats Up*, ASSOCIATED PRESS, Nov. 9, 2008, *available at* 11/9/08 APALERTAZ 15:36:48 ("California customers pay about double what Arizonans pay for a kilowatt-hour of electricity, and the line would allow California to tap cheap electricity."); Leonard Anderson, *Southern California Pushes for More Reliable Grid*, REUTERS, Nov. 22, 2006, *available at* 11/22/06 REUTERS 22:00:17.

[211] Mohamed Labib Awad et al., *Using Market Simulations for Economic Assessment of Transmission Upgrades: Application of the California ISO Approach*, *in* RESTRUCTURED ELECTRIC POWER SYSTEMS: ANALYSIS OF ELECTRICITY MARKETS WITH EQUILIBRIUM MODELS 241, 260, 265 (Xiao-Ping Zhang ed., 2010).

[212] Paul Davenport, *Arizona Regulators Reject New Electric Line to California*, SAN DIEGO UNION-TRIB., May 30, 2007, *available at* http://legacy.signonsandiego.com/news/state/20070530-1728-wst-sharingpower.html.

[213] *Id.*

[214] *Id.*

invoke its backstop siting authority and overrule the Arizona decision,[215] Southern California Edison ultimately decided to scale back the project and settled for the construction of an intrastate line in California.[216]

The now-completed Trans-Allegheny Interstate Line, owned by Allegheny Power and Dominion Power, encountered similar resistance from some Pennsylvania regulators. The line runs from Southwestern Pennsylvania through West Virginia and terminates in the Northern Virginia suburbs of Washington, DC.[217] The logic of the project is apparent: connect the low-cost generation of southwestern Pennsylvania and West Virginia with the rapidly growing Washington, DC metropolitan area and reduce electricity prices and strengthen reliability in the nation's capital and other parts of the East Coast.[218] PJM, the RTO whose geographic footprint includes all the affected states, had deemed the project necessary to strengthen the grid in its Eastern region.[219] Two administrative law judges ("ALJs") for the Pennsylvania Public Utilities Commission approached the matter differently, however, by taking a Pennsylvania-centric view of the project.[220] They recommended that the commissioners deny approval to the line on the grounds that it facilitated the export of cheap power from Pennsylvania to coastal metropolises.[221] Their unconditional recommendation to deny approval created uncertainty over the project's future.[222] Fortunately for residents of the East Coast, a majority of the Commission took a more holistic view of the project's benefits and authorized the project on the grounds that it strengthened the regional market.[223]

B. NIMBYism

The phenomenon of local residents opposing industrial and public projects in their neighborhoods has become prevalent enough to warrant its

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[215] Jeff Beattie, *Southern California Edison Halts Arizona Power Line Plans*, ENERGY DAILY, May 18, 2009, *available at* Factiva, Doc. No. EDLY000020100819e55i00011.

[216] Cassandra Sweet, *Edison International Unit Wins Approval for Calif Transmission Line*, DOW JONES BUS. NEWS, Nov. 20, 2009, *available at* Factiva, Doc. No. DJON000020091121e5bl00004.

[217] Sean D. Hamill, *Vast Power Line Project Irks Monastery and More*, N.Y. TIMES, Apr. 9, 2008, at A17.

[218] *Maryland Regulators Highlight Precarious Supply Situation*, POWER MKT. TODAY, Jan. 22, 2007, *available at* Factiva, Doc. No. NGIPMT0020070122e31m00002.

[219] *Id.*

[220] Marc Levy, *Judges Deal Setback to Proposed Power Line*, PITTSBURGH POST-GAZETTE, Aug. 22, 2008, at B5.

[221] *See id.*

[222] *See id.*

[223] Janice Crompton, *Power Line Foes to Discuss Energy Options*, PITTSBURGH POST-GAZETTE, Nov. 23, 2008, at W1. The lone dissenting commissioner endorsed the ALJs' recommendation and found it unfair that Pennsylvania ratepayers would bear a portion of the line's costs despite receiving no benefit from it. *Id.*

own acronym—NIMBY—meaning not-in-my-backyard.[224] Although it arises at the local level instead of the state level, NIMBYism is similar to parochialism in that it results from the asymmetric distribution of costs and benefits of a proposed project. Because transmission lines yield concentrated costs and diffuse benefits,[225] opponents often have a strong personal incentive in resisting public projects while beneficiaries do not have enough at stake to make public action worthwhile. Furthermore, the threat of a prospective loss may be more likely to motivate public action than a prospective gain of similar magnitude.[226] In short, small groups of adversely affected parties will typically organize and take action against unwelcome projects while beneficiaries, although members of large groups, will remain unorganized and passive.[227] NIMBYism, like state-level parochialism, can be undesirable from a larger societal perspective.[228]

The New York Regional Interconnection ("NYRI"), a line that would yield significant economic and environmental benefits, has been in prolonged limbo because of strong NIMBY resistance. This direct-current line is proposed to run from Upstate New York to the suburbs of New York City.[229] From a system-wide perspective, the need for the project is clear. New York City is a net importer of power while Upstate New York is a net exporter.[230] Often, the lack of adequate transmission capacity prevents the most economical power plants from serving the nation's largest metropolitan area; low-cost generators, including wind farms,[231] in Upstate New York cannot serve the New York City market due to congested transmission lines.[232] This frequent market separation between New York City and the rest of New York State market has had significant adverse effects on residents of New York City. The dependence on local generation has led to higher prices,

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[224] Orlando E. Delogu, *"NIMBY" Is a National Environmental Problem*, 35 S.D. L. REV. 198, 198 (1990).

[225] Barak D. Richman & Christopher Boerner, *A Transaction Cost Economizing Approach to Regulation: Understanding the NIMBY Problem and Improving Regulatory Responses*, 23 YALE J. ON REG. 29, 32 (2006).

[226] *See* Christine Jolls, Cass R. Sunstein & Richard Thaler, *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471, 1484 (1998).

[227] *See* MANCUR OLSON, JR., THE LOGIC OF COLLECTIVE ACTION: PUBLIC GOODS AND THE THEORY OF GROUPS 53–54 (1965).

