Long-Term Transmission Rights

A HIGH-STAKES DEBATE

The absence of long-term transmission rights could exclude potential competition—and cause higher electricity costs.

By Laurence D. Kirsch

Once upon a time, back in the days of the "traditional regulation" of the electric power industry, one could plunk down a billion dollars on a generation plant and have a pretty good idea of what one would be paying to deliver the power to customers. If one were a transmission owner, the cost of transmission service would depend upon the costs of building and maintaining transmission, which tend to rise over time in a reasonably stable manner. If one were not a transmission owner, one would obtain transmission service from a transmission provider that would be committed to provide service for the life of the generating plant at cost-of-service rates that would, again, rise over time in a reasonably stable manner. In either case, there were the possibilities of transmission service curtailment and of nasty inflationary surprises; but both service quality and prices nonetheless remained fairly stable.

In the new world of locational marginal pricing (LMP), the price of transmission service between generators and loads can bounce around wildly from one hour to the next. For a large power plant, the variability in transmission charges can be in the tens or even hundreds of millions of dollars over the life of the plant. To address such financial risks, the regional transmission organizations (RTOs) that use LMP have introduced various forms of transmission rights that guarantee a stable transmission charge over the lives of the rights. But because the available rights have lives of no greater than one year, they are useless for the purpose of hedging the transmission risks that are faced by an investor in a new generator with a 40-year life. In other words, someone who plunks a billion dollars down on generation plant today will have very little idea what one will be paid for transmission service over the life of the investment.

Although power-industry restructuring has not changed significantly the aggregate uncertainties in the costs of transmission service and generation dispatch, the financial effects of these uncertainties have been redistributed among market participants in ways that, among other things, have created new financial risks for investors in generation. These uncertainties discourage generation investment and ultimately raise the price of electricity to consumers.

Why is it that transmission owners, who offered long-term transmission rights (LTTRs) under traditional regulation, are unable or unwilling to do so in restructured markets? Why is it that, in our new competitive electricity markets, nobody is out there selling, at a profit, the long-term transmission products that some transmission customers surely want?

To address questions like these, the Federal Energy Regulatory Commission (FERC) recently invited "comments on establishing long-term transmission rights in markets with locational pricing."[1] In brief, the comments indicate that restructured markets have been designed so that those who have the ability to build transmission have little incentive to do so. Indeed, the comments of the parties who are most likely to build transmission (*i.e.*, transmission owners) and of the parties responsible for overseeing transmission planning (*i.e.*, the RTOs) indicate that they have little or no interest in addressing the long-term problems created by transmission price uncertainty. The fundamental cause of this disinterest is that electricity markets have been restructured in a way that discourages the parties who are best able to manage long-term transmission price risks from actively doing so.

Are Long-Term Transmission Rights Necessary?

The battle lines are clearly drawn. On one side are transmission-dependent market participants who believe that LTTRs are a necessary component of efficient competitive markets. On the other side are investor-owned utilities, RTOs, and others who believe either that electricity markets have no need for LTTRs, that the markets already have tools equivalent to LTTRs, or that only minor tweaking of market designs is needed to provide the benefits of LTTRs.

The advocates of LTTRs emphasize that LTTRs are needed to encourage efficient generation investment.[2] As stated by the American Public Power Association (APPA):

> No APPA member wants to sink the required high capital costs into a state-of-the-art base load clean coal unit, only in the end to pay natural gas-determined prices for the power because of the imposition of LMP-based transmission congestion charges that cannot be fully hedged on a long-term basis.[3]

Many parties thus regard the absence of LTTRs as a factor that discourages generation entry. They assert that the consequent underinvestment in generation can lead to serious competitive problems, including fostering of market power. As stated by Federal Trade Commission staff:

> Providing potential generation entrants and other market participants with means to manage long-term transmission risk is likely to help develop competitive wholesale electric power markets. In a market economy, entry is a critical factor that contributes to the development of competitive markets. Entry erodes existing market power, provides more customers with products that closely match their preferences, and brings innovations that reduce costs to market. However, efficient entry may be discouraged or delayed by high levels of risk (relative to expected returns) that cannot be managed through long-term supply contracts or other arrangements. Lack of efficient entry may harm consumers through higher prices, less customer choice, and ineffi-

cient production that wastes real resources.[4]

Some advocates of LTTRs see LTTRs as part of the larger need for forward markets and price stability.[5] Such price stability is seen as helping encourage investment in generation and reducing price risk for consumers.

