Reliably Unreliable: The Problems with Piecemeal Federal Transmission and Grid Reliability Policies

Joshua P Fershee, University of North Dakota
POLICY PAPER

July 2011

RELIABLY UNRELIABLE: THE PROBLEMS WITH PIECEMEAL FEDERAL TRANSMISSION AND GRID RELIABILITY POLICIES

Joshua P. Fershee

© 2011 University of Connecticut School of Law, Center for Energy and Environmental Law, all rights reserved.
I. Executive Summary

In the past, electricity was considered a local concern, but over time major portions of the electrical grid have become regional, national, and even international in scope. Electricity regulation has evolved into a complex web of multijurisdictional oversight, and this evolution has created both tensions and opportunities. National legislation and regulation have helped increase reliability, diversify the fuel mix for electricity generation, and create a more open market for electricity. However, national regulation designed to enhance open markets also created opportunities for abuse. In addition, the increasing level of federal oversight has led to conflicts between state and federal entities as the traditional sense of local control over siting and delivery of electricity has been eroded.

A large portion of the current U.S. transmission system is between thirty and fifty years old. As the transmission grid ages, reliability concerns increase; an old grid is simply more likely to fail. Still, new transmission infrastructure is expensive, labor-intensive, and complex. Further, there are significant concerns about whether upgraded and expanded transmission lines are the best way to improve safety and reliability. Certainly, with the advent of microgrids and other technologies, transmission lines are not the sole option. A multi-faceted approach that considers local and regional needs, as well as those of the nation as a whole, is necessary.

There are several areas in need of consideration. Recent federal legislation designed to address transmission siting has been well intended, but limited in scope. Further, recent court decisions have all but eliminated the potential effectiveness of the federal siting authority. In addition, cost allocation issues for new energy facilities have emerged as paramount in the relatively new era of competitive markets for power generation, and these issues have been exacerbated by recent energy policy developments. Finally, policies designed to address public safety and environmental concerns have impeded (or run the risk of impeding) broader policy goals, because the policies are often limited in scope and not part of a comprehensive package then ensures necessary synergies to improve grid reliability.

There is no shortage of effort at the state, regional, and federal levels to improve reliability and safety. Unfortunately, in many cases, the efforts have been competitive
with other energy-related policies (such as climate change initiatives and renewable energy mandates), and jurisdictional conflicts have obstructed, rather than facilitated, many such efforts. It is time for Congress to provide clear authority to someone to make and coordinate changes. A failure to act to preserve and improve the safety and reliability of our electric system would be a costly and avoidable failure. And that is something no one can afford.

II. The Issue: Challenges of our National Transmission Structure

We face a Congress that puts forth an ever-increasing volume of laws in general, and of criminal laws in particular. ... Fuzzy, leave-the-details-to-be-sorted-out-by-the-courts legislation is attractive to the congressman who wants credit for addressing a national problem but does not have the time (or perhaps the votes) to grapple with the nitty gritty.¹

Justice Scalia’s lament about criminal law is just as apt in the energy sector. Electricity was originally considered a local concern, but over time major portions of the electrical grid have become regional, national, and even international in scope. Electricity regulation has evolved into a complex web of multijurisdictional oversight. This evolution has created both tensions and opportunities.

On the opportunity side, national legislation and regulation have helped increase reliability, diversify the fuel mix for electricity generation, and create a more open market for electricity. On the tension side, national regulation designed to enhance open markets also created opportunities for abuse, such as the California Energy Crisis of 2000-01, an electricity shortage caused by utility companies’ price and service manipulations. In addition, the increasing level of federal oversight has led to conflicts between state and federal entities as the traditional sense of local control over siting and delivery of electricity has been eroded.

Once considered a luxury, access to electricity is now plainly a necessity. Demand for electricity continues to increase, both because of an increasing population and an increasing individual demand for power (e.g., cell phones, iPads, etc.). As demand increases, demand on U.S. energy infrastructure increases, posing a significant risk to reliable access to electricity. This is true at every part of the electricity delivery process: generation, transmission, and distribution; all three areas are critical to reliability. Generation is the process through which electric power is converted from another form of energy. New generation facilities are needed to meet increasing demand and to replace outdated or otherwise inadequate plants. In addition, heightened awareness and understanding of environmental and climate change concerns in the energy sector have also led to demand for generation facilities that use cleaner, more sustainable resources to generate power.

Transmission is the process through which electricity is moved across long distances via transmission lines. The system of transmission lines is known as the bulk power system, and the system allows generators to sell their electricity to broader markets over longer distances. Similarly, distribution is the process by which electricity is delivered to the end user of the electricity. Distribution lines are lower voltage lines that bring alternating current power into the home or business. Although generation and distribution are essential parts of electricity delivery, adding transmission resources tends to be the most complex part of the process. That is not to say that new generation facilities and distribution facilities are without controversy, only that transmission has jurisdictional and cost-allocation concerns that are generally less easy to resolve than concerns in the other two areas.

The U.S. transmission grid has long been recognized as needing an upgrade to keep up with increasing demand, ensure grid reliability, and improve security (such as protection from terrorist attack). Reliability concerns are particularly related to congestion and outages, the latter of which can be caused by failures of aging lines and transformers, accidents, or by deliberate terrorist attack (both physical and cyber).

The transmission grid is especially important for Connecticut for a variety of reasons. First, Connecticut, which is part of the Eastern Interconnection, is especially vulnerable to large outages because of multiple transmission constraints, most notably in the southwestern part of the state. Second, as a net exporter of electricity, the transmission grid is a key part the state’s economy. Third, Connecticut has some of the highest electricity rates in the country, and the expanded ability to move power could help reduce the cost for all involved.