[228] Michael B. Gerrard, *The Victims of NIMBY*, 21 FORDHAM URB. L.J. 495, 495–96 (1994).

[229] *Project Overview*, N.Y. REG'L INTERCONNECTION, http://www.nyri.us (last visited Oct. 13, 2011).

[230] *See* DOE CONGESTION STUDY, *supra* note 111, at 44–45.

> Most of the electricity flows in upstate New York are either west-to-east or north-to-south, and all move electricity toward the New York City area. Because transmission capacity into this area is limited, New York City is an epicenter of transmission congestion and its delivered energy prices are higher than in other eastern load centers.

Id.

[231] Matthew L. Wald, *Wind Energy Bumps Into Power Grid's Limits*, N.Y. TIMES, Aug. 26, 2008, at A1.

[232] DOE CONGESTION STUDY, *supra* note 111, at 44–45.

due to the higher costs and market power of in-city generators,[233] and lower local air quality.[234] In other words, residents of New York City pay both from their pocketbook and long-term health on account of inadequate transmission capacity. By facilitating greater power flows from Upstate New York, NYRI would produce major benefits for the millions of residents of New York City and its suburbs.

Despite its substantial benefits, the NYRI project has run into a classic case of NIMBY resistance. Residents living along the route of the NYRI line have mounted significant opposition to the project. They have argued that the line would mar the bucolic landscape of the Upper Delaware River Valley.[235] Specifically, they cite the line's potential effects on endangered species, tourism, property values, and the health of nearby residents as grounds to block the project.[236] In addition, they have contended that they should not bear the costs of a project that would benefit outsiders.[237] New York politicians, including Senator Charles Schumer (D) and former Senator Hillary Clinton (D),[238] have taken up the opponents' cause and pledged to fight the project at multiple levels.[239]

This political dynamic illustrates how the individual stakes often matter much more than the aggregate benefits and costs. The project would have yielded significant benefits to residents of New York City; the costs while real and deserving of regulatory attention were probably much smaller in comparison. Because the costs were concentrated among a few thousand individuals at most and the benefits were dispersed among millions, however, opponents were much more active in opposing the project and mobilizing legislative resistance. To illustrate it hypothetically, the owner of a bed-and-breakfast in the Catskills, who feared losing guests and tens of thousands of dollars in annual revenue because of the transmission line, was much more likely to participate in public activism and the regulatory process than one of New York City's several million residents, who would save a modest amount on her monthly electricity bill and breathe less polluted air due to the line. Statewide, New York politicians like Senator Schumer sided with one group

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[233] *Id.*; Daniel L. Shawhan et al., *An Experimental Test of Automatic Mitigation of Wholesale Electricity Prices*, 29 INT'L J. INDUS. ORG. 46, 47 (2011) ("[C]oncentrated ownership and frequent transmission congestion give NYC's generation owners market power. . . . [S]ix companies own 99% of the generation capacity in NYC.").

[234] *See* U.S. PIRG EDUC. FUND, POLLUTION ON THE RISE: LOCAL TRENDS IN POWER PLANT POLLUTION 45, 56 (2005) (indicating 337% rise in sulfur dioxide emissions and 14% rise in nitrogen oxide emissions from the Ravenswood generation station in Queens, New York between 1995 and 2003).

[235] Anthony DePalma, *Chafing at a Plan to Add Power Lines to the Landscape*, N.Y. TIMES, July 10, 2006, at B1.

[236] *Id.*

[237] *Id.*

[238] *Sens. Schumer, Clinton Introduce Bill to Protect State's Right to Oppose New York Regional Interconnect's Current Power Line Route*, U.S. FED NEWS, Aug. 14, 2007, *available at* Factiva, Doc. No. INDFED0020070819e38e0024p.

[239] Devlin Barrett, *NY Lawmakers Seek to Block NYRI Power Line*, ASSOCIATED PRESS, Feb. 5, 2007, *available at* Factiva, Doc. No. APRS000020070205e3250031m.

of New Yorkers over another group of New Yorkers because of this asymmetry in individual benefits and costs. In the face of NIMBY opposition and an unfavorable cost allocation mechanism, the NYRI is all but dead.[240]

NorthWestern Energy's proposed Mountain States Transmission Intertie (MSTI) that would run from central Montana to Midpoint, Idaho is facing fierce resistance from nearby farmers and other landowners.[241] The line would integrate Montana's wind resources, among the most bountiful in the nation, into Western power markets.[242] Opponents, including actor and local rancher Bill Pullman, have argued that the line would be another eyesore on their horizon and principally benefit those residing outside Montana.[243] They contend the line should be partly constructed on adjacent federal government land instead.[244] This alternate route, however, may not be feasible from an engineering perspective and would run through a wildlife preserve for endangered elk.[245] Project supporters like Montana Governor Brian Schweitzer have recognized the legitimacy of opponents' grievances but have noted that Montana has historically been an exporter of power and has derived substantial benefits from its abundant energy resources.[246] The fate of MSTI and other bitterly opposed transmission lines in the region will affect the future of many proposed wind energy facilities that require new lines to sell their power.[247]

C. Protectionism: How Incumbents Use the Transmission Siting Process to Insulate Themselves from Competition

The market expansion function of transmission can reduce the profitability of generators possessing market power. Generators within load pockets profit from having market power and would like to continue maintaining the "quiet life" of a monopolist (or an oligopolist).[248] These entities stand to lose from a transmission line that exposes them to competition and drives

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[240] *Commission Officially Dismisses NYRI*, N.Y. PUB. SERV. COMM'N (Apr. 21, 2009), http://www3.dps.state.ny.us/pscweb/WebFileRoom.nsf/0/AF865D6E5239CC858525759F0053BA39/$File/pr09033.pdf?OpenElement; Kathy Larsen et al., *NYRI Line Developers Pull Plug on State Siting Process After FERC Ruling on Cost Recovery*, ELEC. UTIL. WEEK, Apr. 13, 2009, *available at* Factiva, Doc. No. EUW0000020090427e54d00004.