On the other side of the debate are parties who believe that LTTRs are unnecessary for essentially three reasons. First, these parties say that few market participants actually are interested in obtaining LTTRs.[6] For example, referring to the transmission rights that it offers in the form of transmission congestion contracts (TCCs), the New York Independent System Operator says that "the majority of market participants have not indicated great interest in TCCs with a duration beyond two years. … Demand for TCCs of extremely long duration appears to be low."[7]

Second, the opposing parties assert that the transmission rights offered by the RTOs already meet customers' needs, and perhaps already constitute something equivalent to a long-term hedge.[8] For example, the PJM Interconnection believes that, because its annual financial transmission right (FTR) allocations can be renewed indefinitely from one year to the next, "its existing market design generally meets the long term needs of participants"[9] and that certain of its "FTR allocations are the functional equivalent of longer-term ARR/FTR entitlements for existing historic resource deliveries."[10] PJM does concede, however, that its transmission rights regime "meets the long-term needs with respect to existing resources and new transmission resources, but does not necessarily provide for allocation of rights related to new resources and load growth."[11] In other words, an investor in new generation would lack a mechanism for hedging against long-term transmission price risk.

Third, some opponents of LTTRs claim that LTTRs can lead to inefficiencies that harm consumers, including encouraging the exercise of market power by generators.[12]

The opponents of LTTRs argue that regional stakeholder processes will be sufficient to provide any needed improvement in LTTR availability.[13] The arguments for allowing regional differences are that the regions have different system characteristics and state regulatory environments, and that the regions have different customer preferences for how LTTRs should be designed.[14]

The division of opinion on the question of whether LTTRs are needed is more or less a division between "haves" and "have-nots": the "haves" think that LTTRs are either unnecessary or are already available, while the "have-nots" think that LTTRs are essential to efficient competitive markets. In a sense, both groups are right. Market participants with large portfolios of generation assets tend to have geographic diversity that enables them to better manage transmission congestion risk relative to market participants with small portfolios. In addition, vertically integrated market participants have a relatively easier time building new transmission to serve their loads than do transmission-dependent market participants. The combination of these facts means that larger, vertically integrated utilities have less need for hedges against long-term congestion cost risk than do smaller, less integrated market participants.

A key policy question, therefore, is: Are the disadvantages of the smaller market participants attributable to real cost advantages of the larger participants, to the discriminatory practices of the larger transmission-owning participants, or to both cost advantages and discrimination? Do the larger, vertically integrated participants have real economic advantages, such as economies of scale, that naturally make them stronger competitors? Does vertical integration allow the larger firms to subtly discriminate in favor of their own generation resources by (for example) promptly building transmission to serve their own loads and generation while delaying transmission that helps other firms? If the cost advantages of the larger participants are real, then a survival-of-the-fittest policy ultimately will lead to lower costs of electricity. But if the advantages of the larger participants arise from discriminatory access to transmission, then a continuation of current policies—including the absence of LTTRs—will exclude from the market potential competition that could ultimately lead to lower costs of electricity.

Will Physical and Financial Rights Coexist?