Although there is no consensus opinion as to the type, location, or amount of new transmission infrastructure that is necessary, there is a strong sense that significant transmission upgrades are needed in some form. Recognizing this, the United States Congress has tried to support investment in transmission infrastructure to improve and update the “national grid” through a variety of mechanisms, none of which have been especially successful.

It is important to keep in mind that there is, in fact, no such thing as a national U.S. power grid in the true sense. The transmission system in the 48 contiguous states is actually a combination of three separate power grids: (1) the Eastern Interconnected

---

2 U.S. DEP’T OF ENERGY, NATIONAL ELECTRIC TRANSMISSION CONGESTION STUDY 21 (2006) (“[T]he southwest Connecticut area is currently affected by six different transmission constraints.”). Although this congestion study was vacated, see infra, the concerns about transmission constraints remain.


5 Id.
System, (2) the Western Interconnected, and (3) the Texas Interconnected System. These three systems operate largely independently, but there are limited connections. The grid has international connections, as well. To the north, significant parts of Canada are fully interconnected with the Western and Eastern grids. To the south, Texas and the Western power grids have minor connections with Mexico.

A large portion of the current U.S. transmission system is between thirty and fifty years old. As the transmission grid ages, reliability concerns increase, as an old grid is simply more likely to fail. Still, new transmission infrastructure is expensive, labor intensive, and complex. Much like major systems in the home, like heating and air conditioning, there is little interest in replacing systems that are still operational and safe. One of the key challenges is determining the useful life of transmission systems so that reliability is ensured without incurring unnecessary costs.

The North American Electric Reliability Corporation (NERC) is the “nation’s Electric Reliability Organization” (ERO) and serves as the group charged with making such determinations. NERC has existed since 1968 and was certified by Federal Energy Regulatory Commission (FERC) in 2006 as the nation’s first ERO. Consistent with the requirements of the Energy Policy Act of 2005, as the certified ERO, NERC’s reliability standards are mandatory and enforceable. Every year, NERC provides three reports that assess North America’s bulk electric system reliability. NERC describes the reports as follows:

- A Long-Term Reliability Assessment that looks out 10 years, typically issued in the fall
- A Winter Assessment, issued in the late fall, which reports on the reliability outlook for the coming winter season

---

6 Id.
7 Id.
8 Id.
9 Id.
10 Norris & Dennis, supra note 3 at 28.
11 See id.
12 Cf. id.
14 N. Am. Elec. Reliability Corp., Company Overview: History, at http://www.nerc.com/page.php?cid=1711. All NERC guidelines and operations plans were voluntary until NERC was certified as the ERO. Id.
• A Summer Assessment, issued in the spring, which reports on the reliability outlook for the coming summer season.\textsuperscript{17}

NERC’s 2010 Long-Term Reliability Assessment found that “existing transmission systems and planned additions to the system over the next ten years appear generally adequate to reliably meet customer electricity requirements.”\textsuperscript{18} Still, the report noted, in areas where planned system construction has been unable to proceed, because of difficulty siting and permitting transmission projects, there are some reliability concerns.\textsuperscript{19} Further, if planned additions to the system do not occur as scheduled over the next decade, transmission concerns are likely to become more problematic because of the long timeline to bring new transmission projects online.

Transmission issues are also expected to increase reliability concerns in the future as variable generation sources, like wind and solar, continue to increase.\textsuperscript{20} The best sites for large-scale wind and solar projects are often located in remote areas that lack sufficient infrastructure to bring electricity to consumers.\textsuperscript{21} Increased demand and initiatives designed to address climate change concerns (by reducing greenhouse gas emissions) are also factors that increase reliability concerns.\textsuperscript{22} Because of all these issues, the NERC reported that “transmission permitting and siting is considered one of the highest risks facing the electric industry over the next ten years.”\textsuperscript{23}

Congress and regulators mean well. Transmission related legislation and regulation are designed with the intent to be helpful and to facilitate a stronger, more robust grid. Unfortunately, even with the best intentions, recent policies have come up short. At a FERC-sponsored technical conference, an executive from the largest regional transmission organization in the country (PJM Interconnection)\textsuperscript{24} explained:

Today, rather than having the policy of a strong transmission grid, we effectively have a minimalist transmission policy, where transmission almost becomes in most regions of the country an antecedent to generation, and is just largely built to help move local generation to local

\textsuperscript{17} N. AM. ELEC. RELIABILITY CORP., 2010 LONG-TERM RELIABILITY ASSESSMENT 21 (2010).
\textsuperscript{18} Id.
\textsuperscript{19} Id.
\textsuperscript{20} Id.
\textsuperscript{21} N. AM. ELEC. RELIABILITY CORP., RELIABILITY IMPACTS OF CLIMATE-CHANGE INITIATIVES: TECHNOLOGY ASSESSMENT AND SCENARIO DEVELOPMENT 41 (2010).
\textsuperscript{22} N. AM. ELEC. RELIABILITY CORP., supra note 17, at 21.
\textsuperscript{23} Id.
\textsuperscript{24} PJM is a regional transmission organization (RTO) responsible for coordinating “the movement of wholesale electricity in all or parts of 13 states and the District of Columbia.” PJM Interconnection, About Us, at http://pjm.com/about-pjm.aspx.
load. … [W]e really have a transmission system on life support as opposed to that robust system that we want.25

Recent policies designed to improve and enhance the transmission grid have been largely ineffective because, in each case, the lack of a comprehensive plan creates nearly insurmountable hurdles.26 Part III of this paper will discuss problems with legislation designed to address transmission siting. Part IV will consider cost allocation issues and explain how such concerns have been exacerbated by recent energy policy developments. Part V will cover policies designed to address public safety and environmental concerns and explain why current policies may confuse or impede broader public goals. In conclusion, Part VI will argue that a more comprehensive energy package, addressing and linking the policies discussed in Part III-V, is needed to improve grid reliability, reduce environmental harm (including climate concerns), and help control long-term costs.