[241] Phil Taylor, *Battle Over Mont. Transmission Line Stymies Wind Development*, N.Y. TIMES GREENWIRE (Aug. 24, 2011), http://www.nytimes.com/gwire/2011/08/24/24greenwire-battle-over-mont-transmission-line-stymies-win-63749.html.

[242] *See id.*

[243] *Id.*

[244] *Id.*

[245] *Id.*

[246] *Id.*

[247] *Id.*; Ken Otterbourg, *The Power Struggle for Wyoming's Wind*, CNN MONEY (Sept. 14, 2011), http://tech.fortune.cnn.com/2011/09/14/the-power-struggle-for-wyomings-wind/.

[248] John R. Hicks, *Annual Survey of Economic Theory: The Theory of Monopoly*, 3 ECONOMETRICA 1, 8 (1935).

market prices closer to marginal cost.[249] A new transmission line can, furthermore, create competition for an existing line connecting two otherwise isolated markets.

To stave off this competition, incumbent generation and transmission owners can use state and local regulatory procedures to block the construction of new lines. By virtue of their size, these enterprises often have considerable clout in the halls of state government and can join with other opponents to derail a project. As with NIMBY-based opposition, the widely different individual stakes of the winners and losers from a new transmission line may frustrate the construction of necessary projects. A firm possessing market power may have strong incentives to oppose a transmission line because it would earn significantly lower profits in a market made more competitive by the line.[250] In contrast, the thousands of beneficiaries of the line, who would pay less for electricity, may not have enough at stake to mount support as a collective group.[251] Because project opponents have stronger incentives than project beneficiaries to promote their economic interest, states may favor the interests of powerful incumbent utilities at the expense of in-state residents who would benefit from lower power prices.

The two-year legal and regulatory fight from 2002 to 2004 over the now-operational Cross-Sound Cable illustrates how incumbents can resist new transmission lines. The line is a direct current cable that runs underneath the Long Island Sound from New Haven, Connecticut to Shoreham, New York and connects the New England and New York power markets.[252] The developer proposed the line as a merchant project and so would bear the economic risk in its entirety—in other words, it would make money based on the existence of price differentials between the two markets.[253]

From the very beginning, the project was controversial as some critics worried that the line would damage fragile shellfish beds in New Haven harbor.[254] After the developer agreed to route the line so that it would avoid the shellfish beds for all but 700 feet of its subsea route, the Connecticut State Siting Council gave the project environmental clearance. Then-Attorney General Richard Blumenthal, with the support of other state and local politicians, appealed the Siting Council's decision.[255] During the course of Blumenthal's unsuccessful appeals, the line was installed and ready to begin

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[249] Enzo E. Sauma & Shmuel S. Oren, *Do Generation Firms in Restructured Electricity Markets Have Incentives to Support Social-Welfare-Improving Transmission Investments?*, 31 ENERGY ECON. 676, 678 (2009).

[250] *See id.*

[251] *See id.*

[252] *See* Jim Rossi, *Transmission Siting in Deregulated Wholesale Power Markets: Re-Imaging the Role of Courts in Resolving Federal-State Siting Impasses*, 15 DUKE ENVTL. L. & POL'Y F. 315, 316 (2005) [hereinafter *Siting in Deregulated Markets*].

[253] *See id.*

[254] Linda L. Randell & Bruce J. McDermott, *Chronicle of a Transmission Line Siting*, PUB. UTIL. FORT., Jan. 2003, at 34, 36.

[255] *Id.*

operation.[256] In light of the legal battle, the Department of Energy ("DOE") issued an emergency order authorizing use of the line under very limited circumstances.[257] The emergency order lapsed in late 2002 without ever having been used to mandate operation of the line.[258]

In 2003, the line's regulatory woes only continued. Although the line had not been buried to the required depth at certain points, the Army Corps of Engineers found that this would have no adverse environmental impact.[259] Nonetheless, the Connecticut Department of Environmental Protection prohibited the line from transmitting power because of this technical violation of the state permit.[260] The state legislature, in addition, passed a moratorium on the construction of underwater transmission lines in 2002 that prevented the project developer from either seeking a modification of its permit or reburying the line at the required depth.[261] Even with the Northeastern Blackout of August 2003 underscoring the fragility of the grid and the importance of maintaining sufficient reserve generation, the dispute over the line continued. Finally in 2004, FERC intervened and after an extended battle forced the parties to reach an agreement allowing the Cross Sound Cable to transmit power in June of that year.[262]

While some of it was likely based on a concern for environmental protection, Northeast Utilities' opposition to the Cross Sound Cable illustrates how protectionist motives can impede transmission investment.[263] It had an obvious incentive to oppose the project: Northeast, an incumbent utility in Connecticut, owned an older line across the Long Island Sound and had proposed expanding its capacity instead of constructing the parallel facility.[264] Northeast's lobbying, at the very least, amplified the opposition to the operation of the Cross Sound Cable. Revealingly, the final settlement between New York and Connecticut included an agreement by the Long Island Power Authority, a principal beneficiary of the new line, to pay eighty million dollars toward upgrading Northeast's existing undersea line.[265]

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[256] *Id.*

[257] *Id.*

[258] *Id.*

[259] Linda Randell & Bruce McDermott, *Cross-Sound Blues*, PUB. UTIL. FORT., Feb. 2004, at 20, 20.

[260] *Id.*

[261] *Id.* at 20–21.

[262] Bruce Lambert, *New York and Connecticut Agree to End Cable Dispute*, N.Y. TIMES, June 25, 2004, at B6.

[263] Rossi, *Siting in Deregulated Markets*, *supra* note 252, at 317.

[264] *Id.*; Jim Brumm, *Northeast Utilities Plans 600 MW Line*, REUTERS, June 27, 2001, *available at* Factiva, Doc. No. LBA0000020010712dx6r00sx7.

[265] Lambert, *supra* note 262.