In general, transmission-dependent market participants favor physical transmission rights,[15] while transmission owners and RTOs favor financial rights.[16] The basic issue raised by the advocates of physical transmission rights is one of certainty: They believe that physical rights provide a more certain hedge against price uncertainty than do financial rights. According to the Los Angeles Department of Water and Power, "It is only with the contractual security of physical rights that a load serving entity gains sufficient transmission security and has the ability to bring power from its resources home with reliability and price stability."[17] According to the Transmission Agency of Northern California, "In California … transmission users have faced significant volatility and uncertainty in the use of financial rights."[18]

On the other hand, advocates of FTRs claim that financial rights are consistent with efficient power system dispatch, while physical rights can undermine efficient dispatch. For example, ISO New England believes that "physical rights are fundamentally inconsistent with economic dispatch."[19] The Midwest ISO is concerned that "a system of physical rights …

will either result in greater than necessary inefficiencies … or will require the dispatcher to violate certain transmission rights in pursuit of least cost dispatch."[20] National Grid USA expects that "physical rights would undermine the efficient operation of the networked, bulk transmission system and existing financial transmission rights regimes."[21]

As a matter of economic theory, FTRs ideally can provide to transmission customers all of the hedging benefits that would be provided by physical rights; FTRs are fully consistent with economic dispatch, while physical rights can lead to uneconomic dispatch. The question is whether the theoretical strengths of financial rights are actually manifest in a world of imperfect institutions.

Hence, the debate over physical rights is fundamentally a debate about trust: Can financial rights, supposedly renewable from one year to the next, subject to congestion revenue adequacy tests and to rules that may change with evolving market design, be trusted to offer hedges of the same quality that have been offered historically by physical rights?

Who Should Guarantee Transmission Rights?

In the LMP-based RTO markets, RTOs attempt to offer quantities of transmission rights that do not exceed the quantities of power that can be physically delivered by the transmission system. This limitation on the quantity of transmission rights, which the industry refers to as the "simultaneous feasible test" for deliverable power, is logical but not necessary. One can imagine that certain firms could be in the business of speculating on the future costs of congestion, and could offer LTTRs for prices that reflected expected congestion costs plus a risk premium. One can further imagine that these firms could limit their risk by building new transmission when congestion costs became high enough, thus reducing their exposure to congestion costs and increasing power systems' physical capabilities to deliver power. Because transmission owners are already in the business of building new transmission, and because transmission owners historically have offered long-term transmission service, one might also imagine that transmission owners ideally are positioned to offer long-term transmission service in restructured markets.

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But parties on all sides of the transmission rights controversy agree that, because of the creation of RTOs, transmission owners no longer have the authority to control transmission risks. On one side of the debate, APPA notes that "RTO … regimes … all suffer from diffusion of responsibility for transmission planning among the RTO and many member transmission owners (TOs)."[22] On the other side of the debate, the Edison Electric Institute notes that "transmission owners within organized markets have turned over control of their transmission systems to RTOs and ISOs. Transmission owners in these markets lack the tools and authority necessary to take actions to reduce congestion costs."[23]

Southern California Edison says that, "In the past, TOs were able to control their cost risk from congestion through redispatch; however, under an RTO or ISO regime, TOs are no longer the control area operators and thus would not have the ability to manage risk."[24] National Grid USA, which is the sort of transmission-focused firm that ideally would offer long-term rights among its menu of services, explains why neither it nor other transmission owners should want to assume the associated risks:

> In today's RTOs/ISOs, transmission owners do not have the tools or information to manage congestion costs; ownership and operation of the transmission system are split among the RTO/ISO and numerous transmission owners; the ultimate decision of how many financial transmission rights to offer is made by the RTO/ISO—not the individual transmission owners; and transmission owners may be subject to restrictions at the state level that would bar recovery of costs needed to fund shortfalls.[25]

In short, we have created an electricity industry in which transmission firms lack the authority to manage transmission risks, particularly in the long term; and they are consequently unwilling to offer the long-term products that they might offer if they did have such authority. As WPS Resources has put it, "FERC's initiative to develop competitive markets has resulted in the disintegration of vertically integrated entities … so that it currently is unclear who has the transmission obligation to serve and what the obligation means in the current RTO environment."[26]

The question might be raised about whether the RTOs themselves, which bear responsibility for transmission planning, also might bear the risks of offering LTTRs. The Mid-

west ISO denies that this would be appropriate, and instead proposes to pass the buck to transmission owners:

> The RTO/ISO has no ability, nor should it, to manage the risks associated with creating an incorrect quantity of rights. That risk can best be managed (and perhaps only can be managed) by the transmission asset owner.[27]

Other parties similarly note that "RTOs and ISOs should not need to, or aspire to, dabble in the derivative securities business."[28] FTC staff suggest that "private parties have not developed more extensive alternatives whereby transmission customers can mitigate transmission risk in RTO areas… [partly because of] the non-profit status of RTOs."[29]

Because nobody is willing to be in the business of creating transmission rights beyond those supported by existing physical transmission networks, the debate over the responsibility for guaranteeing transmission rights is limited to the narrow question of who pays for any shortfalls in congestion revenues relative to the nominal values of transmission rights. The suggested solutions have included: issuing quantities of transmission rights that are expected to be significantly less than congestion revenues;[30] issuing only short-term transmission rights, so as to minimize potential errors in forecast transmission system capabilities;[31] prorating downward the payments to transmission rights holders when shortfalls occur;[32] and "socializing" the shortfalls by recovering them from all load.[33] This is a debate over how to divide up a pie of a fixed size, rather than over how to make the pie bigger.

How Should the Transmission Rights Pie Be Divided?

The debate over divvying up the pie involves at least three major questions. First, should transmission rights be given away for free ("allocated") to certain transmission customers, or should they be auctioned? Second, if the rights are given away for free, who should be the lucky recipients? Finally, how should transmission rights be allocated among transmission rights of different durations (*e.g.*, short-term versus long-term rights)? The answers to these questions involve assertions about (among other things) the different rights of old versus new customers, the desirability of supporting some generating technologies over other technologies, and the necessity of LTTRs. Midwest Stand-Alone Transmission Cos.—a group of companies with common interests that often join together in filings at FERC—point out the sterility of this debate:

> If an underlying transmission access problem is not corrected, then the award of FTRs of a longer duration has the effect of shifting risk over time among transmission customers and/or market participants. … It would be vastly more desirable to ensure that transmission capacity expands to keep pace with the needs of all customers, rather than merely deciding which entities bear congestion-related risks.[34]

Who Is Responsible for Transmission Investment?

The problem of offering LTTRs is, at its root, a problem of determining how the transmission system will expand over time, how generation can get built in the right places, and who will pay for those investments. Everyone salutes the flag of building more transmission,[35] but there is no consensus about who should be responsible for actually building it nor about how transmission investors should recover the costs of construction.

The fundamental problem is that power industry restructuring has occurred in a fashion that, in most regions, has left a vacuum of responsibility for the long-term management of transmission congestion, particularly for transmission investment. RTOs generally take responsibility for assuring construction of "reliability upgrades" to the transmission system; but they have been reluctant to exercise leadership in the construction of economic upgrades that supposedly can be provided by the market. PJM has been quite forthcoming in admitting the failure of its policy with respect to economic upgrades:

> Our economic planning process has not been successful to date with respect to stimulating independent development of transmission projects. Only five transmission projects have been submitted into the interconnection queue as a direct result of the economic planning process and each represents minimal facility upgrades. In short, while the economic planning process is sending out useful information to developers, the revenue streams and the related level of certainty available through the inter-

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connection process do not appear, at least so far, to be sufficient to promote the development of independent transmission projects. No significant projects have been proposed through the process to date.[36]

PJM understands that, to get the economic upgrades built, it needs to reform its planning process:

> We are approaching a replacement plan for aging transformers as if they were owned and operated by a single company. We are looking to apply a single set of criteria for determining which transformers need to be replaced across the whole market rather than continuing to have each transmission owner address the issue only as to their system. By applying this approach, we can prioritize transformer replacement based on their overall system impacts rather than simply by its impact within a single zone.[37]

This proposed reform is an indictment of the transmission planning processes not only at PJM but at all RTOs. The reform itself clearly is desirable. But the fact that the reform is needed indicates that RTOs presently lack the authority to mandate economic upgrades, and that they cannot require that the most cost-effective upgrades be built first. This lack of authority guarantees that the RTOs are not providing—and cannot provide—least-cost transmission plans.