III. Building Transmission Requires A Building Site

I understand that FERC’s responsibility is to create a national energy grid. But they have gone about it in a way that has alienated almost everyone around them. The idea of turning over such a critical state right—the right to site electric transmission lines—to an agency and process that we believe has served our state very poorly is an outrage and would rightly leave Connecticut citizens fearing the result.27

Federal power to site transmission facilitates is a contentious issue, in large part because states generally oppose any expansion of federal siting authority.28 In 2009, then

26 See Joshua P. Fershee, Misguided Energy: Why Recent Legislative, Regulatory, and Market Initiatives are Insufficient to Improve the U.S. Energy Infrastructure, 44 HARV. J. ON LEGIS. 327, 360 (2007) (stating that the federal transmission siting “process is protracted and inefficient”).
28 See Richard J. Pierce, Jr., Environmental Regulation, Energy, And Market Entry, 15 DUKE ENVT'L. L. & POL’Y F. 167 (2005) (“State parochialism has a devastating effect on the prospects of approval of most proposed transmission capacity expansion projects.”). As Ashley Brown & Jim Rossi note:

There is an obvious irony in the context of the current debate in Congress over whether there should be federal preemption of the states in regard to transmission siting: while much of the states' political opposition to the expansion of federal siting authority focuses on arguments against preemption of local authority, the irony is that states themselves only acquired siting powers by expressly preemting local jurisdictions.”
Connecticut Governor M. Jodi. Rell, quoted above, strongly opposed legislation that proposed to give FERC broader siting authority for transmission lines. Governor Rell issued a release stating that the Clean Renewable Energy and Economic Development Act “would effectively give FERC the power to put electric transmission lines anywhere it desires.”

She said the proposal was “an assault on state’s [sic] rights and threatens the homes and property of millions of Americans.” Opposition from Governor Rell and other states’ rights advocates has been effective. Only modest, but largely insignificant, increases have been made to FERC’s siting authority, and transmission construction still lags behind the need.

Perhaps not surprisingly, one of the main motivations behind support for federal authority related to electricity transmission is what is commonly known as the not-in-my-back-yard (NIMBY) problem. Siting for significant infrastructure of any kind often meets local resistance, whether the proposed project is for electricity, oil and gas, waste disposal, or transportation. Perhaps no sector is more familiar with NIMBY problems than the nuclear sector, which faces enormous hurdles from localities (among others) related to safety concerns.

The NIMBY problem has become so pervasive that some believe the NIMBY problem is now the BANANA problem: Build Absolutely Nothing Anywhere Near Anything (or Anyone). Concerns about transmission siting have become especially problematic since the mid-1990s, and have led to a number of attempted legislative solutions. The most significant recent attempt was part of the Energy Policy Act of 2005, which granted FERC “backstop authority” to site transmission lines in areas the Department of Energy (DOE) identifies as a “national interest electric transmission corridors” (NIETCs).

To facilitate such determinations, the DOE was charged with developing a report in which it would “designate any geographic area experiencing electric energy transmission capacity constraints or congestion that adversely affects consumers as a[n] [NIETC].”

This backstop siting authority allowed FERC to “issue one or more permits for the construction or modification of electric transmission facilities” in limited circumstances, including when the relevant siting authority (usually a state commission) withheld approval of a siting permit for more than one year after the application was filed “or 1 year after the designation of the relevant national interest electric transmission corridor, whichever is later.” FERC could also issue a permit if the siting authority approved the permit application with conditions that rendered the proposed construction


29 Press Release, Governor M. Jodi Rell, supra note 27.
30 Id.
32 Id.
“not economically feasible” or unable to “significantly reduce transmission congestion in interstate commerce.” FERC read this authority broadly, determining that the “withheld approval” language included all failures to approve the application, whether the siting authority failed to act on the application or specifically denied the application.

When challenged in court, FERC argued that Congress specifically intended to provide authority to intervene “in the event of onerous state approvals that scuttle projects in national corridors,” and thus must have intended also allow intervention where state denials led to exactly the same result. The United States Court of Appeals for the Fourth Circuit disagreed, finding that “withheld approval” applied only to cases where a decision on the application was not rendered within one year. This decision significantly undercut the scope of FERC’s federal siting authority by keeping the status quo largely intact by keeping the bulk of transmission siting authority with the states.

The ability to facilitate transmission construction took another blow in February 2011 when the United States Court of Appeals for the Ninth Circuit vacated the Department of Energy’s (DOE’s) NIETC designations. The court determined that DOE did not properly consult with affected states “in conducting the Congestion Study and failed to undertake any environmental study for its NIETC Designation as required by the National Environmental Policy Act (‘NEPA’), 42 U.S.C. § 4332(c).” The Congestion Study was issued in August 2006 and was the basis for the NIETC designations, which represented one of the key transmission-related components of the Energy Policy Act of 2005. The Ninth Circuit ruling functionally eliminated FERC’s ability to site transmission projects using its backstop authority until the Congestion Study is reissued in compliance with the court’s requirements. At this point, FERC has not exercised its backstop siting authority, and its ability to do so has been delayed, if not destroyed.

As such, perhaps the most significant changes resulting from the transmission-related sections of the Energy Policy Act of 2005 are connected to other circumstances in which FERC was granted siting authority in an NIETC: when a state authority lacks the power to approve the siting or when a state lacks the authority to “consider the interstate benefits expected to be achieved by the proposed construction or modification of transmission facilities.” Some states have tried to reduce the risk that FERC would exercise this authority by creating streamlined transmission siting application processes.