V. Federal Preemption: The Remedy for Parochialism and Protectionism

To overcome state and local resistance to transmission expansions, Congress should preempt local and state authority over transmission planning and vest a single federal regulator with the authority to site and allocate the costs of all new transmission lines. Based on history and institutional expertise, the Federal Energy Regulatory Commission ("FERC") is the agency best suited to regulate the construction of new transmission lines. State jurisdiction over the siting and cost allocation decisions for electric transmission lines allows parochial and protectionist interests to frustrate the creation of stronger regional power markets. Their interests often conflict with the broader aim of expanding the transmission grid to establish a clean, economical, and reliable supply of electricity. Although state regulators ideally would give greater consideration to regional interests, it is unrealistic to expect them to act consistently against their political self-interest.[266]

A. The Inadequacies of Reforms in the EPAct of 2005

While Congress correctly recognized in the EPAct of 2005 that state-siting authority is an impediment to socially beneficial transmission investment,[267] the backstop siting authority given to FERC has proven to be a paper tiger. The Agency can only override state and local authority and approve a proposed line when it is in a National Interest Electric Transmission Corridor ("NIETC"), as defined by the DOE. The DOE has identified two NIETCs: the corridor running from New York City through Northern Virginia and the region comprising Southern California and Western Arizona.[268] As a result, sizeable portions of the country, including some of the areas with the greatest renewable resource potential, are not subject to the federal backstop authority.[269]

Even if the DOE designated the entire country an NIETC, FERC would only be able to exercise its authority under limited circumstances. The agency can only assert its jurisdiction if a state: (1) lacks legal authority to approve the project or consider its out-of-state benefits; (2) cannot approve the transmission proposals of non-utility developers; or (3) fails to issue a decision within one year of receiving an application or imposes conditions that compromise the project's economic benefits or feasibility.[270] The EPAct of 2005 also did not change the fundamental process of transmission sit-

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[266] Brown & Rossi, *supra* note 8, at 710.

[267] *See* Pub. L. No. 109–58, 119 Stat. 594 (codified as amended in scattered sections of 42 U.S.C.).

[268] Nat'l Interest Elec. Transmission Congestion Report, 72 Fed. Reg. 56,992 (Oct. 5, 2007).

[269] *Compare id.*, *with* NREL Wind, *supra* note 59, *and* NREL Solar, *supra* note 61.

[270] 16 U.S.C. § 824p(b) (2006); Swanstrom & Jolivert, *supra* note 80, at 443–44.

ing.[271] Rather, the option of federal intervention was merely grafted on to a regulatory regime in which states still retain primary jurisdiction.[272] Even if developers of transmission lines can eventually obtain preemptive regulatory approval from the federal government, it may come only after a protracted and costly attempt to win over state regulators. This significant likelihood of delay can deter prospective project developers from investing in new lines.

The lack of federal involvement in transmission siting since 2005 has been telling. Notably, FERC has never used its backstop authority over this period. Only one application, later withdrawn, has been filed during this time.[273] In theory, this lack of regulatory activity at the federal level does not signify federal impotence. If the states viewed federal backstop authority as a credible threat, they would likely expedite the approval of transmission projects and refrain from blocking new lines on parochial and protectionist grounds. If, however, states do not consider federal authority to be a credible threat, they may disregard the possibility of FERC intervention when reviewing transmission proposals. The latter appears to be the case as states continue to obstruct the construction of regionally beneficial transmission facilities.[274]

A federal appellate court decision in 2009 further eroded FERC's backstop authority. In *Piedmont Environmental Council v. Federal Energy Regulatory Commission*,[275] the Fourth Circuit held that if a state expressly denies approval for a transmission project within a year FERC cannot exercise its backstop authority.[276] In the wake of this ruling, the federal government is effectively powerless to override the will of states that are determined to block the construction of transmission facilities.[277]

B. Congress Should Preempt State and Local Authority Over Transmission Siting and Ratemaking

Congress should acknowledge the inadequacy of its earlier attempt to fix the broken siting process and grant FERC exclusive authority over the siting and cost allocation for all new transmission lines. FERC should be empowered to authorize the routes of transmission facilities and exercise eminent domain powers in order to obtain the necessary rights-of-way. Because of the interconnected nature of the grid, FERC should be granted juris-

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[271] *See* Pub. L. No. 109–58, 119 Stat. 594 (codified as amended in scattered sections of 42 U.S.C.).

[272] *See* Swanstrom & Jolivert, *supra* note 80, at 422.

[273] Brown & Rossi, *supra* note 8, at 746.

[274] *See supra* Part IV.A–B.

[275] 558 F.3d 304 (4th Cir. 2009).

[276] *Id.* at 313–15.

[277] *See* Santosh Sagar, Note, *A Twenty-First Century Lazarus? The Demise and Possible Rebirth of FERC Backstop Siting Authority*, 37 ECOLOGY L.Q. 693, 699 (2010) ("[In the wake of *Piedmont*], state regulators retain the authority to block the construction of interstate transmission projects, regardless of their potential national benefits.").

diction over all new intrastate and interstate lines—not merely interstate lines—above a certain voltage.[278] High voltage lines have greater transfer capacity and so are more likely to have substantial effects on regional power markets.[279] By setting a lower voltage threshold, Congress would bring a greater number of transmission projects under federal jurisdictions and reduce the scope for state and local obstructionism. This, however, would require FERC to review more project applications, and Congress would have to increase the agency's funding accordingly.

In addition, Congress should bring all cost allocation decisions under FERC authority. FERC presently allocates the costs of interstate transmission lines and intrastate lines in those states that have required utilities to unbundle their rates.[280] As a result, the rates on many intrastate lines remain subject to state regulation. Because states can block transmission projects through one of two means—withholding siting approval or denying cost recovery[281]—Congress must grant both siting and cost allocation powers to FERC if transmission projects are to be immune to state obstructionism. One without the other is insufficient.