Where Do We Go From Here?

In response to requirements in Section 219 of the Energy Policy Act of 2005, FERC has initiated a rulemaking[38] on incentive-based transmission rates that are intended to encourage transmission investment. Whether this rulemaking succeeds depends upon whether it successfully addresses the fundamental causes of under-investment in transmission, which certainly include:

a) the division of responsibilities for transmission planning and investment;

b) the incentives for vertically integrated firms to use transmission to favor their own generation and loads; and

c) the endless debate over who should pay for transmission upgrades.

If this rulemaking merely throws money at transmission owners, it likely will have little effect in overcoming the main barriers to transmission investment, which are institutional rather than economic.

The solutions to the problem of managing long-term transmission-price risk lie in institutional reform. One possibility is that we might design markets in ways that give independent transmission firms sufficient authority to both build and manage transmission, and that also provide for cost-recovery mechanisms that will induce these firms to willingly offer LTTRs among their menu of services. With appropriate pricing, these firms could offer LTTRs at an expected profit while giving market participants incentives to make reasonably efficient locational decisions. A second possibility is that we might develop futures markets for electrical energy for a fairly large number of regional locations, not just the handful of locations that are scattered across the nation at present. These futures markets would apply to a long enough duration of years to give generation investors some assurance of the future prices that they would receive for their products; and these prices would, of course, reflect expectations about future transmission congestion.

Without the advent of LTTRs or of long-term locational futures markets, some elements of the future are clear. Referring to transmission price risk and generation investment, the FTC has noted that "when risk is high and cannot be hedged, potential entrants generally need a higher expected profit level (to compensate for the increased risk they bear) before they will enter."[39] This means that, in the absence of sufficient LTTRs or futures markets, the costs to consumers of future generation will be higher than they would otherwise be because generation investors rightly will demand risk premiums to compensate for the uncertain cost of power delivery. F

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ENDNOTES

1. Federal Energy Regulatory Commission, Notice Inviting Comments on Establishing Long Term Transmission Rights in Markets with Locational Pricing, Long Term Transmission Rights in Markets Operated by Regional Transmission Organizations and Independent System Operators, *Docket No. AD05-7-000*, May 11, 2005.
2. See, for example, the Comments of Association of Businesses Advocating Tariff Equity and the Coalition of Midwest Transmission Customers, California Department of Water Resources State Water Project, California Municipal Utilities Association, Sacramento Municipal Utility District, and Transmission Access Policy Study Group. In this and subsequent footnotes, the "Comments" are those filed by various parties, on or about June 27, 2005, in *Docket No. AD05-7-000*.
3. Comment of American Public Power Association, p. 9.
4. Comment of the staff of the Federal Trade Commission, pp. 4-5.
5. Comments of American Public Power Association, p. 19; Electricity Consumers Resource Council and the American Iron and Steel Institute, p. 2 and p. 5.
6. Comment of First Energy Solutions, p. 10 and p. 13.
7. Comment of New York Independent System Operator, p. 2.
8. Comments of American Electric Power, p. 2; and ISO New England, p. 1.
9. Comment of PJM Interconnection, p. 6.
10. *Ibid*., p. 7.
11. *Ibid*., p. 8.
12. Comment of Public Service Commission of New York, p. 2 and p. 5.
13. Comments of Edison Electric Institute, pp. 2-3; New York Independent System Operator, p. 1; *(Cont. on p. 52)*

tive to individuals eligible to retire, as well as to mid-career personnel. In the past, a key retention item was defined pensions. In today's world, with the portable nature of one's 401(k), employees are much more mobile in their thinking.

HR organization survival will require some very unconventional approaches. The HR organizations will need to become less reactive and much more proactive. To fulfill such a mission, they will need to better understand the requirements embedded in the energy bill and have a detailed understanding of corporate strategic objectives for the next 4 to 5 years. The work processes, training systems, reward structure, and HR culture, all will need to be revamped to best manage both the opportunities and the challenges at hand.