---

34 Id.
37 Id. at 315.
39 Cal. Wilderness Coalition v. U.S. Dep’t of Energy, 631 F.3d 1072, 1079 (9th Cir. 2011)
40 Id.
41 Id. at 1080-82.
Unfortunately, this does not mean states will necessarily approve these proposals; it simply means a decision will be finalized one way or the other.

State commissions have broad and varying authority with regard to transmission siting, which can lead to difficulties even when a state might be inclined to grant permission for new transmission construction.\(^4\) Transmission lines often have impacts beyond state boundaries and require coordination among states to ensure optimal performance.\(^4\) Some states support such coordination and interaction among the states, while others specifically restrict consideration of outside impacts.\(^4\) Still other state laws are silent on the issue.\(^4\)

Connecticut has a unique coordination statute because the statute provides limits on the parties who can be involved and specifically refers to transmission.\(^4\) Transmission compacts can be entered by the Department of Public Utility Control (DPUC) with specific states (or any combination thereof): New York, Vermont, Massachusetts, Rhode Island, New Jersey, and Pennsylvania.\(^4\) The Connecticut legislature (the General Assembly) must authorize any such compacts under the statute, and the compact must then be ratified by the United States Congress.\(^4\)

Connecticut thus technically has the ability to enter into agreements to facilitate interstate transmission construction, but it requires the DPUC to reach an agreement with one or more states, have the agreement approved by the state General Assembly, then have the agreement ratified by Congress before the state can do so.\(^4\) While this process increases the likelihood of regional cooperation, and thus could increase the odds of new transmission siting, it is hardly the streamlined siting process envisioned by Energy Policy Act of 2005.

IV. No Free Lunches: Exacerbating Cost Allocation Concerns

Perhaps the most contentious electricity transmission financing issue is cost allocation for new interstate transmission lines—that is, deciding which electricity customers pay how much of the cost of building and operating a new transmission line that crosses several states.\(^5\)


\(^4\) Id. at 2.

\(^4\) Id. at 7-9.

\(^4\) Id. at 7.


\(^4\) Id.

\(^4\) Id.

\(^4\) Id.

\(^5\) STAN MARK KAPLAN & ADAM VANN, CONG. RES. SERVICE, 111TH CONG., REPORT ON ELECTRICITY TRANSMISSION COST ALLOCATION 1 (Apr. 10, 2010).
Another major obstacle to new transmission lines is determining who will pay for the new construction. This determination became more difficult in 1996 following FERC’s Order No. 888, which required that public utilities “functionally unbundle” wholesale generation and transmission services.\footnote{Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities, FERC Order No. 888, 61 Fed. Reg. 21,540, 21,552 (May 10, 1996) [hereinafter Order No. 888]. Functional unbundling means that corporations must separate their generation and transmission activities, but does not require the creation of separate entities for each function. \textit{Joseph P. Tomain & Richard D. Cudahy, Energy Law in a Nutsheill} 277 (2004).} This unbundling order required open and equal access to transmission services for all potential customers, and required utilities to file an open access transmission tariff with FERC.\footnote{Order No. 888, 61 Fed. Reg. at 21,552.} FERC initiated the unbundling rule because it determined that although transmission lines were a “natural monopoly … no wholesale seller of generation has market power in generation from new facilities.”\footnote{\textit{Id.} at 21,549.} Without requiring open access, this natural monopoly allowed the utilities, which controlled access to the transmission lines, to prefer their own electricity to the power from (often cheaper) third parties.\footnote{\textit{See id.} at 21, 546 (“Because many traditional vertically integrated utilities still did not provide open access to third parties and still favored their own generation if and when they provided transmission access to third parties, barriers continued to exist to cheaper, more efficient generation sources.”).} In 1995, FERC thus put forth a Notice of Proposed Rulemaking\footnote{Promoting Wholesale Competition Through Open-Access Non-Discriminatory Transmission Service by Public Utilities and Recovery of Stranded Costs by Public Utilities and Transmitting Utilities, Notice of Proposed Rulemaking and Supplemental Notice of Proposed Rulemaking, 60 Fed. Reg. 17662 (April 7, 1995), FERC Stats. & Regs. 32,514 (1995).} designed “to remove impediments to competition in the wholesale bulk power marketplace and to bring more efficient, lower cost power to the Nation’s electricity consumers.”\footnote{Order No. 888, 61 Fed. Reg. at 21,541.} After a period of public notice and comment, over the course of a year, Order No. 888 emerged.

Therefore, cost allocation issues for transmission projects pre-date Order No. 888. Historically, transmission lines were relatively short, and they were built as part of a single utility’s system. Over time, technology allowed electricity to be transmitted over longer and longer distances, creating interconnections between more utilities, systems, and end users. Although this model is being reconsidered in many circumstances,\footnote{\textit{See infra} Part VI.} a large portion of the bulk power system is currently operating in this way.

In addition, legislation further complicated the calculations by increasing the number of generators needing access to the grid. In the 1970s, the Public Utility Regulatory Policies Act of 1978 (PURPA) required utilities to purchase (at each utility’s
avoided cost) electricity from qualifying facilities (QFs). QFs are independent power producers (IPPs), which are generation facilities not associated with a utility. The Energy Policy Act of 1992 further increased competition in the generation sector by creating a new subset of IPPs: exempt wholesale generators (EWGs). At the time, the addition of EWGs also added significantly to grid traffic because the act required FERC to provide open transmission grid access to approved EWGs.