Federal preemption would eliminate the parochialism that characterizes transmission planning in many states today. Because of the presence of regional externalities, states are not the appropriate political units to exercise jurisdiction over transmission.[282] Current state processes systematically discount or ignore transmission benefits that are realized outside state lines. Under federal jurisdiction, transmission projects would be evaluated on a more complete, national perspective because federal officials are accountable to all Americans and not just to the citizens of a particular municipality

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[278] An approach that determines on a case-by-case basis whether a proposed line is under federal jurisdiction, while politically more palatable in the near term, is likely to create tremendous uncertainty and generate significant litigation. *See, e.g.*, Steven J. Eagle, *Wireless Telecommunications, Infrastructure Security, and the NIMBY Problem*, 54 CATH. U. L. REV. 445, 489–90 (2005) (explaining how the allocation of power between federal and state governments over wireless tower siting is "vague in its reach and implications" because of its "attempt to have it both ways—to bridge the gap between NIMBY concerns and telecommunications infrastructure expansion with legislation that would have local rules and practices regulated by federal procedural devices.").

[279] *Transmission Questions & Answers*, AM. ELEC. POWER, http://www.aep.com/about/transmission/transmissionqa.aspx (last visited Oct. 23, 2011).

[280] McGarvey, *supra* note 73, at 76.

[281] *See* ROSS BALDICK ET AL., A NATIONAL PERSPECTIVE ON ALLOCATING THE COSTS OF NEW TRANSMISSION INVESTMENT: PRACTICE AND PRINCIPLES 34 (2007).

[282] *See* JAMES M. BUCHANAN & GORDON TULLOCK, THE CALCULUS OF CONSENT 113 (1962).

> [I]t is relatively straightforward to construct a theory for the optimum size of the collective unit, where this size is also subject to constitutional determinations. The group should be extended so long as the expected costs of the spillover effects from excluded jurisdictions exceed the expected incremental costs of decision-making resulting from adding the excluded jurisdictions.

Id.

or state.[283] A federal agency like FERC would credit the regional economic and reliability benefits of a transmission line instead of treating them as externalities as many states currently do.

Although NIMBY and protectionist opponents would still have a forum in which to resist transmission projects, they would likely hold substantially less clout before a federal regulator than in a state or local forum. As James Madison explained over two centuries ago, smaller forums are more easily swayed by a small group of self-interested individuals;[284] applying this principle, federal jurisdiction would likely diminish opponent's actual power to block proposed lines because jurisdiction would be vested at a higher level of government.[285] Powerful groups, whose interests may conflict with larger social objectives, often have the greatest influence at the state and local level and can prevent necessary infrastructure investments that require state and local approval.[286] Local landowners, who sometimes have tremendous political clout in state government, can lobby state legislators and regulators to oppose transmission projects. Their power at the federal level is almost certainly much less.[287] The same is likely true for incumbent utilities; political giants at the state level may often be only dwarves before federal regulators. Furthermore, at the federal level, stakeholders in favor of constructing transmission lines are likely to have equal and offsetting political clout.

With exclusive FERC jurisdiction, a single federal regulator would replace the current regulatory patchwork that governs the siting of transmission lines. At present, transmission developers often have to seek approval from multiple local, state, and federal entities before they can construct a new line. These regulators are often pursuing conflicting objectives; a town zoning authority may, for example, want to minimize the impact of the line on local landscapes and property values while a state utility commission may want to reduce the economic cost of the project to ratepayers. These conflicting regulatory missions can introduce tremendous uncertainty into the siting process. The potential for interminable delay can deter prospective investors from undertaking transmission projects and further deprive the sector of needed upgrades. Even if the process were completely predictable, having to navigate multiple regulatory channels would mean higher initial costs for

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[283] *See* Thomas W. Merrill, *Preemption in Environmental Law: Formalism, Federalism Theory, and Default Rules*, *in* FEDERAL PREEMPTION: STATES' POWERS, NATIONAL INTERESTS 166, 175–76 (Richard A. Epstein & Michael S. Greve eds., 2007).

[284] *See* THE FEDERALIST NO. 10.

[285] *See* Richard Briffault, *Our Localism: Part II—Localism and Legal Theory*, 90 COLUM. L. REV. 346, 408 (1990) (describing how cities do not want to alienate taxpayers, especially those who can relocate); Ashira Pelman Ostrow, *Process Preemption in Federal Siting Regimes*, 48 HARV. J. ON LEGIS. 289, 333–34 (2011) (explaining how under the Telecommunications Siting Policy for wireless towers, federal courts have used their statutory authority to reverse local zoning boards' denials of wireless tower permits).

[286] *See* David B. Spence & Paula Murray, *The Law, Economics, and Politics of Federal Preemption Jurisprudence: A Quantitative Analysis*, 87 CAL. L. REV. 1125, 1189 (1999).

[287] *See* Ostrow, *supra* note 285, at 306.

project development without the promise of any social benefit in return.[288] A single federal regulator would eliminate the current administrative duplication and introduce greater predictability into the siting process.[289]

As part of granting FERC exclusive authority over transmission siting and cost allocation, Congress should require FERC to perform a comprehensive cost-benefit analysis of transmission line proposals. Currently, FERC's process for assessing the benefits of a proposed transmission project is inadequate. FERC examines how the new transmission line would reduce dispatch costs, but does not attempt to quantify the benefits of enhanced reliability and fuel diversity, increased market competition, and reduced emission of various air pollutants.[290] If transmission investment is to occur in a socially desirable and efficient way, FERC must at least attempt to approximate these benefits and factor them into its evaluation of transmission proposals. It would be ironic if transmission-planning authority were stripped from state and local governments on account of their systematic neglect of regional benefits only to be given to a federal agency that commits a similar omission due to its flawed modeling methods.

Furthermore, Congress should require that FERC establish general cost allocation principles through a rulemaking process. At present, even where FERC has authority to allocate transmission costs, it does so on an ad hoc basis.[291] The uncertainty over how costs are to be allocated has spawned protracted litigation and has surely deterred some investors from developing new transmission lines. While there are multiple allocation methods, the two general approaches to cost allocation can be described as "beneficiary pays" and "socialization." Under the former, utilities (and ultimately their customers) are responsible for a portion of costs that corresponds roughly to the benefit they derive. Under the latter, costs are equalized across the affected

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[288] *See infra* Part V.D (explaining how federal regulators can be required to pay due concern to the state and local effects of transmission lines).