We project that the executive leadership and management-level salaries will escalate significantly as the industry competes for the limited talent that will be available. Tomorrow's leaders will need to learn how to manage from afar as the industry consolidates across social and regional boundaries.

To preclude the financial disasters that so defined the Enron era, tomorrow's leaders will need to be well schooled in the nuances of the energy markets. Regional transmission entity leadership will need to do more to hold on to their talent as independent transmission companies form and the volatile world of proprietary energy trading re-emerges. Degreed dispatchers will become the norm as control areas wrestle with the difficult task of managing in real time across vast regional boundaries.

It used to be information technology was all about billing systems and financials. Tomorrow it will be about advanced competitive market models and very complex electric grid contingency analysis.

Utility executives will need to come to terms with the reality that FERC Orders 888, 889, and 2000, in combination with the Energy Policy Act of 2005, will redefine every aspect of the utility industry. The old cliché that "our most important asset is our people" quickly will come home to roost. HR will rise to the top of the priority list as companies struggle to advance their business objectives with half the staff and 40 percent of today's expertise. Those companies that survive will be those who started to address these critical issues two years ago. Throwing money at the problem will not get a company to the finish line. Instead, it will be all about building an integrated strategy that is flexible and strategic, with clearly defined contingencies. F

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(Cont. from p. 41)

Southwest Power Pool Regional State Committee, p. 2.
14. Comments of Coral Power, p. 1; ISO/RTO Council, p. 3 and pp. 6-7; New York Transmission Owners, p. 2; and Tenaska, p. 2.
15. See, for example, the Comments of American Public Power Association, California Department of Water Resources State Water Project, California Municipal Utilities Association, Electricity Consumers Resource Council and the American Iron and Steel Institute, Sacramento Municipal Utility District, Silicon Valley Power, and Southwest Power Pool Regional State Committee.
16. See, for example, the Comments of American Electric Power, DC Energy, Edison Electric Institute, First Energy Solutions, Morgan Stanley, New York Transmission Owners, Pacific Gas and Electric, PJM Interconnection, Reliant Energy, and Southern California Edison.
17. Comment of Los Angeles Department of Water and Power, p. 5.
18. Comment of Transmission Agency of Northern California, p. 4.
19. Comment of ISO New England, p. 20.
20. Comment of the Midwest Independent Transmission System Operator, pp. 5-6.
21. Comment of National Grid USA, p. 1.
22. Comment of American Public Power Association, p. 16.
23. Comment of Edison Electric Institute, p. 6.
24. Comment of Southern California Edison, p. 3.
25. Comment of National Grid USA, pp. 20-21.
26. Comment of WPS Resources, pp. 3-4.
27. Comment of Midwest Independent Transmission System Operator, p. 6.
28. Comment of Silicon Valley Power, p. 16.
29. Comment of the Staff of the Federal Trade Commission, pp. 4-5.
30. Comments of National Grid USA, p. 2; and Pacific Gas and Electric, p. 5.
31. Comment of First Energy Solutions, p. 3.
32. Comments of Edison Electric Institute, p. 9; and Midwest Stand-Alone Transmission Cos., p. 9.
33. Comment of Morgan Stanley, p. 4
34. Comment of Midwest Stand-Alone Transmission Cos., p. 4.
35. See, for example, the Comments of American Electric Power; Electricity Consumers Resource Council (ELCON) and the American Iron and Steel Institute; staff of the Federal Trade Commission; Midwest Stand-Alone Transmission Cos.; National Rural Electric Cooperative Association; Organization of MISO States; Silicon Valley Power; and Southwest Power Pool Regional State Committee.
36. Remarks of Audrey Zibelman, Executive Vice President PJM Interconnection, LLC, *Docket Nos. AD05-5-000 and PL03-1-000*, April 21, 2005, p. 5.
37. *Ibid*., p. 7.
38. Federal Energy Regulatory Commission, Notice of Proposed Rulemaking, Promoting Transmission Investment through Pricing Reform, *Docket No. RM06-4-000*, Nov. 17, 2005.
39. Comment of the staff of the Federal Trade Commission, p. 8.