Despite these issues, such concerns were largely hidden in the bundled costs. Before unbundling was required, cost allocation was considered relatively straightforward, even if it was not as simple as it seemed. As one analysis noted, “the beneficiaries of the transmission service and the customers paying for the services were, in effect, assumed to be the same—the utility’s entire set of captive ratepayers.” This assumption no longer exists today.

Because the increased distances and number of players involved in delivering power, along with the current economic and regulatory environment, the cost allocation process has become especially contentious. In February 2011, a group of senators introduced the Electric Transmission Customer Protection Act (ETCPA) (S. 400), which proposes to amend the Federal Power Act to require that rates for power be assessed in relation to either increased reliability or economic benefit.

The trigger for the ETCPA was a June 2010 FERC Notice of Proposed Rulemaking (NOPR) on Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities. In the NOPR, FERC proposed a cost-allocation methodology that would initially allow transmission providers within each region to determine a cost-allocation model. Regional Transmission Organizations (RTOs) and Independent System Operators (ISOs) would be responsible for developing cost-allocation principles for the regions under their respective charges, as well as across

---

60 Id.
64 KAPLAN & VANN, supra note 51, at 3.
66 Id.
borders. The hope is that the resulting cost-allocation plans will result in more long-distance transmission lines and help support additional renewable energy projects.

The most controversial part of the NOPR is related to FERC’s ability to step in to determine the cost allocation if a region cannot agree on its own cost-allocation plan. Questions about the cost-allocation process continue to be a concern on Capitol Hill, and the ETCPA is designed to ensure that FERC cannot approve rates for new transmission projects “unless the rate or charge is based on an allocation of costs for new transmission facilities that is reasonably proportionate to measurable economic or reliability benefits projected, as determined by the Commission, to accrue to the 1 or more persons that pay the rate or charge.”

FERC Chairman Jon Wellinghoff has responded to letters from five U.S. Senators, the state of California, and the Governor of Maine related to the NOPR and the proposed allocation plans. In a response letter to Senator Bob Corker, Chairman Wellinghoff explained that along “[w]ith the increased regional use of the transmission system came the need to address transmission planning and cost allocation over larger footprints than single utility systems.” Under FERC’s proposed rule, he explained, each region’s transmission providers, “working with their customers and other stakeholders, would determine how to resolve potential differences in state requirements that are selected for inclusion in the transmission planning process.”

In the NOPR, FERC specifically avoided specifying the public policy requirements that any regions had to consider as part of the transmission planning process. Some have noted that a lack of specific policy issues for consideration could lead to conflicting public policies adopted by states in a given region. Chairman Wellinghoff noted, “I expect these differences would be resolved by regional stakeholders during their planning process and not resolved by the Commission.” While it may make sense to provide a single, specific set of issues for all transmission planning, FERC’s option gives more latitude to each state and region. This may be less efficient,

---

67 See id.
70 S. 400, 111th Cong. (2011).
71 Id.
73 Id.
75 Letter from Jon Wellinghoff, supra note 72.
but it hardly indicates any intent on the part of “FERC to run roughshod over state authority,” as Governor Rell feared.\textsuperscript{76}

Cost allocation, and cost generally, quite simply, remains one of the biggest hurdles facing transmission updates and expansions, whether state, regional, or federal efforts are behind the proposal. This is the same hurdle facing virtually every other energy upgrade or evolution. Americans, and many people around the world, support new energy solutions, but they are universally wary of the cost. A June 2010, a \textit{Pew Research/National Journal Congressional Connection} poll found that 87\% of those polled supported requiring ”utilities to produce more energy from renewable sources.”\textsuperscript{77} A substantial majority also supported climate change initiatives, although the bulk of respondents also supported expanding options to increase fossil fuels resources.\textsuperscript{78}

Although Americans have expressed a desire for cleaner energy, they have not expressed a willingness to pay more for it. A \textit{Financial Times/Harris} poll found in October 2010 that “[w]hen those who pay energy bills were asked how much more they would be willing to pay for renewable energy, most people in all countries said either no more or only 5\% more.”\textsuperscript{79} Interestingly, while Americans are often thought of as “less green” than their European counterparts, more people in the United States were willing to pay more than 5\% for clean energy than those polled in Italy, Spain, France, Great Britain, and the United Kingdom.\textsuperscript{80} Still, the numbers are not overwhelming for any group. Australians, too, prefer green energy, with the same caveat: ”So long as it doesn’t cost too much.”\textsuperscript{81}

\section{The Risks of Public Safety and Renewable Energy Policies}

Grid reliability also impacts public safety and the environment in broad and sometimes unexpected ways. The obvious safety issues related to power outages are well recognized. When the power is out, hospitals cannot perform critical functions without backup generation; without refrigeration, food will spoil; traffic lights will not work, etc. But when we think of outages, we usually think of downed power lines or insufficient generation equipment. In today’s world, functioning computer technology is just as significant a concern, and risks of terrorist attack, both cyber and conventional, loom large.

\textsuperscript{76} Press Release, \textit{supra} note 27.
\textsuperscript{78} Id.
\textsuperscript{80} Id.
\textsuperscript{81} \textit{A Preference for Green: So Long as It Doesn’t Cost Too Much}, \textsc{The Economist}, May 26, 2011.
Moreover, environmental harms impact public health and safety, and new policies designed to reduce environmental harm from traditional fuel sources are impacting grid reliability. Poor air quality, climate change, and other concerns related to electricity generation have moved to the forefront of energy policy discussions. The federal government has supported renewable energy generation through various programs, and most states have mandated some level of renewable energy generation. But this support raises other concerns for grid reliability. On the one hand, publicly-supported large-scale renewable energy sources tend to be remote, and often require new transmission lines or add to congestion problems on existing lines. On the other, public support of distributed generation facilities that generate energy near the end user may be attracting both resources and attention away from the important effort of modernizing and expanding our transmission infrastructure. In the effort to promote both remote renewable energy and smaller-scale distributed generation, necessary improvements to our national transmission infrastructure must not be ignored.