[289] *See* Dang, *supra* note 9, at 344 ("Consolidating the siting process into a one-stop permitting process has many benefits. Substantial costs can be reduced because of the elimination of the multiple approval process.").

[290] *See, e.g.*, Budhraja et al., *supra* note 176, at 56–61 (explaining limitations of traditional electrical market models and oft-ignored benefits of transmission investments); BALDICK ET AL., *supra* note 281, at 20.

> Lines that do not carry much power can still enhance efficiency if, through the threat of competition, they reduce supplier market power and limit the need for more intrusive market power mitigation rules. Projects that substantially reduce local market power will also likely have a dramatic impact on prices in a constrained region. Therefore it is also reasonable for the modeling of project benefits to consider the potential for market power, and not just model scenarios where all suppliers are assumed to be operating as 'price-taking,' perfectly competitive, suppliers. Traditional production cost models in effect assume such perfectly competitive behavior and can therefore understate both the efficiency and consumer price benefits of certain projects.

Id.

[291] *See* Brown & Rossi, *supra* note 8, at 764–65 (explaining how FERC approved radically different cost-allocation principles in NYISO and the Southwest Power Pool).

geographic footprint without strict correspondence to the actual expected benefits for each utility and its ratepayers.[292] As a policy matter, there are arguments in favor of both beneficiary pays and socialization methods of cost allocation.[293] Order 1000 requires regional planning bodies to establish cost allocation methods that conform to six criteria but leaves regional planners substantial discretion.[294] Even if FERC were to establish an imperfect method of cost allocation that regional transmission planning bodies would have to follow, such a method would create a regulatory norm and likely represent an improvement over the status quo under which there is no default framework.[295]

C. Preemption Would Be Constitutional and Consistent with Prior Federal Legislation

Although some may decry the proposed expansion of federal authority as an improper infringement of states' rights, under modern Commerce Clause jurisprudence Congress has broad authority to regulate the electric power sector. In *Connecticut Light & Power v. Federal Power Commission*,[296] the Supreme Court stated in dicta that the electric utility industry is "so fused and interdependent that the whole enterprise is within the reach of Congress."[297] Expounding upon its point, the Court described "the cord from a light plug to a toaster on the breakfast table"[298] as a "facility for transmission of interstate energy if any part of the load is generated without the state."[299] Although the Supreme Court has constrained Congress's Commerce Clause authority somewhat over the past two decades,[300] it is unlikely these decisions would be interpreted to restrict Congress's power over the electric power industry. Congress has the authority to regulate the instrumentalities of interstate commerce, the channels of interstate commerce, and

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[292] A Seventh Circuit ruling in 2009 rejected FERC's proposal to socialize transmission costs across a broad geographic area. *See* Ill. Commerce Comm'n v. Fed. Energy Regulatory Comm'n, 576 F.3d 470, 476–77 (7th Cir. 2009) (holding that FERC cannot impose the costs of a transmission project on utilities that derive no benefit from the project).

[293] *See* BALDICK, *supra* note 281, at 3.

[294] 18 C.F.R. § 35 (2011).

[295] *See* BALDICK, *supra* note 281, at 48 ("The problem is not that competing groups do not have legitimate interests to protect, but rather that absent clear policy, the jockeying can be neither fully informed nor focused, and is therefore unnecessarily protracted, and disruptive to the orderly evolution of the grid and of the market it enables.").

[296] 324 U.S. 515 (1945).

[297] *Id.* at 529–30.

[298] *Id.* at 530.

[299] *Id.* at 529.

[300] *See* United States v. Morrison, 529 U.S. 598, 627 (2000) (holding Congress does not have the power under the Commerce Clause to pass certain provisions of the Violence Against Woman Act of 1994); United States v. Lopez, 514 U.S. 549, 567–68 (1995) (holding Congress exceeded its authority under the Commerce Clause in enacting the Gun-Free School Zones Act of 1990).

all economic activity with "substantial effects" on interstate commerce.[301] Electric transmission is certainly a channel of interstate commerce; it facilitates the interstate sale of power.[302] The sale of electricity is, furthermore, an economic activity that has substantial effects on multiple streams of interstate commerce.[303]

Similar to what this Article proposes, many states have preempted local regulatory authority over the siting of transmission lines. As is now occurring at the state level, local governments were frequently rejecting proposed transmission lines based on strictly local cost-benefit calculations. Local governments typically do not want to authorize transmission projects that would impose aesthetic and environmental costs on their residents while benefiting the residents of neighboring counties and towns.[304] The obstructionism of local governments, however, was blocking the construction of transmission lines needed to improve the reliability and efficiency of state electrical systems.[305] To address this problem, many states preempted local regulatory authority over transmission siting.[306] A single state regulator, typically the public utility commission, was vested with the authority to site all transmission lines.[307]

As a policy matter, federal preemption would hardly be an unprecedented departure from past Congressional action. In fact, preemption would be analogous to what Congress has done in the natural gas industry. There Congress preempted significant state regulatory over eighty years ago in the Natural Gas Act.[308] Unlike electricity, natural gas has been sold on a national market for several decades. The largest gas reserves are located in the Gulf Coast region,[309] far from most urban areas and industrial regions.[310] From the

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[301] Gonzales v. Raich, 545 U.S. 1, 16–17 (2005).

[302] *See* Pierce, *supra* note 9, at 462.

[303] Robin Kundis Craig, *Constitutional Contours for the Design and Implementation of Multistate Renewable Energy Programs and Projects*, 81 U. COLO. L. REV. 771, 780 (2010).

[304] *See* Dang, *supra* note 9, at 343.

[305] *Id.*

[306] *Id.*

[307] *Id.*

[308] Pub. L. No. 75-688, 52 Stat. 831 (1938) (codified as amended at 15 U.S.C. §§ 717–717w (2006)). *See* Paula A. Zinozich et al., *The Role of Preemption in Administrative Law*, 45 ADMIN. L. REV. 107, 128 (1993).