a. Protecting the Grid from Virtual World Risks

A relatively new and substantial concern related to grid reliability is the fear of physical and cyber terrorism. FERC has asked Congress for authority to protect the grid from cyber or physical attacks, much as it did in when FERC requested the ability to issue civil penalties to combat market manipulation and uphold tariffs and market rules. 82

As an emerging concern, cyber security could have a significant impact on new transmission infrastructure. There are some in Congress who believe the nation’s greatest security threat is to the electric power grid. In testimony before the House Energy and Commerce Subcommittee, Representative Trent Franks (R-Ariz.), who is a member of the Congressional Electromagnetic Pulse (EMP) Caucus, 83 has said of a national electric grid cyber attack: “The sobering reality is this vulnerability, if left unaddressed, could have grave, societal-altering consequences. … [W]e face a menace that may represent the gravest short term threat to the peace and security of the human family in the world today.” 84

This concern has strong bipartisan support, as demonstrated by four legislative proposals that emerged during the two most recent sessions of Congress, although none

---

to date have become law. This first such proposal was the Grid Reliability and Infrastructure Defense Act (GRID) Act (H.R. 5026), passed by the House of Representatives in June 2010, which would have amended the Federal Power Act such that:

Whenever the President issues and provides to the [Federal Energy Regulatory] Commission (either directly or through the Secretary) a written directive or determination identifying an imminent grid security threat, the Commission may, with or without notice, hearing, or report, issue such orders for emergency measures as are necessary in its judgment to protect the reliability of the bulk-power system or of defense critical electric infrastructure against such threat.85

Although the GRID Act passed the House with strong bipartisan support, it failed to proceed in the Senate. In response to that failure, Representative Franks introduced a more focused bill, H.R. 668, the Secure High-Voltage Infrastructure for Electricity from Lethal Damage (or SHIELD) Act.86 The SHIELD Act proposes only “[t]o amend the Federal Power Act to protect the bulk-power system and electric infrastructure critical to the defense and well-being of the United States against natural and manmade electromagnetic pulse (‘EMP’) threats and vulnerabilities.”87

In addition to the GRID Act (and the subsequent scaled down SHIELD Act currently pending before Congress), the Senate Homeland Security and Government Affairs Committee passed the Protecting Cyberspace as a National Asset Act of 2010 in June of that year.88 The bill proposed an Office of Cyber Policy in the White House and a National Center for Cybersecurity and Communications (NCCC) within the Department of Homeland Security.89 The bill would have also required the NCCC to work with private entities to set cyber security priorities and improve national cyber security defenses for the nation’s most critical infrastructure.90

85 Grid Reliability and Infrastructure Defense Act, H.R. 5026, 111th Cong. (as passed by House, June 9, 2010).
87 Secure High-Voltage Infrastructure for Electricity from Lethal Damage Act, H.R. 668, 112th Cong., (Feb. 11, 2010).
88 Protecting Cyberspace as a National Asset Act of 2010, S. 3480, 111th Cong. (as passed by Senate Homeland Security & Gov’t Affairs Comm., June 24, 2010).
90 See id.
The Cybersecurity Enhancement Act of 2010 passed the House of Representatives in February 2010. The bill did not order direct regulation of cyber security. Rather, the act sought to address several cyber security issues through efforts and recommendations of the National Institute of Standards and Technology and the National Science Foundation.

Lastly, the American Clean Energy Leadership Act was passed out of the Senate Energy and Natural Resources Committee on July 16, 2009. The Act would have amended the Federal Power Act to give FERC the authority to issue emergency orders without notice or hearing when necessary to protect the transmission grid from a “cybersecurity vulnerability,” which are defined as “a weakness or flaw in the design or operation of any programmable electronic device or communication network that exposes critical electric infrastructure to a cyber security threat.” The bill would have also required the NCCC to work with private entities to set cyber security priorities and improve national cyber security defenses for the nation’s most critical infrastructure. The bill would have required the NCCC to work with private entities to set cyber security priorities and improve national cyber security defenses for the nation’s most critical infrastructure. The bill also provided the Secretary of Energy with similar authority if there were an imminent threat to the nation’s electric grid. The Act was similar to the GRID Act, but FERC’s authority would be limited to electric infrastructure operators, and would not require a presidential directive to trigger the agency’s authority.

All of these cyber security bills represented a positive step forward toward improving grid reliability because they addressed a very real threat. Further, they were advanced with bipartisan support, resulting at least in part from their relatively modest costs given the magnitude of the concern. As an example, the Congressional Budget Office said that the GRID Act’s “Statutory Pay-As-You-Go Impact” would have been $0 over the next five years, and would have cost a little less than $7 million per year between 2015 and 2120.

---

92 Id.
93 Id.
95 Id.
96 Id.
97 Id.
98 Id.
99 Id.
Despite the high-risk posed by cyber threats, the relatively low cost of additional protections, and broad, bipartisan appeal, even these cyber security bills have stalled. For example, the House passed the GRID Act unanimously in 2010, but the bill stalled in the Senate, where a number of amendments and debates brought the bill to a halt. Possible reasons that such bills have not passed include industry opposition, alternate views of the level and type of threats posed, and more general political maneuvering. That even these modest bills could not be passed is cause for concern. After all, they were written merely to help keep the current grid up and running; they did not do anything to expand or improve the grid infrastructure. Although debate is healthy, it appears that there is a significant risk that a grid failure, or near failure, will be needed to before more expansive protective measures are taken.

b. The Impact of Promoting Renewable Energy Generation

Increasing concerns about fossil fuels—because of climate change and other environmental impacts, as well as economic concerns—have led to governmental policies promoting clean and renewable energy sources. Such policies have also had an impact on energy infrastructure, particularly transmission. Climate change initiatives and renewable energy mandates tend to increase the need for transmission lines, both in terms of capacity and location. Unfortunately, the enacted climate change and renewable energy policies lack adequate transmission updates as part of those policies. These failures are partly structural and partly political.