> When the formerly local industry was transformed into an interstate industry with increasing importance to the national economy, Congress moved in to regulate the activities that the states could not under the Commerce Clause cases. In addition to Commerce Clause limitations, the states now had to be concerned with preemption by the new federal statutes. The NGA specifically applied to the transportation of natural gas in interstate commerce, the sale of natural gas for resale, and to any 'natural gas companies' engaged in such activities.

Id.

[309] *See Gas Production in Conventional Fields, Lower 48 States*, ENERGY INFO. ADMIN., http://www.eia.gov/oil_gas/rpd/conventional_gas.pdf (last updated Apr. 8, 2009).

[310] *See Share of Total U.S. Natural Gas Delivered to Consumers*, ENERGY INFO. ADMIN., http://www.eia.gov/dnav/ng/ng_cons_pns_a_EPG0_VRP_pct_a.htm (last updated Sept. 29, 2011).

early years of the industry, a well-developed interstate pipeline network has thus been needed to ship gas to where it is used. To facilitate the construction of this network, Congress vested the Federal Power Commission, FERC's predecessor, with exclusive authority over the regulation and siting of interstate natural gas pipelines.[311] More recently, Congress has expanded the scope of federal preemption over natural gas facilities in the EPAct of 2005. Due to the growing reliance on the imports of liquefied natural gas ("LNG") to meet domestic demand and inadequacy of existing LNG terminals, new facilities have to be built.[312] These projects, however, face vigorous local opposition on environmental and safety grounds.[313] If state and local governments could exercise veto power over these projects, new LNG terminals would be very difficult to site and build. Without an expansion in LNG import facilities, sufficient gas supplies would not be able to reach the United States, leading to higher energy prices and harm to the national economy.[314] Perceiving the grave harm from local and state obstructionism, Congress in the EPAct of 2005 granted FERC exclusive authority over the siting of LNG terminals.[315]

Proving that natural gas is not somehow exceptional, Congress partly preempted state and local authority over the siting of microwave towers for wireless communications in the Telecommunications Act of 1996.[316] Microwave towers are aesthetically similar to electric transmission lines: tall metal structures widely thought to blight local landscapes and emit radiation harmful to the health of nearby residents.[317] If local governments had unfettered authority over the siting of microwave towers, they could prevent the construction of towers needed to establish comprehensive national wireless networks.[318] Given the ability and incentive for local governments to frustrate an important national policy objective, Congress prohibited local and state siting decisions that restricted the provision of or limited competition in the market for wireless services.[319] Although its preemption clause is arguably

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[311] *See* Charles G. Stalon & Reinier H.J.H. Lock, *State-Federal Relations in the Economic Regulation of Energy*, 7 YALE J. ON REG. 427, 476 (1990).

[312] *See* James B. Lebeck, Note, *Liquefied Natural Gas Terminals, Community Decisionmaking and the 2005 Energy Policy Act*, 85 TEX. L. REV. 247 (2006).

[313] *Id.* at 249.

[314] Kathryn E. Kransdrof, Note, *Not on My Coastline: The Jurisdictional Battle over the Siting of LNG Import Terminals*, 17 FORDHAM ENVTL. L. REV. 37, 87 (2005).

[315] Energy Policy Act of 2005 § 311, 15 U.S.C. § 717b(e)(1) (2006). Although Congress could not have foreseen this development at the time, the discovery of large shale gas deposits in recent years has rendered the need for LNG imports and new terminals moot. *See* Amy Myers Jaffe, *Shale Gas Will Rock the World*, WALL ST. J. (May 10, 2010), http://online.wsj.com/article/SB10001424052702303491304575187880596301668.html.

[316] Pub. L. No. 104-104, 110 Stat. 56 (codified as amended in scattered sections of 47 U.S.C.).

[317] John Copeland Nagle, *Cell Phone Towers As Visual Pollution*, 23 NOTRE DAME J.L. ETHICS & PUB. POL'Y 537, 538 (2009).

[318] *See* Eagle, *supra* note 278, at 454.

[319] *Id.* at 464–66.

too nebulous,[320] the Telecommunications Act constrained state and local regulatory authority over a matter of national significance and helped usher in twenty-first-century wireless telecommunications.

If Congress were to preempt state authority over transmission siting, it would not only be constitutional, but also consistent with past federal legislative action in network industries. Congress has broad economic regulatory power under the Supreme Court's post-New Deal Commerce Clause jurisprudence. From a political perspective, Congressional action would not be an extraordinary "usurpation" of states' rights. As federal legislation concerning the natural gas and telecom industries illustrates, the balance between federal and state authority is constantly evolving. In the context of transmission planning, numerous state governments themselves have recognized the risks of vesting too much power at the lowest levels of government. Despite acknowledging the importance of federalism in the American system of government, Congress has been willing to expand federal authority at the expense of state sovereignty in response to economic and technological developments.

The creation of federal backstop siting authority in the EPAct of 2005 and recent Congressional discussions to expand federal transmission siting authority[321] suggest the political tides are shifting in the context of electricity. A proposal by Senator Jeff Bingaman (D-N.M.) was especially promising and would have granted the federal government exclusive siting authority over all new interstate transmission facilities.[322] Based on these recent initiatives, exclusive federal authority over the construction of new transmission lines does not seem that far-fetched.

D. FERC Would Not Run Roughshod Over Local and State Interests

While an ever-present fear of federalization in any realm is that local and state interests will be ignored,[323] federal agencies do not retain unlimited discretion and, in fact, are subject to well-established constraints on their decision-making. The National Environmental Policy Act ("NEPA") requires that federal agencies examine the environmental consequences of every action that is likely to have a significant environmental impact.[324] Given the substantial environmental impact of transmission development,[325] NEPA would require FERC to prepare an Environmental Impact Statement ("EIS") examining the environmental consequences of constructing the

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[320] *Id.* at 489–90.

[321] Brown & Rossi, *supra* note 8, at 746–48 (summarizing proposals in Congress to expand federal siting authority).

[322] Sagar, *supra* note 277, at 698.

[323] Tara Benedetti, *Running Roughshod—Extending Federal Siting Authority over Interstate Electric Transmission Lines*, 47 HARV. J. ON LEGIS. 253, 270 (2010); *see also* Lebeck, *supra* note 312, at 266.

[324] 42 U.S.C. § 4331(a) (2006).

[325] *See supra* Part III.ii.b.

line.[326] Once the draft EIS is issued, a forty-five day public comment period, in which all affected parties can make submissions, would follow.[327] This requirement would facilitate the participation of state and local stakeholders who often possess the greatest knowledge of the potential aesthetic, environmental, and local economic implications of a project. Based on the comments received, FERC would revise its draft and release a final EIS.[328]

Although an agency is not required to abide by the findings of an EIS,[329] the preparation of these reports often motivates agencies to factor environmental implications into their decisions.[330] In addition, the federal courts have the authority to review agency decision-making under the "arbitrary and capricious" standard as established in the Administrative Procedure Act ("APA").[331] While this standard of review is deferential, an agency must reply to objections that raise significant concerns and cannot disregard them on account of administrative convenience or its desired outcome.[332]

As part of preempting state authority over transmission planning, Congress should go beyond the requirements of NEPA and the APA to protect local interests adequately. This would be consistent with recent federal preemption in the energy sector. The safeguards Congress included when it preempted state siting authority over LNG terminals in the EPAct of 2005 would serve as a logical model. The law requires the developer of the proposed terminal to follow a pre-filing process before submitting its application to FERC.[333] In the pre-filing process, the project developer must submit information about the project to FERC and then contact all affected parties and hold open houses where they can offer their opinions on the matter.[334] Because of the requirement to disclose information to FERC and host local open houses, affected parties can offer meaningful input regarding the project at comparatively little cost.[335] In addition to providing a forum for meaningful local participation, the EPAct of 2005 also allows the governors of affected states to appoint an agency, such as the state public utility commission or department of environmental protection, to represent local interests before FERC.[336] This agency has the opportunity, though not the obligation, to file a report within thirty days of the commencement of the formal FERC process.[337] Although FERC has discretion over what submission to credit

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[326] 42 U.S.C. § 4332 (2006).
[327] *Id.*
[328] *Id.*
[329] *Id.*
[330] *See* Michael C. Blumm, *National Environmental Policy Act at Twenty: A Preface*, 20 ENVTL. L. 447, 456 (1990).
[331] 5 U.S.C. § 706(2)(A) (2006).
[332] PPL Wallingford Energy LLC v. FERC, 419 F.3d 1194, 1198 (D.C. Cir. 2005) (citing Canadian Ass'n of Petroleum Producers v. FERC, 254 F.3d 289, 299 (D.C. Cir. 2001)).
[333] 15 U.S.C. § 717b-1 (2006).
[334] 18 C.F.R. § 157.21 (2006).
[335] Lebeck, *supra* note 312, at 252.
[336] 15 U.S.C. § 717b-l.
[337] *Id.*

most, the APA once again places limits on its range of action and prohibits it from disregarding significant pieces of information in its decision-making.[338] Even if the local protections of the LNG siting provisions in the EPAct of 2005 are arguably inadequate,[339] they provide a workable template of balancing local, state, and federal interests on which Congress can build.

Contrary to transmission developers who may view continued state and local involvement in transmission planning as a nuisance, these checks would be a feature rather than a bug of federal siting authority. For federal transmission planning to be a true success, it must feature thorough regulatory processes and include participation rights for all stakeholders. As a practical matter, local participation and acceptance may be essential for a project to be built "because local opposition, in contrast to local authority, cannot be preempted."[340] The local economic, environmental, and health costs associated with transmission development, moreover, can be significant and deserve regulatory attention. FERC should consider these local effects when deciding whether to approve a line and require appropriate mitigation measures such as environmentally sensitive line routing and the installation of wildlife deterrent devices if the project is approved. State and local entities would be able to express their views on transmission projects but would not be able to exercise decision-making authority over them. The local costs that are of most salience to state and local regulators cannot be viewed in isolation though and need to be weighed against the regional benefits of grid upgrades. A well-designed federal preemption statute would recognize the important distinction "between having input and having decision-making powers."[341] By vesting a federal regulator with transmission planning powers, preemption would ensure that the local costs of grid expansions are balanced against the regional and national benefits.[342]

VI. Conclusion

Federal and state initiatives have encouraged new entry, whether by cutting-edge natural gas generation or clean wind turbines, and competition in wholesale electricity markets. The economic and environmental promise of these reforms, however, is contingent on the existence of a robust transmission grid—the physical network for moving power. Due to the history of American electric utilities, the grid in its present form is structured to facilitate power generation and consumption primarily on a local scale rather than over long distances. Under present institutional arrangements, moreover, state regulators have the incentive and ability to block the construction of new transmission facilities. Localities and states exemplify the "tyranny of

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[338] 5 U.S.C. § 706(2)(A) (2006).
[339] *See* Lebeck, *supra* note 312, 266–68.
[340] Ostrow, *supra* note 285, at 291.
[341] Brown & Rossi, *supra* note 8, at 719.
[342] *See* Buchanan & Tullock, *supra* note 282, at 113.

small decisions"[343] and make choices that are narrowly rational but undesirable from a regional, national and, in the case of climate change, global perspective.

To mitigate these parochial tendencies and allow for needed transmission investment to occur, Congress should grant exclusive jurisdiction over transmission planning to the Federal Energy Regulatory Commission. Congressional preemption of local and state authority over transmission development is by no means a panacea to what ails the existing energy economy—it must be implemented together with policies that promote energy efficiency and non-carbon resources. Federal jurisdiction over transmission planning, however, is a necessary pillar of a modern energy policy that envisions regional electricity markets generating affordable, clean, and reliable power.

[343] Alfred E. Kahn, *The Tyranny of Small Decisions: Market Failures, Imperfections, and the Limits of Economics*, 19 KYKLOS 23, 23 (1966).