The unfortunate reality is that energy policy has a tendency, especially with respect to electricity, to focus on the energy resources rather than the delivery mechanism. That is, policymakers tend to think in terms of how we get more of a particular resource, such as wind or solar, rather than how that power will be delivered to market. NERC has identified this as a significant potential reliability concerns in the context of climate change initiatives: “Policymakers and regulators need to consider the impacts on bulk power system reliability as part of their development of legislation and regulation processes as such analyses are generally not considered by climate scientists or policymakers.”

103 Testimony Before the S. Comm. on Energy and Natural Resources, at 1-2 (May 5, 2011) (Statement of Dr. William Tedeschi, Senior Scientist, Sandia National Laboratories) available at http://energy.senate.gov/public/_files/TedeschiTestimony050511.pdf (stating that high-altitude EMP grid attacks “are of remote likelihood” and that “susceptibility of the power grid to EMP attacks is not well characterized” and should be further researched).
104 See N. AM. ELEC. RELIABILITY CORP., supra note 21, at ii (2010).
105 Id.
This flaw in policymaking is especially clear in the renewable energy area. There is no federal renewable energy mandate, but twenty-nine states and the District of Columbia have passed mandatory renewable portfolio standards (RPSs) to encourage and facilitate new sources of electric generation. These mandates create a guaranteed market for this energy from renewable sources and thus help ensure investment in new generation. Often, though, these renewable resources are remotely located and require new transmission to bring the electricity to market. As such, new generation often means a need for new transmission, but rarely is transmission infrastructure part of the renewable energy mandate.

The Nature Conservancy has called for more careful consideration of how we locate large-scale renewable energy generation facilities, decrying what it terms “energy sprawl.” Energy sprawl is “the phenomenon of the ever-increasing consumption of land” and is defined as the “product of the total quantity of energy produced annually . . . and the land-use intensity of production.”

The energy sprawl problem is not confined to the siting of large-scale renewable energy facilities far from end users. Without careful consideration and analysis, an extra-high voltage (EHV) system—if authorized by policymakers—could also have massive land-use implications and “significant negative long-term impacts.” Accordingly, there are some who oppose an EHV system and support more local distributed generation. As FERC Commissioner Norris & Legal Advisor Jeff Dennis explain:

Proponents of local or distributed generation argue that development of higher-cost EHV transmission lines will impede the development of local generation sources. They contend that once the costs in EHV are sunk and customers are obligated to pay those costs, the higher capacity and lower-cost renewable generation from more remote locations (e.g., wind and solar from areas where those natural resources are more prevalent) that these facilities would deliver will make higher-cost local renewable generation more difficult to develop, harming the ability of local areas to develop and rely on their own resources. Still other proponents of smaller-scale transmission and local generation include owners of higher-cost

---

106 See Fershee, supra note 38, at 1415 (arguing that a national renewable electricity standard would require additional transmission infrastructure to be successful).
108 See Fershee, supra note 106, at 1423.
109 See KAPLAN & VANN, supra note 51, at 10.
110 Robert I. McDonald et al., Energy Sprawl or Energy Efficiency: Climate Policy Impacts on Natural Habitat for the United States of America, 4 PLOS ONE 1, 1 (2009).
111 Sara C. Bronin, Curbing Energy Sprawl with Microgrids, 43 CONN. L. REV. 547, 549 (2010).
112 McDonald et al., supra note 110 at 1.
113 Bronin, supra note 111, at 549, 553.
Such arguments have been effective, to an extent. The alternative to large-scale renewable energy facilities—distributed generation—has attracted significant public support in terms of both resources and attention. Using more localized, distributed generation has merit, and such efforts are often better managed at the state level than are large-scale transmission projects. The economics of distributed generation are such that customer-owned projects are often far more attractive than are utility-owned projects. Further, distributed generation can help reduce the risk of harm from terrorist attack and other outages, as well as “have beneficial effects on land use and needs for rights-of-way for electric transmission and distribution.”

One option for smaller scale responses to support increased demand and improve reliability is the development of microgrids, which link distributed generation resources, using different resources to generate electricity into a “closed, low-voltage system.” That system serves a small group of energy users, such as a city block or part of a neighborhood. These microgrid systems could help reduce energy sprawl likely to accompany large-scale transmission line upgrades, while increasing grid reliability in the process. Despite the promise of microgrid technology, regulatory, economic, and political barriers exist, just as they do for the large-scale transmission construction.

Additional federal efforts have been put in place to help assist in the development of smaller generation facilities. Although siting of smaller generation facilities is largely a state and local issue, there remains a federal role for wholesale sale of electricity that can sometime create hurdles for new projects. FERC has recognized this issue, and has started the process of clarifying and defining the jurisdictional concerns so that states can support and promote new electricity generating facilities without running afoul of federal

---

114 Norris & Dennis, supra note 3 at 6.
115 This is not to say that there are not state-level concerns, but smaller, local lines are designed to serve those in the general area, thus making it more likely those who stand to benefit are in the same community with those bearing the burden.
117 U.S. DEP’T OF ENERGY, THE POTENTIAL BENEFITS OF DISTRIBUTED GENERATION AND THE RATE-
119 Id.
120 Id.
121 Id. at 561-62.
122 Id. at 565-74.
123 See infra Part III.
laws and regulations. As an example, FERC recently clarified how California could implement its feed-in tariff, which is a tariff designed to encourage generation resources from facilities meeting certain efficiency and emissions standards by guaranteeing a purchase price for electricity generated from such facilities under a long-term contract.\textsuperscript{125} The California feed-in tariff requires investor-owned electric utilities in the state to purchase electricity generated by certain combined heat and power (CHP) generators at a price determined by the California Public Utilities Commission (CPUC).\textsuperscript{126}

FERC explained that the feed-in tariff set by the CPUC is not be preempted by the Federal Power Act, the Public Utility Regulatory Policies Act of 1978 (PURPA), or FERC’s regulations “as long as: (1) the CHP generators from which the CPUC is requiring the Joint Utilities to purchase energy and capacity are [qualifying facilities] pursuant to PURPA; and (2) the rate established by the CPUC does not exceed the avoided cost of the purchasing utility.”\textsuperscript{127} FERC thus indicated that state feed-in tariffs remain limited to “avoided cost” rates consistent with PURPA and earlier FERC decisions, but provided flexibility to calculate avoided costs that are expected to permit higher rates in some cases.\textsuperscript{128} Actions such as this can serve to provide more flexibility, as well as more certainty, for proposed distributed generation projects.\textsuperscript{129} In this way, federal action can help facilitate state-level energy projects.

An integrated and concentrated approach to transmission is needed to support any new renewable energy and climate initiatives, and plans already in place need all the help they can get.\textsuperscript{130}

VI. Conclusion: Diversifying the Transmission Portfolio: One Policy, Multiple Approaches

Although NERC has not identified any major reliability concerns for the next ten years, the time frame to determine transmission priorities is not open-ended. If, for example, it was determined that the nation needs an extra-high voltage (EHV) system to move renewable resources long distances and improve reliability, the time to plan is now.\textsuperscript{131} Any EHV project is likely to take ten years to complete, not including the time to agree that such a project is needed.\textsuperscript{132} This large-scale system could help with reliability

\begin{itemize}
  \item \textsuperscript{125} See id.
  \item \textsuperscript{129} Cf. id. at 973 (“States and local governments in the United States are beginning to enact feed-in tariffs despite uncertainty about their authority to do so.”).
  \item \textsuperscript{130} See Fershee, supra note 106, at 1423.
  \item \textsuperscript{131} See Norris & Dennis, supra note 3 at 6.
  \item \textsuperscript{132} Id.
\end{itemize}
and increase competition, as well as provide additional opportunities for renewable-sourced electricity, but it comes with significant costs.\textsuperscript{133}

It is likely that any national solution will involve both large-scale and small-scale options, and one concept does not need to trump the other. A lack of coordination of efforts could lead to construction of excess capacity in certain regions and contribute to energy sprawl. Careful planning and coordination is thus more crucial to successful grid upgrades in many ways than the type of upgrades to be made.

Because development of a fully upgraded and integrated federal transmission system is hardly imminent, parallel regional and state planning should continue and expand. There is evidence that state and regional action can prove fruitful, even if such action has been slow and relatively modest in scope. The value of new transmission lines located in appropriate settings remains clear. ISO-New England, the independent system operator charged with administering wholesale electricity markets in New England indicated that investments in major transmission upgrades in the past few years have lowered congestion and reliability costs by about 80\%—or $100 million.\textsuperscript{134}

Meanwhile, federal authorities have taken modest steps to improving grid reliability. On May 19, FERC approved rate incentives for a number of transmission projects, including the Atlantic Wind Connection.\textsuperscript{135} That project is planned as a 250-mile underwater direct current system that will parallel the Mid-Atlantic coastline to provide 6,000 MW of offshore wind to the PJM Interconnection.\textsuperscript{136} FERC’s active role in providing rate incentives indicates the Commission’s willingness to do all it can to promote new projects. Unfortunately, it also indicates the limited capabilities FERC has to effect that change.

The great concern is that grid improvements will continue forward at the current slow rate until a major disaster strikes. That disaster could take the form of a massive natural catastrophe, a terrorist attack, massive fuel price spikes, computer failures, or some combination of these. The problem is that long lead times for building transmission infrastructure could mean long-term problems for the nation.

The time has come for Congress and state and federal regulators to “grapple with the nitty gritty.”\textsuperscript{137} This means providing power to someone to make something happen, because a failure to act, is a failure. Nowhere is this more evident than in the proposed

\textsuperscript{133} See id.
\textsuperscript{136} Atlantic Grid Operations A LLC, Order on Petition for Declaratory Order, 135 FERC ¶ 61,144, at P 6 (2011).
cyber security bills discussed *infra*. These bills attempted to address a critical concern, but must not be viewed as substitutes for or related to bills designed to facilitate transmission siting and construction or microgrids. Cyber security is a separate, parallel issue, and policymakers must push forward to address cyber reliability concerns at the same time as, and not in lieu of, physical reliability concerns.

As discussed above, there are organizations and individuals at every level working to make improvements—FERC, state commissions, and the ISOs/RTOs, among others. The efforts just have not been especially fruitful. The Southwestern Power Pool perhaps said it best:

> The real benefits of a major transmission project, as part of a robust EHV network, over its useful life will never be fully captured in an economic model as there are many benefits that fall outside the scope of economic modeling. While precise analysis may be desirable, the limitations of such analysis must be acknowledged. Moreover, it is important to recognize that doing nothing also has a cost.\(^{138}\)

> It will cost something to do nothing, and it has cost something to do nothing. Costs are unavoidable. It is time to do something prudent and thoughtful. In this case, a failure to plan could constitute an emergency for all of us.

---